

**FINAL COMPREHENSIVE REPORT**  
**THE MATERNAL AND CHILD HEALTH RESEARCH PROGRAM**  
**Pregnancy Psychosocial Risk Screening Validation Study**  
**HRSA Grant No. R40 MC07840, January 1, 2007 – December 31, 2011**

## **I. INTRODUCTION**

### **A. NATURE OF THE RESEARCH PROBLEM**

The federal Healthy Start Initiative, like other programs for high-risk women, is designed to reduce infant mortality and improve infant and maternal health by addressing psychosocial and medical risks. In order to identify pregnant women in need of enhanced services, routine comprehensive psychosocial risk screening is essential. For depression and substance use, brief screening tools have been developed and validated for use in primary care settings. However, research was lacking regarding detection of these risks during pregnancy, where even lower levels of emotional distress or substance use may adversely affect fetal or maternal health. Furthermore, most existing screening tools are condition-specific, making it difficult for health care providers to obtain a comprehensive risk profile.

To facilitate multidimensional psychosocial risk screening, the Prenatal Risk Overview (PRO)<sup>1</sup> was developed to assess 13 risk domains associated with poor birth outcomes or poor compliance with prenatal care: telephone access, transportation access, food security, housing stability, social support, partner violence, sexual/physical abuse by a non-partner, depression, cigarette smoking, alcohol use, drug use, legal problems, and child protection involvement. Although used to determine eligibility for a local Healthy Start program, key domains had not been validated in the target population of prenatal care patients. Furthermore, little empirical evidence was available to guide clinical decisions about the utility of re-screening during pregnancy or whether paraprofessionals could effectively administer risk screening interviews.

### **B. PURPOSE, SCOPE, AND METHODS OF THE INVESTIGATION**

The purpose of the Pregnancy Psychosocial Risk Screening Validation Study was to validate the Prenatal Risk Overview (PRO) in clinical settings.

The study was designed to measure criterion validation in several ways:

- Assess sensitivity and specificity of the PRO risk levels for depression (using the PHQ-9<sup>2</sup>), alcohol use disorders,<sup>3</sup> and drug use disorders against diagnoses established through administration of the Structured Clinical Interview for DSM-IV (SCID).<sup>4</sup>
- Assess concordance between the PRO risk levels for partner violence against a shortened version of the Composite Abuse Scale.<sup>5</sup>
- Assess the rate of false negative screens for depression, alcohol use disorders, drug use disorders, and partner violence by comparing PRO responses to medical encounter data.

Two sub-studies addressed effective use of clinical resources to conduct routine screening:

- For the interviewer equivalence study, participants were randomly assigned to be interviewed by either a registered nurse or a community health worker.
- For the re-screening study,<sup>6</sup> results from a readministration of the PRO later in pregnancy were compared with intake results to determine the extent of new risks identified.

Although not part of the original study design, the SCID posttraumatic stress disorder module was also administered to assess the prevalence of this disorder and the relationship of PTSD to other prenatal risk factors.

### C. NATURE OF THE FINDINGS

**PRO validation of major depression and substance use disorders.** As hypothesized, the PHQ-9 questions embedded in the PRO detected major depressive and substance use disorders (abuse or dependence) as measured by the SCID with high rates of sensitivity and specificity. Specifically, the PRO identified a current major depressive disorder episode with sensitivity of 85% and specificity of 84%; an alcohol use disorder with sensitivity of 84% and specificity of 80%;<sup>3</sup> and a drug use disorder with sensitivity of 89% and specificity of 74%.

Comparison of the PRO low risk classifications for the depression, alcohol use, and drug use domains against prenatal medical encounter diagnoses for Medicaid enrollees revealed very low rates of false negatives, defined as low risk classification on the PRO and a diagnosis recorded in encounter data. The false negative rate for a major depressive episode was 2.6%, for an alcohol use disorder, 0.6%, and for a drug use disorder, 2.3%.

**PRO validation of intimate partner violence.** PRO sensitivity against a CAS measure of abusive or threatening partner behavior before or during pregnancy was 35% and barely exceeded 50% for higher CAS cut points. While specificity and predictive values were high, the low sensitivity reflects serious underdetection of partner violence. Comparison of a PRO low risk classification for partner violence against prenatal medical encounter codes for assaults yielded a false negative rate of 1.0%.

