# MICHIGAN PRAMS
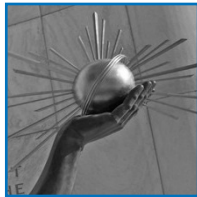Pregnancy Risk Assessment Monitoring System

## Prosperity Region Report

Telling
the story
of Michigan's
moms
and
babies.

# Perinatal Alcohol and Tobacco Use

Birth Years 2012-2014

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## Acknowledgments

## Introduction to the 2012-2014 regional PRAMS data set

Michigan's Pregnancy Risk Assessment Monitoring System (MI PRAMS) is an annual population-based survey of new mothers, assessing behaviors and experiences around the time of pregnancy. MI PRAMS is a collaboration between the Centers for Disease Control and Prevention (CDC) and the Michigan Department of Health and Human Services (MDHHS). MI PRAMS operations are housed within the Maternal and Child Health Epidemiology Section, a part of the Division of Lifecourse Epidemiology and Genomics.

MI PRAMS utilizes a mixed-mode methodology to gather information from women selected for the survey. This combination mail and telephone survey methodology is used to maximize response rates. The weighted response rates were 61% for 2012, 60% for 2013, and 57% for 2014. Data collection for the birth years included within this report was conducted by the Michigan State University, Office for Survey Research.

MI PRAMS surveys approximately 1-2 percent of resident mothers who have delivered a live born infant in Michigan within each calendar year. MI PRAMS mothers are selected using a stratified random sample of live birth certificates. In a typical PRAMS year, women are selected from one of five strata:
- Low birth weight (LBW) infants
- Normal birth weight infants (NBW), black mothers, Southeast Michigan
- NBW infants, black mothers, rest of Michigan
- NBW infants, all other mothers, Southeast Michigan
- NBW infants, all other mothers, rest of Michigan

To create regional PRAMS data sets, the different MI PRAMS sampling strata for each birth year were reorganized into the following four new strata:
- LBW infants, black mothers
- LBW infants, all other mothers
- NBW infants, black mothers
- NBW infants, all other mothers

Mothers who completed MI PRAMS were reassigned into one of these four new strata. Their responses were re-weighted to reflect the experience of other mothers in their prosperity region for a given birth year. To obtain the necessary precision to make comparisons between regions, three years of survey data were aggregated together to form a single data set. Because of their smaller number of births and PRAMS respondents, this report may at times groups prosperity Regions 1, 2, and 3 together to allow for comparison between Northern Michigan and other prosperity regions within the state.
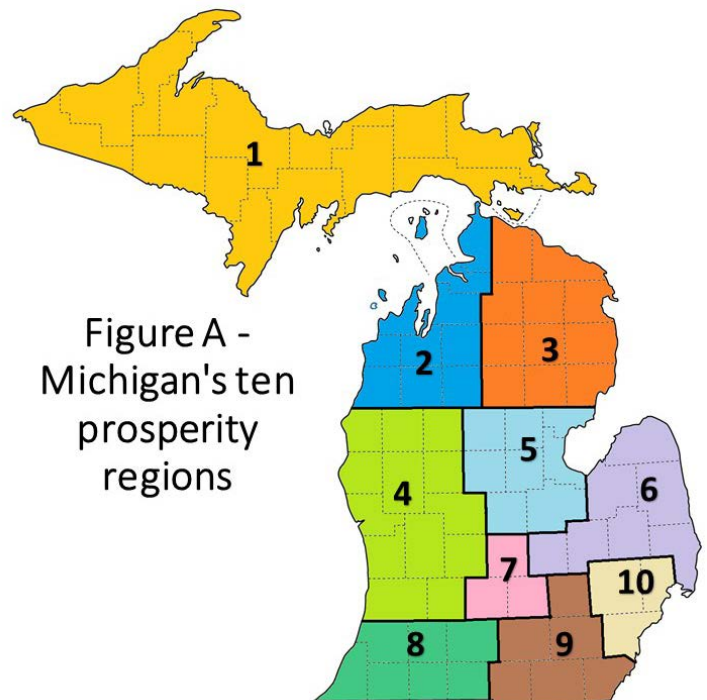


Figure A - Michigan's ten prosperity regions

### Descriptive statistics - average annual live births and PRAMS responders by prosperity region

On average, between 2012 and 2014 there were 113,600 live births per year in Michigan. The average number of live births by prosperity region are included within Figure B. The average annual proportion of live births by prosperity region are included within Figure C.

Figure B - Average annual live births by prosperity region 2012-2014

Figure C - Proportion of average annual live births by prosperity region 2012-2014
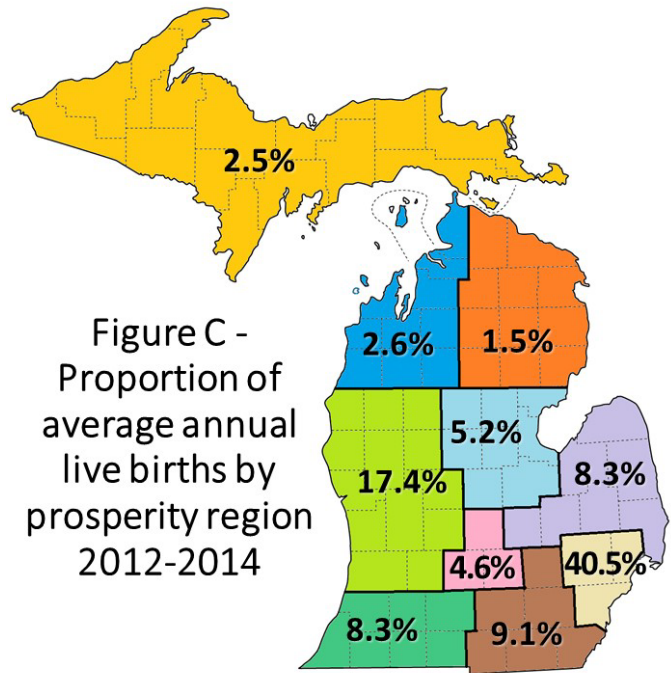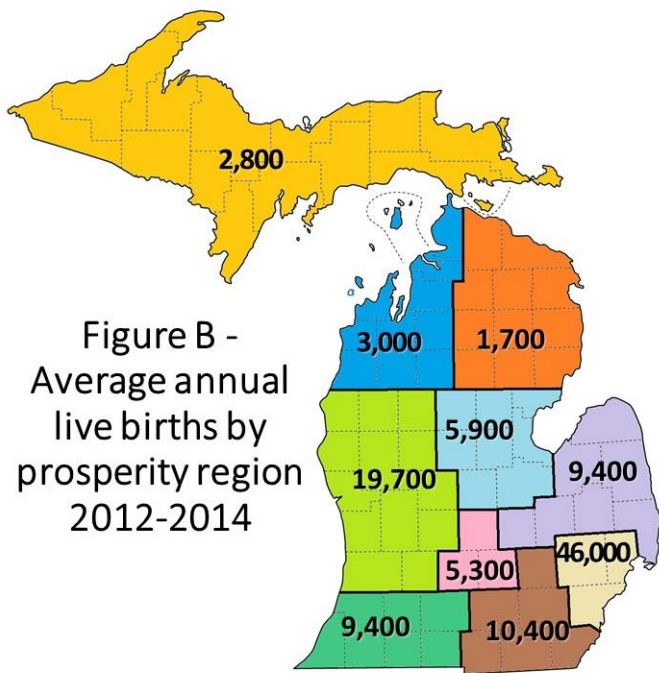
The total number of PRAMS respondents by region across the 2012-2014 birth years varies between 67 [Region 3] and 2,303 [Detroit Metropolitan Area]. Areas with more PRAMS responders have more precise estimates.

Figure D - Number of PRAMS responders by prosperity region 2012-2014

Figure E - Proportion of PRAMS responders by prosperity region 2012-2014
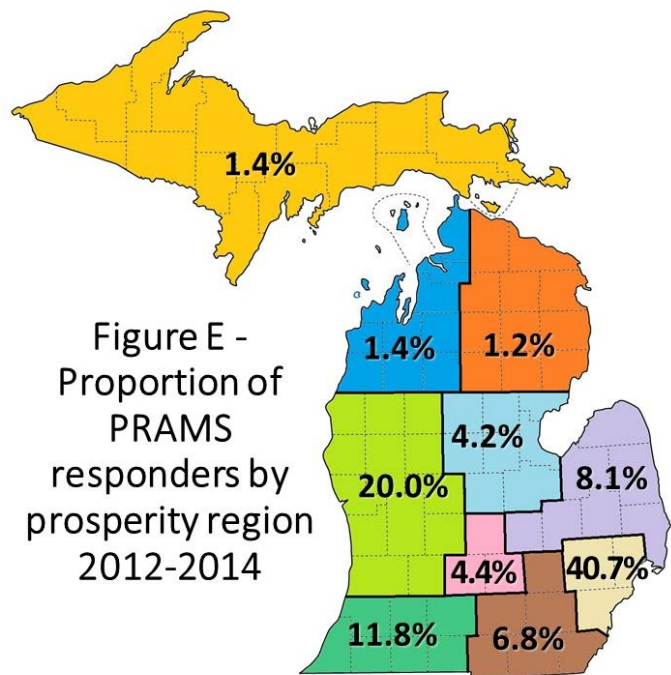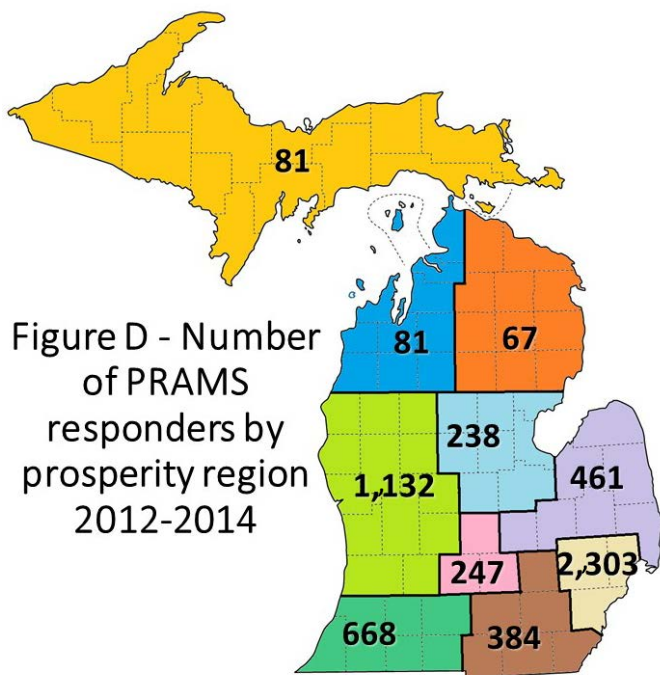
## Analytic notes:  interpretation of tables and graphs, confidence intervals, relative standard error, and comparisons between groups

PRAMS results are most often reported as a weighted percentage. Individual respondents are given an analytic weight so that the sum of all respondents is approximately equal to the total number of live births for the region and time specified. More accurately, the graphs and tables included here report the weighted proportion of mothers of live births. The numbers reported are cumulative across birth years 2012-2014.

