

Women who quit smoking during pregnancy and relapse in the first two years after pregnancy

**Seminar and Defense of the Thesis
of**

Priya Srikanth

April 29, 2009



Introduction

Quitting smoking during pregnancy

- ☞ Maternal smoking – causally associated with adverse health outcomes.
- ☞ Smoking households tend to experience higher levels of food insecurity.
- ☞ Women's behavior during pregnancy influenced by their attitude towards pregnancy.
- ☞ Women participating in WIC had higher prevalence of smoking in the last 3 months of pregnancy.
- ☞ According to the CDC – younger, less educated, non-Hispanic White women smoke during pregnancy compared to their older, more educated counterparts.

Introduction

Effects of smoking during pregnancy

- ☞ Women who smoke during pregnancy are ¹:
 - Twice as likely to experience premature rupture of membranes
 - Twice as likely to experience placenta previa – leading to higher rates of Caesarean section delivery.
 - Higher risk of premature delivery.
- ☞ Babies born to women who smoke during pregnancy are ¹:
 - More likely to be born premature
 - More likely to be of low birth-weight (<2500 gms)
 - 1.4 to 3 times likely to die of SIDS
- ☞ Huge economic burden of hospital/NICU costs for infants associated with maternal smoking during pregnancy ².
 - Hospital cost for non-NICU infant = \$748
 - Hospital cost for NICU infant = \$2,500

1. Preventing smoking and exposure to secondhand smoke before, during, and after pregnancy. (2007). Centers for Disease Control and Prevention. Retrieved from <http://www.cdc.gov/nccdphp/publications/factsheets/Prevention/smoking.htm>

2. Adams, E.K., Miller, V.P., Ernst, C., Nishimura, B.K., Melvin, C., Merritt, R. (2002). Neonatal health care costs related to smoking during pregnancy. *Health Economics*, 11, p193-206.

Introduction

Staying quit, 2 years postpartum

- About half of the women who quit smoking during pregnancy, relapse into smoking, postpartum.
- Evidence suggests that strategies used by women who quit smoking during pregnancy differ from those of non-pregnant quitters and thus resumption of smoking, postpartum, represents the end of a temporary suspension rather than failure to maintain a long-term behavior change.
- Targeting women who quit smoking during pregnancy to help them to stay quit, will be advantageous as these women have already been smoke-free for months and will not have strong nicotine cravings that recent quitters tend to experience.
- Social support, stress and lack of financial resources are some of the risk factors identified thus far.

Introduction

Effects of staying quit, after delivery

- Continued abstinence from smoking, postpartum, reduces women's lifetime risk for smoking-related diseases, such as ¹:
 - lung cancer
 - bladder cancer
 - respiratory symptoms
 - Myocardial infarction
- Also reduces children's exposure to environmental tobacco smoke and its associated health risks, such as ¹:
 - SIDS
 - Ear infections
 - Respiratory illness and asthma
- Subjects first exposed to SHS (Second hand Smoke) between the ages of 0-25 have higher odds of developing lung cancer than those exposed to SHS after the age of 25 ².

1. Levine, M.D., & Marcus, M.D. (2004). Do changes in mood and concerns about weight relate to smoking relapse in the postpartum period? *Archives of Women's Mental Health*, 7, p155-166.

2. Asomaning, K., Miller, D.P., Liu, G., Wain, J.C., Lynch, T.J., Su, L., et al. (2008). Second hand smoke, age of exposure and lung cancer risk. *Lung Cancer*, 61(1), p13-20.

Introduction - PRAMS

- Data are from the 2004 Oregon PRAMS and its 2-year longitudinal follow-up, PRAMS-2.
- Oregon PRAMS is a population-based survey of women who have had a recent live birth. Survey participants are selected from a stratified random sample of the state's birth certificate files.
- In 2004, the Oregon PRAMS survey was administered to 2,814 women. 1,968 women responded with a weighted response rate of 74.8%.

