PROGRAM EVALUATION OF A COUNTY REPRODUCTIVE HEALTH PROGRAM

by

Christy Lee Pacheco

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As members of the Practice Inquiry Committee, we certify that we have read the practice inquiry project prepared by Christy Lee Pacheco entitled “Program Evaluation of a County Reproductive Health Program” and recommend that it be accepted as fulfilling the practice inquiry project requirement for the Degree of Doctor of Nursing Practice.

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DEDICATION

This project is dedicated to the underserved females and males of Coconino County who rely on the care provided by the Reproductive Health Program to improve their health and the health of their families and communities.
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ABSTRACT

Northern Arizona women of childbearing age are at disproportionately higher risk for poverty and persistent health disparities in maternal risk factors and maternal child health outcomes. Preconception care is a lifespan and population-based approach to providing health promotion activities to women of childbearing age to improve the health of women, their families, and communities. The county’s Reproductive Health Program offers comprehensive reproductive and preconception healthcare to underserved women and men throughout the county without regard for ability to pay, serving as a critical safety net for this vulnerable population. A formative evaluation was performed using the CDC’s Framework for Program Evaluation in Public Health and retrospective chart review to assess program implementation. In 2010, 1,561 patients received care over 2,575 visits; the majority of patients (69.4%) were women of childbearing age (females 15-44). Most patients (92.9%) were ≤ 150% FPL, and uninsured (77.8%). Program patients were racially/ethnically diverse, with nearly half identifying themselves as White (48.8%), followed by Hispanic (35.3%), and American Indian/Alaskan Native (11.6%). Program reach was limited. Comprehensive medical and social risk assessment and health promotion activities were consistent with evidence-based recommendations. More than 3,400 STI and pap screenings were performed, with identification of 178 abnormal results at the primary program site. One hundred forty-five females had a positive pregnancy test at the primary program site, one-third (33.1%) to teens. For women of childbearing age not trying to become pregnant (98%), a range of family planning methods were provided, which most commonly included oral contraception (36.9%), followed by condoms (15.4%),
and Depo-Provera injection (12.6%). More than 10% of low-income females 15-44 received referrals for further medical care not provided with program. Logistic regression analysis revealed program visits associated with a decreased risk of unplanned pregnancy, though this was not significant (OR 0.87, 95% CI 0.59-1.29, \( p > 0.05 \)). In conclusion, this program provided evidence-based preconception care to underserved women of childbearing age, though reach was limited. Additional studies are recommended to explore patient needs and barriers to improve reach and tailor services. Development of a community advisory council is recommended to guide program activities.
CHAPTER 1: BACKGROUND AND SIGNIFICANCE

Introduction

Despite the greatest per capita spending on healthcare, worldwide the U.S. continues to rank among the worst for developed countries, 29\textsuperscript{th}, for infant mortality rates, signifying poor maternal health status, limited access to quality care, and broader socioeconomic factors (MacDorman & Matthews, 2008). There are persistent, worsening health disparities in maternal child health outcomes and access to care, particularly for racial/ethnic minorities (Agency for Healthcare Research and Quality (AHRQ), 2005; Centers for Disease Control, 2011), and those living in persistently impoverished rural areas or more distant from metropolitan areas (Larson, Murowchick, & Hart, 2008).

Mitigating maternal child health disparities has been identified as a national priority (U.S. Department of Health and Human Services, 2011). Recognizing that approximately half of all pregnancies are unplanned (D’Angelo et al., 2007), combined with the barriers of early entry to prenatal care, particularly among low-income women, there has been a national focus on improving the quality and access to healthcare prior to pregnancy, or preconception care (Johnson et al., 2006). In Arizona, the need for reproductive health, including preconception care, services has increased 28\% between 2000 and 2008, compared to just 6\% nationally (Arizona Department of Health Services (ADHS), 2010a).

Focusing on the continuum of women’s health care to impact pregnancy outcomes, rather than just on prenatal care, offers the opportunity to improve women’s health status prior to pregnancy, decrease the risk of unplanned pregnancies and associated risks, as well as improve reproductive health outcomes.
This Investigator has been a Family Nurse Practitioner focusing on primary care, community health, and maternal child health issues of rural and medically underserved populations in Northern Arizona for over 12 years, including work with the Indian Health Service, local community health center, and local health department. In the course of Ms. Pacheco’s clinical and program work, the complex needs and poor health status and outcomes of the underserved in Northern Arizona in the context of limited and diminishing resources remains a frustrating reality. This is particularly true for maternal child health status and outcomes. In Arizona, there has been no significant improvement in low birth weight or preterm infants in almost a decade (Arizona Department of Health Services (ADHS), 2010b), due in part to lack of improvement in maternal health status and health behaviors. Nationally, an estimated 4% of women of childbearing age have preexisting medical conditions, with 3% of women taking prescription or over-the-counter teratogenic medications (CDC, 2006). In women with diabetes, for example, poor glycemic control in pregnancy is associated with increased risk of congenital anomalies, preeclampsia, fetal macrosomia and subsequent birth trauma, and infant hypoglycemia (HAPO Study Research Collaborative, 2008), as well as longer-term complications such as overweight and metabolic syndrome (Boney et al., 2005) or diabetes (Dabelea & Crume, 2011) in the offspring. This is particularly concerning given the epidemic of diabetes and fact that fetal organogenesis occurs in the first trimester, mostly prior to a woman being aware she is pregnant. As a result, there has been a shift in focus from early and adequate prenatal care to a broader focus on improving the health status of all women of childbearing age, including evidence-based recommendations from CDC preconception care summits (CDC, 2006; Interception Care Project of California, 2011; March of Dimes, California Chapter, 2011).
Preconception care is a lifespan and population-based approach to providing health promotion activities to women of childbearing age, as well as men, to improve outcomes of women and their offspring, as well as desired timing and spacing of pregnancies, should a pregnancy be desired (CDC). Focusing on interventions prior to pregnancy can facilitate identification and modification of risk factors that lead to poor maternal child health outcomes (Atrash, Johnson, Adams, Cordero, & Howse, 2006). Preconception care is a component of reproductive health care services and is viewed as a commitment to comprehensive women’s health care (Wise, 2008). Ensuring access to quality reproductive health services, including health promotion and family planning, is imperative to improve the health status of women of childbearing age and achieve the desired timing and spacing of pregnancies, if desired, and to improve outcomes of women and their offspring.

This project provides an evaluation of a community-based county reproductive health program that focuses on reproductive health, including preconception care and family planning for uninsured and underinsured low-income individuals in Northern Arizona. Patients in this region have disproportionately higher rates of poverty and persistent health disparities in maternal risk factors and maternal child health outcomes (ADHS, 2010c). The Coconino County health department’s Reproductive Health Program is the only known program offering reproductive health services, including preconception care, without regard for ability to pay in Northern Arizona. However, decreased local, state, and Federal funding threatens the funding and sustainability of this program. A program evaluation providing accountability in the use of limited resources and demonstration of effectiveness is imperative to program sustainability and preserving access to care among
underserved patients. The CDC Framework for Program Evaluation in Public Health will be employed to evaluate select processes and outcomes. This chapter will provide background information on maternal child health outcomes, the community, and the program. Chapter 2 will provide a literature review of preconception care and community based strategies, as well as an overview of the socio-ecological conceptual framework for this study. The evaluation framework and procedures are described in Chapter 3. The primary goal in completing this evaluation is to assess program quality and effectiveness for program improvement, as well as provide accountability in use of public funds, particularly given the limited resources for public health programs.

Background
County Geography and Demographics

Coconino County is located in Northern Arizona, and as the second largest county in the nation in geographic size at 18,617 square miles (U.S. Census, 2010), includes metropolitan, rural, and frontier areas. There is an estimated 134,421 individuals living in Coconino County (U.S. Census), with an average of 7.2 persons per square mile. Almost half the county (46%) is tribal land, and includes Navajo, Hopi, Paiute, Havasupai, and Hualapai Indian reservations (Arizona Department of Commerce, 2009). Just under half of the population (45%) was classified as rural by the U.S. Census Bureau in 2000 (Arizona Department of Commerce). Flagstaff is the largest metropolitan population center, where approximately half the population of Coconino County resides (U.S. Census), followed by Williams, Page, and Sedona (part of which is located in Yavapai County). Based on 2010 census data, 61.7% of individuals in Coconino County identified themselves as White non-
Hispanic, followed by American Indian/Alaskan Native (27.3%), and Hispanic or Latino (13.5%) (U.S. Census). Approximately half (50.4%) of individuals in Coconino County are female, 46.5% of who are ages 15-44 (U.S. Census). Almost one quarter (23.7%) of individuals in Coconino County are high school graduates, and 37.2% have a college degree (associates or higher) (U.S. Census). The unemployment rate in December 2010 was 8.2% for Coconino County, slightly lower than the 9.1% observed statewide, or 9.8% nationally (U.S. Department of Labor, 2011). According to the U.S. Census Bureau's 2005-2009 American Community Survey, the average household size in Coconino County is 2.76 persons with a median income of $48,259; 17.4% of individuals and 11.3% of families are below the federal poverty line (U.S. Census). Of note, Arizona has poverty rates are among the highest nationally at 16.5%, compared to the national average of 14.3% (U.S. Census). However, women of childbearing age (15-44) in Coconino County have even higher rates of poverty at 27.4% (U.S. Census). Therefore, individuals in Coconino County are culturally diverse, frequently rural, and experience disproportionately higher rates of poverty than their state or national counterparts.

Access to Healthcare

Logistical considerations.

There are a number of logistical barriers Coconino County residents may experience in accessing primary care, primarily related to distances across the region and provider shortages. There are nine Federally Qualified Health Centers in Coconino County, including North Country Healthcare and Canyonlands, based in Flagstaff and Page, respectively, and their associated satellite clinics (U.S. H.R.S.A, 2011), two community health centers located
in Flagstaff that cater to Native American patients: NACA (Native Americans for Community Action (NACA), Inc, n.d.) and Sacred Peaks Health Center, a tribal satellite site from the Tuba City Regional Health Care Corporation (TCRHCC, n.d.), in addition to private practices and a newly opened free limited primary care clinic for low-income patients in Flagstaff, run by private donations. There are thirteen tribal and federal Indian Health Service primary care clinics and hospitals across the Hopi Reservation in Northern Arizona, though outside Coconino County, and the Navajo Reservation, which spans across Northern Arizona into New Mexico and Utah and only partly in the county, that provide care free of charge for Native American patients (Indian Health Service, n.d.); many of these sites are in rural or frontier areas. The closest tribal/IHS site from Flagstaff is the Tuba City Regional Health Care Corporation hospital and outpatient clinic located in Tuba City, Arizona, approximately one hour from Flagstaff.

As illustrated, these clinics and practices are spread over a large geographic area across Northern Arizona and may have patients seeking care from adjacent areas. Many patients will travel from remote areas, such as the Grand Canyon or these adjacent reservations to access care in Flagstaff, or other county metropolitan areas such as Page. These patients may travel one hour or more to access care, requiring reliable transportation and money for gas. Native Americans in Coconino County living in rural and frontier areas of the adjacent reservations may have disproportionately higher travel times and logistical barriers, such as obtaining reliable transportation and gas money for travel within the reservation or off the reservation for care, than their metropolitan counterparts. Data from the National Household Travel Survey demonstrated travel for medical care
more than double for rural residents, compared to urban residents (17.5 vs. 8.3 miles), with many rural residents traveling more than 30 miles for care (21.4% vs. 4.5%; Probst, Laditka, Wang, & Johnson, 2007). Other survey data demonstrated an average of more than 50 miles traveled for routine medical care among rural residents (Long & Weinert, 2010). Racial/ethnic and socioeconomic disparities have also been observed nationally for extended travel times (Probst et al.). Furthermore, the concept of isolation and distance, including the logistical barriers to traveling to obtain care, has been identified as a key component to understanding the health needs and care of rural residents (Long & Weinert, 2006). Therefore, the large geographic area of the county, rurality of many areas, racial/ethnic diversity, and disproportionately higher risk for lower socioeconomic status create significant logistical barriers in accessing care.

