

# Correlates of Postpartum Alcohol Use

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## ABSTRACT

**Objective:** The purposes of this investigation are to (1) describe drinking patterns among women attending a postpartum visit, and (2) identify correlates of postpartum “at risk” drinking.

**Methods:** A survey was completed by 8706 women at their postpartum visit. We identified correlates of “at risk” drinking, defined as binge drinking (4 or more drinks per occasion at least once in the past month) or consuming an average of  $\geq 7$  drinks/wk.

**Results:** A total of 997 women (12%) reported “at risk” drinking. At risk drinkers were more likely than other women to have been frequent drinkers prior to pregnancy ( $\geq 7$  drinks/wk), scored 1 or 2 on the CAGE, smoked postpartum, and been unmarried. Black women, those over age 35, “stay-at-home mothers,” and women having breastfed were *less likely* to report “at risk” drinking.

**Conclusion:** This study supports routine alcohol screening of women attending a postpartum visit with their obstetrician.

## INTRODUCTION

Alcohol consumption by women during the postpartum period is important for several reasons. Maternal alcohol consumption has been linked to violence toward children,<sup>1</sup> and the interaction of maternal alcohol use and lactation on infant development remains unclear.<sup>2,3</sup> In addition, if a woman who drinks during the postpartum period becomes pregnant, her future child is at risk for developing one of the fetal alcohol spectrum disorders (FASD). FASD is not a clinical diagnosis, but refers to the full range of outcomes observed in individuals with gestational exposure to alcohol. The

effects of prenatal alcohol exposure are broad and may include physical, mental, behavioral, and/or learning disabilities that persist throughout a child’s lifetime.<sup>4</sup> The most severe outcome is fetal alcohol syndrome (FAS), characterized by dysmorphic facial features, growth deficiencies, and central nervous system abnormalities.<sup>5,6</sup> Because no “safe” level of alcohol consumption during pregnancy has been determined, women who are pregnant or may become pregnant are advised not to consume alcohol.<sup>7</sup>

A woman’s consumption of alcohol generally decreases after the recognition of pregnancy. Eighty percent of women report no alcohol use during pregnancy, and among those who do consume alcohol, many decrease their usage during pregnancy.<sup>8</sup> Following the birth of a child, many women resume frequent drinking and/or binge drinking.<sup>9</sup> Because the likelihood of having a child with FAS increases with subsequent pregnancies, these women may be at particular risk for having a child with FAS.<sup>10</sup> Research has shown that receiving a comprehensive alcohol assessment during pregnancy is associated with reductions in alcohol consumption during pregnancy.<sup>11</sup> However, women who drink heavily often receive prenatal care later in their pregnancies.<sup>12</sup> By the time these women interact with a clinician, irreversible alcohol-related damage to the fetus may have already occurred. Therefore, the postpartum period may be a particularly important time to intervene among female drinkers in order to prevent future alcohol-exposed pregnancies.

While several studies<sup>8,13,14</sup> have documented risk factors for alcohol consumption prior to and during pregnancy, there is limited information on postpartum alcohol use. A study of urban adolescents found that alcohol use decreased substantially during pregnancy but steadily increased throughout the postpartum period.<sup>15</sup> The authors concluded that drug prevention programs should target the 6-month postpartum period. A second study of recent mothers in New Zealand found that women with a tertiary education were more likely to use alcohol in the postpartum period, and those with

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socio-economic deprivation were less likely to use alcohol.<sup>16</sup> Limitations of previous research into postpartum drinking include small sample sizes, limited measures of alcohol consumption, and lack of information on risk factors associated with postpartum drinking.

The purposes of this study are to describe the alcohol consumption patterns of a sample of 8706 women attending a postpartum obstetrical visit and to characterize women who engage in postpartum at risk drinking. This is the largest epidemiological survey of postpartum alcohol use reported to date.

## METHODS

### *Overview*

This study reports findings from a self-administered survey of women attending a postpartum visit to an obstetrician. The survey was the initial screening instrument used to identify potential subjects for a randomized, clinical trial of brief intervention among postpartum women drinkers. The study was approved by 12 different human subjects committees, all of which have their own federal wide assurance (FWA) certificates. The primary institutional review board was the University of Wisconsin Health Sciences Human Subjects Committee. All members of the research team completed NIH-required courses on human subject's protection. All participants provided written, informed consent.