Each table within this report contains the following statistics. The **sample frequency** represents the number of respondents (unweighted) who gave an answer of interest to a survey question. The **weighted frequency** is the number of mothers of live births across the whole 2012-2014 period those responders represent. To obtain an estimate for the number of mothers reporting an experience in one birth year, one would need to divide this weighted frequency by three. The **weighted percent**, also referred to as the point estimate, is the approximate proportion of all mothers of live births for the state or region who gave the answer of interest. The weighted frequency and weighted percent are estimates of what is truly happening at a population level.

PRAMS employs a stratified, randomly selected sample to describe the experiences of Michigan mothers. When using a subset of randomly selected women to represent an entire population, there will be some statistical uncertainty as to how well the estimate represents the population of interest. Two columns quantify this uncertainty - the 95% confidence interval and the relative standard error.

The **95% confidence interval (95% CI)** describes the range in which the actual population value is most likely to be found. A narrow confidence interval indicates a high degree of statistical precision in an estimate; a broad confidence interval indicates more statistical uncertainty in an estimate. The number of respondents has a direct effect on confidence intervals - data at the state-level will have more respondents and narrower confidence intervals. Sub-state regions and demographic subgroups that have fewer respondents will have wider confidence intervals. Confidence interval inference is an imperfect substitute for tests of statistical significance; results for any desired statistical comparison tests can be shared upon request. Typical tests for significance will compare one individual region against a pooled estimate for all other regions combined (i.e. Region 1 vs Regions 2-10 together) or compare one region against each other region individually (i.e. Region 1 vs Region 2, Region 1 vs Region 3, etc.).

Within each graph a horizontal dashed line indicates the **state-level estimate** and allows for an informal visual comparison **between state and regional estimates**. These are not meant for formal significance testing between any sub-state regions and the state-level estimates. Results of significance testing for individual regions versus all other combined regions are reported in the discussion.

The **relative standard error (RSE)** is another important indicator of statistical reliability for a point estimate. The RSE is calculated by dividing the standard error for an estimate by the estimate itself and then multiplying it by 100. Estimates with a smaller RSE are more reliable than estimates with a large RSE. Point estimates with RSE values below 30% are ideal; point estimates with RSE values between 30% and 50% should be interpreted with more caution. Point estimates with an RSE above 50% will be suppressed.

**Survey question**: During the three months before you got pregnant, how many alcoholic drinks did you have in an average week? (A drink is 1 glass of wine, wine cooler, can or bottle of beer, shot of liquor, or mixed drink).

**Response**: Mother indicated any alcohol consumption.



Figure 1: Any alcohol consumption in 3 months before pregnancy by prosperity region; MI PRAMS - 2012-2014
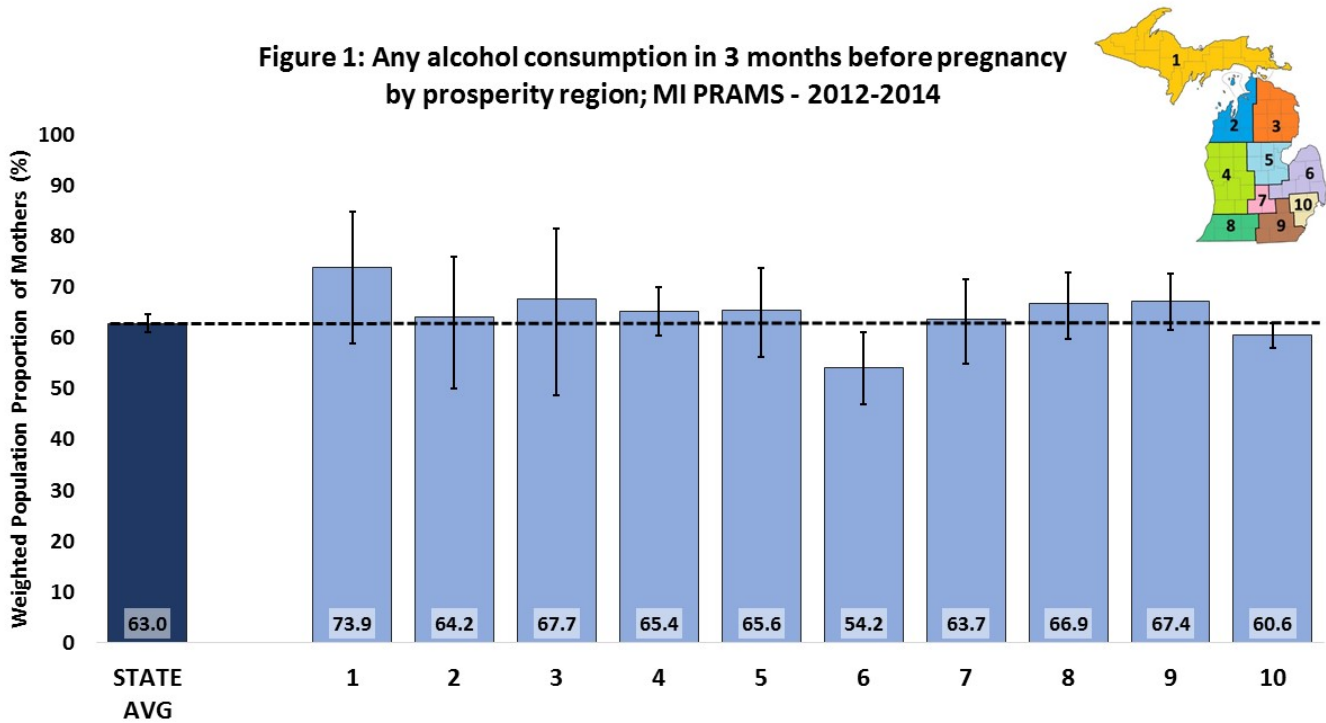
| Table 1. Any alcohol consumption in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014 | | | | | |
|---|---|---|---|---|---|
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
| STATE TOTAL | 3,246 | 208,042 | 63.0 | (61.2-64.8) | 2.5 |
| **Prosperity Region** | | | | | |
| 1 | 49 | 6,129 | 73.9 | (58.4-85.1) | 26.0 |
| 2 | 48 | 5,189 | 64.2 | (50.3-76.1) | 18.5 |
| 3 | 47 | 3,433 | 67.7 | (49.0-82.1) | 26.5 |
| 4 | 645 | 37,523 | 65.4 | (60.4-70.0) | 7.1 |
| 5 | 141 | 11,436 | 65.6 | (56.4-73.8) | 12.9 |
| 6 | 236 | 14,800 | 54.2 | (46.9-61.2) | 8.0 |
| 7 | 151 | 9,684 | 63.7 | (55.0-71.7) | 11.8 |
| 8 | 353 | 18,414 | 66.9 | (60.0-73.2) | 10.2 |
| 9 | 245 | 20,383 | 67.4 | (61.6-72.7) | 8.7 |
| 10 | 1,331 | 81,050 | 60.6 | (58.2-62.9) | 3.0 |

**Survey question**: During the last three months of your pregnancy, how many alcoholic drinks did you have in an average week? (A drink is 1 glass of wine, wine cooler, can or bottle of beer, shot of liquor, or mixed drink).

**Response**: Mother indicated any alcohol consumption.



Figure 2: Any alcohol consumption in last 3 months of pregnancy by prosperity region; MI PRAMS - 2012-2014

^ Estimate suppressed due to <6 responders or relative standard error > 50%.

* Relative standard error is between 30% and 50%. Interpret with caution.
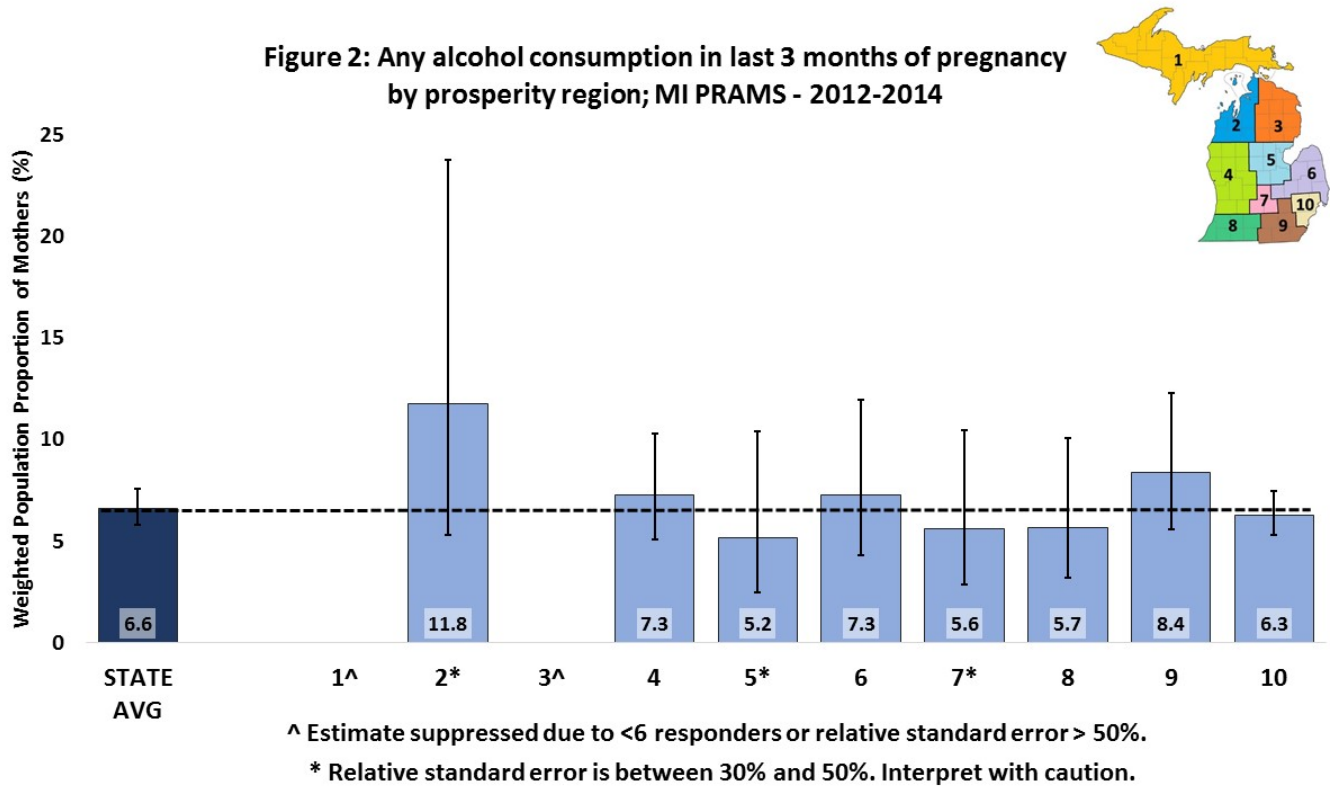
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| **Table 2. Any alcohol consumption in last three months of pregnancy by prosperity region; MI PRAMS - 2012-2014** | | | | | |
| STATE TOTAL | 362 | 21,718 | 6.6 | (5.7-7.5) | 6.9 |
| **Prosperity Region** | | | | | |
| 1 | ^ | ^ | ^ | ^ | ^ |
| 2 | 7 | 957* | 11.8* | (5.3-24.2)* | 38.5* |
| 3 | ^ | ^ | ^ | ^ | ^ |
| 4 | 76 | 4,188 | 7.3 | (5.2-10.3) | 17.6 |
| 5 | 15 | 910* | 5.2* | (2.5-10.4)* | 36.0* |
| 6 | 32 | 2,013 | 7.3 | (4.3-12.1) | 26.1 |
| 7 | 15 | 858* | 5.6* | (2.9-10.5)* | 32.7* |
| 8 | 35 | 1,558 | 5.7 | (3.1-10.1) | 29.7 |
| 9 | 32 | 2,571 | 8.4 | (5.7-12.3) | 19.8 |
| 10 | 147 | 8,421 | 6.3 | (5.2-7.5) | 9.2 |

^ Estimate suppressed due to <6 responders or relative standard error > 50%.

