PREGNANCY INTENTION AND BREASTFEEDING DURATION: 
an analysis of the Oregon PRAMS 2005 dataset

MPH Thesis Presentation
OHSU Department of Public Health & Preventive Medicine
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Presentation Outline

- **Background**
  - Breastfeeding
  - Pregnancy intention (PI)
  - Pregnancy Risk and Monitoring System (PRAMS)
  - Study Objectives

- **Methods**
  - PRAMS sampling and data collection
  - Data analysis
  - Model building
Presentation Outline

- Results
  - Statistics
  - Association between PI and BF
  - Association between other factors and BF
- Discussion
  - Results
  - Defining pregnancy intention (PI)
  - Limitations
- Conclusions
- Future Research
Background: Breastfeeding

- Breast milk: complete, economic, valuable source of infant nutrition
  - Superior immune function
  - Lower post-neonatal mortality
  - Higher cognitive function
  - Mother-infant emotional bond

- Mother benefits
  - Cost savings
  - Health advantages
Background: Breastfeeding

- Breastfeeding trends
  - Generational
  - Geographic
  - Temporal
- AAP recommendations
  - At least 12 months
- Healthy People 2010 recommendations:
  - Immediately postpartum: 75%
  - Six months: 50%
  - One year: 25%
Breastfeeding

![Breastfeeding chart showing percentages of breastfeeding immediately postpartum, six months, and one year for HP 2010, U.S., and Oregon.]
Background: Breastfeeding

- Breastfeeding Definitions
  - Exclusive breastfeeding
  - Nonexclusive

- Time periods of measurement
  - Vary between surveys
    - Initiation: any breastfeeding after birth
    - Duration: 8-10 weeks, 2-3 months, 6 months, 10-12 months

- Many associated risk factors
  - Pregnancy intention
Background: Pregnancy Intention

- **Unintended Pregnancies:**
  - Nearly half (49%) of yearly pregnancies in the U.S.
    - Non-aborted pregnancies lead to unintended births
    - Of these:
      - 2/3 are mistimed
      - 1/3 unwanted

- **Associated with outcomes of:**
  - Less and later prenatal care
  - Higher mortality rate for infants
  - Lower birth weight

- **Healthy People 2010 recommendations:**
  - Decrease prevalence of unintended pregnancies to < 30%
Background: Pregnancy Intention Assessment

- First assessed in 1941
- Currently researched by several large studies:
  - National Survey of Family Growth (NSFG)
  - Pregnancy Risk Assessment Monitoring System (PRAMS)
  - National Longitudinal Survey of Youth (NLSY)
  - Demographic and Health Surveys (DHS)
- Classic categories: **Intended** vs. **Unintended**
  - **Mistimed** included in alternate definitions
Background: Pregnancy Intention Classification

Pregnancy Intention

Unintended

Intended

Unwanted

Mistimed

Intended
Background:
Pregnancy Intention Assessment

- Intended vs. Unintended
  - Imperfect classification
    - Weak predictive power
    - Maternal ambivalence
    - Male partner influence
  - If mistimed women are at less risk than unwanted, could better target breastfeeding resources at smaller group of women
Background: Breastfeeding and Pregnancy Intention

- Research questions:
  - Is an intended infant more likely to be breastfed than an unintended infant?

- Association demonstrated in prior studies
  - Older data sets
  - Lack of important covariates
  - Used populations not consistent with highly prevalent breastfeeding

- No direct comparison of *mistimed* vs. *unwanted*
Background: Literature

- Dye et al. (1997)
  - Mistimed vs. intended
  - East coast population
- Taylor and Cabral (2002)
  - Mistimed vs. intended
  - Alternate pregnancy intention variable formation
- D’Angelo et al. (2004)
  - mistimed vs. unwanted
  - BF initiation, univariate analysis
Background: PRAMS

- PRAMS is a Centers for Disease Control (CDC)-created surveillance system, gathering information on the health of mothers and infants since 1987
  - Includes: breastfeeding, health behaviors, contraception, pregnancy intention
  - Response rates: 65-75%
- Oregon PRAMS is based on CDC-PRAMS
- Administered by the Oregon Department of Human Services
Study Objectives

- Use a 3-category pregnancy intention variable to answer the following research questions with Oregon PRAMS 2005 data:
  
  - What is the association between pregnancy intention and any breastfeeding at eight weeks postpartum?

  - Are unwanted pregnancies less likely than mistimed to breastfeed ≥8 weeks?