### *Sample*

The subjects of this study were women who were 18 years of age and older and were being seen for a postpartum visit at 35 obstetric and gynecologic clinics located in 15 Wisconsin counties. The routine postpartum visit typically occurs between 6 and 12 weeks following delivery. Recruitment occurred from July 2002 to April 2005. The clinic sites were located in rural, suburban, and urban locations.

### *Research Procedures*

All English-speaking women, age 18 and older, were asked by a clinic nurse or receptionist to complete a brief, self-administered questionnaire while they waited for their postpartum appointments. The survey consisted of close-ended questions and took about 5 minutes to complete. The response rate varied by clinic and ranged from 85% to 95%. Reasons for non-participation included non-English speakers, not interested in participating in a research study, absence of a person to supervise accompanying children, and lack of time between check-in and their clinician visit.

### *Measures*

The questionnaire included items relating to sociode-

mographic characteristics and health behaviors prior to, during, and following pregnancy. Questions pertaining to alcohol use were embedded within other health items addressing exercise habits, tobacco use, and breastfeeding. The questionnaire included the CAGE (Cut down, Annoyed, Guilty, Eye opener) as an indirect alcohol screening instrument. The CAGE is a 4-item measure from which a score of 0 to 4 is derived.<sup>17</sup>

For the analyses, all respondents were categorized to differentiate "at risk" drinkers from those who did not engage in "at risk" drinking. For the following 6 variables, subjects were dichotomized:  $\geq 7$  drinks/week prior to pregnancy versus  $< 7$  drinks/wk, being not married versus being married, any postpartum smoking versus none, any breastfeeding in the past 7 days versus none, having some college education versus no college education, and having  $\geq 2$  children versus  $< 2$  children. Subjects were classified into 4 groups based on their CAGE scores of 0, 1, 2, and 3 or 4. The 3 categories for employment status were employed (including part-time and full-time), unemployed, and not in the labor force (referring to stay-at-home mothers, students, and seasonal workers). Race and ethnicity categories included white, non-Hispanic; black, non-Hispanic; and Hispanic. Subjects reporting both black and white, non-Hispanic were classified as black, non-Hispanic.

Postpartum "at risk" usage was defined as meeting 1 of the following criteria: (1) drinking 7 or more drinks per week, on average, or (2) consuming 4 or more drinks in a single day at least once during the past 30 days (binge drinking). This definition is similar to the definition of "frequent drinking" used in the Behavioral Risk Factor Surveillance System (BRFSS) survey.<sup>7</sup> Women who did not provide responses to the questions regarding the presence of alcohol use and did not provide responses to questions about quantity and frequency of alcohol use were excluded from the analysis. Women who answered "no" to any alcohol use, but who then provided data for both quantity and frequency were considered to be drinkers.

### *Data Handling Methods*

All data were checked for missing and out-of-range values. Duplicate responses to a question were resolved by the second author.

### *Statistical Analysis*

Analysis of the data was performed using SPSS for Windows version 11 statistical package (SPSS, Inc. Chicago Ill). Descriptive analyses were performed to characterize the sample. To determine correlates of postpartum at risk drinking, subjects with at risk drink-

ing were compared with subjects who did not engage in at risk drinking. Multivariate logistic regression was used to determine the characteristics that best predicted postpartum at risk drinking. The results are presented as odds ratios (OR). An odds ratio for a given category of a given characteristic is interpreted as the relative increase or decrease in the prevalence of at risk drinking among women in that category compared with the prevalence among women in the referent group.

## RESULTS

### *Sample Characteristics*

The original study sample was comprised of 8706 women. Table 1 shows selected characteristics of women in the sample. Of the women surveyed, 81% identified themselves as white, 6.5% as Hispanic, 5% as black, 3% Asian, and 2% American Indian. The majority of American Indian women in our sample were recruited from clinics not located on reservations.

Over 70% of the sample had attended at least some college and over half reported breastfeeding in the past 7 days. Based on retrospective data collected at the time of the postpartum visit, just over 20% of women reported smoking prior to becoming aware of their pregnancy. About 10% reported smoking while pregnant, and 13% of the total sample reported smoking at the time of the postpartum visit.

### *Prevalence of Alcohol Use*

The percentages of women reporting alcohol use during the pre-pregnancy, intrapartum, and postpartum periods are depicted in Figure 1. Overall, 41.5% of subjects reported alcohol use in the postpartum period with the majority of drinkers consuming 1 drink or less per week. Table 2 lists the prevalence of levels of alcohol use among women prior to, during, and following pregnancy. Of the sample, 1.5% reported consuming an average of 7 or more drinks per week during the postpartum period. Binge drinking in the postpartum period was reported by 11.9% of the sample. Among women who reported binge drinking in the past 30 days, the majority (60%, n=581) reported a single episode, with 24% (n=233) reporting 2 episodes, 10% (n=96) reporting 3 episodes, and about 7% (n=65) reporting 4 or more episodes.

