NAQC Issue Paper

NAQC's Issue Papers aim to provide critical knowledge on important quitline topics and guidance for decision making.

Quitline Services for Pregnant and Postpartum Women:
A Literature and Practice Review

EXECUTIVE SUMMARY

Smoking during pregnancy is the most prevalent cause of poor infant outcomes for which effective interventions exist. To accelerate progress in eliminating tobacco use during pregnancy, strategies should focus on promoting tobacco prevention and cessation before a woman becomes pregnant, reaching and intervening with pregnant smokers, and preventing postpartum relapse among women who have successfully quit during pregnancy. Helping pregnant women to stop smoking and to remain tobacco-free is an essential component of current state quitline service offerings, and many states consider pregnant women a priority population for quitline services. The purpose of this paper is to present research and evaluation data in an easy-to-use format to guide and inform decision-making, resource allocation and service model development for quitline services to pregnant and postpartum women.

The United States Public Health Service (USPHS) recommends pregnant smokers be offered person-to-person psychosocial interventions that exceed minimal advice to quit. The American College of Obstetricians and Gynecologists (ACOG) reaffirmed the USPHS recommendation, and recommends referral to the state's quitline as an adjunct to in-person counseling. Because safety and efficacy of nicotine replacement therapies have not been established for prenatal smoking cessation, ACOG recommends that nicotine replacement therapies be considered only under the close supervision of a provider.

Quitlines are telephone-based tobacco cessation services that help the broad population of tobacco users quit through a variety of services, including counseling, information, cessation medications and self-help materials. Meta-analytic reviews and individual studies over 20 years have established that proactive quitlines are an effective intervention for smoking cessation in the general population. Quitlines have become a critical component of comprehensive state tobacco control programs. However, there is limited evidence of the efficacy of quitlines for pregnant smokers. Also, the quitline service offerings for pregnant and postpartum women and the strategies for state promotion and outreach of quitlines to increase referral, enrollment and retention of pregnant or postpartum women in quitline services are both unknown. Reviews of the literature on cessation effectiveness of quitlines in pregnancy and of current quitlines services and reviews of practice were conducted to identify gaps in knowledge and identify best practices.

In this review of the literature, we found limited evidence on the efficacy of telephone counseling for prenatal smoking cessation and preventing postpartum relapse. Of six studies (one observational study and five randomized controlled trials) that examined telephone counseling for prenatal smoking cessation, two studies reported positive findings that pregnant women who received telephone counseling sessions had significantly higher quit rates than women who received no calls, though self-selection into treatment arms and lack of biochemical verification were study limitations. The remaining four studies, which were randomized controlled trials, did not find a significant effect of telephone counseling on smoking cessation during pregnancy; however, low adherence and participation limit our ability to draw firm conclusions. Of six studies (all randomized controlled trials) that examined telephone counseling on postpartum relapse, telephone counseling may be effective in reducing relapse in the early postpartum period (e.g., up to 6 months), but these positive findings were not sustained at longer follow-up times postpartum (e.g., up to 12 months). Future studies may need to explore modifications of the intervention (e.g., number of sessions, duration or follow-up) and improve uptake and adherence of the intervention.

The current service offerings for the three largest quitline providers include 2-7 counseling sessions during pregnancy and 2-4 calls postpartum. The quitline providers are utilizing a number of strategies to promote engagement and retention of pregnant callers, including using a dedicated coach, incentives for attending counseling sessions, using text messaging to reach clients, engaging partners or spouses, and sending correspondence or reminders about quitline support. However, evaluation data were not available to assess whether these strategies are effective in achieving cessation among pregnant callers. For state promotion and outreach, two states reported using a number of strategies to increase quitline enrollment, such as identifying key partnerships that serve the pregnant smokers, targeting promotional materials for the quitline for pregnant women and providers, improving referral systems to quitlines, and using surveillance data to inform their strategies.

In conclusion, there is limited evidence on the effectiveness of quitlines alone for prenatal smoking cessation and preventing postpartum relapse, and more research is needed. These findings do not change current clinical recommendations, that pregnant smokers should be offered in-person counseling and that quitlines should be used as an adjunct. In addition, because low utilization and adherence limited the available science base, efforts to improve use may be warranted. The selected state quitlines included in our review do provide counseling protocols for pregnant and postpartum smokers; however, many challenges exist in reaching and engaging pregnant smokers in quitlines services. Using the findings from the literature and practice review, recommendations were developed with input and feedback from a review committee. The recommendations have been targeted to four audiences of this paper (decision-makers, quitline service providers, health professionals, and researchers) and are aligned to achieve these three goals: 1) increasing call volume through promotion and outreach, 2) increasing enrollment in quitline counseling, and 3) increasing retention in quitline counseling.

<u>Decision makers within state, provincial and national organizations that fund quitline services</u>

- Promote current clinical recommendations for prenatal smoking cessation that emphasize referral of quitlines as an adjunct to in-person counseling.
- Outreach and education programs for private and public health care and community-based systems can increase their knowledge and awareness of referral of pregnant women to quitlines.
- Training and outreach efforts to health care providers should include detailed information on the important role the provider plays in providing follow-up cessation support to women.
- Effective referral systems to quitlines, such as fax referral or fully-integrated electronic referral systems, can automate and improve the referral process.
- Data on quitline calls with pregnant or postpartum women can help to evaluate promotion and outreach.

<u>Quitline service and cessation providers</u>

- Intake protocols should be tailored for pregnant callers to facilitate acceptance of services.
- If possible, pregnant callers should be routed directly to a quitline coach/counselor so that the first counseling session happens immediately, rather than scheduling a follow-up appointment.
- Timely and useful feedback reports to the referring prenatal care providers regarding patient's enrollment in the quitline may help to facilitate communication on the patient's cessation attempt.
- Current strategies to increase retention of callers (e.g., incentive, text-messaging) may need further evaluation on how they impact retention and quit rates for pregnant smokers.

<u>Health professionals</u>

- All pregnant women should be asked if they smoke in a nonjudgmental way and use screening tools with high validity, such as a 5-part multiple choice question that is recommended by ACOG.
- Communicating to patients how quitlines can help to support them in their quit attempts and describing what quitline services have to offer for pregnant women can improve uptake of referrals.

- Organization strategies (e.g., documentation of smoking status in patient records and formal protocols for fax or electronic referral to quitlines) for tobacco cessation can facilitate quality referrals to quitlines.

Researchers and Evaluators

- Based on gaps in the research, we have identified the following research questions:
  - What is the optimal number of counseling sessions needed to achieve successful sustained quits among pregnant women?
  - What is the critical content that must be addressed during each of these sessions?
  - Are there strategies that could be added to telephone counseling to increase efficacy and/or improve uptake and adherence of counseling, such as incentives or the use of web or texting components?
  - What intervention components or call schedules will help to prevent postpartum relapse up to 1 year after delivery?

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I. INTRODUCTION

Smoking during pregnancy is the most prevalent cause of poor infant outcomes for which effective interventions exist *(1)*. Smoking during pregnancy increases the risk of preterm delivery, fetal growth restriction, birth defects, and infant death *(2)*. In 2002, 5%-8% of preterm deliveries, 13%-19% of term infants with growth restriction, 5%-7% of preterm-related deaths, and 23%-34% of deaths from Sudden Infant Death Syndrome (SIDS) were attributable to prenatal smoking in the U.S. *(3)*. In 2004, infant hospitalization costs in the U.S. attributable to prenatal smoking are estimated to be about $122 million, or $279 per maternal smoker *(4)*.

National goals have been established to reduce prenatal smoking to 1.4% and to reduce smoking prior to conception to 14% by the year 2020 *(5)*. Based on 2010 Pregnancy Risk Assessment Monitoring System (PRAMS) data, an estimated 23% of women smoked in the three months before pregnancy, 11% smoked in the last trimester of pregnancy, and 16% smoked after delivery *(1)*. Though there have been modest declines in prenatal smoking prevalence from 2000 to 2010 (an estimated 0.1 percentage point per year) *(1)*, it would be impossible at this rate to reach the 2020 national goal of reducing prenatal smoking to 1.4% *(5)*. Furthermore, the prevalence of smoking before pregnancy has remained unchanged in the past decade *(1)*. Among women who quit smoking during pregnancy, an estimated 53% relapse to smoking within four months after delivery *(6)* and up to 70% relapse within one-year postpartum *(7)*. To accelerate progress toward eliminating tobacco use during pregnancy, strategies should focus on promoting tobacco prevention and cessation in women before pregnancy, promoting cessation in pregnancy, and preventing postpartum relapse among women who have successfully quit during pregnancy.

State quitlines are available in all 50 states, Puerto Rico, Guam, and the District of Columbia and provide an opportunity to engage and intervene with pregnant and reproductive-aged female smokers. Helping pregnant women to stop smoking and to stay quit is an essential component of current state quitline service offerings, and many states consider pregnant women a priority population for quitline services.

II. REVIEW PURPOSE

The purpose of this paper is to present research and evaluation data in an easy-to-use format to guide and inform decision-making, resource allocation and service model development for quitline services to pregnant and postpartum women. Examples from current practice that reflect the evidence base will be highlighted, and authors will make recommendations. This paper targets four audiences: 1) decision-makers within state, provincial and national organizations that fund quitline services; 2) quitline service and cessation providers who provide guidance to their clients (i.e., state funders), 3) ; health professional; and 4) researchers and evaluators who focus their work on cessation, particularly for pregnant and postpartum women.

