BS723 - Spring 2023
Project 2

Background

In response to the nation's continued need to understand and improve the health status of mothers and children, the Food and Drug Administration (FDA), in collaboration with the Centers for Disease Control and Prevention, Office of Women's Health in the Department of Health and Human Services, National Institutes of Health, and the Maternal and Child Health Bureau in the Health Services and Resources Administration, conducted a longitudinal consumer-based research study – the Infant Feeding Practices Study (IFPS). This study collected information from mothers using a series of questionnaires administered from the woman's seventh month of pregnancy through the infant's first year of life. The study provides detailed information about these topics:

- Foods fed to infants, including breast milk and infant formula
- Factors that may contribute to infant feeding practices and to breastfeeding success
- Mothers' intrapartum hospital experiences, sources of support, and postpartum depression
- Mothers' employment status and childcare arrangements
- Infant sleeping arrangements
- Other issues such as food allergies, experiences with breast pumps, and WIC participation
- Diets of pregnant and postpartum women and of a control group

All data except the birth screener data were collected by mail questionnaires. Data were collected from May 2005 through June 2007. Each infant questionnaire was sent over a period of eight months; for example, the prenatal questionnaire was sent every month to different women in May through December 2005. All data are self-reported by the mother; no medical records were examined to confirm infant health, weight, length, or any other characteristic. Sample criteria required that the mother be at least 18 years old at the time of the prenatal questionnaire, that the infant be full or nearly full-term and a singleton, that mother and baby be healthy at birth, and that the infant not have at birth or develop during the first year of life an illness or condition likely to affect feeding.

Breastfeeding is the best source of nutrition for most infants. It can also reduce the risk for certain health conditions for both infants and mothers. Most mothers want to breastfeed but stop early due to a lack of ongoing support. Certain factors make the difference in whether and how long infants are breastfed. The goal of this project will be to determine if a mother's decision to continue to breastfeed after returning to work and the length of time a mother breastfeeds is associated with the following risk factors 1) weeks of paid maternity leave and 2) mother's contribution to household income.

A description of a subset of the data collected in this study has been provided in the dataset **ifps_new.sas7bdat** and can be found on pages 2-3.

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Variable Name	Description	Units/Code
SAMPMIQ	Sample's ID	
INCOME	Household income	0=less than 30,000 USD, 1=30,000 to 99,000 USD, 2=100,000 USD and higher
HH_SIZE	Household size	1-8 (8 standing for ≥8)
MARITAL	Marital status	Married, Widowed, Divorced, Separated, Never Married
MARITAL_NEW	Martial status	Married Never Married
EDUC	Mother's level of education	1=1-7 years grade school 2=8 years of grade school 3=1-3 years of high school 4=High school graduate 5=1-3 years of college 6=College graduate 7=Post graduate
EDUC_NEW	Mother's level of education	Less than high school diploma High school graduate 1-3 years of college College graduate Post graduate
EMPLOY	Mother's Employment Status	1=Works for someone else full-time 2=Temporarily unemployed 3=Self-employed 4=Works for someone else part-time only 5=Retired and not employed 6=Disabled, student, etc and not employed 7=Full-time homemaker
EMPLOY_NEW	Mother's Employment status	Works full-time Unemployed (temporarily, retired, disabled, student, etc.) Self-employed Works for someone else part-time Full-time homemaker
RACE_ETH	Mother's Race/ethnicity	White Black Hispanic Asian/Pacific Islander Other
P3A	Obstetrician gives prenatal care	No Yes
P3B	Family doctor/other physician gives prenatal care	No Yes
P3C	Midwife gives prenatal care	No