Additionally, there is a shortage of healthcare providers in Coconino County, with 13 sites throughout the county cited as HRSA Health Provider Shortage Areas for primary care (U.S. Department of Health and Human Services Health Resources and Services Administration, 2011), and three areas, including Flagstaff, the largest metropolitan area in the county, designated as Medically Underserved Areas/Populations (MUA/MUP) (U.S. Department of Health and Human Services Health Resources and Services Administration, n.d.). Personal experience while working at a local community health center revealed many patients unable to access care through private offices, even with insurance or Medicaid, since private offices were not accepting new patients, further illustrating the lack of providers to meet demand, and greater reliance on the community health center for care. Native Americans who are also beneficiaries of free primary, secondary, and tertiary care
services through the Indian Health Service located on the reservations, will frequently seek care in metropolitan areas such as Flagstaff. This trend is not surprising and consistent with rural literature noting patients’ willingness to bypass local health care services. Liu, Bellamy, Barnet, and Weng (2008) found nearly one-third of rural residents bypassing local care for their primary medical care, citing reasons including lack of specialists, poorer quality, and reputation. Acceptability of available services, or patients’ attitudes towards local care and willingness to use it, has been found to be a predictor of care utilization among rural residents (Shreffler-Grant, 2006). Bypassing local care, particularly in rural areas such as on adjacent reservations, if care is even available, further increases the demand for services in metropolitan areas such as Flagstaff. This results in increased demand for traditional safety nets such as community health centers and public health programs, particularly among low-income and uninsured patients.

The role of Medicaid and state funding.

Medicaid is playing an increasingly important role in accessing care in Arizona, and recent legislative cuts to the state’s Medicaid program, AHCCCS (Arizona Health Care Cost Containment System), and other public health programs further decrease access to care. At a state level, more individuals relied on Medicaid than their national counterparts (23.1% vs. 19.2%), with those individuals below 200% of the federal poverty line not unexpectedly having a greater reliance on Medicaid (43.2% statewide, and 41.6% nationally) (State Health Access Data Assistance Center, 2010). More than 20% of individuals statewide, including more than one quarter (25.4%) of those below 200% of the poverty line are estimated to not have any insurance coverage at all. Nationally, there are disparities in
health care coverage with Hispanic individuals at disproportionately higher risk of being uninsured (32.4%) than Whites (15.8%); among those ages 18-44 (81.2% uninsured); and among women (45.8% uninsured) (U.S. Census, 2009), which would be expected to also hold true in Arizona. Therefore, women of childbearing age, particularly those who are Hispanic, are at disproportionately higher risk for being uninsured and unable to access care. This is of particular concern given the significant proportion of Hispanic individuals who reside in the county.

In 2009, more than half of the deliveries in Arizona (53.5%) were paid for by Medicaid (ADHS, 2010d). Similar trends in Medicaid coverage were observed in Coconino County, whereby most of the births were paid for by Medicaid (48.7%), followed by private insurance (31.5%), and the Indian Health Service (16.3%) (ADHS). Reliance on Medicaid for births is increasing. Between 1999 and 2009, births (not including prenatal care) paid for by Medicaid increased by 48.3%, in contrast to births paid for by private insurance, which decreased by 6.2% during this time period (ADHS). However, AHCCCS coverage for deliveries does not imply prenatal care coverage, since individuals may qualify only for the emergency statute (i.e. imminent delivery) and no prenatal or follow-up care (Arizona Health Care Cost Containment System, 1994).

Changing legislation related to the state Medicaid program is expected to result in increasing numbers of uninsured patients in Arizona, with further cuts expected in enrollment eligibility, as well as further cuts in safety net programs related to state budget cuts. Of note, in 2009 Arizona experienced the largest decrease in tax revenue nationally at 42.5%, representing the second largest state budget deficit (ADHS, 2010a), significantly
jeopardizing state funding of the Medicaid program and other public health and primary care programs. State budget cuts over the past three years have resulted in all but one of the state funded MCH programs being eliminated, including eliminating all county prenatal block grant funding for services for 19,000 women and children, with significant cuts in the remaining program funding, as well as elimination of more than 80% of state funding for the Arizona Primary Care Program to help support sliding fees at community health centers (ADHS). Therefore, state level funding and policy directly impacts the ability for low-income individuals, including pregnant women and women of childbearing age, to access care. Traditional safety nets are in jeopardy.

Accessing prenatal care.

There are significant disparities in accessing early and adequate prenatal care. In Coconino County, only 85.4% of women accessed prenatal care in the first trimester, with 78.7% receiving adequate prenatal care (9 or more visits), and 1% receiving no prenatal care at all (ADHS, 2010d). Health disparities are observed in accessing early and adequate prenatal care, with prenatal care utilization related to socioeconomic and demographic variables. Statewide, Native American women have the highest rates of late (after the first trimester; 33.8% in 2009) or inadequate (< 5 visits; 10.7% in 2009) prenatal care, followed by Hispanic women (ADHS, 2010b). Hispanic women have the highest rates of no prenatal care (2.9%), followed by Native American women (2.1%) in 2009 (ADHS, 2009). This is of particular concern given the large proportion of Native American and Hispanic women in Coconino County. Of note, Arizona immigration reform laws, such as SB1070, may create a further barrier in access to care, with women fearful of seeking care and risking requests
for proof of documentation status for her or family members. Age has also been found to be an important factor, with 67.3% of teens accessing prenatal care in the first trimester, compared to 80% of women ages 20 or older (ADHS). Geographic differences have also been found. Almost three-quarters of women (74.2%) in 2007 gave birth in a medically underserved area, where just over half (56.5%) of Baby Arizona providers, Medicaid providers for low-income pregnant women, are located (ADHS). Women in rural counties were also less likely to access first trimester care than their urban counterparts (75.5% vs. 80.2%; ADHS).

Insurance status plays an important role in accessing first trimester prenatal care, with rates of prenatal care utilization highest among women with private insurance (91.5%), followed by self-pay (66.6%), Medicaid (66.5%), and Indian Health Service (58.9%) (ADHS, 2009). The markedly lower rates of prenatal care utilization among Medicaid recipients is particularly concerning given the increasing reliance on Medicaid statewide for maternity care, as well as potential impact of Medicaid cuts. Increasing educational level was directly associated with higher rates of first trimester prenatal care utilization, with 66.5% of women with less than a high school educational accessing first trimester care, compared to 89.1% of women with college level or greater education (ADHS). These demographic, socioeconomic, and geographic disparities further reinforce the need to focus on access to care as well as preconception health to improve maternal child health outcomes.
Health Status of Women of Childbearing Age

There are persistent, widening health disparities in Arizona, with African American, Native American, and Hispanic individuals having among the worst health status (ADHS, 2010c). This section provides a brief overview of health status data, followed by data on health and risk behaviors. However, county data for the health status of women of childbearing age is very limited and focused only on vital statistics (e.g. births, deaths). Therefore, available state and national data will also be included to provide a more complete illustration to extrapolate the potential health risks experienced by women of childbearing age in Coconino County. Given the demographics of Coconino County, where the majority of individuals, including women of childbearing age, are Caucasian, Native American, or Hispanic, the data on health status will primarily be focused on these racial/ethnic groups, where available. In 2009, one-third (33.5%) of women who gave birth in Arizona had comorbid medical conditions, such as diabetes or hypertension, with persistent health disparities observed in comorbid conditions or complications among pregnant women statewide (ADHS, 2010b). Statewide, 26.2% of women of childbearing age (ages 18-44) are obese, higher than the national average of 24.4% (March of Dimes, 2011), increasing the risk for pregnancy complications, including gestational diabetes and hypertension. Not surprisingly, rates of diabetes and hypertension in pregnancy increased statewide between 2000 and 2009 (ADHS, 2010b), increasing the risk of perinatal and long-term complications. Almost 4% of pregnancies statewide are complicated by diabetes; this rate is higher in Native American women who have more than double the risk (8.2% of pregnancies; ADHS). Native American women also experience disproportionately higher
rates of chronic hypertension during pregnancy, more than double the state average for pregnant women (1.6% vs. 0.8% of births), and hypertension related to the pregnancy (e.g. pregnancy induced hypertension; ADHS). Comorbid conditions existing prior to a pregnancy have a significant impact on maternal child health outcomes, many of which can be better managed prior to a pregnancy to improve outcomes (Dunlop et al., 2008).

Health and Risk Behaviors

In addition to comorbid conditions, health and risk behaviors can impact maternal child health outcomes. Again, data for women of childbearing age in Coconino County is not available; state and national data are presented here. The multi-state Pregnancy Risk Assessment Monitoring System (PRAMS), developed by the CDC to decrease infant mortality and morbidity, provides important data on maternal health indicators, before, during, and after pregnancy (Centers for Disease Control, 2011). Though this surveillance data does not specifically include Arizona, it does provide important insight into health and risk behaviors among women who have become pregnant. National PRAMS data reveals less than one-third of women (30.3%) having had a preconception care visit prior to becoming pregnant, with higher rates observed among older women, women with private health insurance, and planned pregnancies (D’Angelo et al., 2007). Nationally, among women of childbearing age not trying to become pregnant, more than half of women (53.1%) were not using contraception (D’Angelo et al.). Those with unintended pregnancies were also found to have higher rates of unhealthy behaviors and poorer health status (D’Angelo et al.) National PRAMS data also reveals more than 10% of women missing their postpartum visit (D’Angelo et al.), which is a critical time to discuss family
planning and initiate most contraceptive methods, and follow-up on any health issues, such as follow-up testing for gestational diabetics.

Though daily folic acid supplementation is recommended three months prior to pregnancy, not just during the pregnancy to decrease the risk of neural tube defects (U.S. Preventative Services Task Force, 2009), most women of childbearing age are not taking folic acid. Just over one-third (39%) of women 18-45 in the United States reported taking a multivitamin containing folic acid, with only 20% aware that folic acid prevents birth defects, and half of those (11%) aware that supplementation should begin prior to the pregnancy (March of Dimes, n.d.). In Arizona, folic acid supplementation among women of childbearing age is only somewhat higher at one-half, but lower among racial/ethnic minority and lower socioeconomic status women (AHDS, 2010e). The lower rates of folic acid supplementation among racial/ethnic minority women in Arizona may contribute to the higher rates of birth defects, particularly neural tube defects, observed in these groups (ADHS). Therefore, most women are not aware of the need for folic acid supplementation prior to becoming pregnant and are not implementing this preventative measure. Given the rates of unplanned pregnancies, combined with persistent health disparities, the lack of knowledge and utilization of folic acid supplementation among women of child bearing age is particularly concerning.

Risk behaviors, such as smoking and alcohol use are also important contributors to a woman’s health status and can impact pregnancy outcomes. Smoking during pregnancy has long been associated with low birth weight (Institute of Medicine, 1985). Alcohol is a known teratogen, responsible for Fetal Alcohol Syndrome, a neurodevelopment disorder
that is considered the leading etiology of preventable congenital disorders (American Academy of Pediatrics, 2000). Alcohol use prior to pregnancy is considered an indicator of alcohol use during pregnancy (Floyd et al., 2008). Fourteen percent of women 18-44 statewide reported being smokers and 13.7% reported a history of binge drinking (March of Dimes, 2009), consistent with findings from the Behavioral Risk Factor Surveillance System for Arizona (CDC, 2010a). Native American women reported the highest rates of alcohol use during pregnancy (1.4%), almost triple the state average (ADHSb). Though reported smoking during pregnancy is decreasing over time, an average of 4.8% of women statewide reported smoking while pregnant, with higher rates reported by Caucasian women (8%; ADHS, 2010).