* Relative standard error is between 30% and 50%. Interpret with caution.

**Survey Question**: In the three months before you got pregnant, how many cigarettes did you smoke on an average day?

**Response**: Mother indicated any cigarette smoking.



Figure 3: Any cigarette smoking in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014
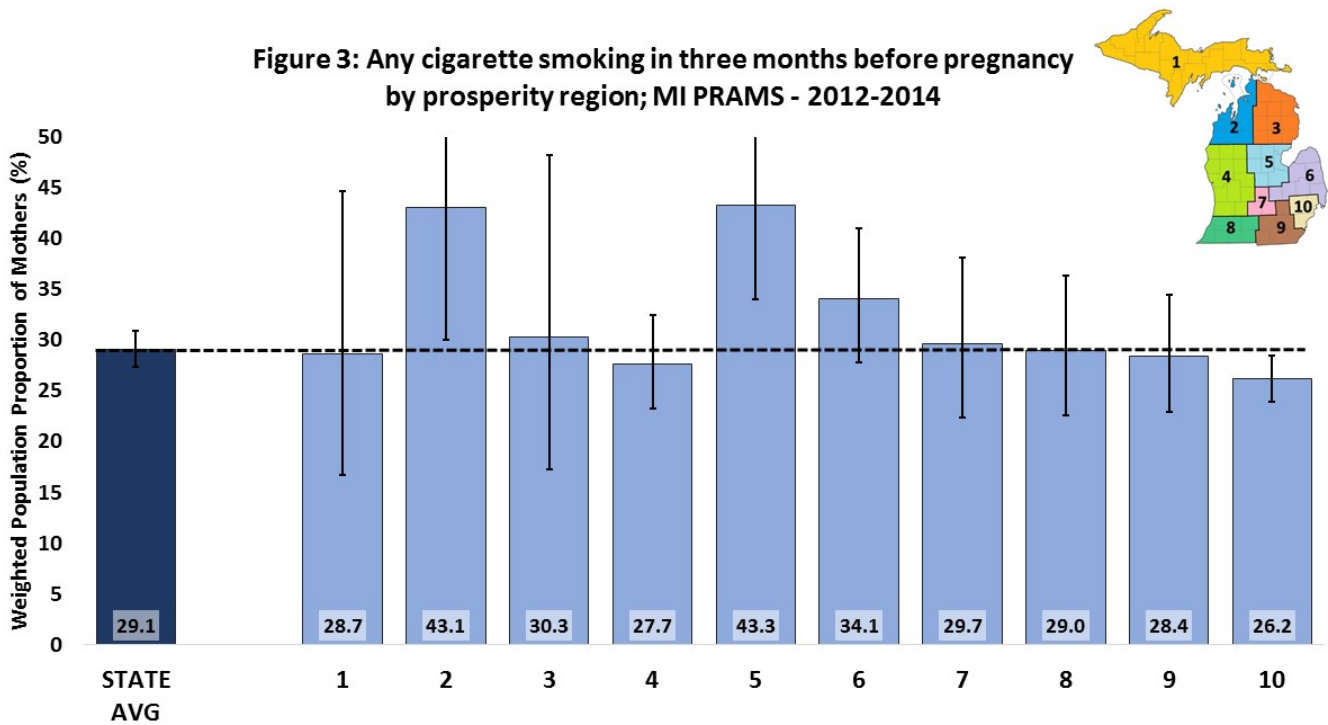
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| **Table 3. Any cigarette smoking in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014** | | | | | |
| STATE TOTAL | 1,531 | 96,275 | 29.1 | (27.4-30.9) | 3.1 |
| **Prosperity Region** | | | | | |
| 1 | 28 | 2,378 | 28.7 | (16.8-44.4) | 24.6 |
| 2 | 33 | 3,533 | 43.1 | (29.9-57.2) | 16.3 |
| 3 | 31 | 1,536 | 30.3 | (17.1-47.8) | 26.0 |
| 4 | 300 | 15,839 | 27.7 | (23.3-32.5) | 8.5 |
| 5 | 80 | 7,482 | 43.3 | (34.0-53.1) | 11.3 |
| 6 | 155 | 9,391 | 34.1 | (27.8-41.0) | 9.9 |
| 7 | 67 | 4,501 | 29.7 | (22.3-38.2) | 13.6 |
| 8 | 195 | 8,014 | 29.0 | (22.6-36.4) | 12.2 |
| 9 | 100 | 8,616 | 28.4 | (23.0-34.4) | 10.3 |
| 10 | 542 | 34,984 | 26.2 | (24.1-28.5) | 4.3 |

**Survey Question:** In the last three months of your pregnancy, how many cigarettes did you smoke on an average day?

**Response:** Mother indicated any cigarette smoking.



Figure 4A: Any cigarette smoking in last three months of pregnancy by prosperity region; MI PRAMS - 2012-2014
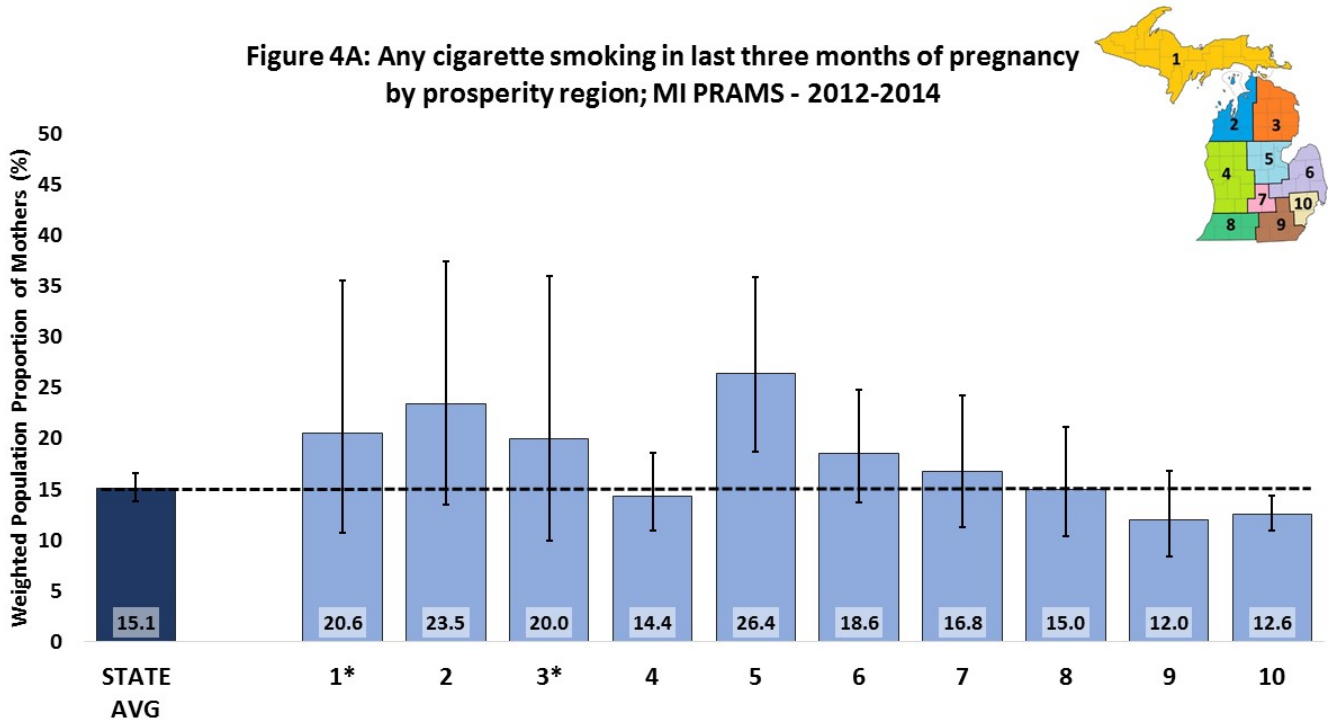
\* Relative standard error is between 30% and 50%. Interpret with caution.

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| **Table 4A. Any cigarette smoking in last three months of pregnancy by prosperity region; MI PRAMS - 2012-2014** | | | | | |
| STATE TOTAL | 820 | 49,844 | 15.1 | (13.7-16.5) | 4.7 |
| **Prosperity Region** | | | | | |
| 1 | 21 | 1,705* | 20.6* | (10.8-35.6)* | 30.3* |
| 2 | 18 | 1,929 | 23.5 | (13.4-37.9) | 26.3 |
| 3 | 23 | 1,015* | 20.0* | (9.9-36.3)* | 32.9* |
| 4 | 162 | 8,260 | 14.4 | (11.0-18.6) | 13.3 |
| 5 | 49 | 4,567 | 26.4 | (18.7-35.9) | 16.6 |
| 6 | 86 | 5,115 | 18.6 | (13.7-24.7) | 15.1 |
| 7 | 36 | 2,559 | 16.8 | (11.2-24.3) | 19.6 |
| 8 | 116 | 4,142 | 15.0 | (10.4-21.2) | 18.2 |
| 9 | 43 | 3,653 | 12.0 | (8.3-16.9) | 18.0 |
| 10 | 266 | 16,899 | 12.6 | (11.0-14.4) | 6.9 |

\* Relative standard error is between 30% and 50%. Interpret with caution.

**Change in Smoking Status During Pregnancy**: Among mothers who were smoking any cigarettes in the three months before pregnancy, how many mothers had quit by the last three months of pregnancy?