		Yes
P3D	Other health care provider gives prenatal care	No Yes
PRENATAL	Did mother receive prenatal care?	No Yes
P7	Mother's weight just before pregnancy (lbs)	80-470
P8FT	Mother's height (just feet)	4-7
P8IN	Mother's height (just inches)	0-11
HEIGHT	Mother's height (in inches)	
BMI	Mother's BMI (kg/m^2)	
P9	Mother's age (years)	18-52
P10	Current average daily cigarettes smoked	0-30
SMOKER	Mother's smokes	Yes No
P12	Did mother have gestational diabetes during pregnancy?	Yes No Don't know/Not sure
P18	Contribution of mother's pay to family income	0=Less than half 1=At least half
P21_1	Weeks of paid maternity leave	0-52
MATLEAVE	Does mother have paid maternity leave?	No Yes
P30	Plan to continue breastfeeding after return to work	Yes No Do Not plaN to work after baby's birth
P31	Number of month's after baby's birth plan to completely stop breastfeeding	0-72
N12A	Mom's doctor's attitude about feeding	Favors breastfeeding only Favors formula feed only Favors mixed formula and breastfeeding No preference Don't know
N31	Mom's feeling about breastfeeding during 1st week	Dislike very much Disliked Neutral Liked Liked very much
N35B	Breastfeeding pain intensity 1st day	0-10 (0=No pain, 10=Worst possible pain, 11=Not applicable)
POSTWIC	Mother or infant participated in WIC postnatally	No Yes

1. Create a library called "proj2" that points to the directory containing the permanent dataset **ifps_new.sas7bdat**. Note you will need to use the statement: `options nofmterr;`

You'll need to apply the same formats the following variables: EDUC_NEW, EMPLOY_NEW, PRENATAL, SMOKER, RACE_ETH, INCOME, MATLEAVE, P18 and POSTWIC that you did in project 1.

Part 1: Association between Length of Time Plan to Breastfeed and Maternity Leave (38 points)

1. a. Conduct the appropriate analysis to determine if there is a statistically association between the length of time the mother plans to breastfeed (outcome) and whether or not the mother has maternity leave (exposure) while adjusting for income, marital_new, educ_new, employ_new, age, smoker, mother's contribution to family income, and participation in WIC. Fill out the results in Table 1. (28 points)

Table 1: Association between Length of Time Plan to Breastfeed and Maternity Leave

Variable	Measure of Effect (95% CI)	P-value
Income		
Less than 30,000 USD (ref)	0.000 (N/A)	N/A
30,000 to 99,000 USD	0.0698 (-0.8260 – 0.9657)	0.8785
100,000 USD and higher	-0.7896 (-2.1504 – 0.5712)	0.2551
Marital status (Married)	0.3479 (-0.4815 – 0.9657)	0.4106
Education status		
Less than high school diploma (ref)	0.0000 (N/A)	N/A
High school graduate	-1.5791 (-4.3641 – 1.2059)	0.2661
1-3 years of college	-0.3735 (-3.0477 – 2.3007)	0.7841
College graduate	0.42098 (-2.3106 – 3.1526)	0.7624
Post graduate	1.0976 (-1.7179 – 3.9132)	0.4444
Employment status		
Works full-time (ref)	0.0000 (N/A)	N/A
Unemployed	0.04944 (-1.4764 – 1.5753)	0.9493
Self-employed	0.3433 (-0.8673 – 1.5538)	0.5780
Works for someone else part-time	0.3901 (-0.4867 – 1.2670)	0.3828
Full-time homemaker	1.5750 (0.4312 – 2.7187)	0.0070
Age	0.0922 (0.0273 – 0.1572)	0.0054
Smoker (yes)	-0.7512 (-1.9551 – 0.4526)	0.2210
Mother's Contribution to Family Income (At least half)	-1.0440 (-1.7420 – (-0.3460))	0.0034
Participation in WIC (yes)	0.2249 (-0.5953 – 1.0450)	0.5907
Maternity Leave (yes)	-0.5485 (-1.2407 – 0.1438)	<.0001

*Values of Less than 30,000 USD, Not Married, Less than high school diploma, Works full-time, Less than half and No are references groups

b. Interpret the results from Table 1. Which predictors show a significant association? Interpret the measures of effect for all statistically significant variables. (5 points)

Mothers who were identified to be full-time homemaker were found to have a significant association with length of time the mother plans to breastfeed (p-value = 0.0070). On average, mothers that were full-time homemakers were observed to have a 1.5750 increase in length of time the mother plans to breastfeed (95% CI: 0.4312, 2.7187). The mother's age was observed to have a significant association with the length of time the mother plans to breastfeed (p-value = 0.0054). On average, as the mother's age increased, the length of time the mother plans to breastfeed increased by 0.0922 units (95% CI: 0.0273, 0.1572). Mothers who were identified to contribute at least half of the family income were observed to have a significant association with the length of time the mother plans to breastfeed (p-value = 0.0034). On average, mothers who contributed to at least half to the family income were observed to have -1.0440 units decrease in the length of time the mother plans to breastfeed (95% CI: -1.7420, -0.3460). There was a significant association between mothers who received maternity leave and the length of time the mother plans to breastfeed (p-value <0.0001). On average, mothers who received maternity leave were observed to have a -0.5485 units decrease in the length of time the mother plans to breastfeed (95% CI: -1.2407, 0.1438).