Rates of sexually transmitted infections (STIs) remain a concern. STIs such as gonorrhea and Chlamydia put women at increased risk of pelvic inflammatory disease and subsequent complications such as infertility and ectopic pregnancy; during pregnancy there is an increased risk of chorioamnionitis, an infection of the amniotic sack that is difficult to treat and frequently results in preterm delivery (Institute of Medicine, 1985). Congenital syphilis is devastating to the fetus, frequently resulting in profound birth defects and fetal loss (World Health Organization, 2010). HIV may be transmitted between partners, as well as vertically from mother to fetus or infant; early identification and treatment has been demonstrated to decrease risk of transmission (Siegfried et al., 2011). Though rates of gonorrhea infection among men and women have been declining between 1999 and 2009, rates of Chlamydia infection have been increasing, particularly among women ages 15-24 who experienced a 3% increase between 2008 and 2009 (ADHS,
Rates of congenital syphilis increased more than 50% between 2006 and 2009, at 31.3 per 100,000 live births, more than 31.3x the Healthy People 2010 goals (ADHS). The highest proportion of HIV infections (67%) have been observed among younger men and women, ages 20-39 (ADHS). Though HIV infection in Arizona is predominantly found in males (86.8%), only about half (51.9%) identified themselves as men having sex with men (MSM); 8.3% were heterosexual, and many (27.1%) did not indicate an HIV risk (ADHS), suggesting that the risk of HIV infection among men and women, regardless of sexual orientation or traditional risk factors, needs to be considered, particularly for women of childbearing age. Therefore, sexually transmitted infections have important implications for the woman, her partner, and in pregnancy.

Maternal Child Health Outcomes

There were 92,616 births in Arizona in 2009, 1,894 of which occurred in Coconino County, a county birth rate of 13.7 per 1,000 population (ADHS, 2010d). Forty-seven percent of births in Coconino County were to Caucasian women, followed by Native American women (38.8%), and Hispanic women (10.7%; ADHS). The rates of teen births in Coconino County were similar to state rates (23.4 vs. 24.4 per 1,000 females 19 or younger), and most common among Native American teens (51.4% of teen births), followed by Caucasian teens (29.1%) and Hispanic teens (16.7%; ADHS). There was no significant improvement in maternal mortality between 1999 and 2009, with an average of 8.2 deaths per 100,000 live births (ADHS, 2010b). Risk factors included increasing maternal age and primarily complications related to the pregnancy or postpartum, with an increased risk related to maternal comorbidities, such as diabetes or hypertension (ADHS).
There has also been no significant improvement in rates of preterm births or low birth weight infants between 2000 and 2009 (ADHS). African American infants remain at the highest risk for preterm births, low birth weight (LBW) infants, and infant mortality (ADHS). Infant mortality rates improved slightly among all racial/ethnic groups in Arizona, between 2000 and 2009 (ADHS). Though the infant mortality rates countywide were lower than observed statewide (3.2 vs. 5.9 per 1,000 live births), rates among Native American infants were much higher (8.4; AHDS). Infant mortality rates were the highest among African American infants, 17.1 in 2009, followed by Native American infants (8.4), and Hispanic infants (5.6) (ADHS). Infant mortality rates were associated with prematurity and low birth weight, maternal age, with women < 20 or ≥ 40 at higher risk, inadequate pregnancy weight gain, and being unmarried (ADHS). The rates of low birth weight infants for Coconino County are among the highest in the state (8.1 per 100 births, compared to 7.1 statewide; ADHS, 2010d). This lack of improvement in morbidity and mortality, combined with significant health disparities provides further support for more innovative strategies in improving outcomes, including focusing on prevention strategies through improving the health status of women of childbearing age.

Cost of Unplanned Pregnancies

There is a significant financial burden associated with unplanned pregnancies, for both the women and families affected by unplanned pregnancies, and their communities. This is particularly concerning given the persistent economic recession and subsequent hardships faced by families and difficult budget cuts experienced at the local and national levels, such as cuts to federally and state funded community programs and safety net
programs. Nationally, the cost of unplanned pregnancies is approximately $11 billion annually (Monea & Thomas, 2003; Sonfield, Kost, Gold, & Finer, 2011). For teen pregnancies, the public cost is approximately $7 billion annually (Maynard & Hoffman, 2008). In Arizona, the cost of all unplanned pregnancies is estimated to be $289 million annually, including $95 million directly paid for by the state annually (Sonfield et al.). Nationally, approximately 46% of unplanned births are publically funded; this is higher in Arizona, where an estimated 52% of unplanned births are publically funded (Sonfield et al.). This cost is particularly concerning given the dire financial situation of Arizona and budget crisis, how much of the state budget this public service funding represents, and resulting cuts to public services such as Medicaid, which further limits access. Preventing unplanned pregnancies is estimated to save approximately $5.6 billion annually nationally, or about half the cost, taking into account the provision of prevention services (Monea & Thomas). Therefore, providing family planning services is also a cost effective and fiscally responsible public health measure, in addition to the health considerations outlined above.

Overview of County Reproductive Health Program

Coconino County’s Reproductive Health Program has been providing community based reproductive health services to the under- and uninsured for over thirty years. This program is the only one in Northern Arizona that provides reproductive health care to all community members without regard to ability to pay. This is a full-time Nurse Practitioner run clinic staffed by two full-time Nurse Practitioners, four nurses and several support staff, that focuses on family planning, reproductive health, and preconception care. Most patients are seen at the primary site in Flagstaff, with additional sites located in Williams,
the county jail and county juvenile detention center. Clinic services are open to females and males, 13 and older, and range from health and risk behavioral assessment to education and counseling, family planning services, and diagnosis and treatment of sexually transmitted infections. Over 2,000 racially and ethnically diverse patients are seen each year, with most at or below 150% of the Federal poverty line. Given the diversity and geographic remoteness of Coconino County, patients may travel from distant cities to seek care. The worsening economic conditions locally and nationally have translated into increased demand for services. Further economic constraints locally and nationally are threatening traditional funding sources that this clinic has relied on. Funding is primarily through Title X and Title V, with additional monies through local private grants, the county health department, and some monies from patient donations. However, federal and state funding has remained level for several years, and local funding support has decreased.

Statement of the Problem

Women of childbearing age in Coconino County are at disproportionately higher risk for poverty, decreased access to care, and poorer health status. Health disparities among maternal/women's health status and maternal child health outcomes are worsening, with both short and long term health consequences. The only known program offering reproductive health services, including preconception care, without regard for ability to pay in Northern Arizona is county health department’s Reproductive Health Program. Decreased local, state, and Federal funding threatens the funding and sustainability of this program. An evaluation of this program’s implementation, including extent that services were provided as intended to targeted patients, and impact on preventing unplanned
pregnancy among program participants, is imperative to ensure access to quality reproductive health services to this underserved, at-risk population.

**Purpose**

The purpose of this study was to evaluate how well the Coconino County’s Reproductive Health Program is being implemented. A formative process evaluation was performed using the CDC Framework for Program Evaluation in Public Health (Centers for Disease Control, 1999), using quantitative methodology, to determine if services were provided as intended to the target population. Program service impact on prevention of unintended pregnancy was also evaluated. These findings may be used in accountability reports required by funders and internally to improve program performance.

**Specific Aims**

(1) Determine the extent to which the target population received program services

   a. Describe the socio-demographic characteristics of program participants

(2) Evaluate select program processes to determine quantity, scope, and quality of services provided

   a. Describe the quantity and type of clinic visits provided (comprehensive vs. episodic)

   b. Describe the frequency and types of STI and pap screenings provided and positive or abnormal results identified

   c. Describe the types of family planning methods provided and proportion of patients provided each method, including stratification by teen status
d. Describe the numbers of positive pregnancy tests identified, including stratification by teen status

e. Describe the frequency and types of patient referrals made to other programs and agencies for follow-up care

(3) Determine the impact of program utilization on risk of an unplanned pregnancy

Significance of the Study to Advanced Practice Nurses

This evaluation provides the opportunity to ensure access to quality preconception care services to women of childbearing age in Coconino County. The county’s Reproductive Health Program is a Nurse Practitioner led program that provides a critical safety net for low-income women of childbearing age who are at disproportionately higher risk for poorer health status and outcomes. Evaluating the quality and scope of services in the context of evidence-based practice provides the opportunity to promote patient safety, quality of care, and improve patient outcomes at an individual and population level, consistent with leadership roles of the Doctor of Nursing Practice prepared professional nurse, outlined by the American Association of Colleges of Nursing (AACN; 2006). These evaluation findings also provide documentation of the need and range of critical safety net preconception care services to women who may not otherwise receive care, which can then be used to justify program services and funding, particularly given the limited and, in some cases, decreasing resources. Furthermore, ensuring equitable access to quality care is consistent with the role of professional nurses in nursing’s contract to promote social justice (American Nurses’ Association, 2010) and aims to mitigate well-documented health disparities in access to care and outcomes. Finally, this evaluation provides accountability
and evidence of the leadership role of professional nurses in clinical practice to provide and improve health care services, and in improving outcomes, consistent with recommendations for the role of professional nursing by the Institute of Medicine (2010).

Definitions

*Family planning:* Includes the process of conducting a comprehensive review of medical history, health status, and reproductive life plan to provide appropriate counseling and contraceptive methods, as indicated, to promote planned timing, spacing, and numbers of pregnancies.

*Reproductive health:* Health status related to reproduction, including medical status and history, social, psychosocial, and behavioral health.

*Preconception health:* Reproductive health, as defined above, in the time period prior to a pregnancy.

*Unplanned pregnancy:* A pregnancy that was not planned, including failure or absence of contraceptive use.
CHAPTER 2: LITERATURE REVIEW & CONCEPTUAL FRAMEWORK

This chapter provides an overview of preconception care and safety net programs for preconception care in Arizona. The definition, rationale, and strategies for providing evidence-based preconception care are described, followed by a brief overview of the Title X and Title V programs and their roles in providing reproductive health services in Arizona. Finally, the ecological model, which serves as the conceptual framework for this project, is presented.

Overview of Preconception Care

Definition and Rationale

Preconception care is a lifespan approach to providing health promotion activities to women of childbearing age, as well as men, to improve outcomes of women and their offspring, should a pregnancy be desired. Preconception care is also seen as a population-based approach to improving women’s health, maternal-child health outcomes, and is a component of reproductive health care services. The CDC defines preconception care as “a set of interventions that aim to identify and modify biomedical, behavioral, and social risks to a woman’s health or pregnancy outcome through prevention and management” (Johnson et al., 2006, p. 3). Preconception care uses a life span approach, recognizing the impact of numerous factors on outcomes, such as maternal health status and behaviors on short and long term health outcomes of the women and their offspring. Preconception care has been defined as a “process, not a visit” (Posner, Johnson, Parker, Atrash, & Biermann 2006, p. S200), reinforcing the need for continued assessment and counseling during primary care
encounters. The March of Dimes has called for preconception care for “every women, every time” to promote risk reduction strategies prior to conception (Korenbrot et al., 2002). Preconception care is also viewed as a commitment to comprehensive women’s health care (Wise, 2008). Focusing on interventions prior to pregnancy can facilitate identification and modification of risk factors that lead to poor maternal child health outcomes (Atrash, Johnson, Adams, Cordero, & Howse, 2006), such as improved management of chronic illness and health behaviors. However, only about one-quarter of primary care clinicians provide preconception care as part of their routine care of women of childbearing age (CDC, 2006). Given the fact that almost half of all pregnancies are unplanned (D’Angelo et al., 2007), integrating preconception care into routine primary care encounters is particularly important to be effective in improving outcomes.