This issue paper was developed in collaboration between the North American Quitline Consortium (NAQC) and the Centers for Disease Control and Prevention (CDC). A review committee comprised of various stakeholders, who represented federal, state, and national organizations for tobacco control or maternal and child health, assisted in defining the scope of the issue paper, reviewed drafts of the paper, and provided input on the recommendations (see Acknowledgments).

III. BACKGROUND

A. Tobacco Use During Pregnancy

i. What is known about pregnant or postpartum smokers?

Pregnancy is a motivating factor for some women to quit smoking and to improve their health and that of their baby. About one out of five women smoked in the three months before pregnancy, and half of these women will quit smoking by the end of pregnancy *(1)*. Based on PRAMS data from New Jersey 2004-2008, very few smokers who smoked before pregnancy (7%) quit in anticipation of becoming pregnant, 43% quit after they found out that they were pregnant, and 5% quit later in pregnancy *(8)*. From other studies, it is estimated that about one-quarter of women who smoked before pregnancy will quit spontaneously (without intervention) when they learn that they are pregnant *(8, 9)*. Compared to continued smokers, those who quit spontaneously tend to have more years of education, higher income, are more likely to be married or partnered, be first-time mothers, enter prenatal care earlier, to have intentions to breastfeed *(9)* and smoke fewer cigarettes *(8)*.

About 11% of women smoke in the last 3 months of pregnancy *(1)*, and these women represent some of the most disadvantaged populations *(10, 11)*. When compared to nonsmokers, women who continue to smoke during pregnancy are younger, have fewer years of education, are more likely to be enrolled in Medicaid *(1)* and have participated in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) *(6)*. Compared to women who quit smoking, women who continue to smoke during pregnancy report smoking more cigarettes per day before pregnancy *(6)*. Other predictors of continued smoking during pregnancy include having a partner who smokes *(12)*, having mental health problems *(13)* and smoking in a prior pregnancy *(14)*. Furthermore, abuse of other substances such as drugs and alcohol is common. For example, in a sample of women who were participating in a clinical trial, 34% of pregnant smokers at 28 weeks tested positive for an illicit drug (i.e., marijuana, opioids) *(15)*. About half of women who continue to smoke during pregnancy report "cutting down" or reducing the number of cigarettes, which indicates that they may be motivated to make positive behavior changes *(8)*.

About 23% of pregnant women (compared to 9% of non-pregnant women) do not disclose their smoking (probably due to the stigma associated with smoking while pregnant), making it difficult for healthcare providers to identify smokers for intervention *(16)*. Additionally, pregnant smokers may over-report quitting, which has been documented in both clinical trials and population-based data *(17, 18)*. Compared to a yes/no smoking screening question, a multiple-choice question in which the woman is able to select an option of cutting down without quitting has been shown to increase disclosure among pregnant smokers *(19)* and is now considered a best-practice approach *(20)*. However, even with optimal screening questions, nondisclosure is high in this population. Previous cessation studies have demonstrated efficacy when based on self-report, but when biochemical verification was used, the same studies demonstrated ineffectiveness *(17)*. Thus, biochemical verification of quit status has become the gold standard when assessing the efficacy or effectiveness of smoking cessation interventions for pregnant women *(21)*. The UK has implemented routine prenatal screening of smoking using carbon monoxide tests with the goal of getting women into cessation services *(22)*. However, it is unclear whether biochemical testing results in more women disclosing their smoking status or quitting smoking *(23)* and whether this may negatively affect the patient/provider relationship *(24)*.

Among those women who successfully quit smoking during pregnancy, over half will return to smoking within four months after delivery *(1)*. Also among spontaneous quitters (quit when they found they were pregnant), over 60% return to smoking within six months after delivery *(9)*. Many women have reported that they considered pregnancy as a period of temporary abstinence and that they quit for the health of the baby, but once the baby is delivered, their motivation to remain abstinent diminished *(25)*. In other studies, predictors of relapse include not intending to remain abstinent, lower confidence in remaining abstinent, the presence of other smokers in the household, not intending to breastfeed, having a partner who smokes, and concerns about body weight *(26, 27)*. Postpartum relapse is associated with having postpartum

depressive symptoms *(28)*. Heightened awareness of the health effects of secondhand smoke (SHS) has increased *(29)*. In recent studies over 90% of postpartum women report maintaining a smoke-free home after delivery; however, disparities exist by state and among certain demographic groups *(30)*. Almost 32 million children and adolescents aged 3–19 years, or about half of children in this age group, are exposed to secondhand smoke based on cotinine levels *(31)*.

Though cigarettes are the most predominant tobacco product used among pregnant women in the U.S., other types of tobacco products are also used. For example, smokeless tobacco use is relatively common among Alaska Native women, with prevalence of smokeless tobacco use before, during, and after pregnancy at 14.2%, 14.6%, and 15.3%, respectively *(32)*. Of Alaska Native women who used smokeless products before pregnancy, only 15.7% quit smokeless products during pregnancy, and over 50% of those who quit reported relapsing after delivery *(32)*. There are no data available on use of new or emerging tobacco products, such as electronic cigarettes, snus, dissolvables or hookah, during or after pregnancy. However, the prevalence of these emergent products (e.g., electronic cigarettes, snu, dissolvables, and hookahs) in 2012 was ≤1% in middle school females and ≤4% in high school females *(33)*. From 2011 to 2012, current use of electronic cigarettes doubled among middle (0.4% to 0.8%) and high school females (0.7% to 1.9%) *(33)*. Among female adults >18 years during 2012-2013, prevalence of use every day or some days was 1.6% for electronic cigarettes, 0.4% for hookahs, and 0.3% for smokeless tobacco *(34)*.

ii. What disparities exist among pregnant smokers?

Significant disparities in prenatal smoking prevalence exist by geographic, demographic, and behavioral characteristics. State-specific estimates of smoking prevalence in the last trimester ranged from 4.5% in Utah to 30.5% in West Virginia in 2010 *(1)*. Smoking during pregnancy was highest among women aged 20-24 years (17.6%), those who had <12 years of education (17.4%), and were a Medicaid enrollee during prenatal care or at delivery (17.6%) *(1)*. Also women with lower incomes or those who participated in WIC, are more likely to smoke before, during, or after pregnancy, compared to nonsmokers *(6)*. Among racial/ethnic groups, the highest prevalences of prenatal smoking were among American Indians/Alaska Natives (26.0%) and non-Hispanic whites (14.3%) and the lowest prevalences among blacks (8.9%), Hispanics (3.4%), and Asians (2.1%) *(1)*. When examing smoking prevalence before pregnancy, half of women aged 18 to 24 years of non-Hispanic white, American Indian, or Alaska Native race/ethnicity smoked in the three months before pregnancy *(35)*.

iii. What is the health impact of smoking on a pregnant woman and her fetus/infant?

During the past 50 years, there has been considerable research detailing the impact of smoking on reproductive health outcomes. Smoking increases the risk of conception delay in women, and smoking around the time of conception can increase the risk of cleft lip and palate and ectopic pregnancy *(2)*. Smoking is causally associated with placental abruption, placenta previa, premature rupture of the membranes, preterm delivery, fetal growth restriction, and SIDS *(36)*. Based on a meta-analysis of 14 smoking cessation trials, pregnant women who received psychosocial interventions had an 18% reduction in preterm births and infants being born with low birth weight *(21)*.

Secondhand smoke can cause many health problems for infants and children, and children whose parents smoke get sick more often *(29)*. Infants exposed to SHS have increased risk of dying of SIDS, as it is postulated that chemicals in the smoke can affect an infant's regulation of breathing *(29)*. Children who are exposed to SHS are more likely to get bronchitis and pneumonia, and ear infections, and SHS can trigger asthma attacks or make symptoms more severe or frequent *(29)*.

B. Tobacco Cessation for Pregnant Smokers

i. Current clinical recommendations

U.S. Public Health Service's (USPHS) 2008 Clinical Practice Guideline *Treating Tobacco Use and Dependence* recommends that clinicians 1) ask all pregnant women about tobacco use and pregnant smokers should be offered person-

to-person psychosocial interventions that exceed minimal advice to quit, and 2) offer effective tobacco dependence interventions to pregnant smokers at the first prenatal visit as well as throughout the course of pregnancy *(20)*.

In a 2010 committee opinion, the American College of Obstetricians and Gynecologists (ACOG) reaffirmed the USPHS recommendations and further added that prenatal care providers deliver a brief counseling session for patients who are willing to try to quit smoking *(37)*. Counseling approaches, such as the 5A's intervention (ask, advise, assess, assist, and arrange), were recommended which are effective when initiated by healthcare providers. ACOG also recommends that referral to a smoker's state quitline may be used as further support to the patient *(37)*.

In a Cochrane review of prenatal cessation interventions, counseling combined with other strategies tailored for women was effective in increasing quits in late pregnancy (pooled relative risk=1.44, 95% CI:1.19-1.75) *(21)*. Pairing counseling with a contingency management intervention in which pregnant women are provided financial incentives for biochemically-confirmed quits, has shown the greatest intervention effect on end-of-pregnancy quits (pooled relative risk=2.95, 95% CI 1.55 to 5.63), but further research is needed to confirm this finding *(21)*.

