

**Promoting Alcohol Abstinence among Pregnant Women: Potential Social
Change Strategies**

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Abstract

Fetal alcohol syndrome disorder, or FASD, is one of the most preventable sources of developmental abnormalities, and has a singular cause – alcohol consumption during pregnancy. Estimates for the costs of treatment of a *single* case of FASD range often above one million dollars. The primary strategy for prevention currently centers on no alcohol consumption during pregnancy. However, a sizeable number of North American women currently drink during pregnancy. A literature review examined the behavior of maternal alcohol consumption in order to understand the rationale associated with drinking. Generally, it appears that pregnant women differ by their alcohol consumption habits and their reasons to drink. In an attempt to eliminate FASD, we review a number of educational, legal, and community-based programs that have been used to promote abstinence and examine where they have been successful. Unfortunately, social marketing strategies have received less attention. Several potential applications of social marketing directed to drinking-during-pregnancy campaigns are suggested, and possible contributions to the overall effort are explained.

KEYWORDS: Fetal Alcohol Syndrome Disorder Prevention, pregnant women, social marketing, social change strategies, alcohol, alcohol abstinence

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Promoting Alcohol Abstinence among Pregnant Women: Potential Social Change Strategies

Introduction

Fetal Alcohol Spectrum Disorder (FASD) is an umbrella term used to describe the range of effects that can occur in an individual whose mother drank alcohol during pregnancy (Health Canada 2004). The term FASD is not intended for use as a clinical diagnosis, instead it incorporates a range of disabilities that may affect individuals whose mothers drank while pregnant (Health Canada 2005), including: Fetal Alcohol Syndrome (FAS); partial FAS (pFAS); Alcohol-Related Birth Defects (ARBD), and; Alcohol-Related Neurodevelopment Disorders (ARND). Individuals with FASD exhibit a wide range of characteristics, from severe growth retardation, intellectual disabilities, behavioral disabilities and learning disabilities with lifelong deficits and implications (Chudley, Conry, Cook, Loock, Rosales, and LeBlanc 2005). FASD is the leading non-genetic cause of mental retardation in the Western world (Malbin 2004), and it is currently recognized as the most preventable source of developmental abnormalities (Centers for Disease Control and Prevention 2004). As a result of health and behavioral problems, estimates of the costs of a *single* case of FASD range often above one million dollars (Abel 1998).

With regard to prevention, our current understanding is that women who drink during pregnancy place themselves at risk for having a child with FASD. No level of alcohol consumption during pregnancy has been determined safe, therefore most recommendations for alcohol consumption suggest complete abstinence from alcohol (CDC 2004). Although this is the standard recommendation it is not widely understood. There is conflicting information given by health practitioners and the community.

This paper reviews research on FASD from a social marketing perspective. It discusses why women of childbearing age drink, what can be done to reduce the incidence of drinking during pregnancy, and suggests possible social marketing intervention strategies. While the review is focused on FASD, we believe there are implications for other social problems.

Prevalence of Drinking Behaviors and Characteristics of Drinkers

According to Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System 2002 survey (CDC, 2004), 52.6% of 64,181 childbearing age women (18-44 years) in the U.S. reported consuming alcohol in the month prior to the survey. Of these 64,181 women, 2,689 (4.7%) were pregnant and 4404 (7.6%) might become pregnant since they reported not using any type of birth control. Use of alcohol was reported by 10.1% pregnant women and by 54.9% women who might become pregnant. Alcohol use among pregnant according to the 2002 survey had declined from 12.8% in 1999 (CDC, 2002).

Demographic and Behavioral Characteristics

Who stops drinking during pregnancy and who continues? In a study by Ockene, Ma, Zapka, Pbert, Goins, and Stoddard (2002), women who stopped drinking during pregnancy were more likely to be younger, unmarried, and ethnically diverse (such as Hispanic). However, women who continue to drink during pregnancy can be profiled into two distinct groups. Best Start (2003) identified them as: a) "women who are over 30 and have 'successful careers,' and b) women who use other substances, have low self-esteem, who are young, poor, unemployed, or depressed" (p. 2). According to Floyd, Decoufle, and Hungerford (1999), the profile that

resembles first subgroup also tends to be a frequent drinker (six drinks or more per week) during the periconceptional period.