Each year, there are persistent pregnancy and perinatal complications. Nationally, 31% of women experience pregnancy-related complications, 12% of infants are born prematurely, 8% of infants are born with low birth weight, and 3% of infants suffer from major congenital malformations (Centers for Disease Control (CDC), 2006). Previous focus on promoting early access to prenatal care has not resulted in improved outcomes. Fetal organogenesis, which occurs during the first trimester, is primarily occurring prior to a woman’s awareness she is even pregnant. Additionally, there are barriers to early entry into prenatal care, particularly among low-income women, which may prevent early identification and management of risk factors. In fact, preterm births have been increasing over time, related in part to a higher prevalence of high risk pregnancies due to advanced maternal or paternal age, chronic problems, obesity, diabetes, and preeclampsia, and
multiple births, resulting in significant infant mortality and morbidity and economic cost (Damus, 2008).

The prevalence of risk factors such as chronic medical conditions and poor health behaviors contribute to poorer outcomes. Preconception care of women with chronic conditions, such as diabetes, thyroid disease, and obesity, aims to decrease the pregnancy, perinatal, and longer-term complications associated with these conditions (Dunlop et al., 2008). An estimated 4% of women of child-bearing age have preexisting medical conditions, with 3% of women taking prescription or over-the-counter teratogenic medications (CDC, 2006). Poorly controlled diabetes in pregnancy is associated with increased risk of congenital anomalies, preeclampsia, fetal macrosomia and subsequent birth trauma, and infant hypoglycemia (HAPO Study Research Collaborative, 2008), as well as longer-term complications such as overweight and metabolic syndrome (Boney et al., 2005) or diabetes (Dabelea & Crume, 2011) in the offspring. Achieving adequate glucose control prior to conception is important in diabetic women who have more than double the risk of congenital malformations, associated with hyperglycemia during pregnancy (Kitzmiller, Wallerstein, Correa, & Kwan 2010), particularly during this critical time of organogenesis. Overweight/obesity is associated with an increased risk of pregnancy complications, such as preeclampsia, macrosomia and subsequent birth trauma, as well as congenital anomalies, which is further increased if the woman is also diabetic (Reece, 2008). Risk behaviors are also associated with increased mortality and morbidity, such as fetal alcohol syndrome associated with alcohol consumption during pregnancy (American Academy of Pediatrics, 2000), and increased risk of preterm birth related to smoking
(Institute of Medicine, 1985). Therefore, preconception interventions to improve the health status and health behaviors of women of childbearing age can positively impact mortality and morbidity.

Strategies

There has been a national movement to improve preconception care. To date, three national summits on preconception health have been held to review existing data, develop strategies, and explore solutions to promote preconception care to improve outcomes. The first summit was spearheaded by the CDC in 2005, whereby the CDC/ATSDR (Agency for Toxic Substances and Diseases Registry) Preconception Care Work Group and the Select Panel on Preconception Care, a panel of experts including members of the American College of Obstetrics and Gynecology and the American Academy of Pediatrics, reviewed existing data to determine evidence-based practice recommendations and develop strategies to improve preconception health (Johnson et al., 2006). Four goals and ten recommendations emerged from this summit. Goals included (p. 1):

1. Improve the knowledge and attitudes and behaviors of men and women related to preconception health;

2. Assure that all women of child-bearing age in the United States receive preconception care services (i.e., evidence-based risk screening, health promotion, and interventions) that will enable them to enter pregnancy in optimal health;

3. Reduce risks indicated by a previous adverse pregnancy outcome through interventions during the interconception period, which can
prevent or minimize health problems for a mother and her future children; and

(4) Reduce the disparities in adverse pregnancy outcomes.

Panel recommendations focused on five areas, including: changes in consumer knowledge, clinical practice, public health programs, health-care financing, and data and research activities (p. 1). There was a focus on prevention, risk reduction, and access to care. A lifespan approach was implemented and included the need for all women of childbearing age to develop a reproductive life plan, outlining the planned timing, spacing, and number of children, if any, that would be amended as needed over time, and used to guide clinical decision making. Since this first summit, two additional national summits have been conducted, in 2007 and 2011, focusing on clinical, systems, and policy level areas (Interconception Care Project for California, 2011; March of Dimes, California Chapter, 2011). In addition to the national summits, five workgroups were developed by the CDC to focus on implementing strategies for the key areas identified in the first summit (Atrash et al., 2008). These workgroups included the following: clinical, public health, consumer, policy and finance, and research and surveillance implementation workgroups (Atrash et al.). The recommendations developed by the clinical workgroup are described in this following section.

Clinical practice.

The CDC’s Preconception Care clinical workgroup outlined the evidence-based clinical content for preconception care. This workgroup was comprised of an interdisciplinary team of 29 workgroup clinicians and more than 30 expert consultants to
establish the clinical content of preconception care and critically review the evidence to develop evidence-based recommendations for preconception care (Jack et al., 2008). Their findings are presented here. The criteria used for the inclusion of preconception care topics included the ability to impact health outcomes, prevalence, and ability to detect. The strength and quality of evidence was then assessed based on criteria employed in the U.S. Preventative Services Task Force Guide of Clinical Preventative Services. More than a dozen sub-topic areas for preconception care were identified. The following is a brief summary of recommended assessments and interventions that had good supporting evidence (Strength of Recommendation A).

- **Health Promotion** – Family planning and establishing a reproductive life plan; weight status (BMI); nutrition, including folic acid and recommendation for all women of childbearing age to ingest 0.4 mg folic acid daily; immunizations; substance use, sexually transmitted infections (risk assessment, counseling, testing, treatment, immunizations as indicated)

- **Immunization** – Hepatitis B, MMR

- **Infectious disease** - HIV status, universal Chlamydia screening for sexually active women ≤ 25 or with risk factors; syphilis (if high risk and prior to pregnancy)

- **Medical conditions** – Management of diabetes (screening if symptoms), thyroid disease (screening if symptoms), phenylketonuria, seizure disorders, hypertension, rheumatoid arthritis; particular attention to control and use of non-teratogenic medications
• *Parental exposure* – Smoking cessation counseling; alcohol and drug illicit substances includes, but only fair evidence to support

• *Family and genetic history* – Screening, though only fair evidence to support

• *Nutrition* – Folic acid/multivitamin with folic acid daily use; calcium and iron supplements if indicated

• *Environmental exposure* – Potential household exposures

• *Psychosocial risk* – Financial resources, access to care, and safety assessments, though evidence lacking

• *Medication* – Prescription and non-prescription

• *Reproductive history* – History preterm birth, cesarean delivery, miscarriage

• *Special Populations* - e.g. Cancer survivors

Moos et al. (2008) further outline how to incorporate these recommendations into the routine care of women of childbearing age, citing the CDC’s recommendation to incorporate risk assessment and health promotion activities universally for all women of reproductive age. The risk assessment is derived from the standard annual medical history, which is outlined as including the following elements: past medical history, family history (including genetic), reproductive history, medications (prescription, over-the-counter, and supplements), allergies, social history, including safety, alcohol, tobacco and drug use, psychosocial, nutrition, and immunization status. Findings then direct further evaluation and intervention, including education, as indicated. Finally, the need for family planning and establishing a reproductive life plan is reinforced given the prevalence of unintended pregnancies and contraceptive method failure.
Programs for Reproductive Health and Preconception Care in Arizona

There are two primary programs that provide support for reproductive health care, including preconception care, in Arizona. These include the Title X Family Planning Program, administered through the Arizona Family Planning Council, and the Title V Maternal and Child Health Program block grant, administered through the state health department, the Arizona Department of Health Services (ADHS). The Bureau of Women’s and Children’s Health coordinates statewide family planning support with the administrators of Title X funds, the Arizona Family Planning Council, targeting gaps in coverage (Arizona Department of Health Services, 2011). These programs are particularly important because, unlike private practices or community health centers who offer sliding fees, consistent with the Federal guidelines for Federally Qualified Health Centers, these programs permit greater access to care, with a sliding fee scale that slides to $0, based on reported income. Additionally, this reported income does not require any additional supporting documenting for proof of income, further decreasing economic and logistical barriers to seeking reproductive health services. This also decreases barriers to teens accessing care by considering the teen’s income only, not household income. This section provides a brief overview of these programs, including historical context and services provided in Arizona.

Title X

The Title X Family Planning Program is a federally funded program through the U.S. Department of Health and Human Service’s Office of Family Planning that has been providing family planning and reproductive health services to men and women since its
enactment in 1970 as part of the Public Health Service Act (U.S. DHHS, n.d.). A wide range of reproductive health services are offered, including preventative health services such as breast and cervical cancer screening and STI/HIV testing, medical exams, patient education and counseling, family planning services, and pregnancy testing and counseling, which are targeted to low-income individuals. In addition to clinical services, the Title X program also provides staff training, data collection, and community outreach and education (Institute of Medicine (IOM), 2009). In response to the CDC’s call for a focus on preconception care and lifespan approach, Title X programs are now required to discuss and document a Reproductive Life Plan addressing the timing, spacing, and number of children patients intend to have, if any. In Arizona, in 2008 46 clinics provided Title X services across the state, most of which were county health departments, followed by Planned Parenthood sites (Guttmacher Institute, 2009). More than 5.2 million men and women across the country received Title X services in 2010, 50,000 of whom were from Arizona, at over 4300 sites, most located within health departments (Fowler, Lloyd, Gable, Wang, & Krieger, 2011). Most of these patients were at or below 100% of the Federal Poverty Line (FPL; 67%), and received services at no cost, and another 23% of patients were at 101-250% of the FPL, and therefore received services at a sliding fee; many of these individuals were racial/ethnic minorities (Fowler et al.). Demand for Title X services has been increasing, with an increase of 0.7% from 2009-2010, and 18% from 1999-2010 (Fowler et al.), and for many patients, this is the only source of routine medical care (Fowler et al.). The demand for services is expected to continue to increase through 2025 (IOM, 2009). The cost and complexity of services is also increasing, related to significant numbers of
uninsured and underinsured individuals, increased costs of screening, particularly related to sexually transmitted infections, and increased costs of contraception (IOM). However, Federal funding has not kept up with program costs, and despite discounted pharmaceuticals through the Office of Pharmacy Affairs’ 340B drug pricing program, grantees report the inability to afford the cost of certain contraceptives, particularly longer acting methods, or cost of certain laboratory tests, such as liquid based cytology for pap smears (IOM). Program staffing is also an issue, with increasing demand for clinical staff, and increased associated costs (IOM). Therefore, Title X provides a wide range of reproductive health services to many low-income women and men, but faces funding and resource challenges to meet the continued increase in demand.