Medication such as nicotine replacement therapies (NRT), bupropion, and varenicline are effective tobacco dependence treatments outside of pregnancy; however, the safety and efficacy of these medications for smoking cessation during pregnancy have not been established. Nicotine is a reproductive toxicant *(38)* and can affect fetal lung development, the central nervous system development, and contribute to the risk of SIDS *(2)*. In a 2012 meta-analysis of six NRT trials for prenatal smoking cessation, the authors found that there was no statistically significant difference in smoking cessation in later pregnancy after using NRT as compared to control (risk ratio=1.33,95% CI: 0.93 to 1.91) *(39)*,. The authors also found no statistical difference in a number of birth outcomes (e.g., still birth, miscarriage, low birth weight, preterm, and neonatal intensive care unit admission) between NRT and control arms. The ACOG Committee opinion states that NRT can be considered if the first-line course of behavioral therapy fails and with close supervision and consideration of the risks of continued smoking and the risks of NRT *(37)*. If NRT is used, ACOG states that it should be with the clear resolve of the patient to quit smoking.

No clinical trials have been published evaluating the use of bupropion or varenicline for smoking cessation during pregnancy *(39)*. Due to product warnings of the risk of psychiatric symptoms and suicide, ACOG cautions the use of bupropion and varenicline in a population at risk for depression and that these medications should be used by physicians who are experienced prescribers only *(37)*.

ii. Utilization of evidence-based methods by pregnant women

There are few population-based studies or surveys that examine the uptake of interventions by pregnant smokers. Based on a review of 28 studies on health care providers' practices for smoking cessation, more than 50% of providers reported they ask women about their smoking status and advise pregnant smokers to quit, however, fewer than 50% reported assessing readiness to change, assisting in smoking cessation, or arranging for follow-up appointments or referrals *(40)*. In a PRAMS survey conducted in New Jersey, almost all women reported that they were asked by their prenatal care provider if they smoked, and half of those asked reported that a provider counseled them to quit smoking *(8)*. The same study also found that an estimated 12% of women who smoked in the last trimester of pregnancy used a cessation method, including self-help materials (6.3%); medications (3.9%); face-to-face counseling (1.7%); telephone-based counseling (1.5%); Internet-based counseling (1.3%); and a class or program (1.0%); however, one-half of the women who smoked during pregnancy reported trying to quit or cut down on their own without assistance *(37)*. Among pregnant smokers participating in an intervention trial on cessation counseling only, 10% reported using a cessation medication (NRT or bupropion) while pregnant *(41)*.

iii. Tobacco cessation coverage for pregnant women

a. Medicaid

The Affordable Care Act (ACA) makes various changes to the benefits provided to Medicaid enrollees. Beginning October 1, 2010, section 4107 of the ACA requires that comprehensive tobacco cessation services[1] be provided without cost-sharing to pregnant women enrolled in traditional Medicaid, thus alleviating a barrier to accessing treatment for this vulnerable population of smokers *(42)*. States must provide without cost-sharing tobacco cessation interventions to newly eligible beneficiaries of the Medicaid expansion. As of 2014, states are precluded from excluding FDA-approved tobacco cessation drugs from coverage for all enrollees in traditional state Medicaid programs *(43)*.

While the ACA requires coverage of cessation for pregnant smokers covered by Medicaid, it offers states great flexibility in designing the actual benefit including – who may provide treatment, duration of treatment, restrictions on number of quit attempts covered per year, and the types of counseling available. Guidance from the Centers for Medicare and Medicaid Services to state Medicaid Directors working to implement requirements of the ACA notes the importance of using the USPHS recommendations to define new tobacco cessation coverage for pregnant women *(20)*. As of 2012, a total of 50 state Medicaid programs and District of Columbia covered pharmacotherapy and 43 Medicaid programs covered counseling services for pregnant women; the eight Medicaid programs not covering face-to-face tobacco-cessation counseling for pregnant women used their state telephone quitlines to satisfy the coverage requirements *(44)*. A CDC report provides data on trends from December 31, 2008, to January 31, 2014 in state Medicaid cessation coverage of all evidence-based cessation treatments except telephone counseling by state Medicaid programs and describes barriers to accessing these treatments (such as charging copayments or limiting the number of covered quit attempts) *(45)*.

b. Private coverage

In addition to the ACA's impact on access to cessation services for publicly-insured pregnant women, the ACA reduces barriers to cessation coverage for many pregnant women who are privately insured. All non-grandfathered private plans, including all plans offered through the Health Insurance Marketplace, must cover certain clinical preventive services without cost sharing, including tobacco cessation interventions. Specifically, the ACA requires non-grandfathered private plans to cover clinical preventive services that receive an 'A' or 'B' grade from the U.S. Preventive Services Task Force (USPSTF), are recommended by the Advisory Committee on Immunization Practices, or are services for women and children supported by the Health Resources and Services Administration. Tobacco cessation interventions for adults in general and pregnant women in particular are recommended with an 'A' grade *(46)*. Specifically, the USPSTF recommends that clinicians ask all pregnant women about tobacco use and provide augmented, pregnancy-tailored counseling for those who smoke. On May 2, 2014, the Departments of Health and Human Services, Labor, and Treasury issued guidance in the form of a Frequently Asked Question *(47)* clarifying that health insurers will be "in compliance with the requirement to cover tobacco use counseling and interventions, if, for example, the plan or issuer covers without cost-sharing:

1. Screening for tobacco use; and,

2. For those who use tobacco products, at least two tobacco cessation attempts per year. For this purpose, covering a cessation attempt includes coverage for:
    - Four tobacco cessation counseling sessions of at least 10 minutes each (including telephone counseling, group counseling and individual counseling) without prior authorization; and
    - All Food and Drug Administration (FDA)-approved tobacco cessation medications (including both prescription and over-the-counter medications) for a 90-day treatment regimen when prescribed by a health care provider without prior authorization."

[1] Comprehensive tobacco cessation services is defined in section 1905(bb)(1) of the Act as diagnostic, therapy, counseling services, and pharmacotherapy.

C. Why Quitlines?

Quitlines are telephone-based tobacco cessation services that help the broad population of tobacco users quit through a variety of services, including counseling, information, cessation medications and self-help materials. The evidence-base for quitlines was established through clinical trials and recommended to health care practitioners through the *USPHS Clinical Practice Guideline: Treating Tobacco Use and Dependence* and *the Community Guide (20, 48)*. Meta-analytic reviews and individual studies over 20 years have established that proactive quitlines in particular are an effective intervention for smoking cessation in the general population. The CDC's *Best Practices for Comprehensive Tobacco Control Programs – 2014* is an evidence-based guide to help states plan and establish effective tobacco control programs to prevent and reduce tobacco use *(49)*. Components of the guide include state and community interventions, mass reach health communication interventions, surveillance and evaluation, infrastructure, and cessation interventions. As part of cessation interventions, several activities are recommended to support and enhance tobacco cessation quitlines in states, such as ensuring that all callers received some form of cessation assistance, providing targeted outreach to underserved populations with high smoking rates, and developing capacity for electronic referrals *(49)*. Quitlines have become a critical component of comprehensive state tobacco control programs; however, there are few studies evaluating the effectiveness of quitlines for pregnant smokers.

Funding for public quitlines varies considerably across states, and quitline funding in a particular state may vary by year *(49)*. An estimate derived from funding recommendations for state tobacco control programs in the 2014 edition of CDC's *Best Practices for Comprehensive Tobacco Control Programs* suggests that states should invest $26.33 per smoker in quitlines annually. Actual spending data from fiscal year 2012 shows that, on average, states invest only $1.53 per smoker in quitlines, far below the recommended level of funding *(50)*.

In 2012, state quitlines received over 1.3 million calls from nearly half a million tobacco users. In addition, they received 171,379 referrals from a variety of sources (97,170 fax referrals from physicians; 45,288 web referrals; 1,509 electronic referrals; and 27,412 referrals from other sources) *(51)*. While quitlines have the ability to reach large numbers of individuals and have long been used as a proven effective, population-based public health intervention, state quitlines, on average, provide cessation treatment for less than 2% of all tobacco users each year.

Detailed information on the service offerings in each state is provided in NAQC's profiles of state quitlines at http://map.naquitline.org/. The variety of services provided, the populations able to use these publicly-provided services, and the level to which the services are promoted depends almost entirely on the availability of funding by the states. Despite their variations, quitlines have emerged as a central cessation resource nationally and support broader tobacco control programs at the state, county and local levels. Non-governmental organizations, such as health care delivery systems, have also positioned quitlines as a central player in systems-change initiatives *(52)*. State-based quitlines are further supported by a national portal number, 1-800 QUIT NOW operated by the National Cancer Institute, which routes callers directly to their respective state's quitline and by national media promotion of that number through CDC's Tips from Former Smokers campaigns in 2012, 2013 and 2014 *(53)*. CDC also provides funding to states through the National Tobacco Control Program and has also provided opportunities to apply for dedicated quitline funding over the past four years *(54)*.

For over 10 years, some state quitlines have been working to leverage the services they provide to foster implementation of systems change within healthcare settings and to assist in their delivery of the 5A's. In that work, quitlines have established referral systems (fax, online and electronic medical record with electronic submission) that allow healthcare providers to refer smokers to quitlines for treatment. Participating providers and health systems in a number of states also have access to various levels of systems change support such as training, academic detailing, and feedback reports for patients referred to the quitline. States employ various strategies to build and sustain their referral networks. Some may direct their efforts toward certain systems in order to better target specific tobacco users (e.g., Federally Qualified Health

Centers to target low socioeconomic status and Medicaid tobacco users). According to the Community Preventive Services Task Force, referral systems, mass media campaigns, and provision of free cessation medications increase both the use of quitline services and the number of patients who successfully quit using tobacco *(48)*.