c. Does it appear that income, marital_new, educ_new, employ_new, age, smoker, mother's contribution to family income, and participation in WIC jointly confounding the association between the length of time a mother plans to breastfeed and whether or not they receive maternity leave? Justify your response. (5 points)

(Adjusted – crude)/Adjusted

$$\left|\frac{(-0.548471384 - (-0.53529))}{-0.548471384}\right| * 100\% = 2.4\%$$

Income, marital status education, employment status, age, smoker status, mother's contribution to family income, and participation in WIC do not jointly confound the association between the length of time a mother plans to breastfeed and whether or not they receive maternity leave as there was not a large change in β estimates for maternity leave by >10% (2.4%).

Part 2: Association between Planning to Continue Breastfeeding after Returning to Work to Breastfeed and Maternity Leave (33 points)
   2. a. For this analysis remove mothers who do not plan to work after the baby's birth.
      b. Conduct the appropriate analysis to determine if there is a statistically association between planning to continue breastfeed after returning to work (outcome) and whether or not the mother receives maternity leave (exposure) while adjusting for income, marital_new, employ_new, race/ethnicity, BMI, age, mother's contribution to family income and number of months mother plans on breastfeeding. Fill out the results in Table 2. (28 points)

Table 2: Association between Planning to Continue Breastfeeding after Returning to Work to Breastfeed and Maternity Leave

Variable	Measure of Effect (95% CI)	P-value
Income		
Less than 30,000 USD (ref)	N/A	N/A
30,000 to 99,000 USD	0.721 (0.383 – 1.359)	0.312
100,000 USD and higher	0.641 (0.254 – 1.618)	0.347
Marital status (Married)	1.203 (0.680 – 2.129)	0.526
Employment status		
Works full-time (ref)	N/A	N/A
Unemployed	0.800 (0.283 – 2.259)	0.673
Self-employed	0.787 (0.287 – 2.157)	0.642
Works for someone else part-time	0.915 (0.475 – 1.764)	0.791
Full-time homemaker	1.048 (0.373 – 2.943)	0.929
Race/Ethnicity		
White(ref)	N/A	N/A
Black	0.811 (0.324 – 2.033)	0.655
Hispanic	0.635 (0.292 – 1.381)	0.252
Asian/Pacific Islander	1.144 (0.262 – 4.998)	0.858
Other	1.887 (0.266 – 13.404)	0.526
Age	0.970 (0.926 – 1.016)	0.193
Maternity Leave (yes)	0.576 (0.349 – 0.950)	0.031
Mother's Contribution to Family Income (At least half)	0.918 (0.546 – 1.544)	0.748
Number of Months Plan on Breastfeeding	2.152 (1.920 – 2.412)	<0.0001

*Values of Less than 30,000 USD, Not Married, Less than high school diploma, Works full-time, Less than half and No are references groups

b. Interpret the results from Table 2. Which predictors show a significant association? (5 points)

Mothers who were identified to receive maternity leave were 0.576 times the odds of continuing to breastfeed after returning to work in comparison to those who did not receive maternity leave, adjusted for income, marital status, employment status, race/ethnicity, age, mother's contribution to family income, and number of months mother plans to breastfeed (p-value = 0.031, 95% CI: 0.349 – 0.950). For the number of months planned on breastfeeding mothers were 2.152 times the odds of continuing to breastfeed after returning to work in comparison to mothers who did not, adjusted for income, marital status, employment status, race/ethnicity, age, mother's contribution to family income, and maternity leave (p-value <0.0001, 95% CI: 1.920 – 2.412).