Title V

The Title V Maternal and Child Health Program is a partnership between the U.S. Department of Health and Human Services’ Health Resources Services Administration’s Maternal and Child Health Bureau and the state’s Maternal Child Health agency, typically located within the state’s health department, that has provided maternal child health services to low income women and children through block grants since its enacted in 1935 as part of the Social Security Act (U.S. DHHS, n.d.). The focus of Title V is to improve access to care for low-income women and children, including prenatal and postnatal care, preventative care for children, childrens’ rehabilitative services, and coordination of care for children with special needs through a matching of federal funds (U.S. DHHS). In 2009, over 39 million women and children received Title V services across the country, the majority of whom were children (33.6 million), followed by pregnant women (2.5 million;
In Arizona, the Arizona Department of Health Services’ Bureau of Women’s and Children’s Health administers the Title V funds for family planning, as well as other Title V services, focused primarily on high-risk newborns and children’s rehabilitative services (Arizona Department of Health Services (ADHS), 2010a). Title V program funding permits a sliding fee schedule that slides to 0 (i.e. donation only) for patients at or below 150% of the Federal Poverty Line, unlike the Title X program that has a cutoff of 100% of the FPL. Therefore, patients who are at or below 150% of the FPL and receive care in programs funded by both Title X and Title V, there is no charge, though donations are accepted. In 2010, 4,300 individuals across the state received Title V family planning services through 12 health departments and Maricopa Integrated Health Systems clinics across Maricopa County (ADHS). However, funding for this program has been significantly decreased. State budget cuts have resulted in a 64% drop in state general funds and resulting elimination of all prenatal block grants to county health departments, cutting services to 19,000 women and children, as well as cuts to other programs.

Conceptual Framework

The conceptual framework for this study and conceptualizing health status, access to care, and health outcomes, is the ecological model of health determinants (Institute of Medicine, 2003). This ecological model recognizes the numerous layers and complex interaction of factors, ranging from individual level to broader socioeconomic and policy level factors, which impact health status and outcomes of individuals and populations over time. Understanding the individual and broader systems levels factors that play a role in the health status of women and health outcomes of women and their offspring, is critical in
developing effective strategies in improving health status and outcomes. Furthermore, these broader social factors, such as socioeconomic status and access to care, geographical through systems and policy level, play a significant role in health disparities (Institute of Medicine, 2003; U.S. Department of Health and Human Services (USDHHS), 2010; World Health Organization, 2011). This section further describes the model and its application to improving women’s health status and maternal-child health outcomes, and role in mitigating health disparities in underserved populations.

Though several ecological models of health determinants have been described, each acknowledges the interaction of numerous individual to broader socioeconomic and systems level factors that impact health status. The Institute of Medicine (2002a, 2003a) describes an ecological model of health determinants, adapted from Dahlgren and Whitehead (1991). The following elements are identified in this model: Innate individual traits, Social, family and community networks, Living and working conditions, and Broad social, economic, cultural, health, and environmental conditions and policies at the global, national, state, and local levels (Figure 1). These elements interact with each other over the life span of the individual. This model is particularly suited to understanding determinants of women’s health status and maternal-child health outcomes. Individual level factors, such as age, chronic conditions such as obesity or diabetes, and behaviors such as smoking impact health status and outcomes. Living and working conditions such as socioeconomic status and access to healthcare create economic and logistical barriers to accessing care that are impacted by broader socioeconomic conditions and policies. Environmental conditions such as the recession results in fewer economic resources for individuals to
afford care, further limited resources for healthcare institutions, and impacts health policy. For example, decreasing state revenue due to the recession played a critical role in state Medicaid cuts, further limiting access to care.

![Ecological model of health]

NOTES: Adapted from Dahlgren and Whitehead, 1991. The dotted lines between levels of the model denote interaction effects between and among the various levels of health determinants (Worthman, 1999).

Social conditions include, but are not limited to: economic inequality, urbanization, mobility, cultural values, attitudes and policies related to discrimination and intolerance on the basis of race, gender, and other differences.

Other conditions at the national level might include major sociopolitical shifts, such as recession, war, and governmental collapse.

The built environment includes transportation, water and sanitation, housing, and other dimensions of urban planning.

Figure 1. Ecological model of health. Determinants of population health. From The Future of the Public’s Health in the 21st Century (p. 52), by the Institute of Medicine, 2002,
A similar ecological model of health determinants has been outlined by the U.S. Department of Human Services in their Healthy People 2020 report and used for guidance in developing strategies to achieve goals, including improving the following areas:
Preconception Health and Behaviors, Access to Health Services, Family Planning, and Maternal, Infant, and Child Health status and outcomes (U.S. DHHS, 2011). The Healthy People 2020 report (U.S. DHHS) considers determinants of health to include “the range of personal, social, economic, and environmental factors that influence health status” (p. 1), and identify the following categories: biology and genetics, individual behavior, health services, social factors, and policymaking. In recognizing the interrelationship of these factors on health status, Healthy People 2020 objectives incorporate strategies at multiple levels. Individual biological and genetic factors, such as age, gender, medical conditions such as obesity or diabetes, and family history of, for example, cardiovascular disease, each contribute to health status. Therefore, one of the objectives to improve maternal-child health outcomes includes having a healthy weight prior to pregnancy. Since individual behaviors such as smoking and level of physical activity also contribute to health status, objectives include increasing avoiding smoking and alcohol use prior to or during pregnancy, and taking folic acid acid prior to pregnancy, among women of childbearing age. Beyond these individual factors, broader socioeconomic and environmental factors play an important role in health status, including health policy at the local, state, and Federal level. For example, state Medicaid cuts are limiting access to care, including reproductive health
care, to an increased number of Arizona residents. The economic recession and increasing poverty rates provide additional social barriers to accessing care. Some of the Healthy People 2020 objectives include increasing the proportion of individuals who have access to healthcare, through insurance coverage, increasing the number of primary care providers, and sources of ongoing care, while reducing the proportion of individuals who are unable to access timely medical care. Therefore, focusing on individual level factors is not sufficient to maintain or improve health status. These Healthy People 2020 objectives provide examples of multi-level strategies to improve health status and outcomes.

The ecological model of health determinants has also been used as a tool to mitigate health disparities. One of the overarching goals of Healthy People 2020 has been to mitigate health disparities, which the U.S. Department of Health and Human Services defines as “a health difference that is closely linked with social, economic, and/or environmental disadvantage” (p. 1). Therefore, understanding and developing strategies to mitigate health disparities requires a broader ecological model of health that incorporates these multi-level determinants of health. One of primary evidence-based recommendations of the NIH Summit, The Science of Eliminating Health Disparities (Dankwa-Mullan et al., 2010), included focusing on the social determinants health, including the “social, cultural, economic, and political context” (p. e9). The Institute of Medicine (2003b) also identified a number of barriers to mitigating health disparities, including language, geographical, cultural, health systems level, and policy level factors, for improved and equitable access to care. These recommendations are consistent with data illustrating, for example, the predominant role of Medicaid coverage in prenatal care (ADHS, 2010a), geographic
barriers for rural individuals traveling for care, fewer healthcare providers resulting in Medically Underserved Areas, or issue of \textit{acceptability}, positive consumer opinion, of available healthcare providers in rural locations (Shreffler-Grant, 2006). The ecological model incorporates these elements and provides a framework for developing practice, research, and policy interventions to improve the health status of women and maternal-child health outcomes.
CHAPTER 3: METHODOLOGY

Study Design

A formative program evaluation was performed using the CDC Framework for Program Evaluation in Public Health (Centers for Disease Control (CDC), 1999) and incorporated a quantitative methodology, including descriptive and logistical regression analyses from retrospective chart review data, to describe and evaluate program implementation and effectiveness in preventing unplanned pregnancy among program participants. Based on Rossi, Lipsey, and Freeman’s (2004) definition of program evaluation, performing a program evaluation permitted a systematic evaluation of program effectiveness, tailored to the political and organizational environments, and “inform social action to improve social conditions” (p. 16). The purpose of this evaluation was to assess the extent to which services were provided as intended to the target population, low-income women of childbearing age in Coconino County, the quality and scope of these services in the context of planned program activities and evidence-based practice, and impact on the primary outcome, prevention of unplanned pregnancy. The goal is to ensure access to quality reproductive health services to underserved women of childbearing age in Coconino County. Providing accountability in the use of public funds for this program, as well as demonstrating effectiveness to justify continued funding support in the era of limited resources, is critical for the sustainability of a program that provides needed care to an underserved population who is at disproportionately higher risk for decreased access to care, poorer health status, and poorer health outcomes.
The CDC Framework for Program Evaluation was selected for its use of community-based participatory research (CBPR) elements, in particular the first evaluation step of engaging stakeholders, to the final step of dissemination of findings. Collaboration with users of the findings aimed to design and conduct an evaluation that reflected stakeholders needs and provide useable information (Patton, 2008). Furthermore, the importance of community engagement and partnering in mitigating health disparities, in this case access to reproductive health care to mitigate disparities in health outcomes, was identified by the NIH Summit “The Science of Eliminating Health Disparities” (Dankwa-Mullen et al., 2010). Community-based participatory research (CBPR) methods, including elements such as partnering, power sharing, and capacity building (Israel et al., 2008), play a role in mitigating health disparities (Minkler & Wallerstein, 2008). However, a fully participatory evaluation, as conceptualized by Springett and Wallerstein (2008), to also include program participants participating in data collection and ongoing sharing of findings, was not feasible given the scope and constraints of this project.

Employing the CDC Framework for Program Evaluation

The CDC Framework for Program Evaluation in Public Health (Centers for Disease Control, 1999) is comprised of four standards and six steps for conducting evaluations (Figure 2), and outlined below.

The four standards that comprise this framework include: Utility, Feasibility, Propriety, and Accuracy. To ensure Utility, or relevance and usability of results, stakeholder needs were considered in the evaluation design, particularly related to accountability. The Feasibility, or realistic ability to conduct the evaluation given the limited time and resources, as well as academic requirements and limitations, were also considered in evaluation design, particularly related to scope. The Propriety, or ethical considerations of conducting the evaluation, is reflected in the incorporation of key stakeholder input in
evaluation design, as well as procedures to protect human subjects, including protecting the confidentiality of patient data. Finally, systematic collection and rigorous analysis of program data aimed to ensure the Accuracy of the findings, or validity of the data and interpretation, with respect to targeted to the users of the findings.

The six steps of the framework include: Step 1 - Engage Stakeholders, Step 2 – Describe the Program, Step 3 – Focus the Evaluation, Step 4 – Gather Credible Evidence, Step 5 – Justify Conclusions, and Step 6 - Ensure Use of Evaluation Findings and Share Lessons Learned. Implementation of these steps for this process evaluation is described below.

Step 1: Engage Stakeholders

The first step in the CDC Framework for Program Evaluation involved engagement of stakeholders. Stakeholders in this program include:

• Public and private funders who directly provide the financial resources,
• Program administrative and clinical staff providing program support and services,
• Patients who receive program services,
• Local health and social service organizations that receive patient referrals, and
• The broader community who shares the financial burden, primarily through taxes, of supporting public health programs and costs of unplanned pregnancies or pregnancies complicated by poor maternal health status, as well as public health risk associated with undiagnosed and untreated sexually transmitted infections.

Through this author’s work as a former Interim Program Manager, as well as history of providing clinical services as a Nurse Practitioner with this program, there were a number of program evaluation needs identified by various stakeholders through previous monthly
program staff meetings led by this author, personal communication with other Nurse Practitioner staff, personal communication with grant funders, and required elements outlined in funder grant and accountability reports. From these encounters, the following evaluation needs were identified: (1) description of patient population; (2) description of services provided, including STI testing, and numbers of abnormal results identified; (3) range of family planning methods provided; (4) role of program in context of primary care and Affordable Care Act; (5) program impact; and (6) stratification of above related to teens. Furthermore, this program evaluation was both supported by program staff, as well as included required grant accountability elements. Finally, dissemination of program evaluation findings to stakeholders promotes utilization of findings for program improvement and providing accountability for use of funds, particularly in developing required annual accountability reports.

Step 2: Describe the Program

Step 2 of the CDC framework includes identification of program components and intended outcomes. These framework elements include: Need, Targets, Outcomes, Activities, Outputs, Resources/Inputs, Relationship of Activities and Outcomes, and are described below.