IV. LITERATURE REVIEW

A. Key Questions

The literature review was guided by key questions identified as priorities by authors and the review committee:

1) *What is the efficacy of telephone-based cessation counseling for pregnant smokers?*
2) *What is the cost-effectiveness of quitline services to pregnant women?*
3) *Integration of quitline services into practice: What are prenatal care providers' attitudes/beliefs about cessation in general and quitlines' effectiveness specifically? What is the referral rate to quitlines by prenatal care providers? What is their knowledge and awareness of quitlines? What are the barriers to referral? Are there effective interventions to increase referrals to quitlines by prenatal care providers?*
4) *Utilization of quitline services: What is the use of telephone-based counseling by pregnant or postpartum women? What is their knowledge and awareness of quitlines? What are the barriers to utilization?*
5) *Media and outreach campaigns: How effective are media and outreach campaigns at encouraging pregnant or postpartum women to access quitline services?*

B. Methods

A systematic review of the literature was conducted to answer the key questions. Two reviewers utilized an electronic search strategy in the PubMed/Medline database searching all titles entered through December 19, 2013. Search terms were derived from PubMed's "Text Word", "Title/Abstract" and "Medical Subject Headings" field. The strategy combined terms related to quitlines (e.g., hotline, quit line, quitline, telephone, telemedicine) with terms related to smoking cessation (e.g., smoking, tobacco, cessation) and pregnant or postpartum women (e.g., pregnancy, postpartum, prenatal, antepartum, obstetric, reproductive).

For the first objective of determining efficacy of quitlines for pregnant/postpartum women, studies were considered eligible if they met the PICO (population, intervention, comparison, outcome) criteria: (1) population must be pregnant or postpartum smokers in North America; (2) intervention must consist of telephone counseling or quitline services (e.g., multiple counseling sessions with a counselor) which could be proactive (call initiated by provider) or reactive (call initiated by smoker) and can include other components; (3) comparison group must consist of women who did not receive telephone counseling; and (4) primary outcomes must be abstinence at end of pregnancy and/or postpartum relapse. Studies that did not meet the inclusion for the first objective were considered for the review if they helped to answer the later objectives regarding prenatal care providers, pregnant or postpartum women's referral, use, or barriers to utilizing quitlines.

A total of 333 abstracts were identified from the multiple searches (through December 19, 2013), of which two abstracts were duplicates of others, resulting in 331 abstracts being screened. Of 331 abstracts screened, 41 full-papers were evaluated for eligibility. Of the 41 full-papers, ten met the criteria for key question #1 (efficacy) *(55-64)*, one was a follow-up analysis of one of the eight studies *(65)*, 7 were relevant to the other key questions *(60, 66-71)*, and seven were review articles related to key question #1 *(21, 72-77)*. For the seven review articles, the reference lists were reviewed, but no additional studies were identified. A telephone counseling protocol was found based on unpublished results of one trial examining efficacy *(78)*; however, since the trial results have yet to be published, the study is not included in this review. Of the 15 papers excluded, four did not focus on the population of interest *(79-82)* and 11 did not meet

intervention criteria outlined in our review *(83-93)*. Reviewers assessed the quality of each study by a published set of criteria, based on study design and internal validity, developed by the USPSTF, which is reported in Table 1 *(94)*.

C. Findings, Key Question 1: Efficacy of Telephone Interventions

i. Description of studies

A total of ten studies (one was an observational study and nine were randomized controlled trials [RCTs]) were included in the review to evaluate the efficacy of telephone quitlines for prenatal smoking cessation and/or preventing postpartum relapse (Table 1). Of these studies, two studies reported cessation outcomes for pregnancy and postpartum periods *(62, 63),* four reported cessation outcomes during pregnancy only *(55, 56, 60, 61)*, and four reported abstinence outcomes during postpartum only *(57-59, 64)*.

In summary, the prenatal interventions across studies ranged from two to six telephone counseling calls during pregnancy, and calls averaged 10 to 90 minutes. During the postpartum period, the number of calls across studies ranged from two to eight, were on average five to 20 minutes each, and intervention calls were started as early as 3-weeks postpartum and continued until 4-months postpartum. Seven studies used bachelors' or masters' level counselors *(55, 57, 59-62, 64)*, two used nurse educators *(56, 58)*, and one used either a counselor or nurse educator. Seven studies provided self-help materials *(55, 56, 58-62)*, and most studies provided additional materials to participants, such as personalized letters or cards from counselor, fact sheets, newsletters, or videos. The studies by Rigotti et al. and Winickoff et al. also included provider reminders focused on smoking cessation *(62, 64)*. Four of the studies also included in-person counseling during prenatal care or in the hospital before delivering the series of telephone counseling calls *(58, 61, 62, 64)*. For the nine RCTs, the comparison groups varied. Six studies used lower intensity interventions (e.g., usual care, educational or self-help materials) *(55-59, 64)*, and three used medium intensity interventions (e.g. brief face-to-face counseling) as the comparison group *(61-63)*. Interventions are described in more detail in a summary table (Table 1).

ii. Prenatal smoking cessation or abstinence

Of the six studies *(55, 56, 60-63)* that assessed prenatal smoking cessation outcomes, two studies *(55, 60)* found a statistically significant effect of telephone counseling on prenatal smoking cessation. In the observational study by Bombard et al. *(55)* analyzed quitline data from 10 states during 2006-2008. The quitline protocol for pregnant smokers included offering self-help materials and/or up to eight counseling sessions. About half of women (51.8%) chose to receive self-help materials only and did not enroll in counseling services. Self-reported quit rates at 7-months follow-up from enrollment was 27.9% for pregnant smokers who enrolled in counseling and 23.9% who received self-help only (p=0.4902). Adjusting for potential nondisclosure, pregnant women who received counseling had adjusted quit rates that were significantly higher when compared to those who received self-help materials only (4.0% and 1.9%, respectively, p=0.01). Only 15% of women who enrolled in counseling sessions received five or more sessions.

In the RCT study by Parker et al. *(60)*, women who completed all three calls had a higher quit rate at 32 weeks gestation (23%, 9.6%; p= 0.03) and higher quit attempts (38.2%, 23.1%; p= 0.003) compared to women who received no calls. A couple of limitations should be noted for this study. First, participants self-selected to receive the varying levels of phone calls, and though authors note that baseline characteristics were not different between the groups, the higher quit rates for those women who completed three calls compared to no calls could be the result of unmeasured differences between groups. Also, biochemical-verification was available for only a third of participants and though the authors adjusted for nondisclosure for those women who only had self-report, misclassification of quit status may still remain.

For the remaining four studies which were all RCTs, there were no statistically significant differences in the primary outcome of smoking cessation during pregnancy. In the study by Ershoff et al. *(56)*, biochemically-verified quit rates were no different between those participants who received the telephone counseling intervention compared to the comparison group at 34 weeks gestation (20.8%, 22.5%, p= 0.57). About 20% of participants in the intervention group

did not receive any calls and, on average, women received only four of the six calls. For the Rigotti et al. study *(62)*, there was no difference in biochemically-verified quit rates at the end of pregnancy between intervention and comparison groups (10.5%, 7.5%, p=0.39). In secondary analyses stratified by baseline characteristics, among women who received five or more counseling calls, lighter smokers, and those who made an earlier quit attempt had significantly higher quit rates in the intervention group when compared to the corresponding counterparts in the control group. The study by Patten et al. *(61)* was unable to recruit a sufficient number of participants (n=35) as majority of women refused to enroll because of lack of time or not ready to quit; and there was no difference in biochemically-verified abstinence during pregnancy between the study's intervention and comparison groups (6%, 0%, p=1.0). For the Stotts and colleagues study *(63)*, there was no difference in biochemically-verified smoking status at 34 weeks gestation between intervention and comparison groups (34%, 32%, p=0.64). Low adherence was an issue, as only 55% of participants received both counseling calls, 13% received one call, and 32% were never received any calls *(63)*.

In general, across studies, it is unclear whether these generally negative findings resulted from the intervention not being effective or failure to deliver the intended intervention.

iii. Postpartum relapse or abstinence

Two *(59, 63)* of six RCTs *(57-59, 62-64)* examining the effect of telephone counseling on postpartum relapse or cessation found positive effects in the early postpartum period, but these results were not sustained at longer follow-up times postpartum. Stotts et al. *(63)*, which delivered counseling during pregnancy only and had no effect on prenatal smoking cessation, found a significant difference in the prevalence of self-reported nonsmokers or light smokers at 6-weeks postpartum between the intervention and the comparison group (24.1%, 14.6%, p<0.01), respectively; however, this difference was not sustained in the intervention group at 3- or 6-months postpartum. McBride et al. *(59)*, which had two intervention arms (one delivered an intervention during pregnancy and postpartum until four months and the other delivered an intervention during pregnancy only) and a control arm, found significant differences in postpartum abstinence rates among the three arms at 2-months postpartum (39%, 35%, 30%, p= 0.04) and 6-months postpartum (33%, 24%, 26%, p= 0.05) but not at 12-months postpartum (p= 0.96). The study had adherence rates of 92% with first call during pregnancy to 78% for third call, and 82% of women accepted the postpartum call.

The study by Rigotti and colleagues *(62)*, which ended counseling contact at 2-months postpartum, found no difference in 3-months postpartum relapse between intervention and controls (6.7%, 7.1%, p=1.0). Jimenez-Muro and colleagues *(57)* evaluated an intervention for both women who had quit smoking before or during pregnancy and those who were currently smoking at postpartum; for those who quit during or before pregnancy, the intervention was not effective at decreasing relapse measured at 3 months postpartum and based on biochemically-verified continued abstinence compared to comparison arm (31%, 23%, p=0.13). Johnson and colleagues *(58)* found no significant differences for biochemically-verified continued abstinence at 6-month follow-up between intervention and control (37.6%, 27%, p=0.10). Only a quarter (24.8%) of participants received all 8 calls. Winickoff and colleagues *(64)* found no significant difference in self-reported 7-day abstinence rates in the intervention group (baseline=31%; follow-up=25%) compared to control group who had no contact with quitline (baseline=38%, follow-up=23%). However, there were increase in 24-hour quit attempts (64% vs 18%, p=0.005). Of those referred to the quitline, 75% accepted enrollment.