Introduction – PRAMS-2

- ☞ In 2006, Oregon OFH began re-surveying PRAMS respondents whose children were now 24 months old.
- ☞ First group of women re-surveyed were 2004 PRAMS respondents.
- ☞ New survey – PRAMS-2 – includes questions on environmental and behavioral factors of the mother/home related to the health and well-being of the two-year old child.
- ☞ 2006 PRAMS-2 was administered to all mothers who responded to the 2004 PRAMS survey, with the exception of:
 - Those who indicated “Do not contact me again” on the contact/information card included with PRAMS survey
 - Those whose babies were deceased
- ☞ From January – August 2006, PRAMS-2 was only administered by mail.
- ☞ From September 2006 to present, PRAMS-2 is administered by both mail and phone.
- ☞ PRAMS-2 survey sent to 1,935 of the 1,968 2004 PRAMS respondents.
- ☞ 865 women responded to the PRAMS-2 survey.

Introduction – PRAMS-2 Response Rate

- PRAMS is weighted according to maternal race/ethnicity and according to low birth-weight to make it generalizable to the general population.
- The PRAMS-2 data were further weighted to account for the loss to follow-up.
- Calculating PRAMS-2 response rate:
 - $\sum \text{PRAMS weights (of PRAMS-2 responders)} / \sum \text{PRAMS weights (total)} = \underline{51\%}$
- According to CDC:
 - $\sum \text{PRAMS-2 weights} / \sum \text{of PRAMS weights (total)} = \underline{74\%}$
- How does Oregon compare?
 - Colorado (1-14 year olds): 2006 response rate 47%
 - Rhode Island (TWOS): 2006 response rate 48.1%

The story of what we wanted to ask.....

- Availability of longitudinal data – PRAMS-2.

- Smoking information now available for:



- We wanted to ask about risk factors for quitters staying quit: comparing women who quit and stayed quit 2 years postpartum with women who quit and relapsed.

What actually happened....

- Only 2004 cohort data available (2006).
- Very limited sample size
 - 24 women stayed quit, 2 years postpartum
 - 34 relapsed into smoking, 2 years postpartum
- Adequate power to only detect Odds Ratios of 5 or higher.
- Primary outcome:
 - Women who quit smoking during pregnancy
- Some preliminary analysis was done on:
 - Staying quit, 2 years postpartum

Study Rationale

- Health consequences of smoking during pregnancy have long been recognized.
- Not much is known about why some women engage in detrimental behaviors, while others do not.
- While trends in smoking prevalence during pregnancy are known, very little is known about trends in quitting during pregnancy, and staying quit postpartum.
- Relatively easier to target women who quit during pregnancy to help them stay quit postpartum, than to target new “quitters”.

Methods – Identifying study population

- Primary outcome: Women who quit smoking during pregnancy.

- 2004 PRAMS data better to use:
 - 181 women quit smoking during pregnancy
 - 231 women smoked during pregnancy

- COMPARED TO -

- 2006 PRAMS-2 (2004 PRAMS cohort):
 - 68 women quit smoking during pregnancy
 - 85 women smoked during pregnancy.
- Preliminary analysis done on PRAMS-2 respondents, hence, only PRAMS-2 respondents used for this analysis.

Methods – Identifying study population (contd.)

- ☞ PRAMS Q29: Have you smoked at least 100 cigarettes in the past 2 years?
- ☞ PRAMS-2 Q14: Have you smoked at least 100 cigarettes in your entire life?
- ☞ Smoking intensity measured for 3 time points in PRAMS:
 - T1: 3 months before pregnancy
 - T2: Last 3 months of pregnancy
 - T3: 2-6 months postpartum.
- ☞ Smoking intensity measured by:
 - In the (time period) how many cigarettes do you smoke on an average day?
 - Possible responses included:
 - 41 cigarettes or more
 - 21 to 40 cigarettes
 - 11 to 20 cigarettes
 - 6 to 10 cigarettes
 - 1 to 5 cigarettes
 - Less than 1 cigarette
 - None

Methods – Coding of Outcome

- Smoking for each time period dichotomized into:
 - Those reporting “None” as ‘non-smokers’ for that time period
 - All else were coded as ‘smoking’ for that time period
- Primary outcome of interest: Quit smoking: Women who reported smoking before pregnancy (T1), but quit smoking during pregnancy (T2)
- Compared to: Not quit smoking: Women who reported smoking before pregnancy (T1) and continued smoking during pregnancy (T2)