The county’s Reproductive Health Program has been providing reproductive health care to uninsured and underinsured individuals in the county for over 30 years. As described in Chapter 1, residents of Coconino County have significant barriers in accessing affordable care, requiring a safety net for care. Primarily funded through Title X and Title V, the principal focus is on family planning for low-income individuals. However, additional funding through local and private grants sources permits broader reproductive health
services. Services are offered to males and females 13 and older, and include:
comprehensive medical, psychosocial, and behavioral risk assessment, physical exams,
family planning counseling and services, including emergency contraception, counseling
testing and treatment for sexually transmitted infections, counseling and testing for HIV,
with referral for positives, folic acid counseling and distribution, and referrals for other
primary or specialty care. Clinic services are provided at several sites in the community,
including main county Health and Community Services building in Flagstaff, as well as in
Williams, and at the county jail and juvenile detention center. A walk-in Teen Clinic is also
held twice a week at the Health and Community Services Building. Services are provided on
a sliding scale based on income, the same sliding scale employed by Federally Qualified
Health Centers, though no one is denied care for inability to pay; for example, patients at
150% of the FPL or lower have no charge, but voluntary donations are welcomed. This
program is staffed by two Nurse Practitioners, four Registered Nurses, and one Nursing
Assistant, in addition to administrative staff. A logic model of resources, activities, outputs,
and outcomes, developed from program documents including as county policies and
procedures, Title V and X program policies, and available grant accountability reports, can
be found in Appendix A.

Step 3: Focus the Evaluation Design

Given the established stage of this program, stakeholder needs, and feasibility
considerations of resources available to perform this evaluation combined with available
data sources, a formative evaluation was performed. As conceptualized by Rossi et al.
(2004), this process evaluation assessed the extent to which this program has been
implemented as intended to the target population, including a description of program participants and selected key program activities, as defined by stakeholder needs and evidence-based practice. Selected service outcomes, including identification of STIs and abnormal paps and impact of program participation on unplanned pregnancy among program participants were also evaluated. These elements were selected based on previous input and needs identified from program staff and funders, as described in Step 1, and follow-up discussions with an NP colleague in the program when discussing the potential design of an evaluation, particularly in light of needed or useful information, available resources, and academic requirement considerations.

The following program processes were described using quantitative methods and statistical analyses:

(1) Determine the extent to which the target population received program services
   a. Describe the socio-demographic characteristics of program participants

(2) Evaluate select program processes to determine quantity, scope, and quality of services provided
   a. Describe the quantity and type of clinic visits provided (comprehensive vs. episodic)
   b. Describe the frequency and types of STI and pap screenings provided and positive or abnormal results identified
   c. Describe the types of family planning methods provided and proportion of patients provided each method, including stratification by teen status
d. Describe the numbers of positive pregnancy tests identified, including stratification by teen status

e. Describe the frequency and types of patient referrals made to other programs and agencies for follow-up care

(3) Determine the impact of program utilization on risk of an unplanned pregnancy

Details on study design and methods follow.

Step 4: Gather Credible Evidence and Step 5: Justify Conclusions

These steps focus on data collection and analysis. The following is an outline of the methods performed when conducting this program evaluation.

Study design.

This study is a program evaluation, using the CDC Framework for Program Evaluation in Public Health (CDC, 1999). A quantitative descriptive approach was employed to describe and evaluate program implementation using retrospective chart review data; correlational analysis, specifically logistic regression was performed to assess impact of service utilization on risk of unplanned pregnancy.

Setting.

The setting for this evaluation is the county health department’s Reproductive Health Program, located in Northern Arizona. The primary site is located at the Health and Community Services building on King Street in Flagstaff, where the majority of program patients are seen, along with two additional satellite sites in Flagstaff and a third in Williams. The primary site includes providers, nursing staff, and administrators that also travel to and staff the satellite sites. All medical records, both hard copy and electronic, are
maintained at the primary site. The program evaluation was physically conducted only at the primary location, but included all program patients.

Sample.

Data was obtained from retrospective chart review data from patient encounters. A convenience sample of all patients seen during the 2010 calendar year was used for the retrospective chart review data. A full calendar year was selected to permit analysis of a full year, consistent with the accountability and contract periods of the primary funders, including Title X and V. These patients were identified through use of the online database to query all program patients for all sites with visits between January 1, 2010 and December 31, 2010. Inclusion criteria included:

1. Any patients, regardless of age or gender, who had a clinic visit between January 1, 2010 and December 31, 2010 at any of the Reproductive Health Program clinic sites,

2. Above patients for whom a patient encounter form was generated.

Exclusion criteria included patients who did not have a formal clinic visit, such as phone call only or just received emergency contraception from the front desk, as per protocol.

A subsample of this above convenience sample was used for evaluation of the primary service outcome, prevention of unplanned pregnancy. A combination of random and purposive sampling of this patient population was used to perform the outcome evaluation for prevention of unplanned pregnancy. For a power of 0.8, or 80% chance of detecting a difference between patients with planned and unplanned pregnancies, with a moderate effect size (0.15) at a significance level of 0.05, a sample of 54 female patients of childbearing age was be required to evaluate one independent variable using logistic
regression. Every patient with positive pregnancy test was to be included in the sample, using a randomly generated list from the database and starting with the first patient listed with a positive pregnancy test and working sequentially until a sample of 30 patients was obtained. Patients who identified planning a pregnancy would be excluded. For a corresponding comparison sample, every female patient of childbearing age with a negative pregnancy test on this randomly generated list from the database was included, starting with the first patient listed with a negative pregnancy test, until 30 patients were selected, for a total of 60 patients. Patients with a positive or negative pregnancy test prior to March 1, 2010 was excluded, since the database does not contain data prior to January 1, 2009, to facilitate using the database to assess visit frequencies over the previous 14 months from the pregnancy test.

Protection of human subjects.

Prior to conducting this evaluation, IRB approval was sought from the University of Arizona. The University of Arizona Human Subjects Protection Program determined that this project was not research as defined by 45 CFR 46.102(d), and did not require IRB authorization to conduct this program evaluation (Appendix B). Formal county Clinical Services Department approval was obtained (Appendix C). Confidentiality of patient information obtained from the retrospective chart review was preserved by recording only de-identified data for analysis, i.e. without name, address, or social security number, that remained password protected, and any hard copy data physically locked.
Data collection procedures.

All records, including electronic database and hard copy records, are the property of the Coconino County Public Health Services District Reproductive Health Program. These records were made available to this Investigator at the King Street clinic site for the duration of this program evaluation, which was less than one year. This section outlines the data sources and collection procedures employed for each study aim.

Specific aim 1: Determine the extent to which the target population received program services.

(a) Describe the socio-demographic characteristics on program participants

The Reproductive Health Program’s electronic password-protected Title X tracking database was queried to obtain socio-demographic data on all program patients. This electronic database contains coded socio-demographic (e.g. excluding name, address, or social security number) and select visit data for all program sites, including the King Street, Juvenile Detention, Jail, and Williams Clinic sites. This Investigator already had an ongoing active login and password and access to this database as part of her Nurse Practitioner duties with the program.

The following queries were performed to obtain frequency data on the following variables. Of note, the database did not permit direct querying of a number of elements, and in some cases necessitated manual review of all variable data to tally relevant data, as outlined below. For demographic variables, each program patient was counted only once during this
study period, January 1, 2010 to December 31, 2010, regardless of the number of visits each unique patient may have had during that time period.

(i) Age and gender: Stratified by the ages required for Title X reporting. A query of age distribution by gender was performed for unique, unduplicated patients.

(ii) Race/ethnicity: All patients and Females 15-44 years; stratified by races/ethnicities required for Title X reporting. A query of race/ethnicity was performed on all unique program patients and all unique female program patients. A separate query was performed on all patients under 15 and above 44, with manual counting to identify data on females < 15 and >44 to exclude from total female (all ages) data.

(iii) % Federal Poverty Line (FPL): All patients and Females 15-44 years; stratified by percentages ranging from ≤ 100% to > 250%, as required for Title X reporting. A query of %FPL for all unique program patients was performed. Manual review of all program FPL data was performed to extract data for Females 15-44 years.

(iv) Insurance status: All patients and Females 15-44 years; stratified by Public/Medicaid, Private, and Uninsured status. A query of insurance status, including public/Medicaid, private insurance, self-pay, and uninsured status for all unique program patients was performed. Manual review of all program insurance status data was performed to extract data for Females 15-44 years.

(v) Zip codes: All patients and Females 15-44 years; stratified by geographic region, including Flagstaff, surrounding areas, Phoenix, Tucson, adjacent reservations, and areas outside Arizona. The database was queried for a list of all zip codes for
all unique program patients. A manual review of zip code data was performed to
categorize and quantify zip code data.

Specific aim 2: Evaluate select program processes to determine quantity, scope, and quality
of services provided.

(a) Describe the quantity and type of clinic visits provided (comprehensive vs. episodic)
The electronic database described above was queried to obtain frequency data on clinic
utilization, program wide and by site:

(i) Clinic visit frequency: Frequency of patient visits to each of the program sites. The
database was queried for total numbers of clinic visits at the King Street, Williams
Clinic, Juvenile Detention, and Jail sites for all program patients. These visits
included any multiple visits by the same patient.

(ii) Unduplicated patients: Numbers of unique, unduplicated patients seen at each
site, i.e. each individual patient counted only once per calendar year, regardless of
number of visits, as required for Title X reporting. The database was queried for
numbers of unique patients seen at each clinic site, not including multiple visits for
patients, for all program patients.

(iii) Encounter type: Frequency of visit type, as denoted by Title X on the patient
encounter form, including: Initial, Annual, Medical, Education and counseling only,
and Pregnancy test and counseling only. The database was queried for encounter
type for all program visits. Visit elements were obtained from review of blank
encounter history and physical forms.
(b) Describe the frequency and types of sexually transmitted infection (STI) and pap screenings provided and positive or abnormal results identified.

The electronic database described above was queried to obtain:

(i) **STI screening**: Numbers of tests performed among all program patients:

Chlamydia, Gonorrhea, HIV, Syphilis, Other, and Chlamydia in females ≤ age 25 per Title X Infertility Prevention Program. The database was queried for testing performed on all program patients for each test. Tallies were performed for age-stratified results.

(ii) **Pap screening**: Numbers of pap tests performed, frequency of abnormal results, including stratification by ASCUS/LGSIL (atypia of undetermined significance and low grade lesions) and ≥ HGSIL (high grade or cancerous lesions), as required by Title X. The database was queried for all pap tests performed for all program patients, and results tallied.

The electronic database does not contain STI results. The hard copy laboratory STI/pap tracking notebook stored in the King Street clinic was reviewed to obtain the number of positive STI tests outlined above in item (1) and abnormal paps outline in item (2). All STI and pap tests, with the exception of HIV tests, were performed at the King Street site and sent to an outside laboratory. HIV testing was performed using on-site rapid testing using Clearview, per clinic laboratory policy and procedure. The notebook was manually reviewed and numbers of positives counted and recorded by STI type: Chlamydia, Gonorrhea, HIV, Syphilis, Other, and Chlamydia in females ≤ age 25. This notebook contains only King Street patient data, not Juvenile Detention, Jail, or Williams Clinic patient data,
and therefore will be an underestimate. However, due to laboratory procedures and lack of electronic medical records, there was no universal method to track results for all program patients.