Figure 4B: Proportion of prepregnancy smokers who quit by last 3 months of pregnancy by prosperity region; MI PRAMS - 2012-2014
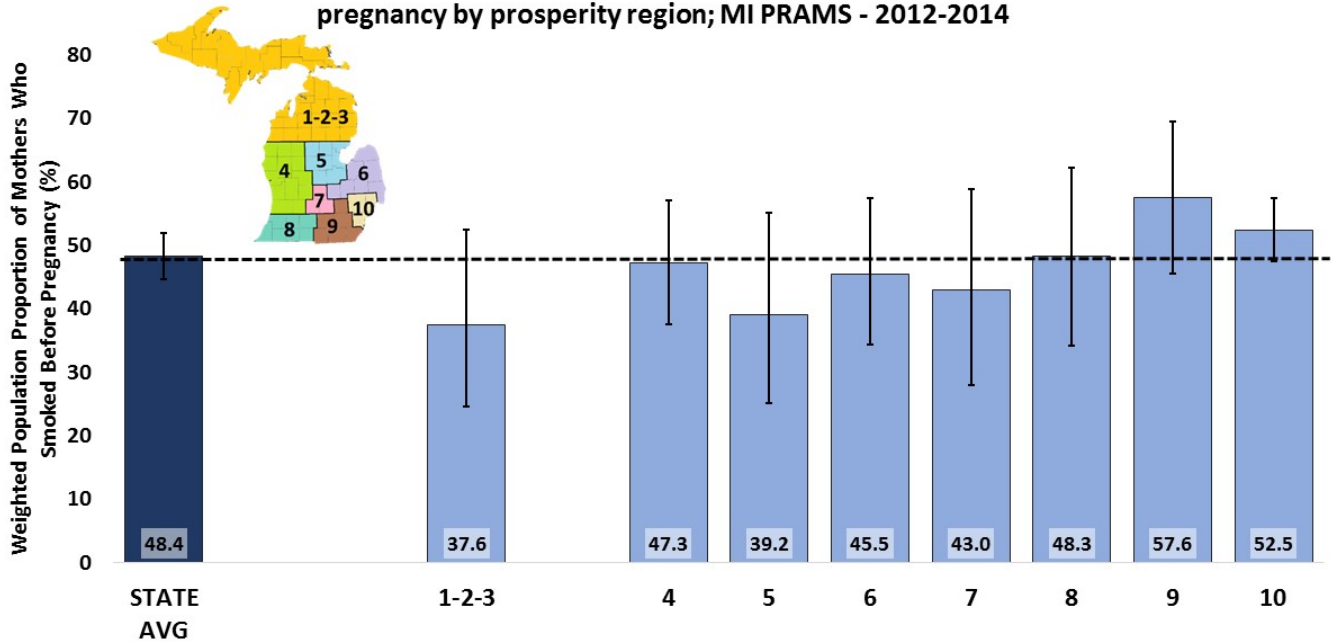
| Table 4B. Proportion of prepregnancy smokers who quit by last 3 months of pregnancy by prosperity region; MI PRAMS - 2012-2014 | | | | | |
|---|---|---|---|---|---|
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
| STATE TOTAL | 714 | 46,496 | 48.4 | (44.8-52.1) | 3.8 |
| **Prosperity Region** | | | | | |
| 1-2-3 | 30 | 2,798 | 37.6 | (24.7-52.5) | 19.3 |
| 4 | 138 | 7,421 | 47.3 | (37.7-57.2) | 10.7 |
| 5 | 32 | 2,933 | 39.2 | (25.0-55.5) | 20.5 |
| 6 | 69 | 4,276 | 45.5 | (34.3-57.3) | 13.1 |
| 7 | 30 | 1,928 | 43.0 | (28.2-59.1) | 18.9 |
| 8 | 79 | 3,872 | 48.3 | (34.3-62.6) | 15.3 |
| 9 | 57 | 4,963 | 57.6 | (45.2-69.1) | 14.6 |
| 10 | 279 | 18,305 | 52.5 | (47.5-57.4) | 5.4 |

**Survey Question**: How many cigarettes do you smoke on an average day now?

**Response**: Mother indicated any cigarette smoking.



Figure 5A: Any cigarette smoking after pregnancy [at survey completion] by prosperity region; MI PRAMS - 2012-2014
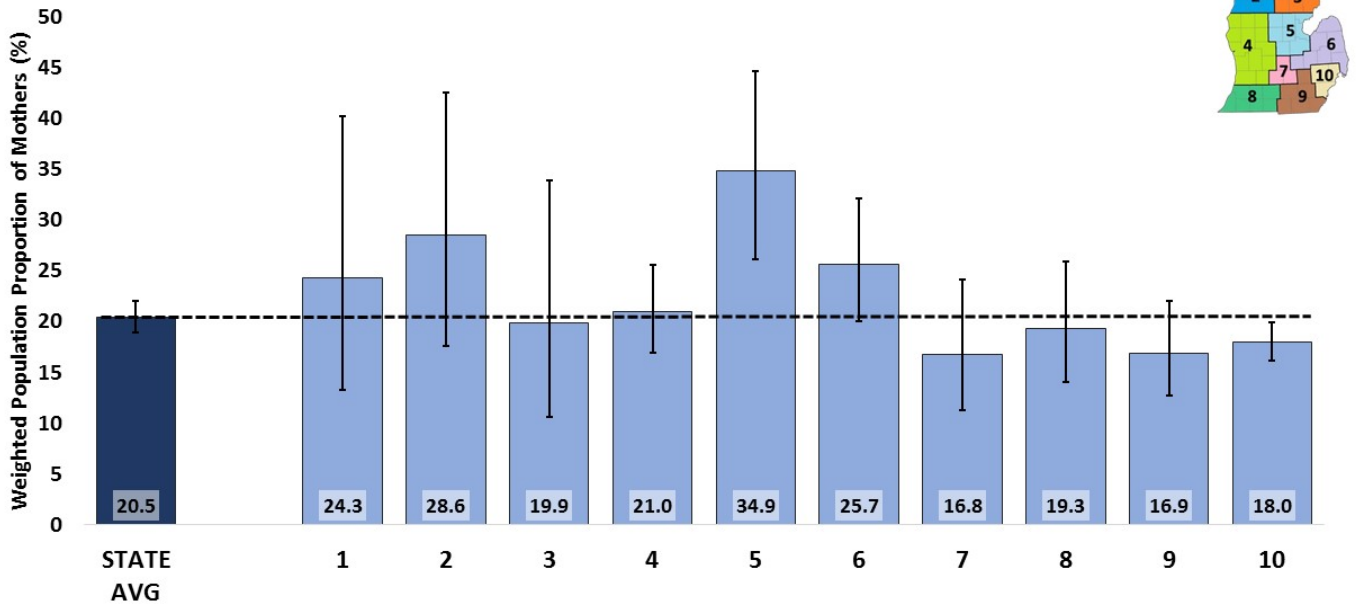
| Table 5A. Any cigarette smoking after pregnancy [at survey completion] by prosperity region; MI PRAMS - 2012-2014 | | | | | |
|---|---|---|---|---|---|
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
| STATE TOTAL | 1,143 | 67,760 | 20.5 | (18.9-22.1) | 3.9 |
| Prosperity Region | | | | | |
| 1 | 22 | 2,007 | 24.3 | (13.4-40.0) | 27.7 |
| 2 | 24 | 2,349 | 28.6 | (17.7-42.8) | 22.4 |
| 3 | 25 | 1,006 | 19.9 | (10.5-34.3) | 29.8 |
| 4 | 231 | 12,154 | 21.0 | (17.0-25.6) | 10.4 |
| 5 | 67 | 6,035 | 34.9 | (26.2-44.7) | 13.6 |
| 6 | 126 | 7,090 | 25.7 | (20.1-32.3) | 12.0 |
| 7 | 40 | 2,565 | 16.8 | (11.3-24.2) | 19.4 |
| 8 | 150 | 5,328 | 19.3 | (14.1-25.9) | 15.6 |
| 9 | 69 | 5,165 | 16.9 | (12.7-22.1) | 14.1 |
| 10 | 389 | 24,061 | 18.0 | (16.2-20.0) | 5.5 |

**Resumption of Smoking Following Pregnancy**: Among mothers were pre-pregnancy smokers that had quit by late pregnancy, how many resumed smoking again after their baby was born?



Figure 5B: Proportion of women who stopped smoking during pregnancy and resumed after pregnancy by prosperity region; MI PRAMS - 2012-2014
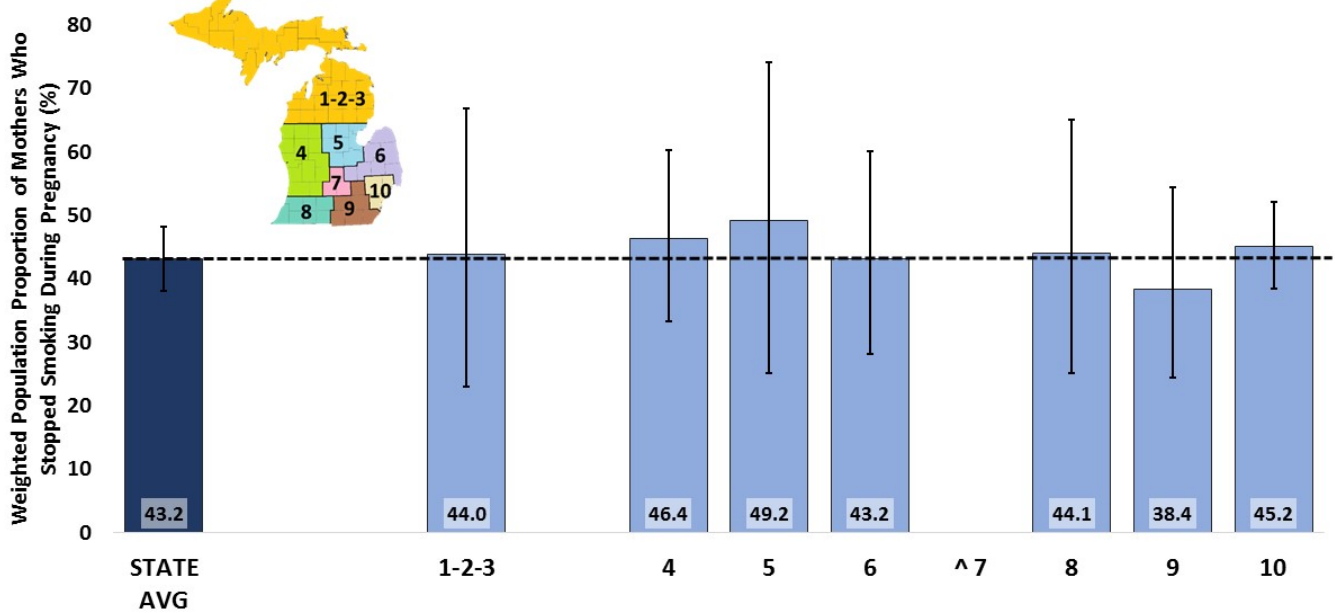
^ Estimate suppressed due to <6 responders or relative standard error > 50%.

| Table 5B. Proportion of women who stopped smoking during pregnancy that resumed smoking after pregnancy by prosperity region; MI PRAMS - 2012-2014 | | | | | |
|---|---|---|---|---|---|
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
| STATE TOTAL | 345 | 20,092 | 43.2 | (38.2-48.4) | 6.0 |
| Prosperity Region | | | | | |
| 1-2-3 | 14 | 1,231 | 44.0 | (23.3-67.0) | 27.1 |
| 4 | 70 | 3,441 | 46.4 | (33.2-60.1) | 15.2 |
| 5 | 17 | 1,444 | 49.2 | (25.0-73.9) | 27.7 |
| 6 | 36 | 1,847 | 43.2 | (27.9-59.9) | 19.6 |
| 7 | ^ | ^ | ^ | ^ | 59.3 |
| 8 | 40 | 1,707 | 44.1 | (25.1-65.0) | 24.4 |
| 9 | 26 | 1,906 | 38.4 | (24.5-54.5) | 20.6 |
| 10 | 135 | 8,267 | 45.2 | (38.5-52.0) | 7.7 |

^ Estimate suppressed due to <6 responders or relative standard error > 50%.

**Survey Question 1**: During the three months before you got pregnant, how many alcoholic drinks did you have in an average week?

**Survey Question 2**: In the three months before you got pregnant, how many cigarettes did you smoke on an average day?

**Responses**: Mothers who answered "YES" to using both alcohol and cigarettes before pregnancy are coded as using "BOTH" (Table 6A).  Mothers reporting use of only one substance are coded accordingly (Table 6B - 6C), as are mothers who reported no substance use in the three months before their pregnancy began (Table 6D). Because of the small number of respondents in substance use subgroups, Regions 1-3 are grouped together to provide more statistically reliable estimates.



