



What's Inside

Page 1

The Burden of Maternal Smoking

- Introduction
- Health Effects of Maternal Smoking

Page 2

Healthy People 2020

Data Sources

Page 3-4

Wyoming Smoking Data

Page 5

Disparities

Page 6

MFH Strategies to Address Maternal Smoking in Wyoming

Page 7

References

The Burden and Health Effects of Maternal Smoking

Introduction

Tobacco smoke is known to contain over 7,000 chemical compounds, many of which are proven to have toxic effects on health. About 70 can cause cancer, including lead, arsenic, ammonia, chromium and carbon monoxide.¹ A recent study conducted by the Centers for Disease Control and Prevention (CDC) determined that 19.8%, or 43.4 million US adults were current smokers.² Cigarettes are highly addictive and the prevalence of lifetime dependence is higher for cigarette smoking than for any other category of substance abuse. Secondhand, or environmental exposure to tobacco smoke is also highly prevalent and problematic. More than 126 million residents in the US three years of age or older were estimated to be exposed to secondhand smoke in 2000. Use of tobacco products is responsible for a large public health burden and financial cost. Cigarettes are responsible for an estimated 443,000 deaths, or one in every five, each year in the US. Chronic diseases

attributed to tobacco use are the leading cause of disease and disability in the US. The economic cost is estimated to be \$193 billion annually in health care costs and loss of productivity. These costs and burdens are entirely preventable.³

Health Effects of Maternal Smoking

Several negative outcomes for both maternal and infant health have been associated with maternal smoking during pregnancy.

Maternal health, increased risk of:

- Altered maternal hormones³
- Elevated heart rate and blood pressure³
- Impaired fertilization³

Infant health, increased risk of:

- Preterm delivery^{3,7}
- Low birthweight^{3,8}
- Cleft lip/palate^{3,4}
- Spontaneous abortion/fetal loss^{3,5}

- Sudden Infant Death Syndrome (SIDS)⁶
- Long term impacts on language and cognitive development^{3,9}

Health Effects of Secondhand Smoke

In 2006, the Surgeon General's Report determined there was sufficient evidence to infer a causal relationship between exposure to second hand smoke and sudden infant death syndrome¹⁵, low birth weight^{16, 17}, lower respiratory illness¹⁸, and middle ear disease.¹⁴ The report also provides evidence that suggests a relationship between environmental tobacco smoke and preterm delivery¹⁹ and childhood cancers including leukemia's²⁰, lymphomas²¹ and brain tumors.^{14, 22}



Fast Facts about Maternal Smoking

- Cigarette smoke contains over 7,000 chemicals. Hundreds are toxic and over 70 can cause cancer
- In 2010, 16.6% of Wyoming women smoked during pregnancy
- Smoking during pregnancy leads to increased risk of: sudden infant death syndrome, preterm delivery, reduced lung function, low birth weight, and other adverse birth outcomes

Healthy People 2020

Healthy People 2020

“Healthy People provides science-based, ten year national objectives for improving the health of all Americans.”²⁶ Healthy People 2020 (HP2020) established four overall goals for this decade:

1. Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death;
2. Achieve health equity, eliminate disparities, and improve the health of all groups;
3. Create social and physical environments that promote good health for all;
4. Promote quality of life, healthy development, and healthy behaviors across all life stages.²⁶

To achieve these goals, objectives have been set for a variety of indicators that are used to measure progress. The three HP2020 objectives relevant to maternal smoking are shown in Table 2.

In order to assess maternal smoking progress in Wyoming, several data sources and several indicators have been used. Data for Wyoming is available for all of these HP2020 objectives by combining and using these different data sources. Some of these objectives also apply to the priorities set by the Maternal and Family Health Section of the Wyoming Department of Health to improve the health of Wyoming women and families.