Further, Wiemann and Berenson (1998) report that, among pregnant adolescents (below 17 years of age), those who continued to drink during pregnancy were more likely to be Mexican-American, to have quit school, to report recent tobacco use, have a partner who drinks, and will have used alcohol during sexual activities. There is also evidence that drinking during pregnancy may be more prevalent among Native American at-risk youth (Ma, Toubbeh, Cline, and Chisholm 1998). Adolescents who stopped using alcohol during pregnancy were significantly more likely to have witnessed or been a victim of or known a victim of violence (Wiemann and Berenson 1998). While only two cultural groups have been identified here, there are cases of FASD in almost every culture, race, and country worldwide.

Why do Pregnant Women Drink Alcohol?

Since a sizeable portion of women drink during pregnancy, it is also critical to understand the reasons behind their behavior. According to Best Start (2003), pregnant women drink due to many factors. First, women may be unaware that they are pregnant. They may not realize they are pregnant until the fourth week (and many in the sixth week) of their pregnancy. Until they realize they are pregnant they continue to drink alcohol. This behavior could negatively influence the baby's health (Floyd et al. 1999).

Second, some women report misperceptions about how much alcohol intake during pregnancy is acceptable and how much harm alcohol can cause. According to one Danish study (Kesmodel and Kesmodel 2002), 76% of women considered some alcohol intake during pregnancy to be acceptable, mostly on a weekly level. These misperceptions may be fuelled by the conflicting messages women are getting from their physicians.

Third, women may continue drinking for social reasons. Many women may believe that it is okay to drink during pregnancy, or believe that drinking during pregnancy is widespread. Various reasons may be shaping these normative perceptions. They may personally know women who drank during pregnancy and who have children who appear outwardly to be healthy. Pregnant women may also drink because they believe it is part of socializing with their friends and participating in social events (Koren, Nulman, Chudley, and Loocke 2003; Testa and Leonard 1995).

Finally, women may be drinking due to psychological and environmental factors. These factors include: alcohol consumption due to addiction, alcohol as a coping mechanism ("to cope with difficult life situations such as poverty, violence, isolation, despair or depression" [Best Start 2003, p. 2]), lack of social support, family history of alcohol problems, and partner's use of alcohol (Chang, Goetz, Wilkins-Haug, and Berman 2000; Leonardson and Loudenburg 2003; Ockene et al. 2002). A partner's drinking habits are predictive of women's habits, which may be a result of males' misperceptions about the consequences of alcohol consumption during pregnancy (Environics Research Group 2000).

From the literature review, it is likely that women drink for many of the reasons as previously listed. We can only guess what groups drink for what reasons (as discussed later in the report). In general, it appears that many women drink during pregnancy due to a lack of awareness of alcohol consequences, belief in maladaptive social norms, or existence of negative psychological and environmental factors.

Youth may be contributing to the FASD problem due to their misperceptions about risks of consuming alcohol during pregnancy. MacKinnon, Williams-Avery, and Pentz (1995) found

that, among 13-20 year olds in the U.S., males and younger adolescents had lower perceptions about the risks of alcohol. Further, 25% of high-school students and 14% of college students reported that it was okay for a woman to drink heavily on one occasion during pregnancy. Similar findings have been reported by Haemmerlie, Merz, and Nelson (1992) and, Walker, Fisher, Sherman, Wybrecht, and Kyndely (2005).

Social Change Strategies: Education, Marketing, Law, and Community-Based Programs

Rothschild (1999) suggested that social change strategies can be placed into three categories: education, law, or social marketing. *Education* attempts to elicit behaviors using informational messages by informing people and soliciting their compliance. Because education cannot deliver benefits, it requires its target to self-initiate the behavior. *Law* can use either coercive power (e.g., threats of punishment such as fines for alcohol-impaired driving) or may rely on free market mechanisms (e.g., taxes on tobacco products) to achieve behavior change. *Social marketing* makes use of marketing principles and techniques to influence people's behavior (Kotler, Roberto, and Lee 2002, p. 5). Typically, social marketing offers benefits or reduces the costs of performing the desired behavior (Rothschild 1999).