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Part 3: Marital Status as an Effect Modifier (16 points)
Conduct the appropriate analysis to determine if marital status is an effect modifier on the effect of maternity leave on length of time the mother was planning to breastfeed and planning to continue breastfeeding after returning to work. Fill out the results in Table 3a. (11 points)

Table 3a: Effect of Maternity Leave Stratified by Marital Status

Outcomes	Married	Not Married	Pvalue**
	Effect Measure (95% CI)*	Effect Measure (95% CI)*	
Length of Time Plan to Breastfeed	-0.6866 (-1.4764 – 0.1032)	-0.0579 (-1.5230 – 1.4071)	0.4906
Plan to Continue Breastfeeding¥	0.564 (0.319 - 0.999)	0.545 (0.158 - 1.882)	0.7726

*Adjust for the same characteristics in Tables 1 and 2.
** P-value for the interaction between term between marital status and maternity leave after adjusting for the same characteristics in Tables 1 and 2.
¥ for the Plan to Continue breastfeeding analysis ONLY, remove mothers who do not plan to work after the baby's birth.

Is marital status an effect modifier when examining the effect of maternity leave on maternity leave on length of time the mother was planning to breastfeed and planning to continue breastfeeding after returning to work? Justify your response. (5 points)

We fail to reject the null hypothesis as there is evidence of no linear association between the interaction of length of time the mother planned to breastfeed and maternity leave, controlling for marital status (β_1 =-0.6866, 95% CI: -1.4764 – 0.1032 vs. β_2 = -0.0579, 95% CI: -1.5230 – 1.4071, p-value = 0.4906).

We fail to reject the null hypothesis as there is evidence of no association between the interaction of the mother's plan to continue breastfeeding and maternity leave, controlling for marital status (OR_1 = 0.564, 95% CI: 0.319 - 0.999 vs. OR_2 = 0.545, 95% CI: 0.158 - 1.882, p-value = 0.7726).

Standard Guidelines for Writing your Report (13 points)
The format of the report should be similar to a journal article. The report should have a brief introduction/background, methods, results, discussion and conclusion sections. Excluding tables and SAS code the written report should be no longer than 2 pages.
Introduction/Background: Briefly describe the background of the problem, the study and dataset and what you are address with your analyses in the report. (3 points)
Methods: Describe the data and how you analyzed it. Do not give specific SAS procedures (i.e. the general public may not know what PROC GLM means). Do not list all of the analyses that you did for each variable. (5 points)
Results/Discussion: Report findings that relate to the objective of the study. This is where most of your tables and figures (as applicable) should appear. Provide captions (titles) for all your tables and figures. Summarize the key findings and important associations that you have observed. Merely presenting the number in the tables is not enough. This is where you would

report pvalues, confidence intervals and any other results from statistical tests. Let your tables and figures present all of the results and simply refer to the tables and highlight significant results they contain in the text. Do not report every pvalue of results in the test, only those that are of interest. Discuss overarching questions that arose during the course of the study. Comment upon interesting findings. Discuss benefits and drawbacks of the current study. (87 points)
Conclusion: Briefly summarize your results and their implications. (2 points)
Appendix: SAS code. (3 points)
NOTE: None of the analyses in this project should be done by hand.

Background:

The Infant Feeding Practices Study (IFPS) is a longitudinal research study conducted by the FDA, in collaboration with other organizations such as the CDC, to improve the health status of mothers and children. The study collected data through a series of questionnaires administered to mothers from their seventh month of pregnancy through the infant's first year of life. The study provides detailed information on infant feeding practices, maternal health, employment status, educational achievement, etc. The dataset includes information on the foods fed to infants, factors that contribute to breastfeeding success, maternal experiences during childbirth, sources of support, and postpartum depression, among other topics. The goal of this project is to determine if a mother's decision to continue to breastfeed after returning to work and the length of time a mother breastfeeds is associated with paid maternity leave and the mother's contribution to household income. This analysis will help identify factors that impact breastfeeding duration and inform organizations in how to best devise policies that will help support mothers who breastfeed.

Methods:

Several different statistical models were used to observe the association of a variety of different variables. The first of these statistical models was a multivariable linear regression model to observe the association between the length of time the mother plans to breastfeed and maternity leave, adjusting for external factors such as income, educational achievement, marital status, employment status, smoker status, age, maternity leave, the mother's contribution to the family income, and participation in the WIC program. The second statistical model conducted was a multivariable logistic regression model to observe the association between the mother planning to continue breastfeeding after returning to work and maternity leave, adjusting for income, marital status, employment status, race/ethnicity, mother's BMI, age, mother's contribution to family income, and number of months mother plans on breastfeeding. The last of the statistical models conducted were a mix of multivariable linear and logistic regression models to observe if marital status was an effect measure modifier on length of time the mother was planning to breastfeed and planning to continue breastfeeding after returning to work.