### *Correlates of Postpartum At Risk Drinking*

Multivariate logistic regression was used to identify significant predictors of postpartum at risk alcohol consumption. Incomplete data excluded 1424 women, leaving 7282 subjects in the final regression analysis. The

variables entered into the model were based on existing literature. The model included 10 sociodemographic and behavioral variables, which are described in the Methods section.

Results, in the form of adjusted odds ratios, appear in Table 3. The odds ratio is a measure of association that approximates how much more likely or unlikely it is for at risk drinking to be present among women with a given characteristic than among those who do not have that characteristic. An OR >1 indicates that a given characteristic is positively associated with at risk drinking while an OR <1 indicates a negative association with at risk drinking. At risk drinkers were more likely than other women in the sample to have: consumed  $\geq 7$  drinks/week prior to pregnancy (odds ratio [OR]=5.8; 95% confidence interval [CI]=4.6-7.2), scored 1 or 2 on the CAGE (OR=2.1 and 4.2 respectively, 95% CI=1.5-2.9 and 2.3-7.7 respectively), smoked following pregnancy (OR=2.5, 95% CI=2.1-3.0), and been unmarried (OR=1.5, 95% CI=1.2-1.8). At risk drinkers were less likely to have breastfed in the past 7 days (OR=0.3, 95% CI=0.2-0.3), been non-Hispanic black (OR=0.6, 95% CI=0.4-0.8), been over age 35 (OR=0.7, 95% CI=0.5-0.9), and been "not in the labor force" such as stay-at-home mothers (OR=0.7, 95% CI=0.6-0.9).

## DISCUSSION

Preventing alcohol-exposed pregnancies is an important public health issue, as the combined rate of FASD's may be as high as 1 in 100 live births.<sup>18</sup> In our study, 12% of women attending a postpartum visit met criteria for at risk drinking. These women were more likely to have been frequent drinkers prior to pregnancy and to be unmarried, smokers, and not breastfeeding. They were less likely to be black, over the age of 35, and "not in the work force," such as stay-at-home mothers, students, and seasonal workers.

The prevalence of drinking prior to pregnancy (58%) among respondents in our sample is similar to the rates of 52.6% reported for women of childbearing age and 54.9% for women who might become pregnant as ascertained from the 2002 BRFSS.<sup>7</sup> The prevalence of alcohol use during pregnancy in our study (5.4%) was lower than rates reported in the literature. In a study of women seeking prenatal care at obstetrical clinics in Michigan, 15% reported alcohol use during pregnancy.<sup>19</sup> However, this difference must be interpreted carefully. In our survey, the questions pertaining to alcohol use during pregnancy were preceded by the phrase, "once you found out you were pregnant." As a result, the re-