(c) Describe the types of family planning methods provided and proportion of patients provided each method, including stratification by teen status

The electronic database was queried to obtain frequency data on:

(i) *Family planning methods:* Frequency of family planning type (e.g. Depo, OCP, Patch, etc, or trying to become pregnant, based on Title X requirements) identified for: Females 15–44 years, and Females 13-19 years. A query was performed for all family planning methods prescribed for each individual method. For patients with multiple visits during the study period, only the last visit during the study period was included for analysis. Manual tallying was performed to obtain frequency data for Females 15-44 and Females 13-19.

(d) Describe the numbers of positive pregnancy tests identified, including stratification by teen status

The hard copy laboratory Pregnancy Test tracking notebook stored in the King Street site clinic was reviewed to obtain frequency data on:

(i) *Pregnancy tests:* the numbers of positive pregnancy tests for patients tested: All patients, age < 15, 15-17, 18-19, 20-34, and ≥ 35, consistent with ADHS cutoffs for teen pregnancy rates and for advanced maternal age.
This notebook only contains pregnancy test data on King Street clinic patients. The database of all program sites was not used for this data, since historically, and with this analysis, outcomes data is markedly underreported.

(e) Describe the frequency and types of patient referrals made to other programs and agencies for follow-up care

The hard copy Title V Monthly Reports containing de-identified data on all Title V program patients, i.e. females 15-44 at or below 150% FPL and seen for a comprehensive visit (Initial or Annual Exam), were reviewed to obtain frequency data on:

(i) **Referrals:** The numbers and types of external referrals, based on Title V tracking, including: Behavioral health, Domestic Violence, Family Planning, Medicaid, Medical Care, Prenatal Care, WIC, or Other. Tallies were manually performed from each monthly report.

Specific aim 3: Determine the impact of program utilization on risk of an unplanned pregnancy.

Due to the absence of an electronic health record, obtaining data for this aim required a multi-step process. The database did not permit searching by pregnancy test result. Therefore, a database query was performed on all program patients between January 1, 2010 and December 31, 2010 to generate a random list of pregnancy test results for all program patients, which included *positive, negative, and none* (not performed) and database identification number, a unique ID that only the database uses for each program patient. The first 30 patients with positive pregnancy test results and first 30 patients with
negative test results were selected for further analysis. The database was queried based on
database patient ID number to provide all program visits, demographic variables, and
family planning method prior to pregnancy test. A manual count of all program visits was
performed to include only visits within 14 calendar months prior to and including the
pregnancy test. No additional time windows were applied. Patients with 14 month time
periods that included dates prior to January 1, 2009 were excluded, i.e. pregnancy test
prior to March 1, 2010, since the database has data only beginning with January 1, 2009.
Patients who were identified as “seeking pregnancy” were excluded; this variable was
included in the family planning data. These data were further manually tallied to compare
each variable between the positive and negative pregnancy test groups.

Data analysis.

Quantitative data analysis for each of the aims is described below and summarized
in Table 1.

Specific aim 1: Determine the extent to which the target population received program
services.

Descriptive statistics were used to describe the socio-demographic characteristics of
program participants, including proportions of program patients based on: Age, Gender,
Race/ethnicity, % Federal Poverty Line, Insurance status, and Zip code. These data were
compared to the program target population and demographics of this target population in
the community to assess reach.
Specific aim 2: Evaluate select program processes to determine quantity, scope, and quality of services provided.

Descriptive statistics were used as appropriate to describe the program service utilization, including proportions of program patients based on: Clinic visit frequency, Unduplicated patients, Encounter types, STI and pap screening and positives/abnormals identified, Family planning methods, Pregnancy testing, and Referrals. These data were evaluated in the context of the program logic model, teen pregnancy and STI epidemiological data, and evidence-based practice described in current literature, including recommendations outlined by the CDC preconception care summits.

Specific aim 3: Determine the impact of program utilization on risk of an unplanned pregnancy.

A logistic regression was performed to determine the odds of a positive pregnancy test (dependent variable) based on the number of clinic visits over the previous 14 months (independent variable) to assess the impact of program utilization on the risk of an unplanned pregnancy among program participants not trying to become pregnant. Descriptive statistics were provided for each group, with Independent t-testing (continuous variables), Chi-square (categorical variables), and Fisher’s Exact (categorical variables with frequencies < 5) testing performed for comparison of characteristics between groups.
**Table 1**

*Summary of Data Resources and Analysis by Specific Aim*

<table>
<thead>
<tr>
<th>Specific Aim</th>
<th>Data Resources</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim 1: Evaluation of Program</strong></td>
<td>Database</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td>Participants vs. Target</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. % Federal Poverty Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Insurance status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Zip code</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aim 2: Evaluation of Program</strong></td>
<td>Database, laboratory records, encounter forms, Title V monthly reports</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td>Processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Program utilization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Screening and identification of positive STIs and abnormal paps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Provision of family planning methods</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Identification of positive pregnancy tests

5. Referrals

| Aim 3: Evaluation of Program Impact on Risk Unplanned Pregnancy | Database, laboratory records | Logistic regression Descriptive statistics Independent t-test, Chi-square, Fisher’s Exact |

Limitations.

Given the nature and focus of a program evaluation, the findings are not intended to be generalizable. However, these findings may be informing to other programs, particularly those receiving Title V and X funding.

Step 6: Ensure Use of Evaluation Findings and Share Lessons Learned

The final step in the evaluation framework focuses on ensuring that the findings are able to be used. The primary focus of this step was to ensure dissemination of results. At the conclusion of the study, an executive summary was made available to all program staff by email and hard copy in the main clinic. A Powerpoint presentation was also made available to program staff, to be delivered at a mutually agreed upon time, likely during a regularly scheduled monthly staff meeting. Finally, based on evaluation findings, in the context of program goals and evidence-based practice from current literature, program recommendations were made, as well as recommendations for future studies.
CHAPTER 4: RESULTS

This chapter includes results from the data collection and statistical analysis for the evaluation of the following aims:

- Specific Aim 1: Determine the extent to which the target population received program services
- Specific Aim 2: Evaluate select program processes to determine quantity, scope, and quality of services provided
- Specific Aim 3: Determine the impact of program utilization on risk of an unplanned pregnancy

For Specific Aim 1, socio-demographic characteristics of program patients are presented. For Specific Aim 2, clinic utilization and selected clinic services are described, including types of encounters, sexually transmitted infection and pap screening, pregnancy testing, family planning services, and referrals. For Specific Aim 3, the results of a logistic regression to determine the odds of having an unplanned pregnancy for program patients are presented.

Specific Aim 1:

Determine the extent to which the target population received program services

The target population for this program is underserved women of childbearing age in Coconino County, particularly those who are low-income and uninsured or underinsured. There are 31,495 females 15-44 years in Coconino County, 8,624 of who are at or below 100% of the Federal Poverty Line, and 7,003 who are teens 15-19 years (FPL; U.S. Census,
2010). Data was not available for additional levels of poverty (e.g. 150%). Individuals below the poverty level were more likely to identify themselves as American Indian/Alaskan Native (29.6%) or Hispanic (29.4%) than White (non-Hispanic; 12.6%; U.S.Census). Of 28,232 Coconino County females 18-44 years, 7,692 (27.2%) were uninsured, 5,036 had Medicaid (17.8%), and 15,504 (55.0%) had private insurance (U.S. Census). No data was available for underinsurance, including deductibles and cost sharing that creating financial barriers to accessing care.

(a) Describe the socio-demographic characteristics on program participants

A total of 1,561 unique patients were seen at all program sites between January 1, 2010 and December 31, 2010. Though patients may have been seen multiple times during 2010, each individual patient was counted only once in this socio-demographic evaluation and therefore considered unique or unduplicated for this study period. The ages and genders of program participants are listed in Table 2. Females comprised 72.0% of the program patient population; 1,082 patients were females 15-44 years. Based on U.S. Census (2010) data, program females represented 3.6% of Coconino County females 15-44 years, and 5.0% of county female teens 15-19 years.
Table 2

*Age and Gender of Program Patients*

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Female</th>
<th>Male</th>
<th>Total (N = 1,561)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>≤ 14</td>
<td>21 (1.3%)</td>
<td>16 (1.0%)</td>
<td>37 (2.4%)</td>
</tr>
<tr>
<td>15-17</td>
<td>159 (10.2%)</td>
<td>87 (5.6%)</td>
<td>246 (15.8%)</td>
</tr>
<tr>
<td>18-19</td>
<td>189 (12.1%)</td>
<td>45 (2.9%)</td>
<td>234 (15.0%)</td>
</tr>
<tr>
<td>20-24</td>
<td>304 (19.5%)</td>
<td>125 (8.0%)</td>
<td>429 (27.5%)</td>
</tr>
<tr>
<td>25-29</td>
<td>196 (12.6%)</td>
<td>76 (4.9%)</td>
<td>272 (17.4%)</td>
</tr>
<tr>
<td>30-44</td>
<td>234 (15.0%)</td>
<td>73 (4.7%)</td>
<td>307 (19.7%)</td>
</tr>
<tr>
<td>≥ 45</td>
<td>21 (1.3%)</td>
<td>15 (1.0%)</td>
<td>36 (2.3%)</td>
</tr>
<tr>
<td>Totals</td>
<td>1124 (72.0%)</td>
<td>437 (28.0%)</td>
<td>1561 (100%)</td>
</tr>
</tbody>
</table>

Figure 3 illustrates the distribution of program patients by gender. The majority of program patients (69.4%) in 2010 were women of childbearing age, females 15-44 years. One-third of program patients (33.2%) were teens, who were predominantly female. The greatest proportion of program patients was females 20-24 years.
Additional socio-demographic characteristics of program patients are listed in Table 3, including Race/ethnicity, Income level as % Federal Poverty Line, Insurance status, and Geographic area of residence, based on zip code. The majority of program patients identified themselves as White non-Hispanic (48.8%), followed by Hispanic (35.3%), and American Indian/Alaskan Native (11.6%). Most patients (92.9%) were at or below 150% of the Federal Poverty Line (FPL), with 84.0% of patients at or below 100% of the FPL; no patients exceeded 250% of the FPL. The majority of patients (77.8%) were uninsured. Just over 10% of patients relied on the state Medicaid program. Approximately equal numbers (11.5%) had private insurance, though deductibles and coinsurance were not assessed. There was a wide geographic distribution of program patients, encompassing most of the state of Arizona, as well as adjacent states. However, program patients most commonly were from Flagstaff (88.6%), followed by Williams (2.9%); 1.8% were from adjacent Indian
Reservations. Demographic characteristics were comparable for females 15-44 years, with the exception of a slightly greater proportion of Hispanic patients (41.7% vs. 35.3%), a slightly higher private insurance (15.8% vs. 11.5%) and public/Medicaid (14.9% vs. 10.5%), and residence (92.6% from Flagstaff vs. 88.6% program-wide). Despite the wide geography represented by program patients, more than 99% of program females 15-44 years were from Coconino County.