Table 2: Healthy People 2020 Maternal Smoking Objectives ²⁶

Goal Percentages for Healthy People 2020	Target %
Increase abstinence from cigarette smoking among pregnant women	98.6%
Increase the proportion of women delivering a live birth who did not smoke prior to pregnancy	85.4%
Reduce postpartum relapse of smoking among women who quit smoking during pregnancy	No specific target set

Data Sources

Beneficial information pertaining to the health of Wyoming men, women, and children are collected through surveillance projects and vital records. Access to this information allows the Maternal and Family Health Section (MFH) to better understand the health needs of Wyoming residents. Information specific to the MFH priority of maternal smoking was collected through the Wyoming and National Vital Statistics Services, and the National and Wyoming Pregnancy Risk Assessment Monitoring System (PRAMS).

Wyoming Vital Statistics Services (VSS)

Vital Statistics Services is the custodian for official records for Wyoming residents regarding birth, death, marriage, and divorce. Information collected on the birth certificate is a critical resource for MFH because it contains comprehensive data including demographics, maternal outcomes and exposures. There are four maternal smoking measures collected on the Wyoming birth certificate used by Vital Statistics: smoked three months prior to pregnancy, smoked in the first trimester, the second trimester, and in the third trimester.

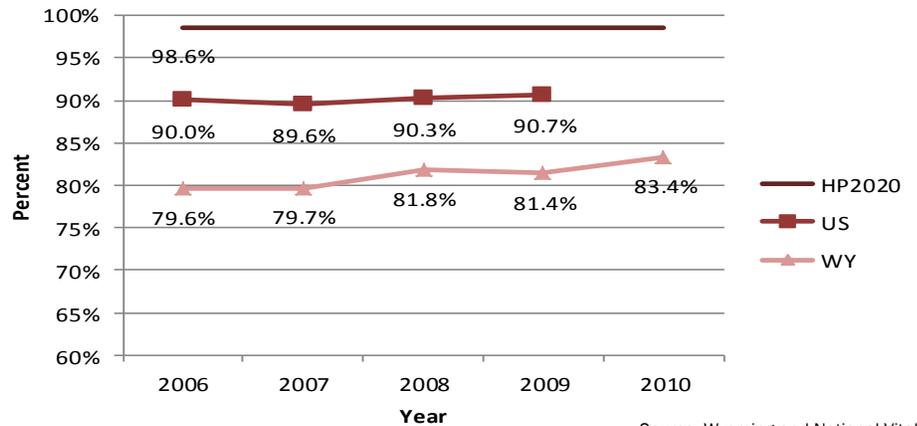
Wyoming Pregnancy Risk Assessment Monitoring System (PRAMS)

Maternal behaviors, exposures, and attitudes prior to, during, and shortly after pregnancy have been studied since 1987 through the CDC surveillance project called PRAMS. In participating areas, PRAMS collects state-specific data from women who have recently given birth to a live infant and are randomly chosen through the state’s birth certificate file. Information collected through PRAMS is used to monitor maternal and child health, identify emerging health issues, and measure progress in health behaviors. PRAMS has been actively collecting data annually in Wyoming since 2007. Smoking data reported from PRAMS includes: proportion of women who smoked three months prior to pregnancy, women who smoked in the third trimester, and proportion of women who were smoking at time of survey.²²



Wyoming Smoking Data

Figure 1: Percent of Mothers Abstaining from Smoking During Pregnancy, Wyoming and US, 2006-2010



Source: Wyoming and National Vital Statistics Service

Figure 1 provides an overview of how Wyoming and the US compare to the HP2020 goal for abstaining from cigarette smoking during pregnancy. Neither the US nor Wyoming has met the HP2020 goal. Between 2006 and 2010 18.8% of Wyoming mothers smoked during pregnancy.