Event (0/1)	Presence of smoking (Yes/No)		No. of women
	T1	T2	
Smoked during pregnancy (0)	Yes	Yes	85
Quit smoking during pregnancy (1)	Yes	No	68

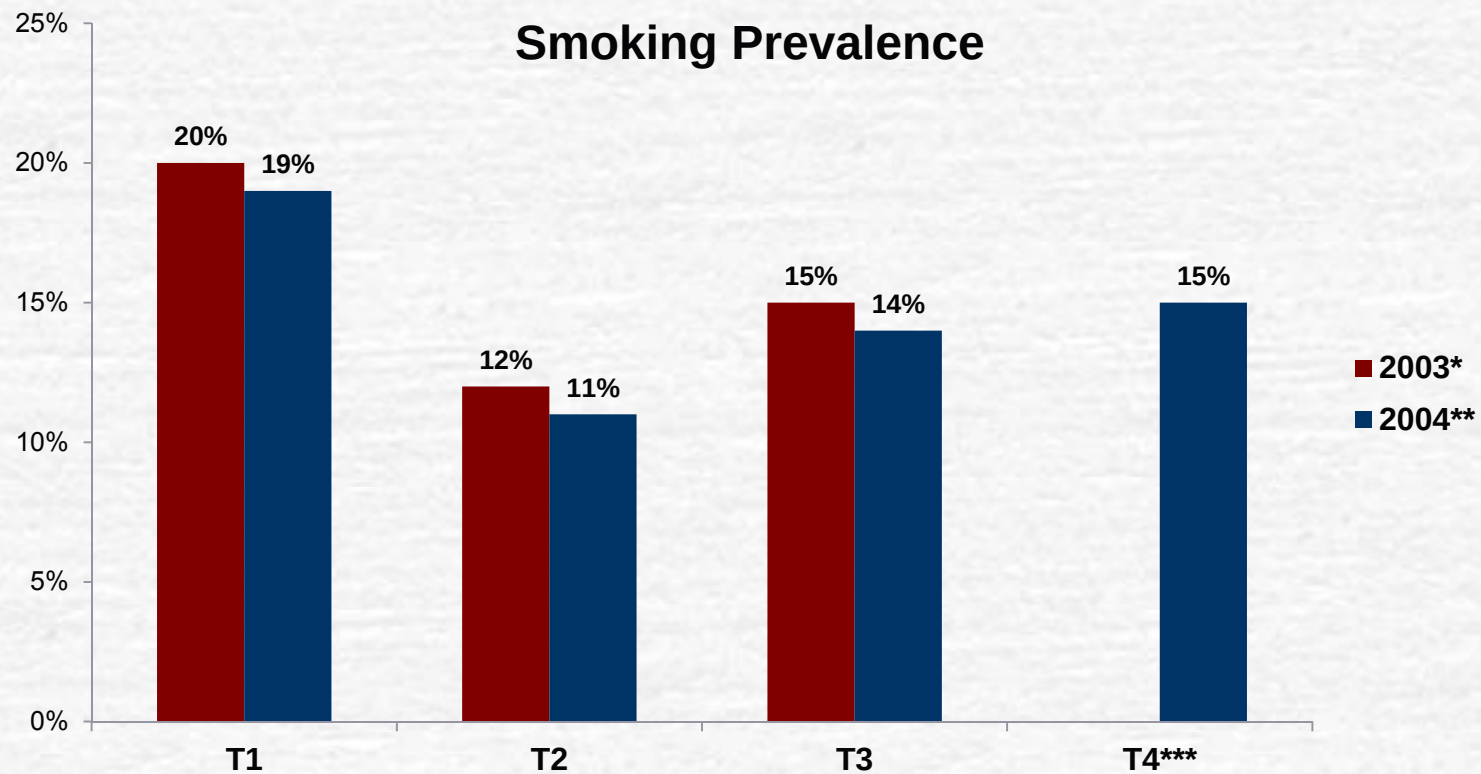
Methods – Possible correlates of quitting smoking during pregnancy