The **interviewer equivalence study** found that community health workers elicited levels of risk comparable to or higher than those reported to registered nurses, including consistently higher levels of risk for all basic needs domains (telephone, transportation, food security and housing stability).

The **re-screening study**<sup>6</sup> found that the second interview identified a moderate or high risk level for at least one risk factor that was not identified at the initial screening for at least half of all study participants, and a new high risk level for one-fourth of study participants.

Current **PTSD** was found to be more prevalent than current major depression (6.6% versus 3.6%) suggesting the focus on prenatal depression screening should be expanded to include PTSD.

## II. REVIEW OF THE LITERATURE

Racial disparities in birth outcomes have persisted throughout the U.S. for decades.<sup>7</sup> A variety of psychosocial risk factors have been found to be associated with poor birth outcomes which likely contribute to racial and income disparities. These include depression,<sup>8</sup> tobacco,<sup>9</sup> alcohol,<sup>10</sup> and other drug use,<sup>11-13</sup> homelessness,<sup>14</sup> poor nutrition,<sup>15</sup> intimate partner violence,<sup>16</sup> and lack of social support.<sup>17</sup> These risk factors occur with disproportionate frequency among low-income and minority women,<sup>18</sup> and tend to co-exist.<sup>19,20</sup>

Comprehensive screening tools that address the multiple psychosocial risk factors that contribute to poor birth outcomes are lacking.<sup>21</sup> Furthermore, the PHQ-9 for depression and substance use screening tools have not been validated against a diagnostic interview among pregnant women. Empirical findings are also lacking for the effect of repeated prenatal screening for psychosocial risks and for psychosocial risk screening conducted by paraprofessionals.

## III. STUDY DESIGN AND METHODS

The Pregnancy Psychosocial Risk Screening Validation Study was designed to validate a structured, multidimensional screening interview, the Prenatal Risk Overview (PRO), in clinical settings. Study components assessed the accuracy of the PRO in detecting clinically relevant risk factors, its administration by paraprofessionals, and the utility of a repeat administration.

- **PRO versus diagnostic interview validation study.** Prenatal care patients were administered selected modules of the Structured Clinical Interview for DSM-IV (SCID) in order to assess the sensitivity and specificity of the PRO in identifying depressive, alcohol, and drug use disorders, and to determine the prevalence of current posttraumatic stress disorder. Participants were also administered a brief version of the Composite Abuse Scale (CAS) to assess PRO findings related to intimate partner violence.
- **PRO versus medical encounter data validation study.** For participants who consented and were enrolled in Medicaid, PRO results were compared with diagnostic codes for psychiatric and substance use disorders and with assault injury codes for partner violence to determine the extent to which the PRO may have underdetected these risk factors.
- **PRO interviewer equivalence study.** Prenatal care patients were interviewed by a registered nurse or a community health worker, randomized by weekday, to determine whether different interviewer types elicited similar levels of PRO risk reporting.
- **PRO re-screening study.** Prenatal care patients were re-administered the PRO approximately 13 weeks after the initial administration to determine whether the second interview appeared clinically justified based on the level of additional risks reported.

#### A. STUDY DESIGN

The PRO was already administered routinely at intake for participating Twin Cities Healthy Start program sites. The study design was observational and included a second administration of the PRO later in pregnancy, administration of the SCID/CAS interview, and analysis of medical encounter data for Medicaid patients. Patients with limited English ability were eligible only for the re-screening and medical encounter data components. The study protocol was approved by two institutional review boards.

#### B. POPULATION STUDIED

Study participants were drawn from consecutive prenatal care admissions at three community health care centers between mid-2007 and the end of 2010.