Figure 6: Any alcohol and / or cigarette use in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014
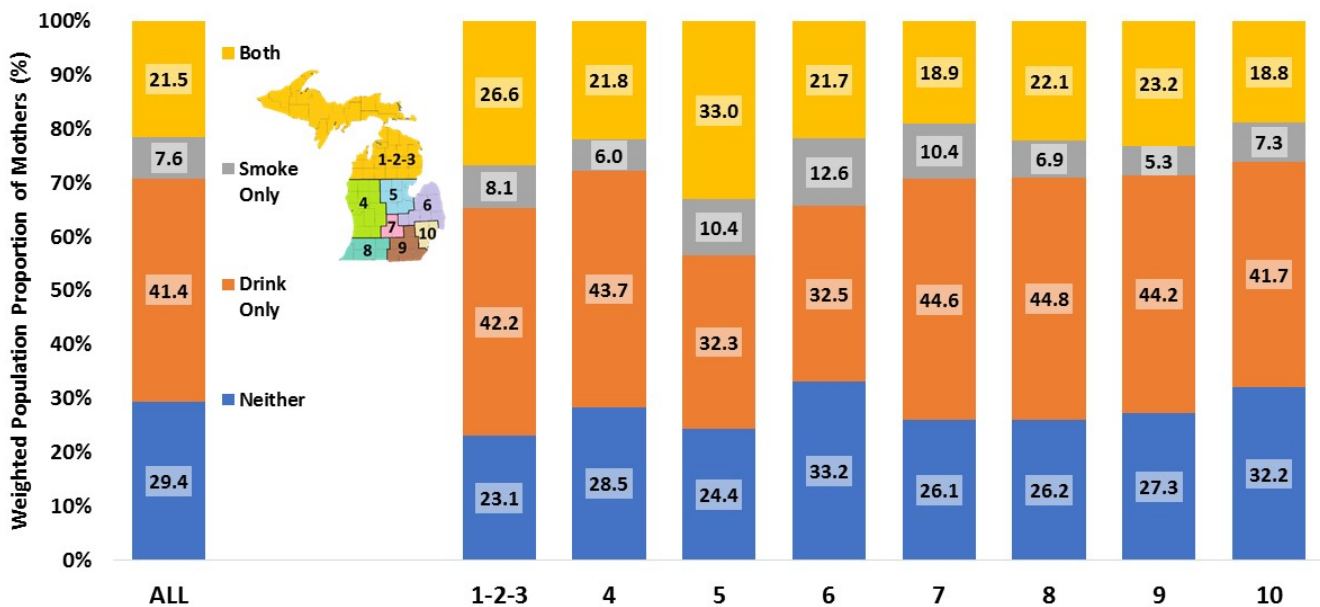
**Table 6A. Mother reports both cigarette and alcohol use in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014**

|  | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| STATE TOTAL | 1,074 | 70,708 | 21.5 | (19.9-23.2) | 3.8 |
| **Prosperity Region** | | | | | |
| 1-2-3 | 63 | 5,699 | 26.6 | (19.4-35.2) | 15.2 |
| 4 | 212 | 12,408 | 21.8 | (17.8-26.4) | 10.1 |
| 5 | 57 | 5,690 | 33.0 | (24.3-43.0) | 14.5 |
| 6 | 99 | 5,919 | 21.7 | (16.6-27.8) | 13.2 |
| 7 | 46 | 2,847 | 18.9 | (13.1-26.5) | 18.0 |
| 8 | 129 | 6,088 | 22.1 | (16.2-29.4) | 15.2 |
| 9 | 76 | 7,010 | 23.2 | (18.2-29.1) | 12.0 |
| 10 | 392 | 25,046 | 18.8 | (16.9-20.9) | 5.3 |

**Table 6B. Mother reports cigarette use but no alcohol use in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014**

|  | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| STATE TOTAL | 445 | 25,129 | 7.6 | (6.7-8.7) | 6.8 |
| **Prosperity Region** | | | | | |
| 1-2-3 | 29 | 1,748 | 8.1 | (4.6-14.1) | 29.0 |
| 4 | 86 | 3,393 | 6.0 | (4.0-8.8) | 20.1 |
| 5 | 23 | 1,792 | 10.4 | (5.7-18.3) | 29.8 |
| 6 | 53 | 3,433 | 12.6 | (8.5-18.3) | 19.6 |
| 7 | 19 | 1,563 | 10.4 | (5.9-17.5) | 27.6 |
| 8 | 64 | 1,910 | 6.9 | (4.2-11.3) | 25.5 |
| 9 | 24 | 1,606 | 5.3 | (3.1-8.9) | 26.7 |
| 10 | 147 | 9,685 | 7.3 | (6.0-8.8) | 9.5 |

**Table 6C. Mother reports alcohol use but no cigarette use in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014**

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| STATE TOTAL | 2,157 | 136,248 | 41.4 | (39.6-43.3) | 2.3 |
| **Prosperity Region** | | | | | |
| 1-2-3 | 81 | 9,052 | 42.2 | (33.1-51.9) | 11.4 |
| 4 | 431 | 24,865 | 43.7 | (38.8-48.7) | 5.8 |
| 5 | 82 | 5,580 | 32.3 | (24.4-41.4) | 13.5 |
| 6 | 137 | 8,881 | 32.5 | (26.3-39.4) | 10.3 |
| 7 | 104 | 6,734 | 44.6 | (36.3-53.3) | 9.8 |
| 8 | 224 | 12,327 | 44.8 | (37.6-52.3) | 8.4 |
| 9 | 168 | 13,348 | 44.2 | (38.4-50.2) | 6.8 |
| 10 | 930 | 55,461 | 41.7 | (39.3-44.1) | 2.9 |

**Table 6D. Mother reports neither cigarette nor alcohol use in three months before pregnancy by prosperity region; MI PRAMS - 2012-2014**

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| STATE TOTAL | 1,864 | 96,652 | 29.4 | (27.8-31.1) | 2.9 |
| **Prosperity Region** | | | | | |
| 1-2-3 | 52 | 4,947 | 23.1 | (16.5-31.2) | 16.2 |
| 4 | 377 | 16,244 | 28.5 | (24.2-33.3) | 8.2 |
| 5 | 69 | 4,205 | 24.4 | (17.6-32.7) | 15.8 |
| 6 | 160 | 9,080 | 33.2 | (26.7-40.5) | 10.6 |
| 7 | 72 | 3,945 | 26.1 | (19.2-34.5) | 14.9 |
| 8 | 237 | 7,199 | 26.2 | (20.6-32.7) | 11.8 |
| 9 | 111 | 8,243 | 27.3 | (22.3-32.9) | 9.8 |
| 10 | 786 | 42,788 | 32.2 | (30.0-34.4) | 3.5 |

**Survey Question 1**: During the three months _before_ you got pregnant, how many alcoholic drinks did you have in an average week?

**Survey Question 2**: In the three months _before_ you got pregnant, how many cigarettes did you smoke on an average day?

**Survey Question 3**: During the _last three_ months of your pregnancy, how many alcoholic drinks did you have in an average week?

**Survey Question 4**: During the _last three_ months of your pregnancy, how many cigarettes did you smoke on an average day?



Figure 7: Comparison of any alcohol and / or cigarette use three months before pregnancy vs last three months of pregnancy; MI PRAMS 2012-2014
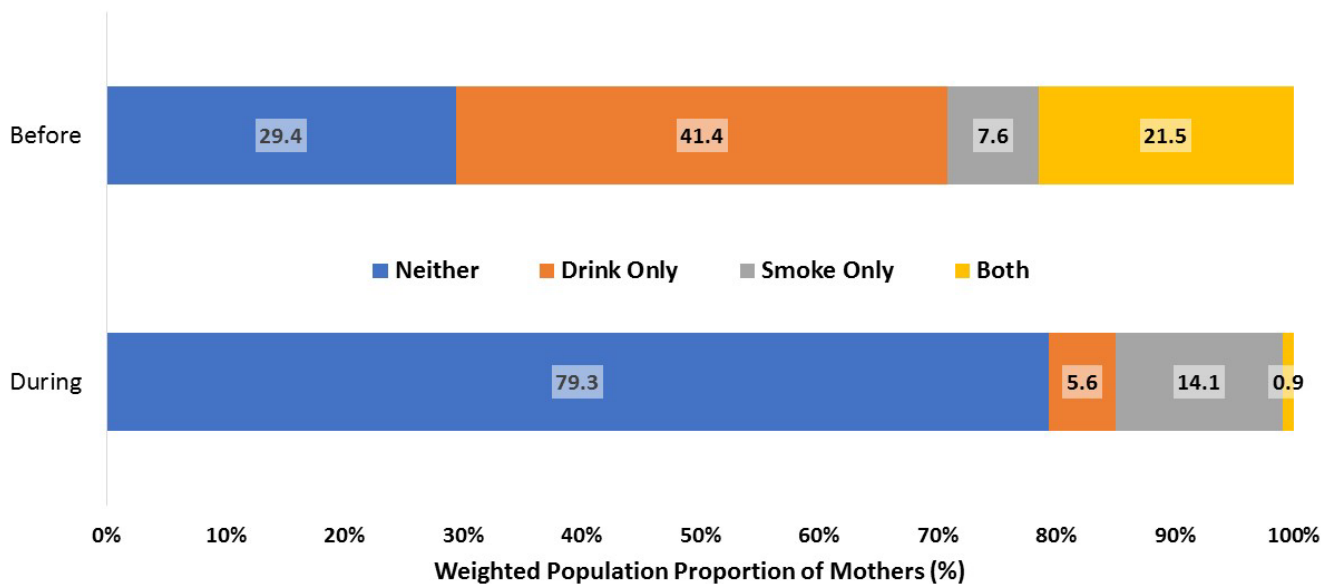
| Table 7. Comparison of any alcohol and / or cigarette use three months before pregnancy and last three months of pregnancy; MI PRAMS 2012-2014 | | | | | |
|---|---|---|---|---|---|
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
| **Three Months Before Pregnancy** | | | | | |
| Cigarettes + Alcohol | 1,074 | 70,708 | 21.5 | (19.9-23.2) | 3.8 |
| Cigarettes Only | 445 | 25,129 | 7.6 | (6.7-8.7) | 6.8 |
| Alcohol Only | 2,157 | 136,248 | 41.4 | (39.6-43.3) | 2.3 |
| Neither | 1,864 | 96,652 | 29.4 | (27.8-31.1) | 2.9 |
| **Last Three Months of Pregnancy** | | | | | |
| Cigarettes + Alcohol | 66 | 3,117 | 0.9 | (0.7-1.4) | 19.9 |
| Cigarettes Only | 747 | 46,616 | 14.1 | (12.8-15.6) | 5.0 |
| Alcohol Only | 296 | 18,600 | 5.6 | (4.9-6.5) | 7.6 |
| Neither | 4,448 | 261,491 | 79.3 | (77.7-80.8) | 3.8 |

**Survey Question 1**: During the last three months of your pregnancy, how many alcoholic drinks did you have in an average week?

**Survey Question 2**: During the last three months of your pregnancy, how many cigarettes did you smoke on an average day?

**Responses**: Mothers reporting use of only one substance are coded accordingly (Table 8A - 8B), as are mothers who reported no substance use in the last three months of pregnancy (Table 8C). Because of the small number of respondents in substance use subgroups, Regions 1-3 are grouped together to provide more statistically reliable estimates.