D. Findings, Key Questions 2-4: Other Relevant Studies

Of nine studies that met the criteria for other key questions: two studies addressed key question #2 (cost-effectiveness) *(60, 66)*, and eight studies addressed key questions #3 (prenatal care providers) and #4 (pregnant and postpartum smokers) *(55, 64, 67-71)*. Because the findings for the other key questions overlapped, the narrative synthesis was grouped by cost-effectiveness, utilization of quitline, integration of quitline services into practice, and media-campaigns and outreach, rather than by key questions.

i. Cost-effectiveness of quitline services

As noted earlier, the Parker et al. study *(60)*, a cohort study, found increased quits associated with providing three telephone counseling calls compared to no calls. Authors documented intervention costs for counseling, training of instructors and staff, meetings, and materials. The cost-effectiveness ratio (i.e., total intervention costs for arm divided by the number of quitters in each arm) was calculated to be $61 for one call, $92 for two calls and $84 for three calls. However, as the quit rates for the three calls increased by 41% compared to the two calls, the three calls would result in more women quitting smoking.

In a 2006 study by Ayadi et al. *(66)*, authors compared the costs of implementing the 5A's in three settings: a clinical trial, a national pregnant smokers quitline, and a rural managed care organization. They found that intervention costs, which included personnel, materials/supplies, incentives for participants, equipment, and training, was similar across all the settings and ranged from $24 to $34 per pregnant smoker. The costs for the pregnancy quitline were calculated at $30 per pregnant smoker for a five-call counseling protocol and providing pregnancy-specific materials. The majority of these costs were related to training and estimates varied for total costs depending on the time spent on counseling, number of pregnant smokers counseled, and use and costs of materials. The study did not assess differences in quits by setting, so cost-effectiveness was not assessed.

ii. Utilization of quitlines services

Bombard et al. *(55)* analyzed quitline data from 10 states during 2006-2008. The quitline protocol for pregnant smokers included offering self-help materials and/or up to eight counseling sessions. Among pregnant callers, 30.2% received one to two counseling sessions, 10.6% received three to four sessions, and 7.4% received five or more sessions. About half of pregnant smokers did not enroll in counseling services and opted for self-help materials only. Half of pregnant smokers were referred to the quitline by their healthcare provider. Half of pregnant smokers reported being very satisfied with quitline services, 21% mostly satisfied, and 21% somewhat satisfied.

iii. Integration of quitlines services into practice

Flenady and colleagues *(67)* conducted an implementation trial to evaluate the dissemination of brief counseling and fax referral to quitlines for public maternity hospitals in Australia. The implementation strategy included many components, such as identifying clinic champions to lead cessation activities, developing a "train-the-trainer" program and implementing practice/systems changes (i.e., provider reminders, modifying electronic medical record to include a 5-part multiple choice question for smoking status and partner smoking status, and chart audits to assess provider practice). After the strategy was implemented, there was an increased percentage of fax referral to the quitlines among smokers in post-implementation compared to pre-implementation (67% vs 14%, respectively; RR= 4.9; 95% CI 3.0, 8.0). However, providers still reported barriers, such as being too busy to offer smoking advice and support to women and that they were not confident in offering the advice, and they do not see the benefit in smoking cessation programs.

Manfredi and colleagues *(70)* reported another implementation trial to assess varying levels of dissemination strategies for smoking cessation in 12 maternal and child public health clinics in Illinois. One group of smokers was only given the quitline number, a second was provided proactive telephone counseling service (participant was called), and the third was provided the proactive telephone counseling service and the clinics received outreach visits (i.e., 'academic detailing') to improve intervention implementation. Though findings were not significantly different, the data suggests a higher uptake of counseling in the two groups offered a proactive quitline services compared to the group given the quitline number only (17.0% and 9.5%, 3.6%).

Tworek and colleagues *(71)* tested the feasibility of implementing fax referral to a state quitline in three obstetrical and gynecology clinics in West Virginia. Within a seven-month period, a total of 58 referrals to quitline services were made, and 25.9% of these referrals resulted in enrollment in the quitline counseling service, which indicates that implementation of fax-to-quit systems is feasible. However, because 6-month follow-up data was available for only eight women, there was insufficient evidence that the program was effective in increasing quits.

iv. Media campaigns and outreach

Two studies *(68, 69)* were found that reported on media and marketing campaigns to promote awareness and utilization of quitlines by pregnant women. The Haviland et al. study *(68)* reported on the *Great Start Quitline, which* was the first national quitline and media campaign targeted specifically to help pregnant women quit. Launched in 2001, the campaign was sponsored byLegacy, and the *Great Start Quitline* was managed by the American Cancer Society. The media campaign included a television ad, print, radio, and internet-based stories, as well as outreach to health care providers and partners. Authors reported that 2.5% of pregnant smokers (n=11,811) called the quitline from December 2001 to September 2003. The majority of calls to the *Great Start Quitline* (79%) occurred during a 3-month window when television advertisements were airing about 900 gross ratings points per week (i.e., measure of audience reach), and 76% of callers reported calling the quitline because of the ads. No data on quit rates were reported.

The Kennedy et al. study *(69)*reported on a multi-modal marketing campaign (brochures, signs, radio ads) called "One Tiny Reason to Quit" to target African American pregnant smokers in Richmond, Virginia and encourage them to call the state quitline. The campaign focused on the "friendliness" and quality of the quitline rather than the free services it provides. Outreach workers were tasked with disseminating campaign materials, and the media campaign included mostly radio ads, with some billboards, newspapers, posters, and social media outlets. Ads were aired in two separate waves during June-October 2009 and January-March 2011. Compared to before the campaign, there was significant increase in number of calls by pregnant callers to the quitline during the ad campaign (Wave 1: 28 pregnant callers during campaign compared to 10 callers before campaign; Wave 2: 45 pregnant callers during campaign compared to 14 callers before campaign) and increases in the proportion of African American pregnant callers during the campaign (Wave: 85.6% of pregnant callers were African American during campaign compared to 26.1% before campaign; Wave 2: 93.0% of pregnant callers were African American during campaign compared to 47.9% before campaign). Gross rating points and quits were not reported.

V. PRACTICE REVIEW

A. Objectives

The practice review was guided by key questions identified as priorities by authors and the review committee:

1. *What are the service offerings for pregnant and postpartum women who call the quitlines? What are the treatment protocols? What strategies are used to engage and retain pregnant women in services? What are the challenges with working with this population?*
2. *What type of promotion and outreach are states conducting to increase referral, enrollment and retention of pregnant or postpartum women in quitline services? What are the lessons learned?*

B. Methods

To learn of service offerings for pregnant and postpartum women, three service providers were selected for interview based on the highest number of states they covered as of April 2013 *(50)*. The selected providers were Alere Wellbeing (27 states), National Jewish Health (10 states), and JSI, Inc. (3 states). Unstructured telephone discussions were completed with a representative from each service provider in December 2013.

To learn of state promotion and outreach strategies, the CDC Office on Smoking and Health tobacco control program identified ten states (Alabama, Alaska, Hawaii, Kentucky, Louisiana, Maryland, Ohio, Pennsylvania, South Carolina, and West Virginia) that have targeted strategies for pregnant or postpartum women. Two states (PA and MD) of the ten states were then selected based on having at least 50,000 births per year, variation in prenatal smoking prevalence, and used different quitline vendors. The prevalence of smoking in last 3 months of pregnancy was 15.1% (PA) and 9.3% (MD),

respectively based on 2010 PRAMS data *(1)*. Unstructured telephone discussions were completed with a representative from each selected state in February 2014.

C. Findings, Objective 1: Quitline Service Offering for Pregnant and Postpartum Women

Table 2 provides summary data from the discussion with three selected quitline providers: Alere Wellbeing, National Jewish Health, and JSI, Inc. In general, all three quitline providers had specialized services for pregnancy and breastfeeding women, additionally, two quitline providers included women who were planning to become pregnant in those services. Eligibility for these services is assessed during the intake call. The call schedule varied across quitline providers. The number of calls during pregnancy ranged from 2 to7 calls, with at least one call close to the due date. In the postpartum period, the number of calls ranged from 2 to 4, with attempts to reach women as soon as possible after the due date or delivery.

Two quitline providers based their protocols on work conducted by Cummins et al. *(78)*, and one on a collaboration that includes Legacy, ACOG, American Cancer Society and Smoke-free Families *(95, 96)*. The Cummins et al. protocol *(78)* is informed by social learning theory and, for smoking cessation, it focuses on 1) 'smoking as a learned behavior and can be unlearned', 2) in order to quit the 'smoker must be motivated and willing to take action', and 3) counseling can help through skills building, social support, and accountability. The theory is then implemented using motivational interviewing techniques, and cognitive behavioral strategies. Topics include pregnancy as a teachable moment; education of health risks of smoking; addressing women's reluctance to change, loss of control over quitting or ambivalence; self-efficacy; and mood and stress management. The Smoke-free Families protocol *(96)* focuses on pregnancy and the postpartum period, and includes scripts for quitlines to use. Legacy developed a postpartum protocol that encourages and supports women to quit or remain quit after delivery and to protect infants from secondhand smoke exposure *(95)*. Topics include: discussing benefits of quitting, partner and household smoking, relapse prevention, risks of secondhand smoke exposure, health benefits of quitting smoking for mother and infant, and addressing potential or underlying issues such as postpartum depression and stress management.