#### C. INSTRUMENTS USED

The **Prenatal Risk Overview (PRO)**<sup>1</sup> is a 10–15 min structured interview which assesses 13 psychosocial risk domains including access to basic needs, interpersonal relationships, risk behaviors, legal problems, and involvement with child protective services. For 9 domains, items were drawn from existing instruments. The depression domain used the PHQ-9.<sup>2</sup> Alcohol and drug use frequency/quantity items were from the National Household Survey on Drug Use and Health;<sup>22</sup> adverse consequence items were from the Rapid Alcohol Problem Screen (RAPS).<sup>23</sup> Partner violence items were from the Abuse Assessment Screen.<sup>24</sup>

A research version of the **Structured Clinical Interview for DSM-IV**<sup>25</sup> was used to establish criterion validity for the PRO depression, alcohol use, and drug use domains, and to assess prevalence of PTSD. An abbreviated version of the **Composite Abuse Scale** was used to assess criterion validity for partner violence.

#### D. STATISTICAL TECHNIQUES EMPLOYED

Statistical analyses were conducted using SPSS 19.0. Bivariate analyses (Pearson's  $\chi^2$  tests and ANOVA) were used to test for statistically significant between-group differences.

## IV. DETAILED FINDINGS

### A. DIAGNOSTIC INTERVIEW AND MEDICAL ENCOUNTER DATA VALIDATION STUDIES

**SCID interview sample.** Of 2,380 pregnant women seen at participating study sites, 1,798 met study criteria; 1,367 were asked to participate with most omissions resulting from unavailability of study staff, and 1,274 either signed consent forms or agreed to a call from the research assistant to schedule the interview. Of women who initially agreed to participate, 745 (58.5%) completed the SCID. Attrition was due primarily to inability to contact the patient.

An attrition analysis revealed that compared with consenters, nonconsenters were significantly more likely to be Asian, foreign-born, married, older, and classified by the PRO as low risk for alcohol or drug use. Although differences in race/ethnicity, nativity, and marital status also reached statistical significance for noncompletion, these percentage differences were relatively small. The validation interview sample was racially/ethnically diverse (58.7% African American, 15.3% Asian, 10.2% white, 7.9% Hispanic, 6.2% American Indian, and 1.8% multiracial or race unknown); 20.8% were foreign-born. Participants were predominantly young (mean age 23.0 years, SD=5.5) and unmarried (83.1%). The mean time between the PRO and SCID interviews was 27.7 days (SD = 25.0); the median was 20 days.

**CAS interview sample.** A subset of the SCID sample (98.1%) completed the CAS; 731 women stated they had a boyfriend or husband or partner during the 12 months before pregnancy recognition and responded to questions about this period and 725 had an intimate partner since pregnancy recognition and responded to the same set of questions focused on that time frame. A total of 722 answered both sets of questions

**Medical encounter data sample.** The sample was limited to 631 Medicaid patients whose data could be obtained from the Minnesota Department of Human Services and who consented to the release of data for comparison with PRO screening results.

#### 1. Major Depressive Disorder Episode, current (n=745)

**PRO depression risk as measured by the PHQ-9:** 608 participants (81.6%) scored at low risk (0-9 points), 80 (10.7%) at moderate risk (10-14 points), and 57 (7.7%) at high or very high risk (15-27 points).

**SCID depression diagnosis:** 27 participants (3.6%) met DSM-IV<sup>26</sup> criteria for a current major depressive episode. An additional 52 (7.0%) met a subdiagnostic threshold of at least 3 symptoms (versus 5 symptoms plus significant distress/impairment required for diagnosis of major depressive disorder).

**PRO versus SCID.** The PRO moderate/high risk classification yielded sensitivity of 85%, specificity of 84%, positive predictive value of 17%, and negative predictive value of 99%.

**PRO versus encounter data.** Of 539 PRO cases classified as low risk for depression, 15 (2.5%) had a diagnosis of a current major depressive disorder episode recorded within 3 months of PRO administration. Of 92 PRO cases classified as moderate or high risk for depression, 16 (17.4%) had a depression-related diagnosis recorded.

#### 2. Alcohol Use Disorders, 12 months pre-pregnancy awareness and current (n=744)

**PRO alcohol use risk:** 48.7% of study participants reported alcohol use during the 12 months before they learned they were pregnant with a typical use quantity of 4 or more drinks per occasion. After pregnancy awareness, drinking patterns changed: 5.4% reported drinking and typical consumption was a single drink. Based on PRO risk thresholds, 75.5% were classified as low risk, 21.2% as moderate risk, and 3.2% as high risk.