  - Could breastfeeding resources be more precisely directed?
Methods: PRAMS Methodology

- Monthly stratified random sample selected from Oregon birth certificates
  - Oversamples: racial minority women, low birth weight whites
    - Analysis weights: (1) sampling, (2) non-response, (3) non-coverage
  - Mail or telephone contact with survey
    - Mothers sampled 2-6 months after giving birth (2000 annually)
      - Second mailing if no response
      - Phone contact, if needed
Methods: Dependent variable (Any breastfeeding at 8 weeks)

- **Breastfeeding:**
  - “Are you still breastfeeding or feeding pumped milk to your new baby?”
  - “How many weeks or months did you breastfeed or pump milk to feed your baby?”

- **Recoded:**
  - Any breastfeeding ≥ 8 weeks postpartum
    - Yes
    - No
Methods: Independent variable
(Pregnancy Intention)

- Pregnancy Intention
  - “Thinking back to just before you got pregnant, how did you feel about becoming pregnant?
    - I wanted to be pregnant sooner
    - I wanted to be pregnant then
    - I wanted to be pregnant later
    - I didn’t want to be pregnant then or at any time in the future
Methods: Independent variable
(Pregnancy Intention)

Pregnancy Intention?

- **Unwanted**: I didn’t want to be pregnant then or at any time in the future
- **Mistimed**: I wanted to be pregnant later
- **Intended**: I wanted to be pregnant then
  - I wanted to be pregnant sooner
Methods: Breastfeeding Risk Factors
(Independent Variables)

- Age
- Maternal education
- Alcohol & tobacco use
- Drug use in pregnancy
- Race/ethnicity
- Maternal parity
- Prenatal care
- Oral health
- Marital status
- Low infant birth weight
- Poverty level
- Domestic violence
- Rural/urban residence
- Postpartum depression
- Parity
- NICU infant admission
Methods: Statistical Analysis

- STATA statistical software
  - For complexity of PRAMS survey weights
    - Calculates weighted multiple logistic regression analysis, correcting standard errors to account for sampling and design effects
- Excluded:
  - Women who did not answer questions on pregnancy intention and/or breastfeeding
Methods: Outline of Analysis

- Identification of potential predictor and confounder variables
- Descriptive analysis: cell counts, correlations, linear associations
- Crude associations with breastfeeding at 8 weeks, cross-tabulations and simple logistic regression
- Multiple regression model building
- Model validation and Comparison
Methods: Model Building

- Variables included in initial full model:
  - Bivariate significance: \( p \leq 0.25 \)

- Backward selection
  - Sequential removal if \( p \geq 0.10 \)
  - Lowest significance removed first
  - Retained if removal changed OR > 10%

- Interactions investigated

- Goodness of fit: `svylogitof` function

- Comparison to STATA automated backward stepwise model
Results: Frequencies

- PRAMS 2005 survey:
  - n = 1915, 68.2% response rate (75.6% weighted)

- Pregnancy intention:
  - Intended: 62.1%
  - Mistimed: 30.4%
  - Unwanted: 7.5%

- Breastfeeding:
  - < 8 weeks: 24.7%
  - ≥ 8 weeks: 75.3%
## Results: Pregnancy Intention

Breastfeeding prevalence at $\geq 8$ weeks by pregnancy intention:

<table>
<thead>
<tr>
<th></th>
<th>Proportion of population</th>
<th>Proportion that breastfed</th>
<th>Unweighted n</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intended</strong></td>
<td>62.1%</td>
<td>81.4%</td>
<td>799</td>
</tr>
<tr>
<td><strong>Mistimed</strong></td>
<td>30.4%</td>
<td>67.5%</td>
<td>383</td>
</tr>
<tr>
<td><strong>Unwanted</strong></td>
<td>7.49%</td>
<td>57.6%</td>
<td>73</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
<td></td>
<td>1,915</td>
</tr>
</tbody>
</table>
Results: Model Building

**Initial full model:**
- Pregnancy intention
- Age
- Education
- Marital status
- Smoking
- Postpartum depression
- Income
- Race/ethnicity
- Domestic Violence
- Dental care
- Low infant birth weight
- Parity

**Final Model**
- Pregnancy intention
- Age
- Education
- Marital status
- Smoking
- Postpartum depression
Results: Multivariate Model

- Final model: 6 predictor variables
- No significant interaction terms
- No evidence of confounding
- Good model fit
  - `svylogitof` F-adjusted test statistic 0.819, p = 0.598
- Comparable to STATA model from automated backward selection
### Results: Breastfeeding & Pregnancy Intention