Figure 2: Percent of Maternal Smoking Before, During, and After Pregnancy, Wyoming and US, 2007-2010

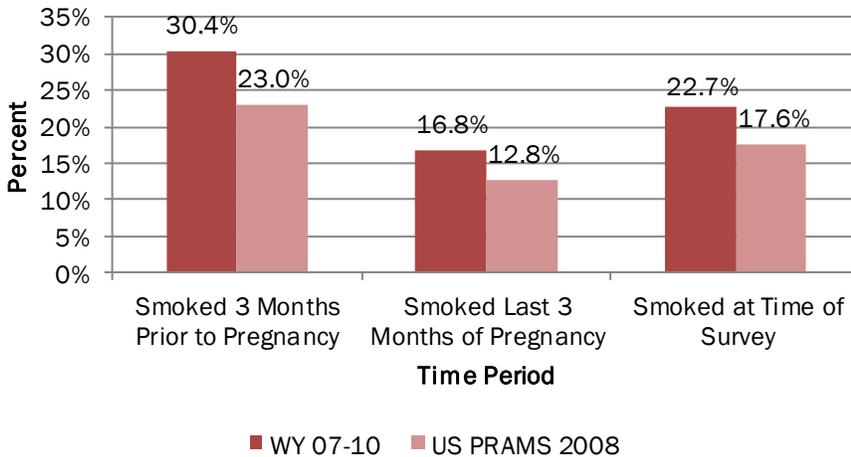


Figure 2 shows the percent of women that self reported smoking in the PRAMS survey before, during, and after pregnancy. Prior to pregnancy, 30.4% of Wyoming women reported smoking compared to 23.0% for the US. HP2020 aims for 85.4% of women delivering a live birth not to have smoked prior to pregnancy. Neither Wyoming nor the US have currently met this goal.

Source: Wyoming PRAMS

Figure 3: Smoking Status, Wyoming, 2007-2010

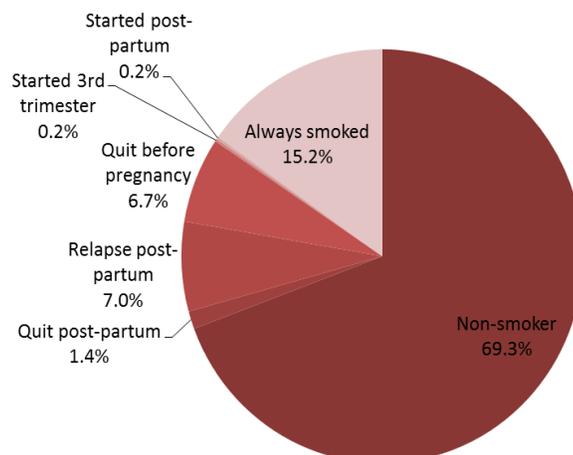


Figure 3 breaks down women into different smoking categories. The majority of women (69.3%) were non-smokers. 15.2% women continued to smoke during pregnancy. After pregnancy, 7% of women reported that they relapsed.

Source: Wyoming PRAMS

Wyoming Smoking Data-Continued

Figure 4: Percent of Smokers Who Quit during Pregnancy, Wyoming, 2007-2010

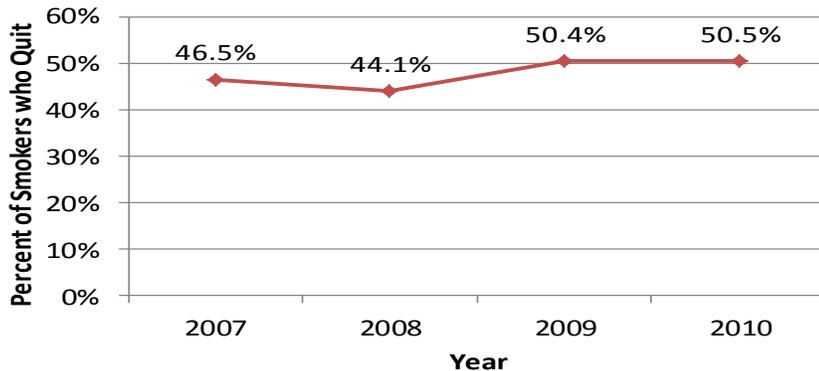
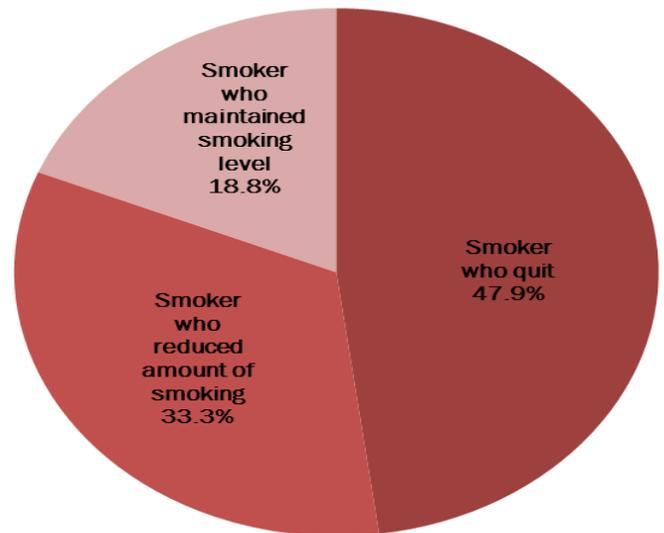