- Possible risk factors were identified from prior literature reviews and some prior studies that used PRAMS data.
- Expected cell counts were examined to ensure adequate cell sizes for inclusion into the model.
- After examining cell counts, most variables dichotomized to ensure sufficient sample sizes.
- Model building conducted in accordance with Hosmer & Lemeshow's model building techniques covered in 'Applied Logistic Regression Analysis'.
- All covariates that were significant in univariate analysis ($p < 0.05$) were eligible for inclusion in the model.
- Other examined covariates that had a p-value of ≤ 0.25 in univariate analysis were also eligible for inclusion.
- Demographics were included in the model to adjust for even if p-value > 0.25 . 15

Results – Demographics of PRAMS-2 respondents

Maternal Characteristic	Unweighted count	Weighted %
Maternal Education		
<12 th /12 th grade	303	37.4%
>12 th grade	557	62.6%
Maternal Age		
<25 years	149	21.7%
>= 25 years	688	78.3%
Marital Status		
All else	216	23.6%
Married	648	76.4%
Annual Household Income		
0-184% FPL	405	49.4%
185% FPL +	405	50.6%
Maternal race/ethnicity		
Non-Whites	474	28.9%
Whites	389	71.1%
Smoked 100 cigarettes in entire life		
No	572	64.6%
Yes	284	35.4%

Results – Smoking Prevalence



*2003 PRAMS respondents

** 2004 PRAMS cohort/2006 PRAMS-2 respondents

*** Only measured for 2006 PRAMS-2 respondents

Results – Univariate Analysis

Quitting smoking during pregnancy

Variable	Unadjusted OR (95% CI)
Maternal Education <12 th /12 th grade >12 th grade	Referent 2.10 (0.70, 6.30)
Marital Status All else Married	Referent 1.68 (0.59, 4.82)
Maternal Age < 25 years >=25 years	Referent 2.02 (0.70, 5.80)
Maternal Race/Ethnicity Non-Whites Whites	Referent 1.02 (0.39, 2.66)
Food insecurity during pregnancy No Yes	Referent 1.39 (0.45, 4.25)
HCW talk about smoking during prenatal visits Yes No	Referent 2.85 (0.68, 11.93)
Annual household income during pregnancy 0-184% FPL >=185% FPL	Referent 3.68 (0.98, 13.79)

Results – Univariate Analysis (contd.)

Variable	Unadjusted OR (95% CI)
Pre-pregnancy smoking intensity Heavy Light	Referent 2.08 (0.71, 6.06)
Intimate Partner Violence (IPV) during pregnancy Yes No	Referent 1.47 (0.33, 6.48)
Stressful Life Events (SLE) during pregnancy ≥1 Event 0 Events	Referent 1.70 (0.37, 7.77)
Pregnancy Intention Unintended Intended	Referent 1.77 (0.61, 5.16)
Depressive Symptoms during pregnancy Yes No	Referent 1.11 (0.36, 3.43)
WIC during pregnancy Yes No	Referent 2.84 (0.87, 9.21)
Maternal pre-pregnancy BMI All else Normal ($18.5 \leq \text{BMI} < 25.0$)	2.49 (0.84, 7.40)

Results – Multivariate Analysis

Variable	Adjusted OR (95% CI)
Maternal Education <12 th /12 th grade >12 th grade	Referent 1.64 (0.35, 7.66)
Marital Status All else Married	Referent 0.89 (0.25, 3.14)
Maternal Age < 25 years >=25 years	Referent 1.60 (0.44, 5.76)
Maternal Race/Ethnicity Non-Whites Whites	Referent 0.82 (0.25, 2.72)
HCW talk about smoking during prenatal visits Yes No	Referent 2.31 (0.41, 12.83)
Annual household income during pregnancy 0-184% FPL >=185% FPL	Referent 2.17 (0.50, 9.42)
Pre-pregnancy smoking intensity Heavy Light	Referent 1.84 (0.54, 6.31)
WIC during pregnancy Yes No	Referent 1.08 (0.29, 4.03)
Maternal pre-pregnancy BMI All else Normal (18.5 <= BMI < 25)	Referent 1.71 (0.54, 5.35)