Of the quitline providers who provided access to NRT for quitline callers, pregnant callers needed their physician's consent in order for the quitline to provide NRT. If physician consent was not received, then the quitline would work with the woman through behavioral counseling only. Two quitline providers offered pregnancy-specific self-help materials, "Giving Up Smoking For You and Your Baby" or "Need Help Putting Out That Cigarette" developed by ACOG and Smoke-free Families *(97)*. All quitline providers used strategies to promote engagement and retention of callers. Some of these included using a dedicated coach, incentives for attending counseling sessions, using text messaging to reach clients, engaging partners/ spouses in intervention and helping them quit too, and sending correspondence or reminders to pregnant women about how the quitline can support them. Two quitline providers also referred their clients to a pregnancy-specific text messaging services (www.text4baby.org developed by a public-private partnership) which provides general information about pregnancy, postpartum and infant health, timed to their pregnancy due date or their baby's birth date, through pregnancy and up until the baby's first birthday, and helps women link to resources for a healthy pregnancy and infant *(98)*.

The quitline providers also reported numerous challenges supporting this population.

- *Challenges exist in engaging the population in quitline services.* Pregnant women were difficult to reach and phone numbers are often disconnected. So quitline providers collected additional contact numbers. Providing a dedicated coach model may make quitline services more acceptable to pregnant women; however, these coaches may not always available when the pregnant woman calls the quitline. Thus, this raises an issue of whether all counselors need to be trained to address this population, given that pregnant callers represent a small proportion of total callers.

- *No or limited promotion and outreach of specialized services for pregnant women.* Although states may target women of reproductive age, they typically do not promote the special services that quitlines provide for pregnant women, which may affect low uptake.
- *Need increased engagement of referring provider.* The quitline providers noted that though referrals are increasing, callers often reported that they did not receive continued cessation support after the quitline referral was made, which may undermine her quitting or remaining quit.
- *Evaluation challenges.* It should be noted that many states are not able to evaluate 7-month follow-up for quitline callers due to a lack of resources. Only a small number of pregnant women call the quitlines and response rates to follow-up evaluations can be low, quitline providers report difficulty in evaluating utilization and quit outcomes for pregnant women. Thus, multi-state evaluations of pregnant women's utilization and follow-up on their cessation during pregnancy and remaining abstinent postpartum are warranted.

D. Findings, Objective #2: Promotion and Outreach to Increase Quitline Utilization among Pregnant Women

Evidence has demonstrated if a state's quitlines services are not promoted effectively to the target population, they will remain unused *(50)*. State programs conduct promotional and outreach strategies to increase quitline reach. Successful tobacco control programs are well-connected to each of the population groups served and use those connections to develop appropriate promotional messages and build trust to maximize referrals. As previously discussed, Pennsylvania and Maryland have identified pregnant women as a target population for quitline services and have developed promotion and outreach strategies to reflect that targeting. Their programs are described below.

i. Pennsylvania

The Pennsylvania Division of Tobacco Prevention and Control (PTPC) partners with National Jewish Health (NJH) to provide the PA Free Quitline. Quitline services are available 24 hours per day and 7 days per week. Callers may receive up to 5 coaching sessions by phone, unlimited, inbound calls as needed, mailed self-help materials to assist with quitting, and up to 8 weeks of free NRT to eligible callers.

In 2013, the PA Free Quitline began offering a specialized service protocol for pregnant women. The protocol allows for cash incentives to callers who complete quitline calls (up to 5 calls during pregnancy at $5 per completed call; and up to 4 calls postpartum at $10 per completed call). Pregnant women work with a dedicated coach throughout the counseling program, are sent tailored self-help materials and are able to receive up to 8-weeks of free NRT with their physician consent.

<u>Promoting the service</u>

To ensure that the targeted people and community-based systems were aware of the enhanced quitline services for pregnant women, the PTPC identified the critical partners needed to build awareness among pregnant women and those who serve this population.

- *WIC*. Promoted 1-800-QUIT NOW to all WIC recipients with a printed promotional message on voucher payments.
- *Department of Public Welfare.* An email was delivered to all 7 Medicaid managed care organizations across Pennsylvania that described the pregnancy protocol.
- *8 regional primary contractors*. Engaged in promotion directly to pregnant women served by the contractors.
- *Physician offices*. Emphasized protocol and systems change in on-site trainings and hosting "lunch and learn" at OB/GYN practices. Offering free NRT for the nonpregnant population is viewed as an incentive for healthcare providers to promote the quitline, especially among their uninsured patients.

- *Women's agency*. Developed a one-page informational sheet on the quitline and placed it in all orientation packets.
- *Other organizations.* The PTPC continues to maintain strong relationships with those serving pregnant women including the March of Dimes, the Maternal and Child Health Task Force, Nurse-Family Partnerships, women's shelters, and Head Start.

In addition to targeted promotion and outreach efforts, the PTPC ensured that the healthcare systems engaged in their Fax-to-Quit program were aware of the specialized services for pregnant callers to the quitline, and the fax referral form allowed providers to note if a woman is pregnant. Rack and wallet cards promoting the pregnancy protocol have been developed and are available in print and online.

From February 1 through June 30, 2013, 61 pregnant women called the PA Free Quitline, and 58 pregnant women enrolled (average of 11.6 women enrolled per month). From July 1 to December 31, 2013, 70 pregnant women called the PA Free Quitline, and in the first two months of 2014, 35 pregnant women have called the quitline with 33 enrolled in the counseling program (average of 16.5 enrolled per month). This increase suggests that the promotional and outreach efforts to this hard-to-reach population of smokers have shown some success, but further evaluation is needed.

After just over one year of implementation of Pennsylvania's specialized services protocol for pregnant women, the PTCP continues to consider ways to increase awareness and increase utilization, taking advantage of the existing promotional infrastructure, strong partnerships with state agencies and healthcare systems currently serving the population, and data collection and evaluation.

<u>Lessons learned so far</u>

- Remove physician barriers. Minimize hurdles for referring physicians on fax referral forms, especially if requiring consent for cessation medications.
- Attend to the assumptions and conduct education of the importance of intervention. The state noted that "There are many people who believe that cessation among pregnant women is a losing battle so should not be fought; that women will start smoking again once the baby is born."
- Offer narrower appointment times on the fax referral forms, rather than four-hour windows of availability. This helps to increase likelihood that they will reach the pregnant woman.
- Offer multiple options for engagement. There are many challenges that exist in reaching and engaging pregnant women in quitline services. The PTCP will soon offer multiple options for engagement such as text and web-based interventions for pregnant women.
- Outreach to a variety of direct service professionals serving pregnant women and women of childbearing age to help ensure the PA Free Quitline is a well-known resource.
- Evaluate special protocols to help improve awareness of, access to, and use of services. Examining quantitative and qualitative feedback during various stages of unique protocol implementation and maintenance can help identify key factors to success.

ii. Maryland

The Maryland Tobacco Quitline, administered by the Maryland Department of Health and Mental Hygiene's (DHMH) Center for Tobacco Prevention and Control (CTPC) and operated by Alere Wellbeing, Inc., provides tobacco cessation services to Marylanders 13 years and older. Additionally, tobacco users 18 years and older are eligible to receive a four-week supply of free NRT, such as the patch or gum. In December of 2012, CTPC expanded quitline services to include an intensive pregnancy support program, counselors who are available 24/7, services provided to teens (formerly only 18 years and older), and web and texting support. The Maryland Tobacco Quitline allows eligible individuals to select the counseling option(s) that work best for them: phone, web and/or texting services. Tobacco users trying to quit may choose an individual service or pair services together.

The existence of the quitline has helped to achieve the goal of reducing tobacco use in Maryland, providing a comprehensive service assisting tobacco users. Quitline utilization data is provided as a key indicator for success of the tobacco control program for Governor O'Malley's State Stat Program, and CTPC provides service measures on a monthly basis. While overall call volume continued to increase from year to year, calls from pregnant women were historically only about 0.9-1.5% of overall quitline volume. CTPC was tasked with increasing utilization among pregnant women by promoting the new service offering of up to 10 proactive counseling calls. The first seven calls are completed within 60 to 90 days of enrollment in counseling, and one call will be delivered 30 days prior to the planned due date. The protocol also includes 2 postpartum contacts (15 days and 45 days postpartum) for those women who quit and structured content for pregnant smokers not ready to quit.

CTPC updated and developed new English and Spanish brochures, posters, and out-of-home materials for promoting the new quitline pregnancy services. Joint promotion and outreach efforts have occurred between state agencies, for example: screening for tobacco use and providing a referral to the quitline was added to the Medicaid enrollment process, a quitline referral and tobacco screening tool was developed and is being used in state family planning clinics; and a Medscape alert was issued by the Secretary of Health, Dr. Joshua Sharfstein, to promote the new pregnancy services. Several trainings have been geared toward WIC staff featuring a quitline pregnancy intervention, and WIC staff has been provided quitline fax referral training. So far, Maryland has seen a trending increase in quitline callers that report pregnancy over the past year, from 1.5% to 2.1%, and currently serves approximately 60 pregnant callers per year.