Behavior change is the end goal of any social change campaign. Each social change campaign has its strengths and weaknesses (Rothschild 1999). Education campaigns are appropriate for those individuals who change their behaviors once they become aware of the positive implications of the desired behavior or the negative outcomes of the current behaviors. Such individuals, it is assumed, have the motivation, opportunity, and ability to behave in the desired direction. Legal approaches (taxes, for example) are appropriate when individuals lack motivation to behave despite possessing awareness, ability, and opportunity. By using the legal stick of fines and punishments, social change agents can influence these individuals to switch their behaviors. Marketing approach is appropriate when targeting individuals who lack environmental opportunity to behave desirably. Finally, community-based campaigns are appropriate when multiple factors influence current behaviors.

Successful social marketing ensures that people have the opportunity, ability, and desire to perform the desired behavior. Formative research may be carried out to understand target individuals and competitive forces. Attractive products and rewards may then be offered to overcome barriers. Social marketers are also not restricted to communication, but may choose to involve the community to bring about societal change.

Various communication-only, legal, and community-based strategies have been employed to promote abstinence among pregnant women. Communication-only campaigns and warning labels have had limited success in effecting behavior change through awareness; while, community-based programs have been effective with problem drinkers. However, there is little evidence of social marketing strategies that address the issue of alcohol consumption and FASD in the literature to date.

Overview of Previous Social Change Efforts on FASD

Educational campaigns

Educational campaigns that use mass media or mass mailings have had limited success in promoting preventive behaviors related to women's drinking habits. Such campaigns employ persuasive messages to encourage target individuals, but do not provide support services to change behavior. Here are some examples.

Olsen, Frische, Poulsen, and Kirchheiner (1989) report that campaign managers carried out several communication activities highlighting the risks of smoking and drinking during pregnancy between 1984 and 1987 in Odense, a Danish city. These results were compared with another Danish city, Aalborg. They aired commercials in local cinema halls, ran reports about the campaign in local radio and newspapers, and conducted a healthy food preparation program on a local television station. They also distributed brochures on smoking, drinking, and eating habits, distributed pamphlets on smoking and healthy diet, and used stickers in several public places. Their results showed that the pregnant women positively received the campaign and were motivated to reduce their alcohol consumption, but these positive reactions did not translate into actual behaviors. About 18-19% pregnant women (n = 6,268) in Odense continued to binge drink (8 or more drinks on one occasion). The average number of drinks per week for the pregnant women continued to be around 1.5-1.8 drinks. These numbers were similar to consumption levels in Aalborg.

Several other examples of media campaigns exist in the literature. However, very few have evaluated the contributions of these campaigns on the awareness and behavior change among individuals who were exposed. Two examples of these approaches are:

- The Minnesota Department of Health sponsored a Minnesota Media Campaign, which was aired on TV and radio during 1994-1995. The campaign attempted to promote alcohol-free pregnancy by creating awareness regarding alcohol consumption, and by challenging alcohol-use norms during pregnancy (The Minnesota Department of Health 1996).
- Best Start introduced alcohol and pregnancy signs among restaurants and bars in Wawa, Ontario, Canada (Burgoyne 1998). The signs carried the message, "Drinking alcohol during pregnancy can cause birth defects." Eighty-seven percent of the restaurants and bars approached during the campaign agreed to participate in this initiative.

Personalized education campaigns have also been tried. A Latin American study, (Belizan, Barros, Langer, Farnot, Victoria, Villar, and the Latin American Network for Perinatal and Reproductive Research 1995) tested the influence of face-to-face home intervention among at-risk pregnant women. The intervention was delivered by trained social workers or obstetrics nurses over four to six visits and included psychological support and health education on a variety of issues including an anti-alcohol program for the pregnant woman and a support person. The experimental group reported better knowledge, but failed to report change in behavioral outcomes including alcohol consumption. A short period of intervention (three months) and structural constraints may have led to campaign failure.