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Results/Discussion:

Table 1: Association between Length of Time Plan to Breastfeed and Maternity Leave

Variable	Measure of Effect (95% CI)	P-value
Income		
Less than 30,000 USD (ref)	0.000 (N/A)	N/A
30,000 to 99,000 USD	0.0698 (-0.8260 – 0.9657)	0.8785
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Marital status (Married)	0.3479 (-0.4815 – 0.9657)	0.4106
Education status		
Less than high school diploma (ref)	0.0000 (N/A)	N/A
High school graduate	-1.5791 (-4.3641 – 1.2059)	0.2661
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Employment status		
Works full-time (ref)	0.0000 (N/A)	N/A
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Smoker (yes)	-0.7512 (-1.9551 – 0.4526)	0.2210
Mother's Contribution to Family Income (At least half)	-1.0440 (-1.7420 – (-0.3460))	0.0034
Participation in WIC (yes)	0.2249 (-0.5953 – 1.0450)	0.5907
Maternity Leave (yes)	-0.5485 (-1.2407 – 0.1438)	<.0001

*Values of Less than 30,000 USD, Not Married, Less than high school diploma, Works full-time, Less than half and No are used as references groups.

According to Table 1, mothers who were identified to be full-time homemaker were found to have a significant association with length of time the mother plans to breastfeed (p-value = 0.0070). On average, mothers that were full-time homemakers were observed to have a 1.5750 increase in length of time the mother plans to breastfeed (95% CI: 0.4312, 2.7187). The mother's age was observed to have a significant association with the length of time the mother plans to breastfeed (p-value = 0.0054). On average, as the mother's age increased, the length of time the mother plans to breastfeed increased by 0.0922 units (95% CI: 0.0273, 0.1572). Mothers who were identified to contribute at least half of the family income were observed to have a significant association with the length of time the mother plans to breastfeed (p-value = 0.0034). On average, mothers who contributed to at least half to the family income were observed to have -1.0440 units decrease in the length of time the mother plans to breastfeed (95% CI: -1.7420, -0.3460). There was a significant association between mothers who received maternity leave and the length of time the mother plans to breastfeed (p-value <0.0001). On average, mothers who received maternity leave were observed to have -0.5485 units decrease in the length of time the mother plans to breastfeed (95% CI: -1.2407, 0.1438).

Table 2: Association between Planning to Continue Breastfeeding after Returning to Work to Breastfeed and Maternity Leave

Variable	Measure of Effect (95% CI)	P-value
Income		
Less than 30,000 USD (ref)	N/A	N/A
30,000 to 99,000 USD	0.721 (0.383 – 1.359)	0.312
100,000 USD and higher	0.641 (0.254 – 1.618)	0.347
Marital status (Married)	1.203 (0.680 – 2.129)	0.526
Employment status		
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Hispanic	0.635 (0.292 – 1.381)	0.252
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Other	1.887 (0.266 – 13.404)	0.526
Age	0.970 (0.926 – 1.016)	0.193
Maternity Leave (yes)	0.576 (0.349 – 0.950)	0.031
Mother's Contribution to Family Income (At least half)	0.918 (0.546 – 1.544)	0.748
Number of Months Plan on Breastfeeding	2.152 (1.920 – 2.412)	<0.0001

*Values of Less than 30,000 USD, Not Married, Less than high school diploma, Works full-time, Less than half and No are used as references groups.

According to Table 2, mothers who were identified to receive maternity leave were 0.576 times the odds of continuing to breastfeed after returning to work in comparison to those who did not receive maternity leave, adjusted for income, marital status, employment status, race/ethnicity, age, mother's contribution to family income, and number of months mother plans to breastfeed (p-value = 0.031, 95% CI: 0.349 – 0.950). For the number of months planned on breastfeeding mothers were 2.152 times the odds of continuing to breastfeed after returning to work in comparison to mothers who did not, adjusted for income, marital status, employment status, race/ethnicity, age, mother's contribution to family income, and maternity leave (p-value <0.0001, 95% CI: 1.920 – 2.412).