**Table 1.** Characteristics of Women in the Sample

| Characteristics<br>(N= 8706)        | N    | %    | Alcohol Data |         |      | Low Risk |      | At Risk |      |
|-------------------------------------|------|------|--------------|---------|------|----------|------|---------|------|
|                                     |      |      | Available    | Abstain | %    | %        | %    | %       |      |
| <b>Age</b>                          |      |      |              |         |      |          |      |         |      |
| 18-21                               | 875  | 10.1 | 837          | 541     | 64.6 | 128      | 15.3 | 168     | 20.1 |
| 22-25                               | 1323 | 15.2 | 1289         | 711     | 55.2 | 330      | 25.6 | 248     | 19.2 |
| 26-30                               | 2597 | 29.8 | 2542         | 1383    | 54.4 | 861      | 33.9 | 298     | 11.7 |
| 31-35                               | 2378 | 27.3 | 2333         | 1272    | 54.5 | 863      | 37.0 | 198     | 8.5  |
| 36-40                               | 882  | 10.1 | 855          | 469     | 54.9 | 321      | 37.5 | 65      | 7.6  |
| 41+                                 | 121  | 1.4  | 113          | 65      | 57.5 | 40       | 35.4 | 8       | 7.1  |
| Missing                             | 530  | 6.1  | —            | —       | —    | —        | —    | —       | —    |
| <b>Race/Ethnicity</b>               |      |      |              |         |      |          |      |         |      |
| White                               | 7071 | 81.2 | 6933         | 3658    | 52.8 | 2413     | 34.8 | 862     | 12.4 |
| Black                               | 450  | 5.2  | 429          | 315     | 73.4 | 58       | 13.5 | 56      | 13.1 |
| Hispanic                            | 567  | 6.5  | 506          | 398     | 78.7 | 58       | 11.5 | 50      | 9.9  |
| Asian                               | 299  | 3.4  | 284          | 226     | 79.6 | 42       | 14.8 | 16      | 5.6  |
| American Indian                     | 185  | 2.1  | 182          | 110     | 60.4 | 26       | 14.3 | 46      | 25.3 |
| Other race                          | 307  | 3.5  | 277          | 218     | 78.7 | 38       | 13.7 | 21      | 7.6  |
| <b>Education</b>                    |      |      |              |         |      |          |      |         |      |
| No college                          | 2100 | 24.1 | 1997         | 1268    | 63.5 | 354      | 17.7 | 375     | 18.8 |
| Some college                        | 6139 | 70.5 | 6025         | 3235    | 53.7 | 2184     | 36.2 | 606     | 10.1 |
| Missing                             | 467  | 5.4  | —            | —       | —    | —        | —    | —       | —    |
| <b>Marital Status</b>               |      |      |              |         |      |          |      |         |      |
| Married                             | 6367 | 73.1 | 6218         | 3447    | 55.4 | 2206     | 35.5 | 565     | 9.1  |
| Not married                         | 1911 | 22.0 | 1839         | 1085    | 59.0 | 338      | 18.4 | 416     | 22.6 |
| Missing                             | 428  | 4.9  | —            | —       | —    | —        | —    | —       | —    |
| <b>Number of Children</b>           |      |      |              |         |      |          |      |         |      |
| 0 or 1                              | 3601 | 41.4 | 3517         | 1924    | 54.7 | 1146     | 32.6 | 447     | 12.7 |
| 2 or more                           | 4706 | 54.1 | 4567         | 2622    | 57.4 | 1404     | 30.7 | 541     | 11.8 |
| Missing                             | 399  | 4.6  | —            | —       | —    | —        | —    | —       | —    |
| <b>Breastfeeding in Past 7 days</b> |      |      |              |         |      |          |      |         |      |
| No                                  | 3265 | 37.5 | 3178         | 1533    | 48.2 | 949      | 29.9 | 696     | 21.9 |
| Yes                                 | 5083 | 58.4 | 4944         | 3034    | 61.4 | 1612     | 32.6 | 298     | 6.0  |
| Missing                             | 358  | 4.1  | —            | —       | —    | —        | —    | —       | —    |
| <b>Smoking Postpartum</b>           |      |      |              |         |      |          |      |         |      |
| No                                  | 7196 | 82.7 | 7031         | 4128    | 58.7 | 2299     | 32.7 | 604     | 8.6  |
| Yes                                 | 1141 | 13.1 | 1113         | 458     | 41.2 | 268      | 24.1 | 387     | 34.8 |
| Missing                             | 369  | 4.2  | —            | —       | —    | —        | —    | —       | —    |
| <b>Employment Status</b>            |      |      |              |         |      |          |      |         |      |
| Employed                            | 5879 | 67.5 | 5755         | 3072    | 53.4 | 1953     | 33.9 | 730     | 12.7 |
| Not in labor force*                 | 1640 | 18.8 | 1590         | 979     | 61.6 | 480      | 30.2 | 131     | 8.2  |
| Unemployed                          | 648  | 7.4  | 623          | 423     | 67.9 | 95       | 15.2 | 105     | 16.9 |
| Missing                             | 539  | 6.2  | —            | —       | —    | —        | —    | —       | —    |

Abstain=not consuming any alcohol during the past 30 days; Low risk=consuming <7 drinks per week AND not consuming 4 or more drinks on any occasion in the past 30 days; At risk=consuming 7 or more drinks per week OR consuming 4 or more drinks on any occasion in the past 30 days.

\* Such as stay-at-home parents, seasonal workers, or students.

sponses may not represent the total alcohol exposure during pregnancy as women's alcohol consumption likely decreased following the recognition of pregnancy. Trends in binge drinking across the 3 time periods could not be assessed as the survey did not include questions about binge drinking prior to or during pregnancy.