**SCID alcohol use disorder diagnoses:** 7.4% met DSM-IV criteria for an alcohol use disorder 12-months before or during pregnancy (7.0% for abuse and 2.3% for dependence).

**PRO versus SCID.** The PRO moderate/high risk classification yielded sensitivity of 84%, specificity of 80%, positive predictive value of 25%, and negative predictive value of 98%.

**PRO versus encounter data.** Of 525 PRO cases classified as low risk for alcohol use, 3 (0.6%) had an alcohol abuse or dependence diagnosis recorded during pregnancy. Of the 106 PRO cases classified as moderate/ high risk for alcohol use, 12 (11.3%) had an alcohol diagnosis.

### **3. Drug use disorders, 12 months pre-pregnancy awareness and current (n=745)**

**PRO drug use risk:** 29.4% of study participants reported drug use during the 12 months pre-pregnancy awareness; 3.0% reported drug use-related neglect of responsibilities. Post-pregnancy awareness, 11.0% reported drug use. Based on PRO risk thresholds, 69.9% were classified as low risk, 12.8% as moderate risk, and 17.3% as high risk.

**SCID drug use disorder diagnoses:** 34.9% reported use of a specific drug at least two times in the 12 months before pregnancy awareness. At this level, the use of marijuana was reported by 33.3%, cocaine by 2.7%, hallucinogens by 1.9%, opiates by 1.1%, and other categories by 0.1-0.4%. Based on DSM-IV criteria, 7.0% were diagnosed with a drug use disorder 12 months before or during pregnancy (4.0% for abuse and 5.2% for dependence).

**PRO versus SCID.** Sensitivity and specificity for the PRO moderate/high risk classification were 89% and 74%, respectively, with a positive predictive value of 21% and a negative predictive value of 99%. The PRO classification of high risk yielded sensitivity of 79%, specificity of 87%, positive predictive value of 32%, and negative predictive value of 98%.

**PRO versus encounter data.** Of 471 PRO cases classified as low risk for drug use, 11 (2.3%) had a drug abuse or dependence diagnosis recorded during pregnancy. Of the 160 PRO cases classified as moderate or high risk for drug use, 47 (29.4%) had a drug diagnosis recorded.

### **4. Intimate Partner Violence 12 months pre-pregnancy awareness (n=731) and during pregnancy (n= 725)**

**PRO partner violence risk.** The PRO classified 91.3% of study participants as low risk, 5.1% as moderate risk and 3.6% as high risk for intimate partner violence.

**CAS partner violence risk** The CAS found that 17.1 % reported at least one pre-pregnancy type of abusive or threatening behavior and 7.4% reported at least three. During pregnancy, one type was reported by 8.0%, three or more by 1.7%.

**PRO versus CAS.** Against a CAS measure of any incident during either time frame, the PRO's sensitivity was 35%, specificity was 98%, positive predictive value was 84%, and negative predictive value was 86%. Against a CAS threshold of three types of abusive behavior, sensitivity increased to 50% but positive predictive value decreased to 57%.

**PRO versus encounter data.** Of 586 PRO cases classified as low risk for intimate partner violence, 6 (1.0%) had an assault recorded during pregnancy. Of the 45 PRO cases classified as moderate or high risk for intimate partner violence, 2 (4.4%) had an assault recorded.

### **B. INTERVIEWER EQUIVALENCE STUDY (N=733)**

**Study sample.** Of 1,416 pregnant women seen at the study sites during the study period, 1,021 met inclusion criteria, and 777 were asked to participate, with most omissions resulting from staff unavailability. The final sample consisted of 733 consenters randomly assigned to interviewer type for the PRO interview. The sample was predominantly young (mean age 22.6 years), unmarried (83.4%), African American (69.7%), and born in the U.S. (73.4%).

**Findings.** No significant differences between study samples were found for comparisons of low risk and moderate/high risk classifications for 6 domains: partner violence, physical/sexual abuse by a non-partner, cigarette use, drug use, legal problems, and child protection involvement. For the combined moderate/high risk classification, CHW interviews resulted in significantly higher rates for depression and three of four basic needs domains – telephone access, food insecurity, and housing instability. For the high risk classification, CHW interviews had significantly higher rates for poor social support and two basic needs domains – transportation access and housing. The only classification for which a significantly higher rate was observed for RN interviews was high risk for alcohol use.