Manual Stepwise

Characteristic	Stage 9 OR, (p-value)	Stage 8 OR, (p-value)	Stage 7 OR, (p-value)	Stage 6 OR, (p-value)	Stage 5 OR, (p-value)	Stage 4 OR, (p-value)	Stage 3 OR, (p-value)	Stage 2 OR, (p-value)	Stage 1 OR, (p-value)
Annual household income during pregnancy	2.17 (0.30)	2.13 (0.31)	2.08 (0.30)	2.18 (0.27)	2.14 (0.28)	2.17 (0.26)	2.44 (0.21)	2.98 (0.15)	3.68 (0.05)
WIC during pregnancy		1.08 (0.91)	1.07 (0.92)	1.06 (0.92)	1.14 (0.84)	1.22 (0.75)	1.40 (0.60)	1.34 (0.64)	1.64 (0.48)
Pre-pregnancy BMI			1.71 (0.36)	1.69 (0.36)	1.69 (0.36)	1.63 (0.40)	1.72 (0.34)	1.93 (0.25)	1.93 (0.27)
HCW talk about smoking				2.31 (0.34)	2.24 (0.34)	2.23 (0.35)	2.44 (0.30)	2.40 (0.30)	2.28 (0.30)
Maternal education					1.64 (0.53)	1.66 (0.51)	1.66 (0.51)	1.98 (0.34)	1.67 (0.45)
Pre-pregnancy smoking intensity						1.84 (0.33)	1.86 (0.31)	1.86 (0.32)	1.92 (0.29)
Maternal age							1.60 (0.47)	1.61 (0.46)	1.56 (0.49)
Marital status								0.89 (0.86)	0.90 (0.87)
Maternal race/ethnicity									0.82 (0.74)

Discussion

- Our study found that 44.5% of women reported quitting smoking during pregnancy.
- The first study to assess quitting smoking during pregnancy was by Fingerhut et al, using 1986 NHIS data. 39% of women in this survey reported quitting smoking during pregnancy.
- Another study using 1988 NMIHS data found that 56% of women reported quitting smoking for at least 1 week during pregnancy.
- A 2000 study using 1996 PRAMS data from 10 states established quitting smoking during pregnancy at 44.5%.
- A 2003 study using PRAMS data from 10 states between the years 1993-1999 found that 43% of women reported quitting smoking during pregnancy.
- Our study is unique because quitting smoking during pregnancy was assessed among PRAMS-2 respondents. This may be a slight over-estimation because:
 - Women may be less likely to report smoking during pregnancy because of the social stigma attached to smoking during pregnancy
 - Prevalence of smoking at least 100 cigarettes in the past 2 years and those who reported smoking during pregnancy were higher in those lost to follow-up compared to the PRAMS-2²² respondents.

Discussion – (contd.)

- In univariate analysis, annual household income during pregnancy ($p=0.05$) and WIC during pregnancy ($p=0.08$) were marginally associated with quitting smoking during pregnancy.
- These associations did not remain significant in multivariate analysis.
- Other studies have demonstrated significant associations between increasing income and higher levels of education with higher quitting rates
- A Maine study using 10 years of PRAMS data (1988-1997) found that prevalence of smoking during pregnancy was higher among WIC participants.
- Even though we found positive associations between higher annual household incomes, higher maternal education and non-participation of WIC with quitting smoking during pregnancy, these associations were not statistically significant in multivariate analysis.

Public Health Implications

- Identifying characteristics of women who quit smoking during pregnancy enables us to target 'high-risk' groups of women for smoking cessation interventions.
- Able to efficiently use limited resources available for smoking cessation interventions.
- More federal support to programs that help women quit smoking during pregnancy and stay quit (such as the National Partnership for smoke free families). [<http://www.smokefreefamilies.tobacco-cessation.org/>]

Public Health Implications

- Among the PRAMS-2 respondents, 26% of those eligible to participate in WIC (had income of 0-184% FPL) did not participate in WIC during pregnancy.
- Encouraging eligible women to participate in WIC through increased awareness would be advantageous.
- WIC is a prenatal nutrition and health education program serving low-income women and children.
- Thus, WIC can provide opportunities for intervention and follow-up of women who smoke.

Strengths

- ✓ Greatest strength of using PRAMS is its population-based nature.
- ✓ The PRAMS-2 dataset was re-weighted to account for the loss to follow-up and thus the PRAMS-2 also enjoys the overall generalizability that PRAMS provides.
- ✓ Both PRAMS and PRAMS-2 surveys evaluate a variety of measures that could affect smoking behavior before, during and after pregnancy, such as:
 - Stressful Life Events (SLE)
 - Social support
 - Depressive symptoms during pregnancy and postpartum
- ✓ This allowed for examination of a multitude of factors in multivariate analysis.