Figure 4 shows the proportion of Wyoming smokers who quit smoking during pregnancy between 2007 and 2010. During this time frame, 47.9% of women who smoked quit during pregnancy.

Source: Wyoming PRAMS

Figure 5: Change in Smoking Status During Pregnancy, Wyoming, 2007-2010

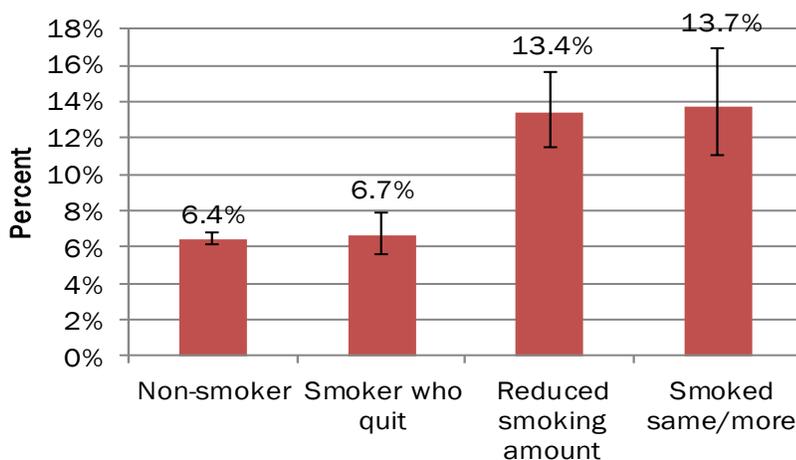
Figure 5 shows the proportion of Wyoming smokers who: quit, maintained, or reduced amount of smoking during pregnancy between 2007 and 2010. Approximately 19% of Wyoming women reported maintaining their smoking level, 33% reported reducing, and 48% reported that they quit.



Source: Wyoming PRAMS



Figure 6: Prevalence of Low Birth Weight by Smoking Status, Wyoming, 2007-2010



Women who smoke during pregnancy are at higher risk of delivering a low birth weight infant. Among women who did not smoke, 6.4% delivered a low birth weight infant. Women that quit smoking delivered a statistically similar percentage of low birth weight infants (6.7%). Women that reported smoking during pregnancy, delivered twice as many (13.7%) low birth weight infants. Women that reported reducing smoking during pregnancy did *not* deliver a significantly different percent of low birth weight infants than those that did not quit smoking. The findings in Figure 6 suggest that there is no safe level of smoking during pregnancy.