Hourly salary for registered nurses and hourly wage for community health workers was averaged over the 36 months of the study. The average hourly salary amount for RNs was \$34.30 compared with an hourly average wage for CHWs of \$15.23. Without considering other personnel costs such as fringe benefits, the hourly cost for CHW-conducted interviews was 56% lower than that for RN-conducted interviews.

### **C. RE-SCREENING STUDY (n=708)**

**Study sample.** During the data collection period, 1,555 prenatal care patients were seen at study sites, but 40 were too close to delivery to allow adequate time to elapse before re-screening. Of 1,515 eligible patients, 1,253 were asked to participate, and 1,093 consented to participate. Of consenters, 708 (64.8%) completed the second PRO. Compared with consenters, nonconsenters were more likely to be Asian or Hispanic, foreign-born, not fluent in English, and married; they were less likely to be at high risk for any PRO domain. Compared with noncompleters, completers were more likely to have had the initial PRO administered before the third trimester and were less likely to be at high risk for any PRO domain.

Participants were young, with a mean age of 23.5 years. Most (92.5%) were women of color; more than half were African American. Three-fourths were unmarried. More than one-third were foreign-born but for only about half of these was the interview conducted in a language other than English.

**Findings.** The mean interval between the two PRO administrations was 13 weeks. For the initial PRO interview, the most prevalent risk factor was social support, followed by housing stability, transportation access, and food security. Four behavioral health risk factors were next most prevalent: cigarette smoking, drug use, alcohol use, and depression.

The proportional increase at the re-screening interview in women identified as at risk for each of the 13 risk factors ranged from 5.6% to 49.0% for the combined moderate/high risk groups and from 5.6% to 73.0% for the high risk groups. For the moderate/high risk classifications, the greatest proportional increases were seen for physical/sexual abuse by a non-partner (49.0%), telephone access (48.1%), partner violence (36.7%), depression (32.4%), and transportation (32.1%), all increasing by roughly one-third to one-half. For the high risk classification only, the greatest proportional increases were seen for physical/sexual abuse by a non-partner (73.1%), telephone access (55.0%), alcohol use (52.9%), child protection involvement (50.0%), partner violence (47.4%), social support (44.3%), transportation (43.6%), housing stability (37.2%), and drug use (36.7%), all increasing by at least one-third to almost three-fourths.

In addition to magnitude of change within domain, the study analyzed overall change in risk status within the study sample. At re-screening, almost half (47.9%) of study participants had a newly identified risk factor at the moderate or high risk level and almost one-fourth (24.3%) had a newly identified risk factor at the high risk level.

#### **D. ADDITIONAL FINDINGS: CURRENT PTSD PREVALENCE (n=745)**

A total of 406 (54.5%) of the 745 SCID respondents reported having experienced a traumatic event including 234 (31.4%) who experienced trauma before age 18. Violence was a common experience: 156 women (20.9%) were victims of and/or witnesses to physical violence and 99 (13.3%) were victims of rape or sexual assault. For 88 of the 99 rape or sexual assault victims, at least one incident occurred before the age of 18 years. For 132 participants (17.7%), a traumatic event occurred within the past two years.

More than one-third of the study participants (n=273, 36.3%) reported intense fear, horror, or helplessness associated with the trauma at the time of its occurrence. This subgroup was administered the PTSD diagnostic criterion questions.

Based on the SCID, 49 study participants (6.6%) met DSM-IV diagnostic criteria for current posttraumatic stress disorder. An additional 31 participants (4.2%) met criteria for a subthreshold diagnosis. A diagnosis required meeting symptom levels for both arousal and avoidance behaviors whereas the subthreshold required meeting symptom levels for only one of these two categories.

Although the PHQ-9 was not designed to detect PTSD, the moderate/high classifications for depression included 28 (57%) of the 49 PTSD cases diagnosed, suggesting significant overlap between symptoms of these two disorders. Almost all of the women diagnosed with PTSD (48 of 49 or 98%) scored at moderate or high risk for one or more of four PRO domains: depression, housing stability, social support, or drug use.