May and Hymbaugh (1989) report an attempt to increase community awareness of FASD consequences among Native Americans and Alaska natives. The campaign distributed a variety of educational materials that discussed numerous topics: alcohol and pregnancy, guidance for male partners, advice for Native American women for a safer pregnancy, for example. Local community workers were also trained to spread awareness about FASD among prenatal groups, school children, and community groups. These tactics successfully increased knowledge; however, the study did not report whether or not the increase in awareness led to change in behavior.

Communication-only campaigns seem to be more effective when used in combination with other strategies, rather than used alone. Kaskutas and Graves (1994) support this assertion. Exposure to three different messages (warning posters in restaurants and bars, warning labels on

alcohol products, and mass media campaigns) among 18- to 40-year-old women led to more conversations about drinking during pregnancy and reduction in alcohol consumption.

Legal Approaches

A prime example of a legal approach is the United States policy calling for warning labels to be placed on alcoholic beverages. Follow-up studies suggest these strategies are of limited efficacy.

Warning labels on alcohol containers are legal mandates, but they essentially have potential educational effects. The United States introduced a warning label in 1989 and requires that it be placed on all alcoholic beverage containers sold or distributed in the country (Caprara, Soldin, and Koren 2004). It reads as follows: "*GOVERNMENT WARNING: According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects.*" Warning labels are also used in Canada, though their usage depends on the province (Caprara, Soldin, and Koren 2004; Yukon Liquor Commission 2002). Typically, these label messages take the form of "*WARNING: Drinking alcohol during pregnancy can cause birth defects.*"

Examining the content, most warning labels use fear appeals that highlight the adverse fetal consequences of drinking alcoholic beverages. Warning labels on alcoholic beverage containers seem to work conditionally. Multiple exposures to warning messages about alcohol consumption increase awareness, especially among Hispanics (Marin 1997) and stimulate conversations about drinking during pregnancy (Kaskutas and Graves 1994). Labels also provide the advantage of keeping awareness steady over time. Other sources such as advertisements, signs and posters do not offer that advantage (Kaskutas et al. 1998).

Hankin and his colleagues have conducted a few studies testing the influence of warning labels on inner-city African American women. Hankin, Sloan, Firestone, Ager, Sokol, Martier, and Townsend (1993) found that labels may cause light, but not heavy, drinkers to abstain. Similarly, according to the Hankin, Firestone, Sloan, Ager, Sokol, and Martier (1996) study, labels seem to positively influence drinking habits among nulliparous women but not among multiparous women.

Exposure to warning labels leads to increased awareness of the consequences of drinking during pregnancy. However, the exposure levels are not consistent across populations. Six and 18 months after the introduction of warning labels, men, 18-29 year olds, heavy drinkers, and the more educated had more likely seen the labels (Graves 1993). Other groups (e.g., 30 years and older and abstainers) may be less effectively reached (Graves 1993; Greenfield, Graves, and Kaskutas 1999; Kaskutas and Greenfield 1992). The 1996 study by Hankin, Sloan, Firestone, Ager, Sokol, and Martier (1996) among inner-city African-American women revealed that women older than 29 years and non-risk drinkers were less likely to have seen the warning labels even after 50 months of its introduction. This finding creates an interesting situation where labels influence light drinkers but they are less likely to see them. The reverse is true for heavy drinkers.

Exposure to warning labels runs into other challenges. First, there tends to be a seven-month lag (Hankin et al. 1993) between enactment of law and increase in awareness of the label, and influence on conversations. Second, people tend to reveal false positive responses, that is they report seeing the label when they had not actually seen it or report seeing the labels before they were implemented (Graves 1993). Finally, warning labels, similar to other communication-

only tools, are less effective in reducing alcohol consumption levels among pregnant women (as revealed by Kaskutas et al. 1998).

Other than warning labels, a variety of other legal approaches have been employed. These include: mandatory distribution of brochures to applicants for a marriage license (as required by law in the states of Wisconsin, Oregon, and Rhode Island [Ris, 1988])¹, taking away child custody from pregnant women who indulged in alcohol and drug consumption (Jessup and Roth 1988), restrictions on where alcohol products can be advertised, and so on. Information on effectiveness of these attempts was not available in the literature.