<u>Promoting the service</u>

Although a CTPC priority is to increase enrollment of pregnant women in quitline services, the long-term goal for the program is to reduce smoking among women of child-bearing age, thus reducing the number and proportion of women who become pregnant and are already smoking. In looking at prevalence rates among non-pregnant women within the 24 local health jurisdictions, program staff noted that while some jurisdictions had rates as high as 27%, others had very low prevalence rates. This review of the surveillance data allowed the program to identify the need to target outreach and promotion narrowly and focus on 10 jurisdictions with the highest need. In 2014, the program has expanded this focus to 16 jurisdictions.

After holding meetings with stakeholders and service providers within each of the 10 initial jurisdictions to learn more about the community-specific infrastructure in place to support cessation among pregnant women, CTPC, along with partners from the DHMH's Center for Chronic Disease Prevention and Control and Maternal and Child Health Bureau developed the Pregnancy and Tobacco Cessation Help (PATCH) initiative. The initiative aims to address and reduce smoking rates among pregnant women, women of child bearing age, and members of their households and social environments. Increasing referrals to the Maryland Tobacco Quitline is a key outcome for the PATCH initiative.

PATCH is a capacity building project, requiring each local health department to incentivize partners to develop portals for marketing, intervention, and referrals to quitline and local health department services. Each local health department worked collaboratively with partners in a system change initiative to raise the awareness of the problem and provide solutions, involved more people promoting non-smoking norms, and engaged pregnant women and members of their households in existing community based settings. In the first three months, CTPC enlisted 22 incentivized partners to be portals for PATCH in ten counties.

While most of Maryland's efforts to increase utilization of the quitline by pregnant women are focused on the systems that serve this population, there has been targeted promotion directly to pregnant women through bus and billboard ads developed by local health departments and a January, 2014 television ad that promoted quitline services for pregnant women. Preliminary findings indicate that 17 pregnant women called the quitline in January which was the most calls by pregnant women in one month since the launch of the quitline in 2006. Additional mass media outreach and health communication efforts are planned for summer, 2014, that will feature Marylanders who have quit smoking while using the quitline. The CTPC hopes to feature a pregnant woman in one of these ads. CTPC will also target health care

professionals and is developing a PATCH toolkit with quitline materials for professionals to post in offices and other healthcare settings where they see women of childbearing age.

Lessons learned so far

- Small incentives stimulated partner cooperation and led to increased referrals to local health department cessation services.
- People who quit smoking need help in different ways. It is important to continue to provide and promote all ways people can obtain cessation help.
- It is important to increase reach and continue to expand and foster partnerships with local health departments, state programs such as WIC, child and maternal health program (immunizations, home visiting, and family planning programs), the Medicaid program, asthma, and oral health programs.

VI. Conclusion

A. Limitations of This Review

There is one major limitation of this review. For the practice review, we were only able to conduct the practice review among selected quitline service providers and states, so this information may not be representative of or generalizable to other providers and state activities. The practice review attempts to highlight best practices and lessons learned; however, it would be useful to compile information from other states that are targeting promotion and outreach strategies to pregnant and postpartum women.

B. Summary of Key Findings

In the literature review, data on the efficacy and effectiveness of quitline services for pregnant and postpartum women are limited. Of the six studies that evaluated telephone counseling on prenatal smoking cessation, two studies found that pregnant women who received telephone counseling sessions had statistically significant higher quit rates than women who received no calls, *(55, 60)*; however, use of self-reported quits and self-selection in receiving telephone counseling may bias the results. None of the four RCT studies found an effect of telephone counseling and smoking cessation during pregnancy, though low acceptance and participation in the intervention makes these findings difficult to interpret. However, one study, which explored subgroup differences, found that telephone counseling may be effective for lighter smokers and those who used more calls *(62)*. Even within controlled clinical trials, adherence to the call schedule and reaching pregnant smokers were identified as major challenges. Many challenges exist (e.g.., low-income, increased mobility) in reaching and engaging pregnant smokers in quitlines services. For quitlines to be effective, strategies are needed to encourage women to continue the counseling protocol to achieve quits. High satisfaction has been reported among pregnant women who participated in telephone counseling. More research is needed to assess the quality and number of counseling sessions to achieve successful and sustained quits.

Two of six RCTs found that telephone counseling may be effective in reducing postpartum relapse in the early postpartum period, but these positive findings were not sustained at longer follow-up times postpartum. Though one trial delivered telephone counseling only during pregnancy, the remaining four trials did not deliver counseling beyond 4-months postpartum. Thus, interventions that are effective in the early postpartum period may need to be extended for a longer period of time in order to assess their impact on 12-month postpartum relapse rates.

Media campaigns that were specific to pregnant smokers also showed success in increasing calls to quitlines. Messages that focus on the quality and satisfaction that smokers will receive from quitlines have been found valuable; however, additional formative testing may also be needed to identify barriers and facilitators for pregnant smokers' use of quitlines. Quitline administrative data also suggest that pregnant women's health care providers are a major referral source for

quitlines; however, more needs to be done to encourage pregnant women to enroll in the quitline. Also, the feasibility of fax referral systems integrated with other strategies, such as in-person counseling and tailored self-help resources, were perceived as feasible to prenatal care providers, and resulted in enrollment in quitline counseling among pregnant women. Newer technologies, such as fully integrated electronic referral systems, could also be explored to automate the referral process and increase efficiency.

In the practice review, the service offerings for the three largest quitline providers included between 2-7 counseling sessions during pregnancy and 2-4 calls postpartum. The quitline providers are utilizing a number of strategies to promote engagement and retention of pregnant callers (e.g., using a dedicated coach, incentives for attending counseling sessions, using text messaging to reach clients, engaging partners or spouses, and sending correspondence or reminders about quitline support); however, evaluation data are not available to assess whether these strategies are effective for increasing enrollment and ultimately increasing cessation.

Of the two states reviewed, best practice approaches for promotion and outreach to increase quitline enrollment of pregnant women were identified. First, states identified critical partnerships that serve the priority population for outreach (e.g., WIC, Medicaid, prenatal care clinic, community organizations). They also developed promotional materials for the quitline for pregnant women or providers to communicate what specialized services are available for pregnant callers. Fax referral systems or integrating referral to quitlines into existing enrollment processes (e.g., Medicaid enrollment) or screening tools removed barriers to providers and made the referral process more efficient. Ongoing data collection and evaluation were key for states in identifying where to target efforts (e.g., areas with high prenatal smoking prevalence) and whether promotion and outreach efforts were effective (e.g., number of callers to quitline service and services received).

C. Recommendations

There is limited evidence on the efficacy of quitlines for prenatal smoking cessation and preventing postpartum relapse; however, low adherence and participation in the interventions limit our ability to draw firm conclusions. Future studies may need to explore modifications of the intervention (e.g., number of sessions, duration or follow-up) and improve uptake and adherence of telephone counseling. These findings do not change current clinical recommendations, such that pregnant smokers should be offered in-person counseling and that quitlines should be used as an adjunct *(20, 37)*. The state quitlines included in the review do provide counseling protocols for pregnant and postpartum smokers; however, many challenges exist in reaching and engaging pregnant smokers in quitlines services.

Recommendations were developed based on the findings from the literature and practice review, as well as input and feedback from a review committee (see Acknowledgments). The recommendations have been targeted to each audience of this paper (decision-makers, quitline providers, health professionals, and researchers) and are aligned by three goals: 1) increase call volume through promotion and outreach, 2) increase enrollment in quitline counseling, and 3) increase retention in quitline counseling. First, evidence suggests that promotion and outreach to pregnant women can increase call volume to quitlines. This requires funding and collaborations between state tobacco control programs and other public health programs. Second, once pregnant women are referred and contacted by quitlines, more can be done to increase enrollment rates into quitline counseling services, rather than receiving self-help materials only. Finally, given that many challenges exist in engaging and following up pregnant smokers, strategies are needed that will help retain women in services so that they are able to get the support they need to quit smoking and remain tobacco-free.

i. Decision-makers within state, provincial and national organizations that fund quitline services

- Promote current clinical recommendations that emphasize referral to quitlines as an adjunct to in-person counseling for pregnant smokers. There is limited evidence that quitlines alone are efficacious for pregnant smokers, which is in contrast to the general population of smokers for which quitlines have been determined as

efficacious. This may be relevant to states promoting broad referral to quitlines for clinics or health systems that may also see pregnant women, and they will need a nuanced approach based on clinical recommendations for pregnant smokers.