Characteristics associated with postpartum at risk drinking in this study were similar to correlates of drinking found among pregnant women. Floyd's study of periconceptual drinking patterns found that smoking and being unmarried were associated with frequent drinking,<sup>8</sup> and Flynn's study of pregnant women in Michigan demonstrated a positive association between smoking and higher risk alcohol use during pregnancy.<sup>19</sup> We did not observe the association between higher education and drinking that has been reported previously.<sup>8</sup> This lack of association may in part be due to the educational attainment of our sample. Over 70% of women in our sample had completed some college, and only 8% had not earned a high school degree or equivalent. It is possible that our sample contained too few women of low educational attainment to detect differences in drinking behaviors. However, this is unlikely since the odds ratio for at risk drinking among women with some college education versus all others was 1.0 (95% CI, 0.8-1.2). Our finding that women who are "not in the work force" are less likely to engage in risky drinking is similar to previous research showing that full-time housewife status is a protective factor against alcohol use during pregnancy.<sup>14</sup> Given the small sample sizes for racial/ethnic groups other than white, black, and Hispanic, caution should be used when interpreting our findings regarding the relationship of race and ethnicity in postpartum drinking.

The 10 factors included in our multivariate analysis accounted for a modest amount of the predictability of the outcome variable (Nagelkerke  $R^2=.25$ ). This indicates that many additional factors are related to at risk alcohol consumption in the postpartum period. Further research is needed to elucidate these factors.

### Limitations

There are limitations to our study. Data was not collected on individuals who did not consent to participate in the study. It is possible that the drinking habits of women who did not agree to participate in the study differed from those who did participate. However, the study was presented as a questionnaire about general health, minimizing the potential for self selection based on alcohol consumption patterns. The subjects for this study were surveyed at the time of their postpartum

**Table 2.** Percentage of Women Reporting Various Levels of Alcohol Consumption During the Pre-pregnancy, Intrapartum, and Postpartum Periods

| Drinks/<br>week | Pre-pregnancy<br>N=8298* | Intrapartum<br>N=8283* | Postpartum<br>N=8236* |
|-----------------|--------------------------|------------------------|-----------------------|
| Abstainer       | 41.6                     | 94.6                   | 56.2                  |
| 1 or less       | 27.6                     | 5.1                    | 30.1                  |
| >1 to 3         | 13.6                     | 0.2                    | 8.2                   |
| >3 to <7        | 10.0                     | 0.06                   | 4.0                   |
| 7 or more       | 7.2                      | 0.02                   | 1.5                   |

Prepregnancy=behaviors during the 6 months before the most recent pregnancy; Intrapartum=behaviors during the most recent pregnancy; Postpartum=behaviors since the birth of your most recent child, specifically the past 30 days.

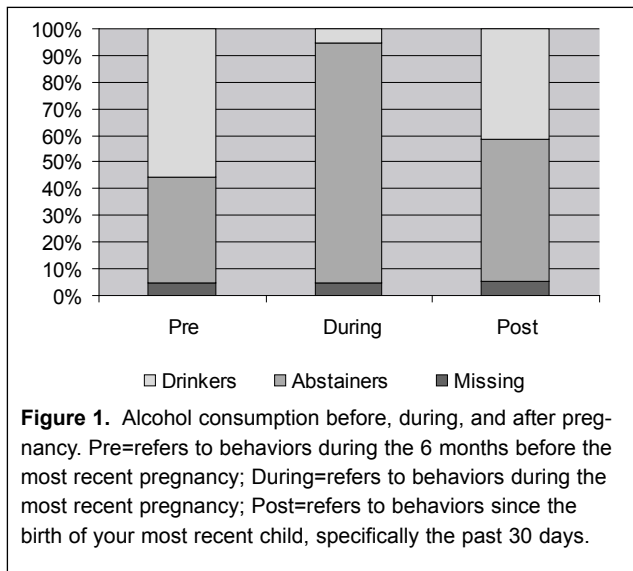
\* The sample sizes vary due to missing data.