Source: Wyoming PRAMS

Disparities among Maternal Smoking

Disparities

HP2020 defines a health disparity as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.”⁵⁴⁻⁵⁵

Figure 7: Smoking Status 3 Months Before Pregnancy by Maternal Demographics, Wyoming, 2007-2010

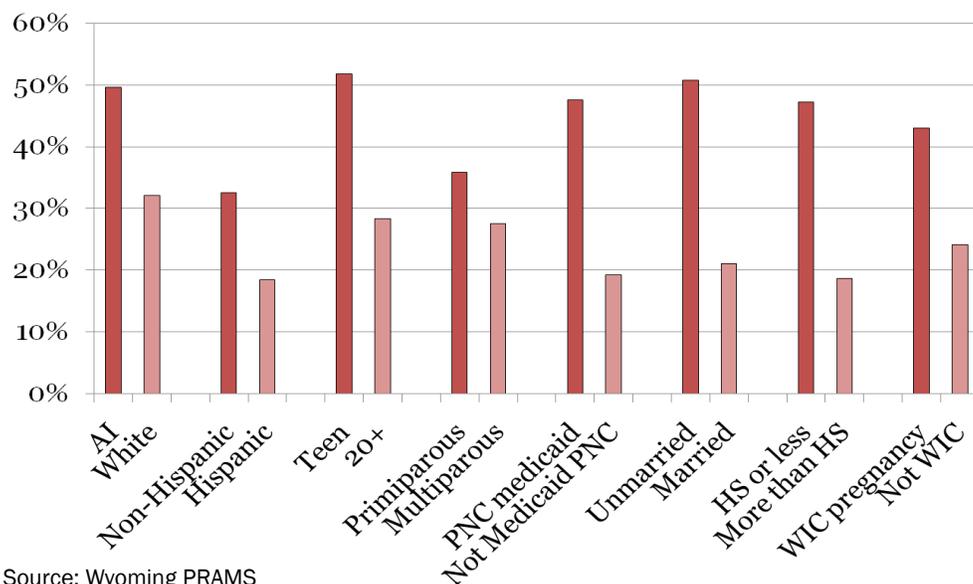
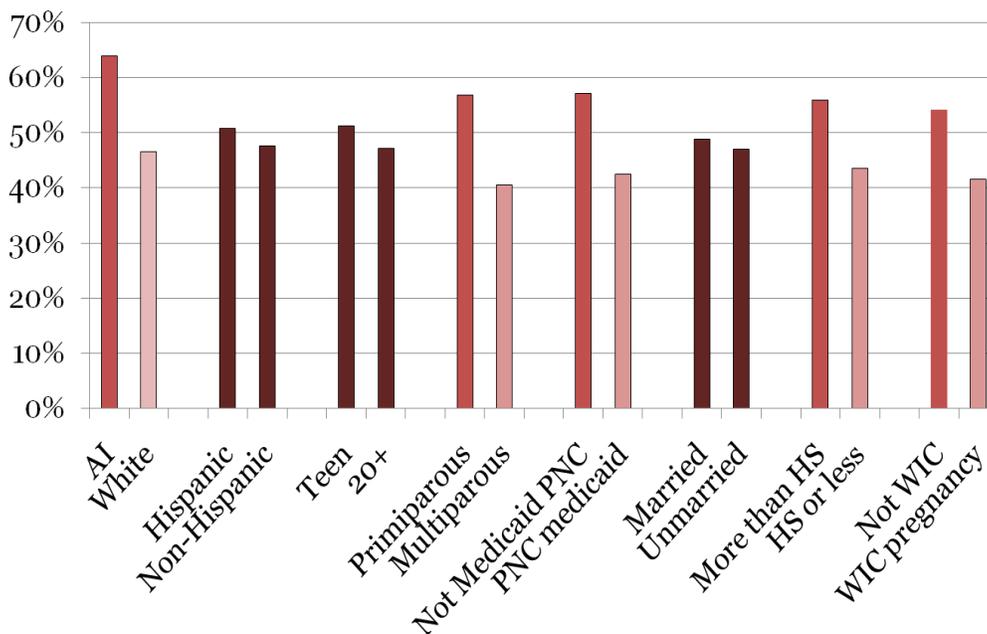


Figure 7 shows prevalence of smoking 3 months prior to pregnancy for Wyoming women by maternal demographics. These characteristics are all associated with smoking before, during and after pregnancy. Teens have the highest prevalence, over 50%, of smoking prior to pregnancy compared with all other groups. All differences pictured are statistically significant.