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Table 3: Effect of Maternity Leave Stratified by Marital Status

Outcomes	Married	Not Married	Pvalue**
	Effect Measure (95% CI)*	Effect Measure (95% CI)*	
Length of Time Plan to Breastfeed	-0.6866 (-1.4764 – 0.1032)	-0.0579 (-1.5230 – 1.4071)	0.4906
Plan to Continue Breastfeeding¥	0.564 (0.319 - 0.999)	0.545 (0.158 - 1.882)	0.7726

According to Table 3, marital status was not observed to have a linear association between the length of time the mother planned to breastfeed and maternity leave, adjusted for income, educational achievement, marital status, employment status, smoker status, age, maternity leave, the mother's contribution to the family income, and participation in the WIC program (p-value = 0.4906). Furthermore, marital status was not observed to have an association between the mother's plan to continue breastfeeding after returning to work and maternity leave, adjusted for income, marital status, employment status, race/ethnicity, age, mother's contribution to family income, and maternity leave (p-value = 0.7726).

Conclusion:

The Infant Feeding Practices Study illustrates the association between breastfeeding and maternal leave, as well as other factors. For example, maternity leave is associated with the length of time the mother plans to breastfeed for those who were identified to be full-time homemakers. In addition, the association between maternity leave and duration of breast feeding was significant for mothers who were identified to receive maternity leave (see Table 1). Mothers who planned to continue breastfeeding after returning to work is significantly associated with maternal leave for those received maternal leave. In addition, mothers who planned to continue breastfeeding after returning to work is significantly associated with the length of time mothers planned to breastfeed (see Table 2). Marital status was observed to not be an effect measure modifier on the association between maternal leave and length of time the mother plans to breastfeed and the mother's plan to continue breastfeeding after returning to work (see Table 3).