Strengths – (contd.)

- First use of 2006 PRAMS-2 data.
- Since participants are followed forward in time, temporality of data maintained.
- Study was able to explore demographic distribution of the first year of PRAMS-2 respondents.

Limitations

- ☞ Loss to follow-up.
- ☞ Characteristics of PRAMS-2 respondents versus those lost to follow-up differed by some important demographic characteristics and smoking information.
- ☞ Cross-sectional nature of PRAMS and hence causation cannot be inferred.
- ☞ Study did not have adequate power to detect meaningful shifts with the sample size available.
- ☞ Self-reported smoking status not verified by any biological tests.

Limitations – (contd.)

- Recall bias – smoking for T1, T2 and T3 collected retrospectively at time T3. This may lead to under-reporting of smoking intensity.
- Maternal smoking during pregnancy has a social stigma attached to it, hence may be under-reported.
- Possibility of reporting bias of sensitive topics such as IPV and alcohol consumption during pregnancy, thus underestimating the magnitude of the Odds Ratios.

Back to the story....

- Back to the initial “What we wanted to ask...” question
- Preliminary analysis done to explore characteristics of women who stayed quit, 2 years postpartum (N=24).
- In comparison to women who quit smoking during pregnancy, but relapsed into smoking, 2 years postpartum (N=34).

Methods – Identifying study population

- ✓ PRAMS-2 Q14: Have you smoked at least 100 cigarettes in *your entire life*?
- ✓ For those who answered “Yes” to the above question, smoking intensity measured at a fourth time point (T4).
- ✓ Smoking intensity measured with the following question: How many cigarettes do you smoke on an average day now?
- ✓ Possible responses include:
 - 41 cigarettes or more
 - 21 to 40 cigarettes
 - 11 to 20 cigarettes
 - 6 to 10 cigarettes
 - 1 to 5 cigarettes
 - Less than 1 cigarette
 - None (0 cigarettes)
- ✓ Smoking dichotomized into:
 - Those reporting “None” as ‘non-smokers’ for that time period
 - All else were coded as ‘smoking’ for that time period