### **V. DISCUSSION AND INTERPRETATION OF FINDINGS**

#### **A. CONCLUSIONS TO BE DRAWN FROM FINDINGS**

This study was the first to focus on a population of pregnant women to: (1) use a diagnostic interview to systematically assess major depression, PTSD, alcohol use disorders, and drug use disorders; (2) validate a multidimensional screening tool against a diagnostic interview; (3) specifically validate the PHQ-9 against a structured diagnostic interview for depression; (4) compare screening results with medical encounter diagnoses; (5) assess the value of repeating the screening interview; and (6) compare screening results between professional and paraprofessional interviewers. The study found:

- PTSD, drug use disorders, and alcohol use disorders (all about 7%), were more prevalent than major depression (4%). This finding suggests that the emphasis of many government agencies and professional associations on prenatal depression screening may be too narrow, especially for higher-risk, low income populations.
- Depression, alcohol use, and drug use items embedded within a broader psychosocial screening instrument identified with high sensitivity and specificity prenatal care patients who met criteria for diagnoses of major depression and alcohol and drug use disorders.
- The PRO classified substantial proportions of women as at risk who did not meet diagnostic criteria for depressive and substance use disorders and who were not identified during medical encounters. Labeling these as “false positives” obscures the value of risk screening, which aims to identify women who could benefit from an early intervention that may mitigate potential harm. Risk classifications based on subthreshold levels of distress or symptomatic behavior provide specific and valuable information to health care providers and case managers to guide counseling, monitoring, and referral decisions.

- Community health workers can be valuable members of care teams, and the PRO study showed that they were effective at administering a structured interview. Using CHWs in this role may reduce the burden on prenatal intake nurses, especially in settings that serve high risk pregnant women or in programs that offer wraparound services in a clinical setting and need a systematic way to identify women in need of such services.
- For Healthy Start and other programs which allocate resources for enhanced case management of psychosocial needs, this study has demonstrated that re-screening provides additional opportunities to identify and address risk factors. Re-administering a version of the PRO or a similar interview is a worthwhile investment for high-risk populations whose life circumstances change rapidly or who may need time to develop the trust with their provider to facilitate self-disclosure.

## **B. EXPLANATION OF STUDY LIMITATIONS**

The accuracy of self-report may be affected by recall error and social desirability. Specifically, underreporting of substance use may have been influenced by a law that required reporting of drug use and habitual or excessive alcohol use during pregnancy. However, even if fear of adverse consequences suppressed disclosure, there is no reason to believe it would have differentially affected reporting on the PRO versus the SCID because study participants were advised that their health care providers would be made aware of risks detected from both interviews. The encounter data analysis revealed that more at-risk women were identified by the PRO than through routine clinic visits.

The predominance of low-income urban residents affects the generalizability of the findings. However, screening among such populations may yield the highest benefit because of their exposure to multiple risks.<sup>27</sup> The exclusion of non-English speakers also limits generalizability. Because our earlier research<sup>28</sup> found that pre-pregnancy awareness drug use was much lower among foreign-born women than U.S. born women (3.8% versus 35.3%), we believe their inclusion would likely not have appreciably affected study results related to substance use. Attrition is another limitation, attributable to the difficulty in contacting women who often lacked stable housing or reliable access to transportation and a telephone. Although attrition may have affected use prevalence rates on the SCID, it is unlikely to have affected its level of agreement with the PRO.

A final consideration is that the domains validated in this study were embedded in a multidimensional screening interview that first inquired about the lack of basic needs and social support. This introduction may have provided a context in which women were more comfortable disclosing emotional distress and risk behavior. Asking the questions from the study domains in isolation, or in a paper-and-pencil questionnaire, may have yielded different responses.

## **C. COMPARISON WITH FINDINGS OF OTHER STUDIES**

The interview equivalence and the re-screening studies addressed research questions which had not been previously addressed in the literature.