Community-Based Programs

The third area of focus within the realm of social change pertains to community-based programs. Community-based approaches have been successfully employed in a variety of settings and in targeting a variety of populations. In some cases, these attempts take a multidisciplinary approach combining one or more of these techniques: campaigns correcting normative perceptions, fear appeals, marketing, skill-enhancement, motivational interviewing, and counseling. A summary of campaigns organized by the target audience is provided.

Programs Targeting Pregnant Women

Some evidence suggests that dissonance-type approaches can be effective. For example, motivational interviewing has been shown to be effective in reducing drinking. In a study with a small sample size (N = 42), Handmaker, Miller, and Manicke (1999) reported that motivational interviewing persuaded heavy drinking pregnant women to reduce their alcohol consumption more effectively than providing them with informative reports or literature. Motivational interviewing has also been reported as successful in reducing alcohol consumption among heavy drinking women of childbearing age but not pregnant (Ingersoll, Floyd, Sobell and Velasquez 2003). Similarly, using an approach where women determine their own abstinence goals was also shown to be effective. Chang et al. (2000) conducted a study to test the effect of a brief intervention (identifying drinking goals while pregnant, reason for the goal, risk situations for drinking, and alternatives to alcohol) among women in their 16th week of pregnancy. “Current drinkers, who named abstinence as their goal, did reduce subsequent prenatal alcohol use” (Chang et al. 2000, p. 365). Setting abstinence as a goal was associated with concern for personal and baby’s health, awareness of FASD, and positive social support. Of course, abstinence before the 16th week of pregnancy would be preferable.

Programs to Target Substance-Abusing Women

To help overcome substance abuse, programs using a case-management approach, using multidisciplinary drug treatment, and building life-skills seem to be working. However, programs enhancing social skills, restructuring the social network, and providing individualized social support fail to report positive influence. A few model Substance Abuse and Mental Health Services Administration (SAMHSA) case-management programs such as Project LINK and the Parent-Child Assistance Program (P-CAP) program have been successful in lowering substance abuse.² For example, Grant, Ernst, Streissguth, and Stark (2005) report success of P-CAP program in Washington State.

¹ Similar to warning labels, receipt of brochures when registering for marriage license is a piece of communication for the target individual.

² All model SAMHSA programs noted in this article were retrieved from the website:
<http://modelprograms.samhsa.gov/>

Drug treatment and counseling programs have shown positive results. A study by Svikis, Golden, Huggins, Pickens, McCaul, Velez, Rosendale, Brooner, Gazaway, Stitzer, and Ball (1997) found that infants of drug-abusing pregnant women belonging to the group that received multidisciplinary drug treatment along with obstetrical care services were half as likely to require neonatal intensive care unit hospitalization. The Wheel (Women Helping to Empower and Enhance Lives) project as discussed by Ashery, Wild, Zhao, Rosenshine, and Young (1997) used an individual as well as group counseling intervention to reduce HIV-related sexual and drug-risk behaviors among low-income, less educated women. When subjects who received the two interventions were combined into a single group, alcohol use declined by 18% following the interventions.

Skills-enhancement programs have shown mixed results. On the one hand, life-skills training (communication skills, assertion skills, problem-solving skills) with booster sessions reduced alcohol use among problem drinking women (Connors and Walitzer 2001). On the other hand, a social skills training and social network restructuring programs failed to prevent drug use among high-risk pregnant (30% were either pregnant or parenting), multiethnic, low-income female adolescents (14-19 years old) any more effectively than no-skills intervention or normative education strategy (Palinkas, Atkins, Miller, and Ferreira 1996).

Youth-Based Programs to Prevent or Reduce Alcohol Use

Youth-based programs employ a multi-disciplinary approach and report positive influence on drinking behaviors. For example, the Project SUCCESS (Schools Using Coordinated Community Efforts to Strengthen Students), a model SAMHSA program, provides in-school services to 14- to 18-year-old high-risk, multi-problem high-school adolescents. The program is designed to prevent and reduce substance abuse by providing normative and preventive education, counseling and skills training, problem identification and referral, community-based processes and environmental approaches. Another model SAMHSA program, the Too Good for Drugs (TGFD) Program, is a comprehensive K-12 school-based prevention program that teaches children skills that build social competence and autonomous problem solving.