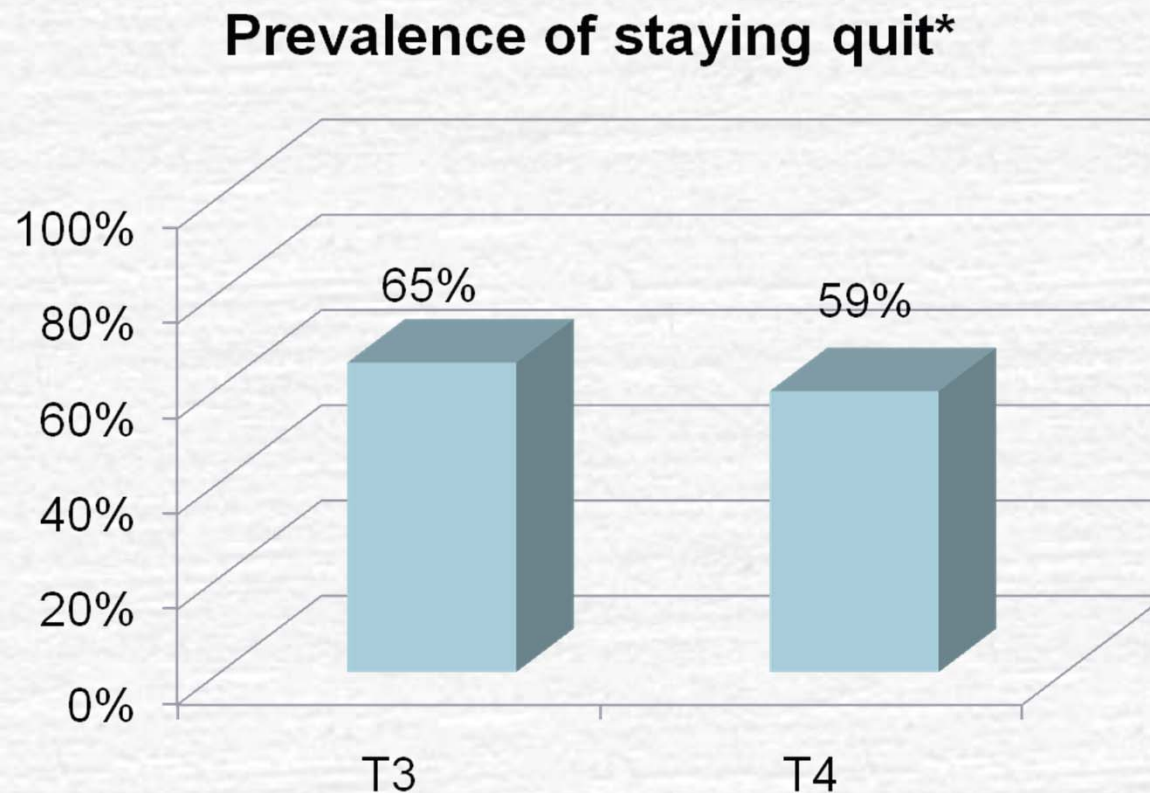
Examining Patterns of Smoking

Presence of Smoking (Yes/No)					
T1	T2	T3	T4	No. of women	Event (0/1)
Yes	Yes	Yes	Yes	69	Persistent Smokers
Yes	Yes	Yes	No	5	Excluded
Yes	Yes	No	Yes	2	Excluded
Yes	Yes	No	No	5	Excluded
Yes	No	Yes	Yes	15	Quit/Relapsed (0)
Yes	No	Yes	No	6	Excluded
Yes	No	No	Yes	19	Quit/Relapsed (0)
Yes	No	No	No	24	Stayed Quit (1)
No	Yes	Yes	Yes	0	Excluded
No	Yes	Yes	No	0	Excluded
No	Yes	No	Yes	0	Excluded
No	Yes	No	No	0	Excluded
No	No	Yes	Yes	3	Excluded
No	No	Yes	No	0	Excluded
No	No	No	Yes	2	Excluded
No	No	No	No	3	Excluded

Methods – Possible correlates of staying quit, 2 years postpartum

- Possible risk factors were identified from prior literature reviews and some prior studies that examined relapse into smoking, 2-6 months postpartum.
- PRAMS variables that were meaningful to consider.
- After examining cell counts, most variables dichotomized to ensure sufficient sample sizes.
- Model building conducted in accordance with Hosmer & Lemeshow's model building techniques covered in 'Applied Logistic Regression Analysis'.
- All covariates that were significant in univariate analysis ($p < 0.05$) were eligible for inclusion in the model.
- Other examined covariates that had a p-value of ≤ 0.25 in univariate analysis were also eligible for inclusion.
- Demographics were included in the model to adjust for even if p-value > 0.25 .

Results – Prevalence of staying quit



*Among those who reported smoking before pregnancy (T1) and quit smoking during pregnancy (T2)

Preliminary Results – Univariate Analysis

Staying quit, 2 years postpartum

Variable	Unadjusted OR (95% CI)
Maternal Education <12 th /12 th grade >12 th grade	Referent 20.33 (3.99, 103.54)
Marital Status All else Married	Referent 1.29 (0.18, 9.05)
Maternal Age < 25 years >=25 years	Referent 8.92 (1.35, 59.03)
Maternal Race/Ethnicity Non-Whites Whites	Referent 2.44 (0.49, 12.19)
Current annual household income 0-184% FPL 185% + FPL	Referent 1.51 (0.25, 9.22)
Food insecurity in the past 12 months Yes No	Referent 1.34 (0.12, 14.57)
People in household who smoke Yes No	Referent 1.72 (0.27, 11.07)

Preliminary Results – Univariate Analysis Staying quit, 2 years postpartum (contd.)

