Survey Fatigue: Investigating the Effects on Response Rates of Repeat Sampling in the PRAMS Non-Hispanic Black Oversample in Three Wisconsin Counties

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Background

- The Wisconsin Division of Public Health received CDC funding for the Pregnancy Risk Assessment Monitoring System (PRAMS) in 2006 and began data collection in 2007.
- In 2011, Wisconsin PRAMS received funding from the Wisconsin Partnership Program for a non-Hispanic black oversample in the four University of Wisconsin-Madison Lifecourse Initiative for Healthy Families (LIHF) counties to inform and evaluate community-based collaboratives' efforts to address racial and ethnic disparities in infant mortality.
- In three of these counties, Wisconsin PRAMS samples 100% of non-Hispanic black mothers.
- Recent declines in response rates in this population may be due in part to survey fatigue among women receiving the PRAMS survey across multiple years of the oversample.

Study Question

Are 2012 response rates lower among non-Hispanic black women in Kenosha, Racine, and Rock counties who also received the survey in 2011 compared to non-Hispanic black women who received the survey in 2012 but not 2011?

Methods

- PRAMS 2011-2012 data were joined to a dataset of linked deliveries to mothers across births in order to identify women repeatedly sampled by PRAMS in the first two years of the 100% oversample.
- The 2011-2012 linked deliveries dataset matches women across deliveries using mother's first name, maiden name, and date of birth.
- PRAMS data were linked to the delivery set using birth certificate numbers, and repeatedly sampled mothers were then identified through duplicate unique IDs from the delivery set.
- Second PRAMS records were then linked to the mother's first PRAMS record using the delivery set unique ID.
- Analysis was restricted to multiparous women resident in the 100% oversample counties for either birth.
- Differences in 2012 response were assessed using Fisher's Exact tests and log binomial regression.
- Data were linked and analyzed using SAS 9.4.

Results

- Overall in Wisconsin, there were 2,695 mothers sampled in 2012. Of these, 71 (2.6%) received surveys in both 2011 and 2012.
- Forty-nine of the 71 repeat mothers were non-Hispanic black mothers resident in Racine, Rock, and Kenosha counties, representing 7.0% of the oversample population in these counties (n=704) and 11.1% of the multiparous oversample population (n=440).

Figure 1. WI PRAMS 2011 and 2012 Response among Repeatedly Sampled Non-Hispanic Black Mothers Resident in Oversample Counties

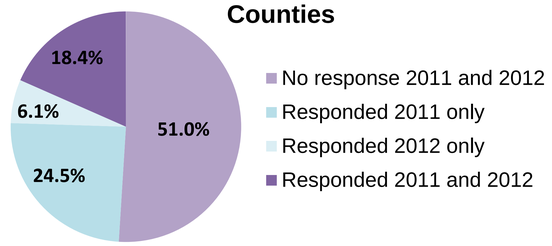

Table 1. Characteristics of Multiparous Non-Hispanic Black Mothers Resident in Oversample Counties in the 2012 WI PRAMS Sample (n=440)

	Repeat (n=49)	Non-repeat (n=391)
2012 Response*		
Respondent	24.5%	50.1%
Non-respondent	75.5%	49.9%
Age*		
<20	10.2%	4.9%
20-24	65.3%	36.6%
25-34	22.5%	49.1%
35+	2.0%	9.5%
Education		
Less than high school	32.7%	22.3%
High school	34.7%	32.5%
At least some college	32.7%	45.3%
Marital status		
Married	10.2%	17.9%
Other	89.8%	82.1%

*Fisher's Exact p-value < 0.05

- Repeat mothers, who tended to be younger than their non-repeat counterparts (see Table 1), had a 2012 response rate of 24.5 percent, which was significantly lower than the non-repeat mothers (50.1%). (see Figure 1)
- In crude log binomial models (see Table 2), multiparous women were 51 percent more likely to not respond to 2012 PRAMS than their non-repeat counterparts.
- Age and education also exhibited association with non-response in crude log binomial models.
- In the model adjusting only for age, the factor associated with both repeat sampling and non-response, the effect of repeat sampling was attenuated but still statistically significant.
- In the adjusted model including age, education, and marital status, repeat sampling did not exhibit a significant effect.

Table 2. Crude and Adjusted Log Binomial Regression Models Predicting WI 2012 PRAMS Non-Response among Multiparous Non-Hispanic Black Mothers Resident in Oversample Counties

	Crude Prevalence Ratios (PR) and 95% Confidence Interval (CI)	Model 1† Adjusted PRs and 95% CI	Model 2‡ Adjusted PRs and 95% CI
Repeatedly Sampled	**1.51 (1.25-1.83)***	**1.27 (1.05-1.54)***	**1.19 (0.98-1.43)**
Age			
<20 years	1.37 (0.80-2.35)	1.29 (0.75-2.21)	1.14 (0.66-1.96)
20-24 years	1.68 (1.12-2.52)*	1.58 (1.05-2.40)*	1.39 (0.92-2.12)
25-34 years	1.10 (0.72-1.68)	1.24 (0.71-1.67)	1.02 (0.67-1.56)
35+ years	Reference	Reference	Reference
Education			
Less than high school	1.54 (1.23-1.93)*	--	1.33 (1.06-1.68)*
High school	1.49 (1.21-1.85)*	--	1.33 (1.08-1.67)*
At least some college	Reference	--	Reference
Marital Status			
Married	Reference	--	Reference
Other	1.38 (1.03-1.85)	--	1.12 (0.83-1.51)

* p-value < 0.05
† Model 1 includes repeat sampling and age
‡ Model 2 includes repeat sampling, age, education, and marital status

Limitations

- Repeat birth over the short time frame of two calendar years is associated with many risk factors for non-response. The presented models control for potential confounding factors such as age, education, and marital status, but there is likely to be residual confounding.
- These results currently reflect the relationship of the 100% non-Hispanic black oversample in the LIHF counties over only two data years of the oversample. More data years are needed to fully investigate the relationship between repeat sampling and declining response rates.
- Although the oversample only began in 2011, there are likely some mothers who were sampled prior to 2011 who were sampled in 2011 and/or 2012.

Conclusions

- Although repeatedly sampled mothers were 51 percent more likely to not respond to PRAMS 2012 than non-repeat mothers in the crude model, after adjustment for age, the magnitude of the relationship between repeat sampling and response decreased to 27 percent.
- After further adjustment for education and marital status, the relationship between repeat sampling and response became non-significant. However, this could be due to small sample size rather than a lack of true association.
- The PRAMS census of non-Hispanic black mothers in the three LIHF counties may result in many of the same women being sampled each year, which could negatively affect response rates.
- Further investigation of the effects of repeated sampling on response rates will be possible as more years of oversample data become available.

Public Health Implications

- If repeat PRAMS sampling of the same mother has a negative effect on response rates, then this will become a larger issue with every year of the 100% non-Hispanic black oversample in Racine, Rock and Kenosha Counties.
- If there is an independent effect of repeated sampling on response rates, then it may be beneficial to match newly sampled PRAMS mothers with previous years' samples and develop targeted messaging for those receiving the survey for the second pregnancy or more in a short time span.
- Alternatively, the sampling fraction in the oversample counties may need to be re-evaluated.

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