Because the proportion of mothers who reported using both alcohol and tobacco through the last three months of pregnancy is very small at the state level (0.9%; 95% CI: 0.7-1.4%), estimates for sub-state regions are too small to report reliable estimates. Although this is a small group of high-risk mothers, they are excluded from the regional graphs in Figure 8 and Tables 8A-C.



Figure 8: Alcohol or cigarette use in last three months of pregnancy by prosperity region; MI PRAMS - 2012-2014
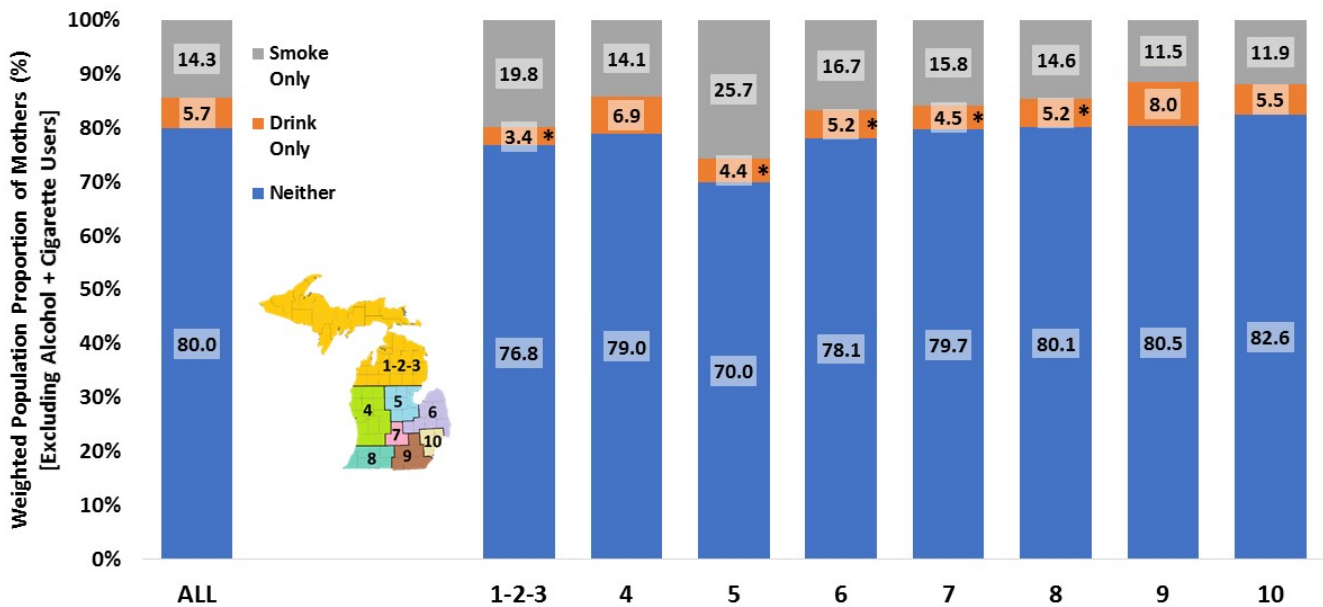
\* Relative standard error is between 30% and 50%. Interpret with caution.

**Table 8A. Mother reports cigarette use but no alcohol use in last three months of pregnancy by prosperity region; MI PRAMS - 2012-2014**

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| STATE TOTAL | 747 | 46,616 | 14.3 | (12.9-15.7) | 5.0 |
| Prosperity Region | | | | | |
| 1-2-3 | 59 | 4,156 | 19.8 | (13.6-27.9) | 18.3 |
| 4 | 145 | 7,976 | 14.1 | (10.7-18.3) | 13.7 |
| 5 | 46 | 4,395 | 25.7 | (18.0-35.2) | 17.1 |
| 6 | 75 | 4,499 | 16.7 | (12.1-22.6) | 16.1 |
| 7 | 33 | 2,376 | 15.8 | (10.4-23.2) | 20.4 |
| 8 | 109 | 4,007 | 14.6 | (10.0-20.8) | 18.7 |
| 9 | 41 | 3,497 | 11.5 | (7.9-16.5) | 18.6 |
| 10 | 239 | 15,711 | 11.9 | (10.3-13.7) | 7.2 |

**Table 8B. Mother reports alcohol use but no cigarette use in last three months of pregnancy by prosperity region; MI PRAMS - 2012-2014**

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| STATE TOTAL | 296 | 18,600 | 5.7 | (4.9-6.6) | 7.5 |
| Prosperity Region | | | | | |
| 1-2-3 | 7 | 706* | 3.4* | (1.3-8.4)* | 47.3* |
| 4 | 61 | 3,932 | 6.9 | (4.8-9.9) | 18.5 |
| 5 | 13 | 752* | 4.4* | (2.0-9.3)* | 39.0* |
| 6 | 22 | 1,409* | 5.2* | (2.9-9.3)* | 30.0* |
| 7 | 12 | 676* | 4.5* | (2.2-8.9)* | 35.3* |
| 8 | 30 | 1,439* | 5.2* | (2.8-9.7)* | 32.4* |
| 9 | 30 | 2,415 | 8.0 | (5.3-11.8) | 20.5 |
| 10 | 121 | 7,272 | 5.5 | (4.5-6.7) | 10.1 |

* Relative standard error is between 30% and 50%. Interpret with caution

**Table 8C. Mother reports neither cigarette nor alcohol use in last three months of pregnancy by prosperity region; MI PRAMS - 2012-2014**

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| STATE TOTAL | 4,448 | 261,491 | 80.0 | (78.4-81.5) | 4.0 |
| Prosperity Region | | | | | |
| 1-2-3 | 156 | 16,092 | 76.8 | (68.4-83.5) | 16.6 |
| 4 | 887 | 44,771 | 79.0 | (74.4-83.0) | 10.4 |
| 5 | 171 | 11,985 | 70.0 | (60.4-78.1) | 15.1 |
| 6 | 346 | 21,031 | 78.1 | (71.7-83.3) | 13.6 |
| 7 | 194 | 12,019 | 79.7 | (72.0-85.8) | 17.1 |
| 8 | 511 | 21,977 | 80.1 | (73.4-85.5) | 15.4 |
| 9 | 308 | 24,393 | 80.5 | (75.0-85.0) | 13.0 |
| 10 | 1,875 | 109,222 | 82.6 | (80.6-84.5) | 5.6 |

**Survey Question**: Which of the following statements best describes the rules about smoking inside your home during your most recent pregnancy, even if no one who lived in your home was a smoker?

**Response 1**: Smoking was permitted anywhere inside my home.
**Response 2**: Smoking was allowed in some rooms or at some times



Figure 9: Smoking was allowed inside mother's home during pregnancy by prosperity region; MI PRAMS 2012-2014
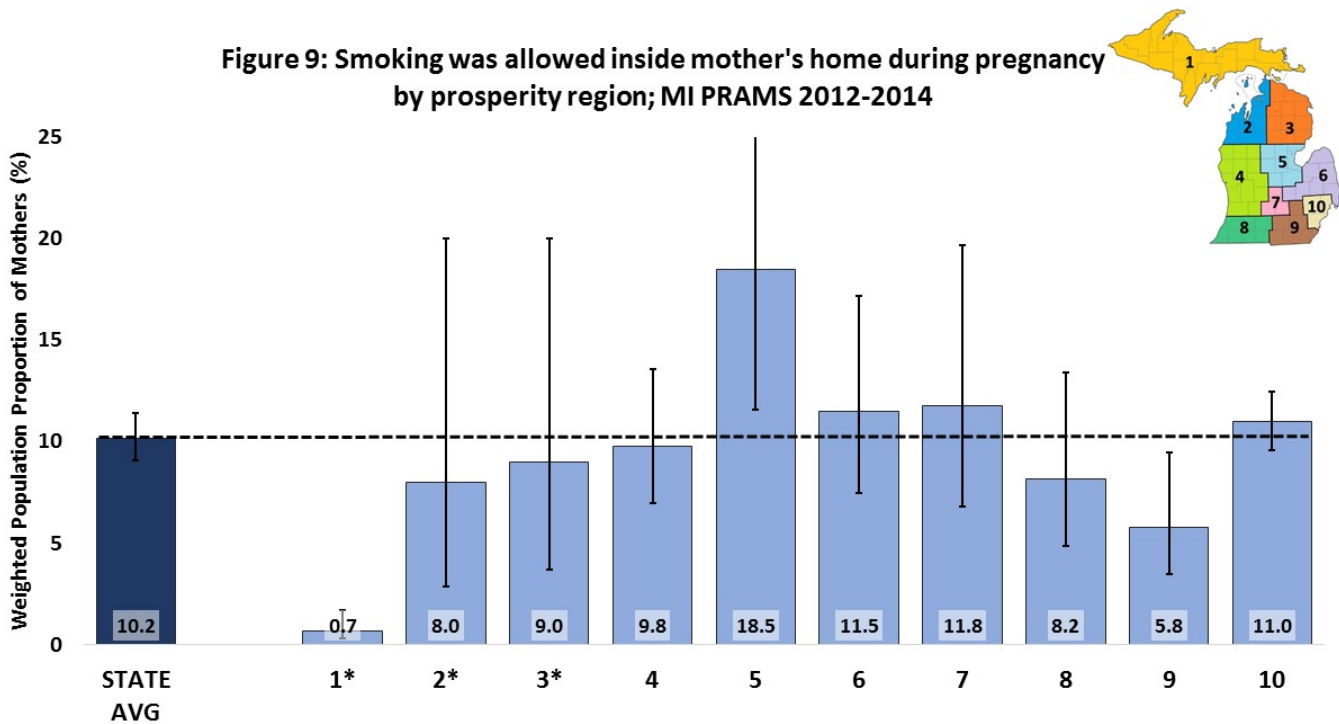
* Relative standard error is between 30% and 50%. Interpret with caution.

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| **Table 9. Smoking was allowed inside mother's home during pregnancy by prosperity region; MI PRAMS - 2012-2014** | | | | | |
| STATE TOTAL | 641 | 33,388 | 10.2 | (9.1-11.4) | 5.8 |
| **Prosperity Region** | | | | | |
| 1 | 6 | 62* | 0.7* | (0.3-1.7)* | 46.4* |
| 2 | 7 | 654* | 8.0* | (2.9-20.0)* | 49.9* |
| 3 | 11 | 456* | 9.0* | (3.7-20.0)* | 42.9* |
| 4 | 108 | 5,661 | 9.8 | (7.0-13.6) | 16.9 |
| 5 | 33 | 3,203 | 18.5 | (11.6-28.1) | 22.5 |
| 6 | 59 | 3,119 | 11.5 | (7.5-17.2) | 21.2 |
| 7 | 22 | 1,724 | 11.8 | (6.8-19.7) | 27.1 |
| 8 | 82 | 2,243 | 8.2 | (4.9-13.4) | 25.8 |
| 9 | 26 | 1,748 | 5.8 | (3.5-9.5) | 25.6 |
| 10 | 287 | 14,521 | 11.0 | (9.6-12.5) | 6.7 |

*Relative standard error is between 30% and 50%. Interpret with caution.

**Survey Question 1**: Which of the following statements best describes the rules about smoking inside your home during your most recent pregnancy, even if no one who lived in your home was a smoker?
**Response 1**: Smoking was permitted anywhere inside my home.
**Response 2**: Smoking was allowed in some rooms or at some times.