Appendix

```
options nofmterr;
libname proj2 '/home/u63114430/Project 2';
run;
proc format;
value EDUC_NEWf 1 = "Less than High School Diploma"
               2 = "High School Graduate"
               3 = "1-3 Years of College"
               4 = "College Graduate"
```

```
                              5 = "Post Graduate";
value EMPLOY_NEWf 1 = "Works Full Time"
                                2 = "Unemployed (temporarily, retired, disabled, student,
etc."
                                3 = "Self-Employed"
                                4 = "Works for Someone Else Part-Time"
                                5 = "Full-time Homemaker";
value PRENATALf 1 = "Mother Has a Health Care Worker (obstetrician, family
doctor/other physician, midwife, other health care provider)"
                        0 = "Mother Does Not Have a Health Care Worker";
value SMOKERf 1 = "Mother Smokes At Least One Cigarette a Day"
                        0 = "Mother Does Not Smoke";
value RACE_ETHf 1 = "White"
                                2 = "Black"
                                3 = "Hispanic"
                                4 = "Asian/Pacific Islander"
                                5 = "Other";
value INCOMEf 0 = "Less than 30,000 USD"
                                1 = "30,000 to 99,000 USD"
                                2 = "100,000 USD and higher";
value MATLEAVEf 0 = "Mother Did Not Take Maternity Leave"
                                        1 = "Mother Received At Least 1 Week of Maternity Leave";
value P18f     0 = "Less than Half of Mother's Income Contributed"
                        1 = "More than Half of Mother's Income Contributed";
value POSTWICf  0 = "No"
                                1 = "Yes";
run;
/*Table 1 Stats*/
Data proj2;
set proj2.ifps_new;
format EDUC_NEW EDUC_NEWf. EMPLOY_NEW EMPLOY_NEWf. PRENATAL
PRENATALf. SMOKER SMOKERf. RACE_ETH RACE_ETHf. INCOME INCOMEf.
MATLEAVE MATLEAVEf. P18 P18f. POSTWIC POSTWICf.;
proc reg data = proj2;
model P31 = MATLEAVE /clb;
run;
proc glm data = proj2;
class MATLEAVE (ref = 'Mother Did Not Take Maternity Leave') MARITAL_NEW (ref
= 'Not Married') EDUC_NEW (ref = 'Less than High School Diploma')
EMPLOY_NEW (ref = 'Works Full Time')INCOME (ref = 'Less than 30,000 USD') P18
(ref = "Less than Half of Mother's Income Contributed")
POSTWIC (ref = 'No') SMOKER (ref = 'Mother Does Not Smoke');
model P31 = MATLEAVE INCOME MARITAL_NEW EDUC_NEW EMPLOY_NEW P9
SMOKER P18 POSTWIC / SOLUTION CLPARM;
```

```
means MATLEAVE;
lsmeans MATLEAVE / stderr;
run;
/*Table 2 stats*/
data PROJ22;
set proj2;
if P30 = "Do Not plaN to work after baby's birth" then DELETE;
if MARITAL_NEW = ' ' then DELETE;
run;
proc logistic data = proj22;
class P30 (ref = 'No') MATLEAVE (ref = 'Mother Did Not Take Maternity Leave')
MARITAL_NEW (ref = 'Not Married') EMPLOY_NEW (ref = 'Works Full Time')
INCOME (ref = 'Less than 30,000 USD') P18 (ref = "Less than Half of Mother's Income
Contributed")
EMPLOY_NEW (ref = 'Works Full Time') RACE_ETH (ref = 'White')  / PARAM = ref;
model P30 = MATLEAVE MARITAL_NEW EMPLOY_NEW INCOME P18 BMI
RACE_ETH P31 P9 / clparm=wald;
run;
/*EMM questions row 1*/
proc glm data = proj2;
where MARITAL_NEW = 'Not Married';
class MATLEAVE (ref = 'Mother Did Not Take Maternity Leave') EDUC_NEW (ref =
'Less than High School Diploma')
EMPLOY_NEW (ref = 'Works Full Time') INCOME (ref = 'Less than 30,000 USD') P18
(ref = "Less than Half of Mother's Income Contributed")
POSTWIC (ref = 'No') SMOKER (ref = 'Mother Does Not Smoke');
model P31 = MATLEAVE INCOME EDUC_NEW EMPLOY_NEW P9 SMOKER P18
POSTWIC / solution clparm;
run;
proc glm data = proj2;
where MARITAL_NEW = 'Married';
class MATLEAVE (ref = 'Mother Did Not Take Maternity Leave') EDUC_NEW (ref =
'Less than High School Diploma')
EMPLOY_NEW (ref = 'Works Full Time')INCOME (ref = 'Less than 30,000 USD') P18
(ref = "Less than Half of Mother's Income Contributed")
POSTWIC (ref = 'No') SMOKER (ref = 'Mother Does Not Smoke') ;
model P31 = MATLEAVE INCOME EDUC_NEW EMPLOY_NEW P9 SMOKER P18
POSTWIC / solution clparm;
run;
proc glm data = proj2;
class MATLEAVE (ref = 'Mother Did Not Take Maternity Leave') EDUC_NEW (ref =
'Less than High School Diploma')
EMPLOY_NEW (ref = 'Works Full Time')INCOME (ref = 'Less than 30,000 USD') P18
(ref = "Less than Half of Mother's Income Contributed")
```

```
POSTWIC (ref = 'No') SMOKER (ref = 'Mother Does Not Smoke') MARITAL_NEW (ref
= 'Not Married');
model P31 = MARITAL_NEW|MATLEAVE INCOME EDUC_NEW EMPLOY_NEW P9
SMOKER P18 POSTWIC / solution clparm;
run;
/*EMM questions row 2*/
proc sort data = proj22;
by MARITAL_NEW;
run;
proc logistic data = proj22 descending;
by MARITAL_NEW;
class MATLEAVE (ref = 'Mother Did Not Take Maternity Leave') EMPLOY_NEW (ref =
'Works Full Time')
INCOME (ref = 'Less than 30,000 USD') P18 (ref = "Less than Half of Mother's Income
Contributed")
EMPLOY_NEW (ref = 'Works Full Time') RACE_ETH (ref = 'White');
model P30 = MATLEAVE EMPLOY_NEW INCOME P18 BMI RACE_ETH P31 P9;
run;
proc logistic data = proj22 descending;
class MATLEAVE (ref = 'Mother Did Not Take Maternity Leave') MARITAL_NEW (ref
= 'Not Married') EMPLOY_NEW (ref = 'Works Full Time')
INCOME (ref = 'Less than 30,000 USD') P18 (ref = "Less than Half of Mother's Income
Contributed")
EMPLOY_NEW (ref = 'Works Full Time') RACE_ETH (ref = 'White')  / PARAM = ref;
model P30 = EMPLOY_NEW INCOME P18 BMI RACE_ETH P31 P9
MATLEAVE|MARITAL_NEW/ clparm=wald;
run;
```