First Nations Individuals

The Baby SAFE (Substance Abuse Free Environment) program (a model SAMHSA program) uses a multi-disciplinary approach among First Nations individuals in Hawaii and has been successful in decreasing the incidence and prevalence of drug/alcohol use among pregnant women and improving birth outcomes for these women. In this program, counseling staff provides in-person, or by phone, counseling, education, and support services.

Health-care Professionals

Health-care professionals have the power to effectively communicate information on risks with women at the interpersonal level (Gordis and Alexander 1992; Kesmodel and Kesmodel 2002) and to promote screening tests and counseling sessions (Kloehn, Miner, Bishop, and Daly 1997). These interactions may be more effective than a mass media campaign in promoting responsible alcohol consumption during pregnancy (Minor and VanDort 1982).

However, several misperceptions exist among health-care professionals. According to Diekman, Floyd, Decoufle, Schulkin, Ebrahim, and Sokol (2000), health-care professionals, especially those graduating before warning labels were introduced, are unclear about the adverse

effects of alcohol use during pregnancy, and about the effective methods for screening and counseling women who report alcohol use during pregnancy. Similar findings have been reported in Canada (Enviro-nics Research Group 2000).

In sum, education-only campaigns appear to increase awareness, but have limited influence on changing behaviors. Meanwhile, warning labels increase awareness, but are more effective with light drinkers than heavy drinkers. When used in synergy, media-based campaigns and warning labels have a greater influence on changing behaviors. Community-based comprehensive social change programs have a good record of influencing at-risk women drinkers and youth. Importantly, no marketing-only campaign was found in our literature review.

Proposed Prevention-Based Social Change Campaigns

Until now, we have summarized the profile of the target market and the reasons for their alcohol consumption behaviors during pregnancy. We have also summarized past attempts to address this issue. We now proceed to segment and target the market. One of the first things to note is that women differ in their demographic and psychographic makeup (e.g., women earning low and high income continue to drink during pregnancy) and the reasons why they consume alcohol. Due to both population size and individual differences, it becomes necessary to group these women into homogeneous segments. Previous research has also revealed that certain social change strategies work under certain conditions. Depending on the profile of the target group, appropriate social change attempts should be carefully selected and targeted. For example, education campaigns and warning labels are appropriate among low-risk drinkers; community-based approaches are appropriate among women who face economic hardships and struggle with addictions; and marketing approaches are appropriate for those men and women who drink for social reasons.

In the following section, target individuals are divided into segments and appropriate social change strategies are proposed for each segment to promote abstinence during and before pregnancy. TABLE 1 summarizes this discussion.

TABLE 1 ABOUT HERE

Segment One: Women Who Drink During Pregnancy

Women in this segment drink during pregnancy. As described previously, there tend to be two subgroups in this segment: a) educated and older women with “successful careers,” and b) young, poor, unemployed, or depressed women who have low self-esteem and those who use other substances (Best Start 2003, p. 2).

The professional, well-educated women (sub-segment 1) who are aware of consequences but who continue to drink during pregnancy (Ingle, Owen, Jones, Perry, and Cassidy 1994) may be doing so, as we conclude, for social reasons. For these women, drinking may be satisfying their need to socialize, and may be perceived as the social norm. For this sub-segment, it may be appropriate to use a social marketing approach and provide alcohol-free alternatives for purposes of socialization. These alternatives should have similar features as the current social events that involve drinking. These alternatives would provide opportunities to have fun, to chat, to listen to music, or to play games while charging a similar monetary price and be conveniently located. By offering such attractive opportunities in the environment, these alternatives will enhance the

benefits of abstaining (“healthy child”), reduce the costs (“won’t feel left out from my group” or “won’t get bored sitting at home spending evenings by myself”) and positively influence self-efficacy (“I can abstain and yet socialize”) (Andreasen, 2004). The second sub-segment could be approached with community-based programs that use counseling, case management, and multi-disciplinary treatment approaches to reduce substance abuse. To motivate behavior change among these women, they have to be exposed to comprehensive approaches that remind them about and reinforce the goals of abstinence. Overall, based on previous research, one can conclude that women in this segment may not respond positively to message-only campaigns. Hence, messages such as “Alcohol is bad for your baby” or “Just Say No” may not work.