**Survey Question 2**: During the last three months of your pregnancy, how many cigarettes did you smoke on an average day?
**Response**: Mother indicated any cigarette smoking.



Figure 10: Mother smoked during last three months pregnancy or smoking was allowed inside home during pregnancy by prosperity region; MI PRAMS 2012-2014
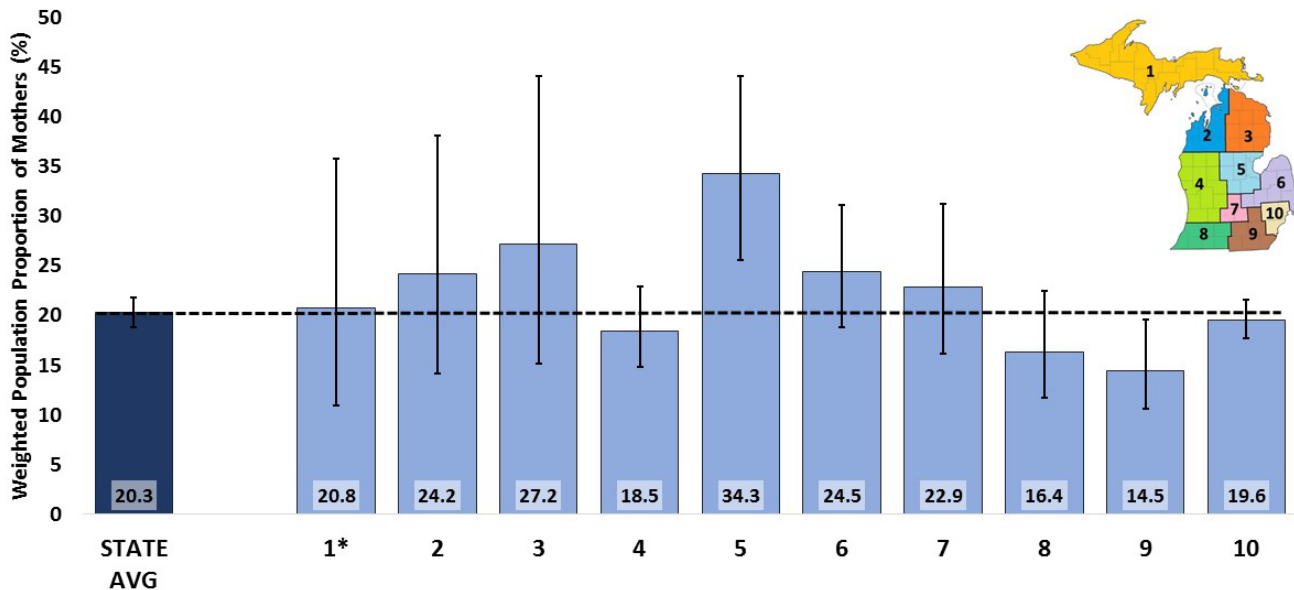
* Relative standard error is between 30% and 50%. Interpret with caution.

| Table 10. Mother smoked during last three months pregnancy or smoking was allowed inside home during pregnancy by prosperity region; MI PRAMS 2012-2014 | | | | | |
|---|---|---|---|---|---|
| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
| STATE TOTAL | 1,196 | 66,289 | 20.3 | (18.8-21.8) | 3.9 |
| **Prosperity Region** | | | | | |
| 1 | 23 | 1,725* | 20.8* | (11.0-35.8)* | 30.0* |
| 2 | 21 | 1,986 | 24.2 | (14.0-38.4) | 25.5 |
| 3 | 29 | 1,380 | 27.2 | (15.2-44.0) | 27.0 |
| 4 | 226 | 10,586 | 18.5 | (14.8-23.0) | 11.2 |
| 5 | 66 | 5,884 | 34.3 | (25.6-44.2) | 13.9 |
| 6 | 118 | 6,631 | 24.5 | (18.9-31.2) | 12.8 |
| 7 | 47 | 3,325 | 22.9 | (16.2-31.3) | 16.8 |
| 8 | 151 | 4,506 | 16.4 | (11.7-22.5) | 16.7 |
| 9 | 56 | 4,384 | 14.5 | (10.5-19.6) | 15.8 |
| 10 | 459 | 25,883 | 19.6 | (17.7-21.6) | 5.1 |

*Relative standard error is between 30% and 50%. Interpret with caution.

**Survey Question**: During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about any of the things listed below? Please count only discussions, not reading materials or videos.

**Response**: How smoking during pregnancy could affect my baby.



Figure 11: Mother reports any prenatal care discussions about smoking during pregnancy by prosperity region; MI PRAMS - 2012-2014

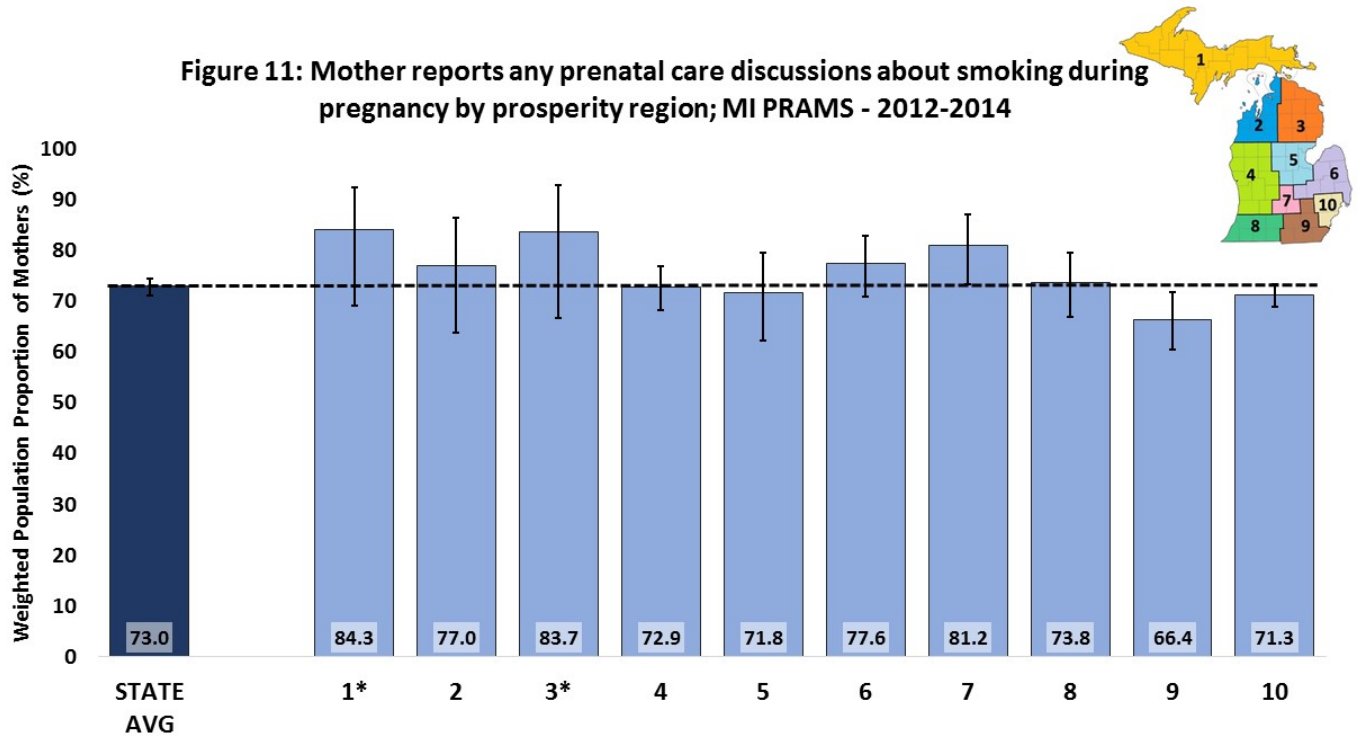\* Relative standard error is between 30% and 50%. Interpret with caution.

| | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| **Table 11. Mother reports any prenatal care conversations about smoking during pregnancy by prosperity region; MI PRAMS - 2012-2014** | | | | | |
| **STATE TOTAL** | 4,307 | 240,008 | 73.0 | (71.3-74.6) | 3.1 |
| **Prosperity Region** | | | | | |
| 1 | 66 | 6,984* | 84.3* | (69.8-92.6)* | 35.7* |
| 2 | 60 | 5,932 | 77.0 | (63.5-86.6) | 25.3 |
| 3 | 53 | 4,218* | 83.7* | (66.4-93.0)* | 39.9* |
| 4 | 877 | 41,875 | 72.9 | (68.3-77.0) | 8.2 |
| 5 | 183 | 12,501 | 71.8 | (62.3-79.7) | 15.7 |
| 6 | 370 | 21,232 | 77.6 | (71.0-83.0) | 13.6 |
| 7 | 194 | 12,076 | 81.2 | (73.4-87.1) | 18.4 |
| 8 | 547 | 20,365 | 73.8 | (67.0-79.7) | 12.3 |
| 9 | 259 | 20,165 | 66.4 | (60.6-71.8) | 8.5 |
| 10 | 1,698 | 94,659 | 71.3 | (69.0-73.5) | 4.0 |

*Relative standard error is between 30% and 50%. Interpret with caution.

**Survey Question**: During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about any of the things listed below? Please count only discussions, not reading materials or videos.

**Response**: How drinking alcohol during pregnancy could affect my baby.



Figure 12: Mother reports any prenatal care discussions about alcohol use during pregnancy by prosperity region; MI PRAMS - 2012-2014

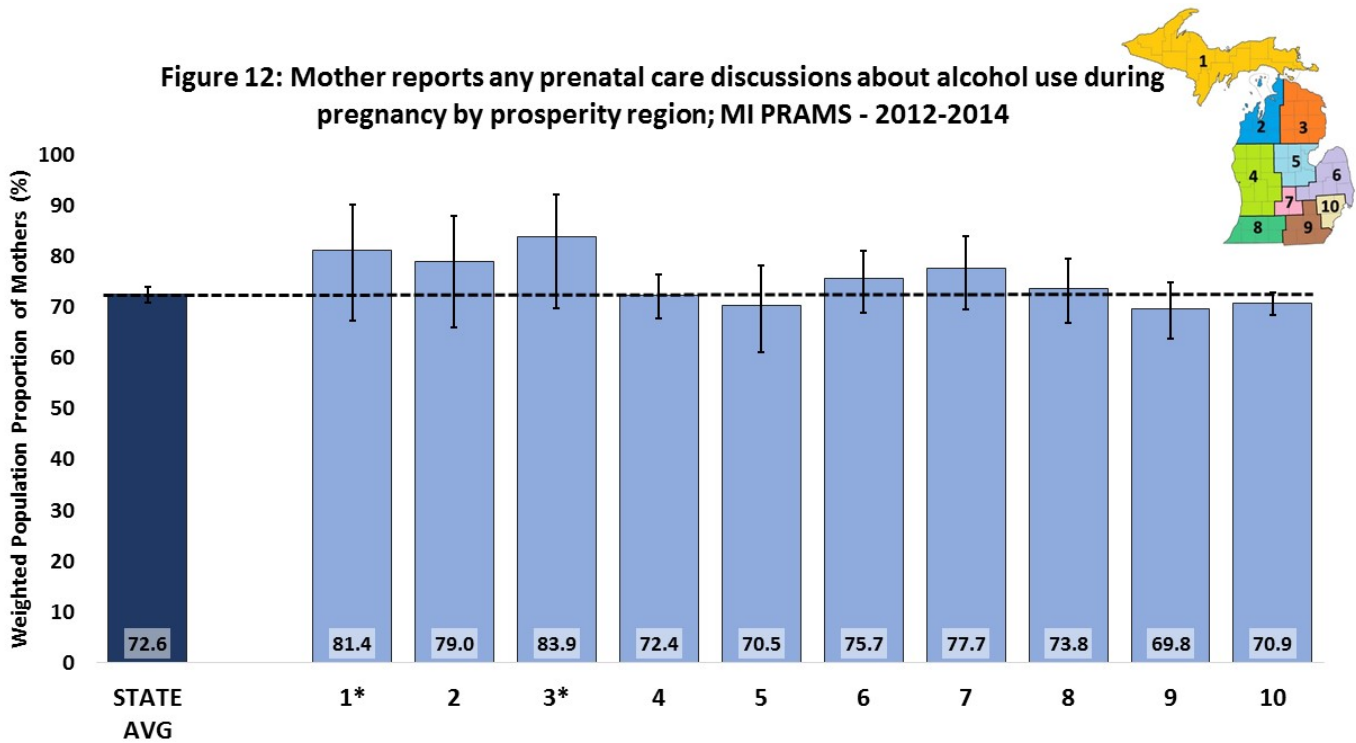\* Relative standard error is between 30% and 50%. Interpret with caution.