Variable	Unadjusted OR (95% CI)
Pre-pregnancy smoking intensity Heavy (>10 cigarettes) Light (<=10 cigarettes)	Referent 1.25 (0.2, 7.8)
Stressful Life Events (SLE) in the past 12 months ≥1 Event 0 Events	Referent 3.03 (0.34, 27.07)
Postpartum depressive symptoms in the first 12 months No Yes	Referent 1.76 (0.27, 11.30)
Postpartum depressive symptoms in the past 12 months No Yes	Referent 6.73 (1.33, 34.08)
Physical Activity in the past (2-6 months postpartum) ≥5 days a week ≤ 4 days a week	Referent 1.98 (0.17, 23.15)
HCW advised to quit smoking Yes No	Referent 3.68 (0.49, 27.89)
HCW offer help to quit smoking Yes No	Referent 2.92 (0.40, 21.40)
Current BMI All else Normal	Referent 1.24 (0.20, 7.70)

Preliminary Results – Multivariate analysis

Staying quit, 2 years postpartum

Variable	Adjusted OR (95% CI)
Maternal Education <12 th /12 th grade >12 th grade	Referent 13.30 (2.36, 74.87)
Marital Status All else Married	Referent 0.35 (0.02, 5.04)
Maternal Race/Ethnicity Non-Whites Whites	Referent 3.00 (0.23, 38.34)
Maternal Age < 25 years ≥25 years	Referent 3.92 (0.27, 57)
Postpartum depressive symptoms in the past 12 months No Yes	Referent 11.27 (1.83, 69.52)
HCW advice to quit smoking Yes No	Referent 6.53 (0.99, 43.01)

Discussion of preliminary results

- Prevalence of staying quit at 2 years postpartum for 2006 PRAMS-2 respondents is 58.7%.
- Prior studies have established relapse into smoking, 2-6 months postpartum, at 50% or higher (prevalence of staying quit, 50% or lower).
- Prior studies also point out that relapse rates are higher with increasing time after delivery.
- Hence, our estimates for staying quit is most likely an overestimation and the true underlying rate of staying quit, in the population, may be lower than this.

Discussion of preliminary results – (contd.)

- Maternal education and SRPPD (self-reported postpartum depressive symptoms) in the past 12 months were significantly associated with staying quit, 2 years postpartum.
- These associations remained statistically significant after adjusting for other factors of race/ethnicity, maternal education, marital status and HCW advise to quit smoking.
- Women with higher levels of education are more likely to stay quit.
- Women who reported experiencing postpartum depressive symptoms in the past 12 months were also more likely to stay quit.
- Very little research done to find out what the effects of quitting smoking are on those with a history of depressive symptoms.
- Unclear whether smokers with a history of depressive symptoms run the risk of a new depressive episode once they quit smoking.

Public health implications

- ✓ Depression and smoking are co-morbid conditions and should not be treated in isolation from each other.
- ✓ More research on how postpartum depressive symptoms can affect smoking behaviors in new mothers.
- ✓ Continued screening of depressive symptoms and smoking behaviors would be important to learn about this health condition and how it can affect smoking behavior in women.

Future Studies

- We were unable to examine some well-known risk factors for quitting smoking during pregnancy such as pre-pregnancy smoking intensity and depressive symptoms during pregnancy.
- This was a very preliminary analysis examining possible characteristics of women who stayed quit, 2 years postpartum.
- Combining multiple years worth of PRAMS-2 data will enable re-examination of other risk factors such as SLE, social support, pre-pregnancy smoking intensity, people in household who smoke and SRPPD.
- Enhanced understanding of behavioral differences by race/ethnicity necessary to apply population-based interventions.
- Minority race/ethnicity categories may make up small target populations amenable to culturally sensitive smoking cessation interventions.

Challenges

- Longitudinal data arise when participants are measured on the same variable on several different occasions.
- Graphical displays of longitudinal data can then be examined to assist in deciding suitable methods of analysis.
- Not able to truly use methods for longitudinal data here:
 - T1, T2, T3 data collected at a single point in time.
 - T4 – truly longitudinal data point.

Challenges – (contd.)

- Interpreting PRAMS-2 weighted response rate.
- Understanding how PRAMS variables may be used in conjunction with research questions relating to PRAMS-2 time point.

Acknowledgements

- ☞ My thesis committee:
 - Ken Rosenberg, MD, MPH
 - Jodi Lapidus, Phd
 - Elizabeth Adams, Phd, RD
- ☞ My husband – Srikanth Srinivasan
- ☞ My children – Anagha & Krishna
- ☞ Al Sandoval & Tina Kent, DHS
- ☞ Mike Lasarev
- ☞ Fellow students