Segment Two: Women Who Do Not Realize They Are Pregnant

This segment comprises women of child-bearing age who are not yet aware that they are pregnant. They are also more likely to quit drinking once they realize that they are pregnant. Women in this segment, as we define them, are also more likely to drink occasionally and at lighter levels. A primary prevention campaign may be necessary for these women since they realize they are pregnant only in the fourth week (and many in the sixth week) of their pregnancy. Drinking during the first few weeks of pregnancy could negatively influence baby’s health (Floyd et al. 1999). Further, most women in this segment are aware of alcohol consequences on the fetus, but they are not clear about the exact disabilities caused by FASD. They are also not clear as to how much intake of alcohol is harmful (EnviroNics Research Group 2000). Keeping these factors in mind, we recommend exposing these women to messages throughout their childbearing age that rectify misperceptions about the exact nature of alcohol consequences.

Previous research has shown that this segment responds well to message campaigns. Increased awareness among these women seems to have a positive influence on their behavior (Hankin, Sloan, et al. 1993). It may be appropriate to remind this segment through warning labels, media campaigns, point-of-sale campaigns, and distribution of brochures to applicants of marriage licenses. However, two suggestions are recommended: 1) it is important to ensure synergy among these communication elements (Kaskutas and Graves 1994), and 2) while fear-based appeals are normally used to communicate drinking consequences, health communication literature has shown that these appeals are more effective when they are supplemented with positive solutions (Witte 1992).

Segment Three: Adolescents (Less Than 18 years)

Three kinds of campaigns could be employed to prevent alcohol use among adolescents. Similar in-school strategies have been recommended by Ma et al. (1998).

Message campaigns for low-risk drinkers. Adolescents in this segment are associated with high self-esteem and motivation for good health. They are also likely to drink responsibly once they become aware of consequences. These individuals could be persuaded to abstain from alcohol by being exposed to a variety of communication campaigns including school curriculum (for example, teaching abstinence in high schools perhaps in home economics or personal health classes) and media campaigns.

Marketing campaigns for those who drink in order to socialize. Individuals who drink for social reasons may respond more positively to marketing campaigns that offer more attractive alternatives to socialize. After-school programs demanding active involvement in social and physical activities, and youth mentoring programs could be promoted.

Community-based campaigns for high-risk drinkers. Programs using a multi-disciplinary approach and involving parents, teachers, and trained personnel could be employed in order to deal with high-risk individuals (those already practicing risky behaviors, or those who are children of alcoholics, for example).

Segment Four: Male Partners

Partner alcohol use is a good predictor of alcohol use during pregnancy, especially among adolescents (Wiemann and Berenson 1998). To ensure that male partners exhibit responsibility in their own drinking habits while their female partner is pregnant, two types of campaigns could be employed: (1) Education campaigns would create awareness about the effects of alcohol use on fetus development and the importance of providing support to their partners to abstain from alcohol during pregnancy, and (2) a marketing campaign would promote alcohol-free alternatives to social activities for the couple during pregnancy.

Segment Five: Healthcare Professionals

Healthcare professionals (physicians, midwives, and general practitioners) have power to influence women's drinking behaviors. While creating education campaigns targeting women, this group could be used as endorsers or spokespersons.

In addition, it is necessary to create a dialogue with these individuals. According to Clark and Tough (2003), four findings about health-care professionals were revealed. These findings along with our recommendations are discussed as follows:

1. Healthcare providers send a variety of messages to women about how much alcohol should be consumed before and during pregnancy. To ensure that the message of abstinence gets consistently passed on to women, health professionals should be contacted using personal communication techniques.
2. Healthcare providers cite lack of time as an important reason for not discussing alcohol consumption with women of childbearing age. To overcome time barriers, health providers could be provided with brochures that discuss alcohol effects. Each time a woman of childbearing age visits a health clinic, the provider could hand out this brochure thus reducing his/her time involvement. Alternatively, when women approach doctor's office for pregnancy tests, the test result documents could include warnings about not drinking.
3. The majority of health-care providers (60%) "believe a registry of specialists for consultation, referral resources, and clinical practice guidelines would be helpful in their practice" (retrieved from AADAC 2004, p. 99). This database needs to be developed (if not already in existence) and made available to healthcare providers.
4. A few providers (25%) expressed a desire for "training in addictions counseling, assistance with diagnosis, or access to information via telemedicine" (retrieved from AADAC 2004, p. 99). Necessary help should be offered to these select few providers.