**Table 12. Mother reports any prenatal care conversations about alcohol use during pregnancy by prosperity region; MI PRAMS - 2012-2014**

|  | Sample Frequency | Weighted Frequency | Weighted Percent | 95% Confidence Interval | Relative Standard Error |
|---|---|---|---|---|---|
| **STATE TOTAL** | 4,270 | 238,711 | 72.6 | (70.9-74.2) | 3.1 |
| **Prosperity Region** | | | | | |
| 1 | 60 | 6,739* | 81.4* | (67.0-90.4)* | 31.3* |
| 2 | 60 | 6,083 | 79.0 | (65.7-88.0) | 26.7 |
| 3 | 49 | 4,232* | 83.9* | (69.4-92.3)* | 34.9* |
| 4 | 873 | 41,585 | 72.4 | (67.8-76.6) | 8.1 |
| 5 | 179 | 12,264 | 70.5 | (61.3-78.2) | 14.7 |
| 6 | 355 | 20,718 | 75.7 | (69.0-81.3) | 12.9 |
| 7 | 186 | 11,384 | 77.7 | (69.6-84.2) | 16.6 |
| 8 | 548 | 20,259 | 73.8 | (66.9-79.7) | 12.4 |
| 9 | 272 | 21,223 | 69.8 | (64.0-75.0) | 9.3 |
| 10 | 1,688 | 94,225 | 70.9 | (68.6-73.1) | 3.9 |

*Relative standard error is between 30% and 50%. Interpret with caution.

### Regional PRAMS perinatal substance use report - observations and discussion 1

There is variation across the state in maternal substance use before and during pregnancy. Despite the smaller sample sizes of regional PRAMS, some regional differences rise to the level of statistical significance. For regions named here as differing above or below the state average, the point estimate for that region was compared against the pooled point estimate for the remaining regions and that difference was statistically significant at the α < 0.05 level.

Just under two thirds of Michigan mothers (63.0%, 95% CI: 61.2% - 64.8%) report that they were consuming some alcohol in the three months before pregnancy [**Table 1**]. Prepregnancy alcohol consumption was significantly lower in Region 6 versus the remainder of the state, and in Region 10 versus the remainder of the state. By the last three months of pregnancy, the proportion of mothers consuming alcohol drops to 6.6% (95% CI: 5.7% - 7.5%); no regions differed significantly from the state average [**Table 2**]. Although this is about a 90% reduction from the proportion of mothers drinking any alcohol before pregnancy, the risks of late pregnancy alcohol exposure in these pregnancies may be sizable.

Three in ten Michigan mothers (29.1%, 95% CI: 27.4% -30.9%) report smoking any cigarettes in the three months before conception [**Table 3**]. Mothers in Region 2 and Region 5 were above the state average for prepregnancy smoking and mothers in Region 10 were below the state average. By the final three months of pregnancy the proportion of mothers smoking any cigarettes drops by about half to 15.1% (95% CI: 13.7% - 16.5%) [**Table 4A**]. Although Regions 2 and 5 have the highest proportions of mothers smoking during pregnancy, only the difference in Region 5 reaches statistical significance compared to the remainder of the state. The proportion of mothers in Region 10 who smoked during the last three months of pregnancy is below the state average. About half of mothers who smoked before pregnancy had quit by the last three months of pregnancy (48.4%, 95%CI: 44.8% - 52.1%) [**Table 4B**]. No region of the state had a significantly higher or lower proportion of women who stopped smoking during pregnancy.

Turning the focus to cigarette smoking after pregnancy, about two in ten Michigan mothers (20.5%, 95% CI: 18.9% - 22.1%) [**Table 5A**] report any smoking at the time they completed the PRAMS survey (between two and six months postpartum). The proportion of mothers smoking after pregnancy was significantly higher in Region 5, although several more regions have differences that are not significant. As with smoking before pregnancy and in the last three months, Region 10 was lower than the remainder of the state for smoking after pregnancy. Among mothers who smoked before and quit during pregnancy, just under half had resumed smoking by the time they completed the PRAMS survey (43.2%, 95% CI: 38.2% - 48.4%) [**Table 5B**]. No region of the state had a significantly higher or lower proportion of women resume smoking after pregnancy.

For the first time, we report the proportion of Michigan mothers who were both smoking and drinking around pregnancy. **Table 6A** shows that polysubstance use was not uncommon in the three months before pregnancy; two in ten mothers were both smoking and drinking alcohol (21.5%, 95% CI: 19.9% - 23.2%). Combined smoking and drinking was relatively more common in Region 5 and less common in Region 10. **Table 6D** shows that only a minority of Michigan mothers (29.4%; 95% CI: 27.8% - 31.1%) were neither smoking nor drinking before pregnancy. This proportion was higher in Region 10.

While polysubstance use before pregnancy is not uncommon, less than 1% of mothers reported both smoking and drinking in the last three months of pregnancy (0.9%, 95% CI: 0.7% - 1.4%) [**Table 7**]. This proportion is so small that estimation at the regional level is not feasible - positive news for Michigan infants from 2012-2014. Although this is a high-risk group of mothers deserving of attention, due to their small numbers in each region the remaining substance use tables excludes these women.

### Regional PRAMS perinatal substance use report - observations and discussion 2

**Table 8C** shows that four out of five Michigan mothers (80.0%) report no alcohol or tobacco use in the last three months of pregnancy (95% CI: 78.4% - 81.5%). Region 5 had a significantly higher proportion of mothers who reported both smoking and drinking in late pregnancy, while Region 10 had a significantly lower proportion.

One in ten Michigan mothers report that smoking was allowed in their home during pregnancy (10.1%, 95% CI: 9.1% - 11.4%) [**Table 9**]. Significantly fewer mothers from Region 1 and Region 9 reported that smoking was allowed in their home. Nearly one in five mothers from Region 5 (18.5%, 95% CI: 11.6% - 28.1%) reported that smoking was allowed somewhere in their home, almost double the state average.

**Table 10** shows a cumulative measure for smoking exposure during pregnancy, compiled from the data in Tables 4 and 9. This measure shows the proportion of mothers who did not smoke but lived in a home where smoking was allowed during pregnancy, added to the proportion of mothers who reported smoking during the last three months of pregnancy. Approximately one in five Michigan mothers report tobacco exposure during pregnancy, either through their own cigarette use or because other people were allowed to smoke in their home (20.3%, 95% CI: 18.8% - 21.8%). As with prior measures of tobacco exposure, this number is significantly higher in Region 5 (34.3%, 95% CI: 25.6% - 44.2%). Although there is no significant difference in smoking during pregnancy for mothers in Region 9, the cumulative tobacco exposure for this region was significantly lower than the remainder of the state (14.5%, 95% CI: 10.5% - 19.6%). While this is a cumulative measure it is not exhaustive; mothers may still have been exposed to tobacco smoke at their workplace or in other locations.

Because the risks of smoking and drinking during pregnancy are well-documented, it is important that physicians and nurses who provide prenatal care discuss these risks with *every expectant mother*. **Table 11** shows the proportion of all Michigan mothers who report having a prenatal care conversation about smoking during pregnancy. About three quarters did have a conversation about smoking during prenatal care (73.0%, 95% CI: 71.3% - 74.6%). Conversations about smoking were significantly more common in Regions 1 and 7, and less common in Region 9. Notably, conversations about smoking did not differ significantly in the region of the state with the highest proportion of all pregnancy tobacco measures (Region 5). Compared to conversations about smoking, a similar proportion of mothers (72.6%, 95% CI: 70.9% - 74.2%) say that they had any prenatal care conversations about the risks of alcohol use during pregnancy [**Table 12**]. More mothers in Region 3 reported prenatal care discussions about alcohol. Together, tables 11 and 12 show that over a quarter of mothers go through prenatal care without discussing the dangers of two common and preventable pregnancy risks.

One goal of prenatal care is to refer mothers to services that may help to improve their health and the health of their infant. MI PRAMS asked mothers whether, during pregnancy, they attended a support group or meetings to help them to stop smoking [data not shown in tables]. Among mothers who smoked in the three months before pregnancy, only 4.1% (95% CI: 3.0% - 5.4%) report attending a smoking cessation support group or class during pregnancy. Among women who smoked during the last three months of pregnancy, only 5.6% (95% CI: 3.9% - 7.9%) report that they attended a class or support group during pregnancy to help them stop smoking. MI PRAMS tells us that very few women who smoked before or during pregnancy participated in these classes.

## MI PRAMS strengths and limitations

**Strengths**: MI PRAMS is a population-based survey administered using a standard procedure and a validated survey instrument. Women share their personal information in the context of a confidential research study and disclose substance use at rates greater than that seen in other perinatal data sources. Multiple years of survey data were pooled to provide more statistical power in these estimates. This survey oversampled mothers of low birth weight infants and African-American mothers. The pool of possible responders is drawn from all certificates of live birth. Because there is data on non-responders, statistical adjustments are made to adjust for possible non-responder bias.

**Limitations**: While regional analysis provides population-level data for new areas within the state, dividing the overall pool of responders limits the power to detect statistically significant differences. Estimates for regions with the fewest responders and estimates for rare behaviors and experiences are less precise at the stub-state level. Pooling together multiple survey years into one data set removes the ability to test for trends over time. Although the survey collects data close to the time of delivery (2-6 months postpartum), there is the possibility for recall bias. The survey is collected at one point in time and does not allow for measuring differences over time in individuals. The survey instrument is administered only in English.

## PRAMS data requests and contact information

The mission of Michigan PRAMS is to collect high-quality data and provide analytic products that help facilitate positive changes for Michigan mothers and babies. If these results have been useful for you or your organization, please let us know! Your reports of how PRAMS data has been useful to your organization are vital to keeping PRAMS running.

**If you need different analyses to help make positive changes for the mothers and babies that you serve, please contact the PRAMS project coordinator**:

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# MDHHS

**Michigan Department of Health & Human Services**