Source: Wyoming PRAMS

Figure 8: Percent of Women who Quit Smoking by Maternal Demographics, Wyoming, 2007-2010

Figure 8 shows the percent of women who quit smoking by maternal demographics. American Indian women are more likely to quit smoking during pregnancy than white women. First time mothers quit at a higher percent than women with prior pregnancies. Women participating in Medicaid or WIC are less likely to quit than those who do not participate. Those with more than a high school education quit at a higher percent than those with high school or less education. Statistically significant differences between paired demographic categories are shown in different colors. (Statistical difference by Medicaid status, not maternal age)



Source: Wyoming PRAMS

MFH Strategies to Address Maternal Smoking in Wyoming



Maternal and Family Health (MFH), working with stakeholders, established nine health priorities in 2010 following a Needs Assessment for the Title V Maternal and Child Health Block Grant. One of the priorities is to reduce the percent of women who smoke during pregnancy.

To increase capacity to address this priority, MFH issued block grants to public health nurses (PHN) in 22 of the 23 Wyoming counties. Thirteen of these counties have chosen to address maternal smoking. Some of the activities planned include assessment, education and monitoring of pregnant clients, participating in local tobacco coalitions, encouraging pregnant moms to sign up for Text4Baby, referrals to Quitline and/or tobacco cessation classes. Some offices have PHN trained to use **Screening, Brief Intervention, Referral and Treatment (SBIRT)** or to use the **5-A's** (Ask, Advise, Assess, Assist and Arrange). The 5-A's (*Ask, Advise, Assess, Assist, Arrange*) is a brief smoking intervention designed for a clinical setting. In less than three minutes, a provider can “ask the patient if he or she uses tobacco; *advise* him or her to quit, *assess* willingness to make a quit attempt, *assist* him or her in making a quit attempt and *arrange* for follow-up contacts to prevent relapse.”

The **Wyoming Quit Tobacco Program** is a free online (Quitnet) and over the phone (Quitline) service to help people who want to quit smoking. The program is overseen by the Public Health Division. Wyoming Quit Tobacco Program offers free and reduced-cost medication, free counseling sessions over the phone, and an online community for support. The program also offers printed resources, an individualized quit plan, and resources for people who are helping friends quit.

MFH participates in a maternal smoking prevention group sponsored by **Tobacco Cessation at the Wyoming Department of Health**. The group consists of PHN, Tobacco Cessation (WDH and WRIR), Women, Infants and Children (WIC), MFH, March of Dimes, Indian Health Service, and Medicaid. One of the items being considered is making training available for SBIRT and 5-As. The group is also evaluating how to better utilize Quitline's fax referral.

MFH is also participating with the Chronic Disease Integration. One of the major topics is the use of tobacco. As information develops it will be made available.



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Maternal and Family Health provides leadership to ensure that all Wyoming women, children and families, including those with special health care needs, have access to prevention services and public health programs to create a strong foundation for optimal lifelong health.



<http://health.wyo.gov>

Maternal and Family Health Priorities for 2011-2015

1. Promote healthy nutrition among women of reproductive age.
 - *Promote folic acid intake among Wyoming women of reproductive age.
 - *Promote a healthy pre-pregnancy body mass index and adequate weight gain during pregnancy.
2. Promote healthy nutrition and physical activity among children and adolescents.
3. Build and strengthen services for successful transitions for children and youth with special health care needs.
4. Reduce the rate of unintentional injury among children and adolescents.
5. Design and implement initiatives that address sexual and dating violence.
6. Reduce the rate of teen births.
7. Reduce the percentage of women who smoke during pregnancy.
8. Build and strengthen capacity to collect, analyze, and report on data for children and youth with special health care needs.
9. Support behaviors and environments that encourage initiation and extend duration of breastfeeding.