**Table 3.** Correlates of Postpartum At Risk Drinking

|                                                                                | Adjusted OR | 95% CI   |
|--------------------------------------------------------------------------------|-------------|----------|
| ≥7 drinks/week prior to pregnancy<br>versus <7 drinks/week*                    | 5.8         | 4.6-7.2  |
| Being "not married"<br>versus being married*                                   | 1.5         | 1.2-1.8  |
| Postpartum smoking<br>versus not smoking*                                      | 2.5         | 2.1-3.0  |
| <b>CAGE Score</b>                                                              |             |          |
| Score=0                                                                        | Referent    | NA       |
| Score=1*                                                                       | 2.1         | 1.5-2.9  |
| Score=2*                                                                       | 4.2         | 2.3-7.7  |
| Score=3 or 4†                                                                  | 4.9         | 1.4-17.8 |
| <b>Age</b>                                                                     |             |          |
| 22-35                                                                          | Referent    | NA       |
| 18-21                                                                          | 1.0         | 0.7-1.2  |
| 35 and older*                                                                  | 0.7         | 0.5-0.9  |
| <b>Employment Status</b>                                                       |             |          |
| Employed                                                                       | Referent    | NA       |
| Not in labor force*                                                            | 0.7         | 0.6-0.9  |
| Unemployed                                                                     | 0.8         | 0.6-1.1  |
| Breastfeeding in past 7 days<br>versus no breastfeeding in<br>the past 7 days* | 0.3         | 0.2-0.3  |
| <b>Race/Ethnicity</b>                                                          |             |          |
| White, non-Hispanic                                                            | Referent    | NA       |
| Black, non-Hispanic*                                                           | 0.6         | 0.4-0.8  |
| Hispanic                                                                       | 0.8         | 0.5-1.1  |
| Having ≥2 children<br>versus <2 children                                       | 1.2         | 1.0-1.4  |
| Some college education<br>versus no college education                          | 1.0         | 0.8-1.2  |

\* Significant at  $P<0.01$ .

† Significant at  $P<0.05$ .



visit. As a result, our findings may not be generalizable to women who do not receive this level of care. Finally, information about behaviors prior to pregnancy and during pregnancy was self-reported at the postpartum visit, and could be subject to recall bias.

**CONCLUSIONS**

Despite numerous public awareness campaigns and the inclusion of warning labels on alcoholic beverages, fetal alcohol spectrum disorders continue to be a significant cause of disability. FAS is the leading known cause of mental retardation/developmental disabilities in the western world, and it is preventable.<sup>20</sup> The disabilities associated with FASD’s persist throughout a person’s lifetime, and are associated with significant costs to families and society.<sup>21</sup> While the prenatal period is clearly an important time to intervene among women drinkers, by the time a woman realizes that she is pregnant, irreversible damage to the fetus may have already occurred. Research has demonstrated that brief intervention is feasible and effective when conducted in the offices of primary care physicians.<sup>22</sup> The routine postpartum obstetrical visit is one setting for such an intervention. Other settings for intervention may include the offices of pediatricians, family physicians, public health nurses, or clinics associated with the Women, Infants, and Children program. These represent settings where a mother might accompany her children to appointments. While some providers might feel that inquiring about maternal alcohol use is beyond the scope of their practice, we urge medical professionals to adopt alcohol screening as a routine part of care as many have done for the assessment of postpartum depression and paren-

tal smoking practices.

To our knowledge, this is the largest study of drinking patterns among women attending a postpartum visit to an obstetrician. Risk factors such as being unmarried, smoking, and not breastfeeding may assist health care professionals in identifying women who may be at increased risk of binge drinking or frequent drinking. In addition, given the prevalence of at risk drinking and the potentially severe effects of gestational alcohol exposure, health care professionals who regularly see women with risk factors for drinking should consider the routine use of brief alcohol screening instruments such as the T-ACE<sup>23</sup> or TWEAK.<sup>24</sup>

Both the T-ACE and TWEAK have been tested among samples of pregnant women to identify risk drinking.<sup>25</sup> T-ACE stands for tolerance, annoyed, cut down, and eye opener. It consists of the following questions. How many drinks does it take to make you feel high? Have people annoyed you by criticizing your drinking? Have you ever felt you ought to cut down on your drinking? Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hang-over? Two points are given when a pregnant woman reports that more than 2 drinks are necessary for her to feel “high” or experience the intoxicating effects of alcohol. One point is given for each “yes” answer to the remaining 3 questions. It is considered positive if a woman scores 2 or more points. TWEAK stands for tolerance, worried, eye opener, amnnesia, and cut down. The questions are as follows: How many drinks can you hold? Have close friends or relatives worried or complained about your drinking in the past year? Do you sometimes take a drink in the morning when you get up? Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember? Do you sometimes feel the need to cut down on your drinking? It is scored on a 7-point scale with 2 points given if a woman reports she can consume more than 5 drinks without falling asleep or passing out and 2 points given for a positive answer to the worry question. For each of the remaining 3 questions, 1 point is given for an affirmative response. A score of 2 or more is indicative of an at-risk drinker. Following a positive screen with the T-ACE or TWEAK, health care professionals should engage their patient in a discussion about the effects of alcohol on the developing child and should offer brief intervention or make a referral for services.

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