Conclusion

One could follow a marketing process to address the public health problem by:

- 1) Identifying the individuals who contribute to the social problem, and the reasons they enact problem behaviors,
- 2) Understanding the efficacy of previous attempts,
- 3) Segmenting the individuals based on the reasons why they behave undesirably, and
- 4) Proposing solutions to motivate each segment to change its behavior,

- 5) Executing the campaign, and
- 6) Finally, evaluating the campaign and receiving feedback for improvements.

To illustrate this process, the context of FASD prevention campaigns in North America was discussed. Education, marketing, law, and community-based strategies were proposed in order to influence five identified segments. A similar process could be applied to address other social problems.

Numerous research studies could be carried out in the future. First, while this study has proposed segmentation and targeting approach to solving a social problem, it remains to be tested how these solutions play out in the real world. A follow up study using experimental design could test the appropriateness of recommended strategies. Second, the current segmentation framework was proposed in the context of promoting alcohol abstinence among pregnant women to prevent FASD incidence. It would be useful to test whether such a framework could also be applied in addressing other contexts such as promoting seat belt use or promoting recycling behavior. Finally, it would enhance social marketing literature if a study was conducted to understand particular features of alcohol-free alternatives that would attract childbearing women. Other than enhancing the understanding of social change agents, it will also allow private entrepreneurs to venture into a new business opportunity.

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TABLE 1: Summary of Proposed Social Change Campaigns

Segment #	Target	Primary Objective	Strategy
1	<p><i>Women who drink during pregnancy (Best Start, 2003)</i></p> <ul style="list-style-type: none"> • Sub-segment 1: 30+ women with successful careers • Sub-segment 2: Young, poor, unemployed or depressed, and indulge in substance abuse 	<ul style="list-style-type: none"> • Sub-segment 1: Change social norms; offer alternatives to socialize, promote skills to resist social pressure • Sub-segment 2: Promote skills to overcome addiction; offer support services 	<ul style="list-style-type: none"> • Sub-segment 1: Marketing approach (to promote alcohol-free social clubs) • Sub-segment 2: Comprehensive community-based programs
2	<p><i>Women who might be pregnant but do not realize it</i></p>	<p>Promote abstinence by spreading awareness and reminding of consequences of drinking</p>	<p>Media campaigns, warning labels, point-of-sale posters</p>
3	<p><i>Adolescents (<18 years)</i></p> <ul style="list-style-type: none"> • Sub-segment 1: Low-risk drinkers • Sub-segment 2: Those who drink to socialize • Sub-segment 3: Those who indulge in substance abuse 	<ul style="list-style-type: none"> • Sub-segment 1: Create awareness about consequences of drinking during pregnancy • Sub-segment 2: Offer alternatives to socialize • Sub-segment 3: Promote skills to prevent or overcome addiction 	<ul style="list-style-type: none"> • Sub-segment 1: In-school curriculum, media campaigns, warning labels, point of sale posters • Sub-segment 2: marketing campaigns (e.g., after-school programs) • Sub-segment 3: Comprehensive community-based programs
4	<p><i>Male partners of pregnant women</i></p>	<p>Increase awareness of consequences of drinking during pregnancy; correct misperceptions, and promote responsible drinking when female partner is pregnant</p>	<p>Education (to teach about consequences), and marketing campaigns (to promote alcohol-free social clubs)</p>
5	<p><i>Healthcare professionals</i></p>	<p>Correct misperceptions about consequences of drinking during pregnancy; seek cooperation to proactively teach women about the consequences</p>	<p>Personalized communication</p>