Our study was the first to validate the PHQ-9 against a structured diagnostic interview in a pregnant population. The sensitivity and specificity rates for a diagnosis of depressive disorder were comparable to the sensitivity and specificity rates of 88% found in the original validation study of the PHQ-9 in primary care and obstetrics-gynecology clinics.<sup>29</sup> Our study also found higher sensitivity and specificity than those (74% and 73%) found in a study using provider diagnosis as the validation criteria.<sup>30</sup>

Other prenatal screening validation studies have taken starkly different approaches to alcohol use validation than our study. The T-ACE and TWEAK were validated against self-identification as a problem drinker<sup>31</sup> and against self-reported use of a quantity of one ounce of absolute alcohol per day;<sup>32</sup> the Substance Use Profile Pregnancy Scale was developed and validated through secondary data analyses against self-reported use of a substance in the past 30 days.<sup>33</sup> Whereas these studies used self-reported use quantity as the gold standard against which screening questions were measured, our study used self-reported use as a component of the predictor variable and a structured diagnostic interview as the gold standard.

Prenatal drug use screening validation studies were not available for comparison. Our finding that marijuana was the drug used most commonly is consistent with other reports.<sup>34</sup>

#### **D. POSSIBLE APPLICATION OF FINDINGS TO ACTUAL MCH HEALTH CARE DELIVERY SITUATIONS (INCLUDING RECOMMENDATIONS WHEN APPROPRIATE)**

The PRO is in the public domain and available for general use. Comprehensive multidimensional psychosocial risk screening of pregnant women effectively identifies significant risks with a minimal investment of time. Repeat screening also appears warranted to identify significant risk factors not present—or present but not disclosed—early in pregnancy. Community health workers or other paraprofessionals could administer the screen and provide the clinician with the results, thus serving as a cultural bridge between patients and clinicians, performing a task for which the clinician may not have time, and at lower cost. For many pregnant women, substance use or depression symptoms may not meet standard diagnostic criteria and they are not referred for assessment or treatment. Nevertheless any alcohol or drug use and persistent emotional distress may pose harm to the fetus. Health care providers need to identify appropriate resources and/or provide effective interventions to reduce distress and substance use. Guidelines regarding effective alternatives to chemical dependency treatment, medication, or therapy would be useful. Because the PRO addresses depression, alcohol and drug use within a broader constellation of other risk factors, the responses it elicits may inform prenatal interventions by helping health care providers understand these behavioral health issues within the disadvantaged context and comorbidities that often surround and precipitate these problems and make it harder to comply with recommendations for treatment or behavior change.

#### **E. POLICY IMPLICATIONS**

Health care policy should support prenatal psychosocial risk screening through reimbursement policies, training on effective screening tools and methods, and funding for supportive interventions to respond to identified risk factors. Resources should be directed specifically at low-income and other populations with disproportionately high rates of infant mortality and poorer maternal and infant health outcomes.

#### **F. SUGGESTIONS FOR FURTHER RESEARCH**

Ongoing research is needed to determine the most effective ways to respond to psychosocial risk factors identified through prenatal screening. For example, although brief interventions for alcohol and drug use have been found to be effective in some settings and with some populations, more research is needed to successfully promote and sustain the cessation of substance use during pregnancy. Marijuana use, in particular needs more attention. Research is also needed to test effective methods of relieving stress and distress during pregnancy.

## **VI. LIST OF PRODUCTS**

### **Published**

Harrison PA, Godecker A, Sidebottom AS. Psychosocial risk screening during pregnancy: additional risks identified during a second interview. *Journal of Health Care for the Poor and Underserved*, 2011;22:1344-1357. PMID: 22080714

Harrison PA, Godecker A, Sidebottom AS. Validation of the alcohol use module from a multidimensional prenatal psychosocial risk screening instrument. *Maternal and Child Health Journal*, 2011: Nov 26 [epub ahead of print].  
<http://www.springerlink.com.ezp1.lib.umn.edu/content/3267120x47x057u4/> . PMID: 22120427

### **Under review**

Harrison PA, Godecker A, Sidebottom AS. Validity of the Prenatal Risk Overview for detecting drug use disorders in pregnancy.

Sidebottom AS , Harrison PA, Godecker A, Kim, H. Validation of the Patient Health Questionnaire (PHQ)-9 for depression screening during pregnancy.

Godecker A, Harrison PA, Sidebottom AS. Nurse versus community health worker identification of psychosocial risks in pregnancy through a structured interview.

### **In preparation**

Kim H, Harrison PA, Godecker A. Prenatal PTSD and trauma exposure among low income women.

### **Planned**

Development of a scale to detect depression and PTSD during pregnancy.

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