- Outreach and education programs for private and public health care and community-based systems can increase their knowledge and awareness of referral of pregnant women to quitlines. Pregnant women are engaged in prenatal care and other pregnancy-related services, and referrals contribute to a significant proportion of pregnant quitline callers. Organizations that serve a high percentage of pregnant or postpartum smokers may include WIC, Medicaid, Healthy Start, high-risk prenatal care clinics, and home visiting programs. Targeted, tailored media campaigns to encourage pregnant women to call the quitline have resulted in increases in call volumes. Messages in these campaigns have focused on the quality of counseling services, non-judgmental support of quitline counselors, satisfaction that other pregnant smokers have received from quitlines, and emphasizing benefits of quitting smoking during pregnancy. State and local tobacco and maternal and child health programs can work in concert to establish these connections and to promote quitlines.
- Training and outreach efforts to health care providers should include detailed information on the important role the provider plays in smoking cessation: 1) emphasizing current clinical recommendations that quitlines can be used as an adjunct to in-person counseling; 2) accurately describing what quitline services have to offer the patient; 3) telling the patient that quitlines are non-judgmental in approach, effective at helping women quit, and have services tailored specifically for pregnant women (if applicable in that state); and 4) follow-up with the patient on their progress with the quitline and their cessation efforts in general.
- Effective referral systems to quitlines, such as fax referral or a fully integrated electronic referral system, can automate and improve the referral process *(52)*. Electronic referral systems allow for automation of the process and increases efficiency. These systems should include a mechanism for patients to obtain provider consent for cessation medications, if applicable for state quitlines. Systems that can provide timely and useful feedback to providers may enhance providers' willingness to refer.
- Data on quitline calls with pregnant or postpartum women can help to evaluate promotion and outreach and inform programs. It should be noted that the number of pregnant callers to a single state may be small. Measures may include:
    - The number of referrals of pregnant women received;
    - The number of referred pregnant women reached for services and the number of attempts made by the service provider to reach each woman;
    - The number of pregnant women calling for services on their own (self-referral);
    - The number of referred and self-referred pregnant women enrolled in counseling services;
    - The number of counseling calls completed; and
    - Quit outcomes for pregnant women, at end of pregnancy, and postpartum relapse. Given high-nondisclosure rates among pregnant smokers, using self-reported or biomarkers with high validity should be considered, though it may not be practical on a large scale.

ii. Quitline service and cessation providers

- Intake protocols should be tailored for pregnant callers to facilitate acceptance of services. All contact with pregnant smokers should foster non-judgmental relationships with pregnant smokers. Pregnant smokers should be encouraged to enroll in counseling rather than accepting self-help materials only, as counseling may be more effective. Benefits of quitting and remaining quit postpartum can be emphasized in the counseling.
- If possible, pregnant callers should be routed directly to a quitline coach/counselor so that the first counseling session happens immediately, rather than scheduling a follow-up appointment with a pregnant caller. Evidence has shown that pregnant smokers may be difficult to engage and may only use a few counseling calls *(55)*. Though more research is needed, findings from the literature review suggest that call schedules with about 3-5 calls may be effective for certain groups of pregnant smokers (i.e. light smokers and those more motivated to quit).

- Timely and useful feedback reports for the referring prenatal care provider regarding a patient's enrollment in the quitline may help to facilitate communication on the patient's cessation attempt. Provider advice and follow-up can be powerful for pregnant women, but it can also reinforce communication channels between prenatal care settings and quitline providers.
- Current strategies to increase retention (e.g., using incentives, utilizing text-messaging and web components, having a dedicated coach) may need further evaluation on how they impact retention and quit rates for pregnant smokers.

iii. Health professionals

- All pregnant women should be asked if they smoke in a nonjudgmental way and use screeners with high validity *(20, 37)*, such as a 5-part multiple-choice question *(19)*. Women should be advised to quit smoking *(20)*. Though in-person psychosocial counseling is recommended, women can be referred to quitlines for additional support in their quit attempts *(37)*.
- Communicating to patients how quitlines can help to support them in their quit attempts and describing what quitline services have to offer for pregnant women in her state can improve uptake of referrals. Continue to check in with pregnant women during future visits and after delivery on their progress with the quitline.
- Organizational strategies for tobacco cessation can facilitate quality referrals to quitlines. These strategies include having support and buy-in from administrators and staff, provision of quality cessation training for all staff, and implementation of systems-level changes (such as documentation of smoking and assistance in women's records and formal protocols for fax referral and electronic referral).

iv. Researchers and evaluators

- Based on gaps in the research, we have identified the following research questions:
    - What is the optimal number of counseling sessions needed to achieve successful sustained quits among pregnant women?
    - What is the critical content that must be addressed during each of these sessions?
    - Are there strategies that could be added to telephone counseling to increase efficacy and/or improve uptake and adherence of counseling, such as incentives or the use of web or texting components?
    - What intervention components or call schedules will help to prevent postpartum relapse up to 1 year after delivery?

In conclusion, smoking during pregnancy is a prevalent cause of poor infant outcomes for which effective interventions exist. Limited evidence suggests that quitlines alone may be effective for pregnant women who are light smokers or women who are more motivated to quit, and telephone counseling may be effective in preventing relapse in the early postpartum period. However, future studies may need to explore modifications of telephone counseling (e.g., number of sessions, duration or follow-up) and improve uptake and adherence of the intervention. These findings do not change current clinical recommendation, such that pregnant smokers should be offered in-person counseling and that quitlines should be used as an adjunct. Challenges exist in engaging and retaining pregnant smokers in quitline services. Existing quitline service offerings and strategies have attempted to overcome these challenges through the use of incentives and texting services, but these strategies need further evaluation to determine if they improve engagement and increase cessation. State promotion and outreach strategies included targeted and tailored information for both pregnant women and prenatal care providers to inform them of the specialized quitline services available to support their quitting and remaining quit. By helping pregnant and postpartum women be tobacco-free, we can move closer to reaching the Healthy People 2020 goal of reducing prenatal smoking to 1.4%.

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Table 1. Summary of studies for telephone counseling among pregnant and postpartum women.

Study	Sample size/setting	Population	Design	No. prenatal calls/duration/ schedule	No. postpartum calls/duration/ schedule	Comparison	Outcome and time of assessment	Biochemical Verification (Y/N)	Significant effect (Y/N)/p-value
Bombard 2012	246/10 US states	Pregnant women 18-44 years of age who called the quitline and was interested in quitting	Observational	5-8/length not noted	NA	Self-help materials only	7 months follow-up	N	Y – adjusted quit rates (4.0% and 1.9%, p=0.0109)
Ershoff 1999	332/ Southern California	Pregnant women who smoked prior to pregnancy and smoked at least 7 days prior to interview	Double blinded RCT	4 to 6/10-15 minutes	NA	Self-help materials only	Cessation 34wks gestation	Y	N
Jimenez-Muro 2013	412/ Spain	Postpartum, current smokers and recent quitters	RCT	NA	4 calls/15 minutes/ 3, 6, 9, 12 weeks	Education materials and two check calls	Abstinence 3 months postpartum	Y	N
Johnson 2000	251/Canada	Postpartum women, smoked prior to pregnancy and quit once pregnant	RCT	NA	8 (up to 20 min each, average 4-5 min)/weekly during first month and biweekly for second and third month	"Usual care"- no information about smoking relapse prevention	Abstinence 6 months postpartum	Y	N
McBride 1999	897/ Seattle WA	Pregnant, current smokers and recent quitter	RCT	3 calls/9 minutes	4 calls/8 minutes/ 4wk pp, and two calls about 4 to 6-week intervals (4 months)	Self-help materials only	Relapse 2, 6, and 12 months postpartum	N	Y – 2 and 6-month postpartum (no effect for 12-month pp)
Parker 2007	358/ Rhode Island, Connecticut, Massachusetts	Pregnant, current smokers	RCT	3 calls/length not noted	NA	No telephone counseling calls	Cessation 32wks gestation	N	Y (23% for 3 calls, 9.6% for no calls,

									p= .03)
Patten 2010	35/ Alaska	Pregnant, current smokers or users of smokeless tobacco	RCT	4 calls/ 10-15 m/week 1, 2, 4, 6	NA	Brief face-to face counseling and education materials	Cessation during pregnancy ≥60 days post-randomization	Y	N
Rigotti 2006	442/ Massachusetts	Pregnant, current smokers	Double-blind RCT	Average of 4 calls/≤90 min	Average of 1 call/≤15 min	Brief face-to face counseling and could be referred to state quitline	Cessation end of pregnancy; Relapse 3-months postpartum	Y	N
Stotts 2002	733/ Texas	Pregnant, current smokers	RCT	2 calls/20 minute/28 weeks and 30 weeks	NA	Brief face-to face counseling and self-help materials	Cessation 34wk; Relapse 6-wk, 3 or 6 month postpartum	Y – for prenatal cessation N – PP based on self-report	N – prenatal cessation Y – 6wk pp smoking (24.1%, 14.6%, p<.01)
Winickoff 2010	101/Massachusetts	Postpartum parents who were current smokers in past 30 days or recent quitters	RCT	NA	5 calls/45 min for initial call and 10-15 min for follow-up calls	No telephone contact with quitlines	Cessation 7-day abstinence rates at 3 months postpartum	Y	N (7day quits, intervention: baseline=31%, follow-up=25%; control: baseline=38%, follow-up=23%, not significant)

Abbreviation: No.=number; PP=postpartum; RCT= Randomized controlled trial

Table 2. Summary of service offerings for pregnant and postpartum women among selected quitline providers.*

Service provider	Eligibility status	No. prenatal calls/ schedule	No. PP calls/schedule	Access to NRT	Self-help materials	Engagement and retention strategies			
						Dedicated coach	Incentives	Texting	Other
Alere Wellbeing	Pregnant, breastfeeding, or planning to become pregnant in 3 month	7 (within 60-90 days)/1 (30 days before due date)	2/15 days and 45 days	Need physician consent	Pregnancy-specific	No	Yes	No	Refer to text4baby; engage partners/spouses
National Jewish Health	Pregnant, breastfeeding, or have children at home	5 (allowed more if needed)/ 1 c (2 wks before due date)	4 /1 call (2 wks after due date)	Need physician consent	Pregnancy-specific	Yes	Yes	Yes	Letter sent to woman before and after delivery
JSI, Inc	Women up to 45 who are pregnant, breastfeeding, or planning to become pregnant	2-5 calls (based on stage of pregnancy)	2-4 calls (as soon as possible after delivery)	Unavailable	General quit guide	Yes	No	No	Refer to text4baby

Abbreviation: No.=number; NRT= Nicotine replacement therapy; PP=postpartum; Wks=Weeks.

*Quitline providers were selected based on whether they served the highest number of states, as of April 2013: Alere Wellbeing (27 states), National Jewish Health (10 states), and JSI, Inc (3 states)