<table>
<thead>
<tr>
<th>Multivariate analysis</th>
<th>OR</th>
<th>95% C.I.</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mistimed compared to unwanted</td>
<td>1.99</td>
<td>1.00, 3.96</td>
<td>0.049</td>
</tr>
<tr>
<td>Intended compared to unwanted</td>
<td>2.45</td>
<td>1.27, 4.72</td>
<td>0.008</td>
</tr>
<tr>
<td>Intended compared to mistimed</td>
<td>1.23</td>
<td>0.81, 1.86</td>
<td>0.334</td>
</tr>
</tbody>
</table>
**Results: Additional Covariates**

- Significantly associated with breastfeeding ≥8 weeks:

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR (95% C.I.)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-smoking</td>
<td>1.99 (1.19, 3.34)</td>
</tr>
<tr>
<td>Marital status</td>
<td>1.72 (1.15, 2.58)</td>
</tr>
<tr>
<td>Absence of postpartum depression</td>
<td>1.85 (1.10, 3.12)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>referent</td>
</tr>
<tr>
<td>20-24</td>
<td>2.25 (1.20, 4.19)</td>
</tr>
<tr>
<td>25-34</td>
<td>3.45 (1.87, 6.38)</td>
</tr>
<tr>
<td>≥ 35</td>
<td>2.83 (1.27, 6.32)</td>
</tr>
</tbody>
</table>
Discussion: Concordance with Literature

- **Dye et al. (1997)**
  - *Mistimed vs. intended*
  - Breastfeeding intention only
  - East coast population

- **Taylor and Cabral (2002)**
  - *Mistimed vs. intended*
  - First births only, no tobacco adjustment
  - Alternate pregnancy intention variable formation

- **D’Angelo et al. (2004)**
  - *Mistimed vs. unwanted* (OR 1.38, 1.30-1.46)
  - Breastfeeding initiation, univariate analysis only
Mistimed pregnancies are statistically more likely to be breastfed at 8 or more weeks than unwanted pregnancies.

Pregnancy intention overall is significantly associated with any breastfeeding ≥ 8 weeks.

By classifying pregnancies as intended/mistimed/unwanted, resources may be targeted at the most potentially risky: the 7.49% that are unwanted.
**Discussion**

- Despite increasing national trends, effect of pregnancy intention on breastfeeding still relevant.
- Increasing percentage of unwanted pregnancies among U.S. women.
  - Largely occurred among poor, less educated women.
  - Yet Oregon unwanted childbirths decreasing.
Discussion: Pregnancy Intention Definition

- Continually evolving variable
- NSFG quantifies mistiming of pregnancy
  - < 2 years too soon
  - ≥ 2 years too soon
- ‘Wantededness’ vs. Intendedness
  - Unintended pregnancy ≠ unwanted child?
Breastfeeding \( \geq 8 \)w was significantly associated with:

- Age
- Non-smoking
- Lack of postpartum depression
- Marital status

Implies that efforts to increase breastfeeding duration should be focused on young, unmarried, smoking women and those who endorse postpartum depression.
Discussion: Study Strengths

- **PRAMS** as validated, cross-sectional study with wide breadth of known and possible covariates
  - Many previous studies lacking key covariates
  - Current data
- Use of 3-level pregnancy intention variable
  - Directly compared *mistimed* vs. *unwanted pregnancy intention*
- Oregon-specific data
  - More generalizable to Western states
Discussion: Limitations

- Cross-sectional study
  - Only measures association, not risk
- Recall bias and temporality
- Self-reported information
- Modest response rate
- Outcome definition:
  - Breastfeeding $\geq$ 8 weeks analyzed, vs. AAP recommendations of $\geq$ 6 months
  - ‘Any’ vs. ‘Exclusive’ breastfeeding
- Survey non-response
- STATA survey function
  - Not all types of analysis available
Discussion: Limitations continued

- Alcohol
- Similar variables:
  - Education, Income, Age
- Immediately postpartum variables:
  - Proxies for breastfeeding or reverse causation?
- Other potential predictor variables or confounders
  - Medical conditions preventing breastfeeding
  - Illicit substance abuse
Conclusion

- Breastfeeding services should be targeted to the group at greatest potential risk: unwanted pregnancies
- Three-level pregnancy intention variable should be used for future research gathering and policy implications
- Education of public health and pediatric researchers is needed on the meaning and implications of the term, mistimed pregnancy
Future Research

- Study longer durations of breastfeeding
- Better define pregnancy intention
  - Pregnancy wantedness
  - Improving variable reliability, predictability
  - Timing of mistimed
- Does decreasing incidence of unwanted pregnancies within a community correlate with increase in breastfeeding?
- How to effectively address women with mistimed pregnancies?
- Among mistimed pregnancies, does contraceptive access, use, or failure play a significant role in defining pregnancy intention?
Acknowledgments

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