Table 3
Socio-demographic Characteristics

<table>
<thead>
<tr>
<th>Attribute</th>
<th>All Patients (N = 1561)</th>
<th>Females 15-44 y (N = 1082)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>761 (48.8%)</td>
<td>488 (45.1%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>551 (35.3%)</td>
<td>451 (41.7%)</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>181 (11.6%)</td>
<td>99 (9.1%)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>32 (2.0%)</td>
<td>15 (1.4%)</td>
</tr>
<tr>
<td>Asian</td>
<td>6 (0.4%)</td>
<td>6 (0.6%)</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>36 (2.3%)</td>
<td>21 (1.9%)</td>
</tr>
<tr>
<td><strong>% Federal Poverty Line</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>Count</td>
<td>Percentage</td>
</tr>
<tr>
<td>------------</td>
<td>-------</td>
<td>------------</td>
</tr>
<tr>
<td>≤100%</td>
<td>1311 (84.0%)</td>
<td>946 (87.4%)</td>
</tr>
<tr>
<td>101-125%</td>
<td>78 (5.0%)</td>
<td>54 (5.0%)</td>
</tr>
<tr>
<td>126-150%</td>
<td>61 (3.9%)</td>
<td>42 (3.9%)</td>
</tr>
<tr>
<td>151-175%</td>
<td>32 (2.0%)</td>
<td>16 (1.5%)</td>
</tr>
<tr>
<td>176-200%</td>
<td>29 (1.9%)</td>
<td>15 (1.4%)</td>
</tr>
<tr>
<td>201-225%</td>
<td>15 (1.0%)</td>
<td>4 (0.4%)</td>
</tr>
<tr>
<td>226-250%</td>
<td>35 (2.2%)</td>
<td>11 (1.0%)</td>
</tr>
<tr>
<td>&gt;250%</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

**Insurance Status**

<table>
<thead>
<tr>
<th>Status</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninsured</td>
<td>1215 (77.8%)</td>
<td>745 (68.9%)</td>
</tr>
<tr>
<td>Private</td>
<td>179 (11.5%)</td>
<td>171 (15.8%)</td>
</tr>
<tr>
<td>Public/Medicaid</td>
<td>164 (10.5%)</td>
<td>161 (14.9%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>3 (0.2%)</td>
<td>3 (0.2%)</td>
</tr>
</tbody>
</table>

**Geographic Region**

<table>
<thead>
<tr>
<th>Region</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flagstaff</td>
<td>1383 (88.6%)</td>
<td>1002 (92.6%)</td>
</tr>
<tr>
<td>Williams</td>
<td>46 (2.9%)</td>
<td>42 (3.9%)</td>
</tr>
<tr>
<td>Navajo Reservation</td>
<td>26 (1.7%)</td>
<td>9 (0.8%)</td>
</tr>
<tr>
<td>Location</td>
<td>Count 1</td>
<td>Percent 1</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>Grand Canyon</td>
<td>17 (1.1%)</td>
<td>15 (1.4%)</td>
</tr>
<tr>
<td>Page/Fredonia</td>
<td>17 (1.1%)</td>
<td>3 (0.3%)</td>
</tr>
<tr>
<td>Phoenix/Central</td>
<td>14 (0.9%)</td>
<td>6 (0.6%)</td>
</tr>
<tr>
<td>Munds Park/Parks</td>
<td>11 (0.7%)</td>
<td>7 (0.6%)</td>
</tr>
<tr>
<td>Prescott/Verde Valley</td>
<td>10 (0.6%)</td>
<td>6 (0.6%)</td>
</tr>
<tr>
<td>Sedona</td>
<td>9 (0.6%)</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>Outside Arizona (CA, NV)</td>
<td>6 (0.4%)</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td>Winslow/Leupp/Holbrook</td>
<td>5 (0.3%)</td>
<td>3 (0.3%)</td>
</tr>
<tr>
<td>Tucson/South</td>
<td>4 (0.3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Ash Fork/Seligman</td>
<td>2 (0.1%)</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td>Hopi Reservation</td>
<td>1 (0.1%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

\( y = \text{years} \)
The racial/ethnic diversity among program patients is illustrated in Figure 4, and predominantly included patients who identified themselves as White (non-Hispanic), Hispanic, and American Indian/Alaskan Native.

Figure 4. Proportion of program patients by race/ethnicity
The racial/ethnic diversity of program patients who were females 15-44 was comparable to the entire program population, though there was a greater proportion of Hispanic patients in this population (Figure 5).

Figure 5. Proportion of program patients by race/ethnicity, females 15-44 years
Figure 6 illustrates the large proportion of patients who are at or below 100% of the Federal Poverty Line (FPL), for both all program patients (84.0%), and females 15-44 years (87.4%). Equal proportions (8.9%) of all program patients and females 15-44 years were between 101 and 150% of the FPL. No program patients were at or above 250% of the FPL.

Figure 6. Proportions of program patients by % Federal Poverty Line, comparison of all program patients and females 15-44 years

Specific Aim 2: Evaluate select program processes
to determine quantity, scope, and quality of services provided

(a) Describe the quantity and type of clinic visits provided (comprehensive vs. episodic)

Characteristics of clinic utilization by program clinic site are listed in Table 4. The majority of clinic encounters (92.3%) occurred at the primary program site on King Street, followed
by the Juvenile Detention Center site (6.3%). There were 2,575 patient visits for 1,561 unique patients, with an average of 1.6 visits/patient in 2010.

Table 4

*Clinic Utilization by Program Site*

<table>
<thead>
<tr>
<th>Site</th>
<th>Unique Patients</th>
<th>Patient Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N = 1,561)</td>
<td>(N = 2,575)</td>
</tr>
<tr>
<td>King Street</td>
<td>1382 (88.5%)</td>
<td>2378 (92.3%)</td>
</tr>
<tr>
<td>Williams</td>
<td>8 (0.5%)</td>
<td>15 (0.6%)</td>
</tr>
<tr>
<td>Juvenile Detention</td>
<td>150 (9.6%)</td>
<td>161 (6.3%)</td>
</tr>
<tr>
<td>Jail</td>
<td>21 (1.3%)</td>
<td>21 (0.8%)</td>
</tr>
</tbody>
</table>

Table 5 lists the types of clinic encounters for all patient visits (N = 2,575 visits).

Comprehensive encounters, including Initial (new patient) and Annual exams, represented one-third (34.4%) of clinic visits. The majority of visits were Medical exams (62.9%), which included focused episodic visits, such as family planning only (i.e. birth control refill or change), or STI screening.
Table 5

*Clinic Utilization by Encounter Type*

<table>
<thead>
<tr>
<th>Encounter type (N = 2,575)</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>1620 (62.9%)</td>
</tr>
<tr>
<td>Annual</td>
<td>452 (17.6%)</td>
</tr>
<tr>
<td>Initial</td>
<td>432 (16.8%)</td>
</tr>
<tr>
<td>Education &amp; counseling only</td>
<td>47 (1.8%)</td>
</tr>
<tr>
<td>Pregnancy test &amp; counseling only</td>
<td>24 (0.9%)</td>
</tr>
</tbody>
</table>

Based on patient history and encounter forms employed by the program, comprehensive encounters included completion of a comprehensive medical history by the patient and reviewed by a provider. Elements included medical history, reproductive history, medications, immunizations, allergies, social history, including sexual history (partner numbers, gender, types of encounters, risk profile of partners), smoking status, past or present history of drug use, and safety. Comprehensive encounters also included a full medical exam, including STI and pap testing as indicated by the provider, and patient education. Standardized documentation for patient education included the following items: contraceptive, pregnancy, HIV risk, DES exposure, nutrition/folic acid, smoking/alcohol/drugs, safety/sexual coercion/DV, condoms given, BSE, HPV, immunizations, STD/vaginitis, Plan B, and parental involvement. Medical encounters
included a directed medical and social history review and, if indicated by the provider, a medical exam and/or testing, and patient education. Medical exams included episodic family planning visits (refills or start/restarts) or STI testing. Education and counseling exams were similar to medical exams in history review and patient education, but did not include a physical exam or STI testing. Similarly, pregnancy test and counseling encounters included only review of direct medical history and performing a pregnancy test, and counseling related to the pregnancy test. History review, testing, and counseling were performed by RNs and NPs. Per program policy, exams and diagnosis were performed by NPs.

(b) Describe the frequency and types of sexually transmitted infection (STI) and pap screenings provided and positive or abnormal results identified.

Program wide, more than 3,400 sexually transmitted infection (STI) tests and pap screenings were performed (Table 6). The most common test was Chlamydia (n = 1168 tests), followed by Gonorrhea (n = 908 tests), and HIV (n = 482 tests). Of note, patients may have received repeat testing for specific STIs during 2010. One hundred thirty-five sexually transmitted infections were identified at the primary clinic in 2010, including Chlamydia, Gonorrhea, HIV, and Syphilis. Half (50.8%) of all positive Chlamydia tests identified at the primary King Street site were to females age 25 or younger. Approximately 10% of Chlamydia tests and pap screens came back abnormal.
Table 6

*STI and Pap Screening*

<table>
<thead>
<tr>
<th>Test</th>
<th>Tests Performed</th>
<th>Positives/Abnormals Identified&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlamydia – all patients</td>
<td>1168</td>
<td>126 (10.8%)</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>908</td>
<td>3 (0.3%)</td>
</tr>
<tr>
<td>Chlamydia – females ≤ 25</td>
<td>549</td>
<td>64 (11.7%)</td>
</tr>
<tr>
<td>HIV</td>
<td>482</td>
<td>2 (0.4%)</td>
</tr>
<tr>
<td>Syphilis</td>
<td>344</td>
<td>4 (1.2%)</td>
</tr>
<tr>
<td>Pap</td>
<td>436</td>
<td>43 (9.9%)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Primary program site only

Abnormal pap results identified at the primary program site are listed in Table 7. The majority of lesions were Atypical Squamous Cells of Undetermined Significance (ASCUS; n = 26), followed by low grade lesions, (Low Grade Squamous Intraepithelial Lesion (LGSIL); n = 11), and high grade (High Grade Squamous Intraepithelial Lesion (HGSIL) or worse lesions (n = 6).
Table 7

*Pap Results, Primary Program Site*

<table>
<thead>
<tr>
<th>Pap result</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCUS</td>
<td>26 (6.0%)</td>
</tr>
<tr>
<td>LGSIL</td>
<td>11 (2.5%)</td>
</tr>
<tr>
<td>≥ HGSIL</td>
<td>6 (1.4%)</td>
</tr>
</tbody>
</table>

(c) Describe the types of family planning methods provided and proportion of patients provided each method, including stratification by teen status

Table 8 lists the family planning methods provided to female patients 15-44 years and teens 13-19 years at a clinic visit. For patients with more than one clinic visit during the study time period, this represents the method provided at the latest clinic visit. The most commonly provided method to both females 15-44 years and teens 13-19 years included oral contraceptive pills (36.9% and 44.1%, respectively), followed by condoms (15.4% and 14.4%), and Depo-Provera injection (12.6% and 14.4%). Approximately 10% of females 15-44 years were using an intra-uterine device (IUD), which may have been inserted at the clinic or elsewhere. Less than 5% of females who were not trying to become pregnant were not using any method of birth control following a clinic visit. Seven percent of female teens 13-19 years were planned to use abstinence. Two percent of females (n = 24) identified that they were trying to become pregnant, and were excluded from these proportions.
Table 8

*Family Planning Methods Provided, All Sites*

<table>
<thead>
<tr>
<th>Method</th>
<th>Females 15-44 y</th>
<th>Females 13-19 y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Oral Contraceptive Pills</td>
<td>399 (36.9%)</td>
<td>162 (44.1%)</td>
</tr>
<tr>
<td>Condoms</td>
<td>167 (15.4%)</td>
<td>53 (14.4%)</td>
</tr>
<tr>
<td>Depo-Provera injection</td>
<td>136 (12.6%)</td>
<td>53 (14.4%)</td>
</tr>
<tr>
<td>IUD</td>
<td>107 (9.9%)</td>
<td>9 (2.5%)</td>
</tr>
<tr>
<td>Abstinence</td>
<td>55 (5.1%)</td>
<td>25 (6.8%)</td>
</tr>
<tr>
<td>Patch</td>
<td>28 (2.6%)</td>
<td>14 (3.8%)</td>
</tr>
<tr>
<td>Ring</td>
<td>12 (1.1%)</td>
<td>15 (4.1%)</td>
</tr>
<tr>
<td>Sterilization – female&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9 (0.8%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Implant</td>
<td>5 (0.5%)</td>
<td>3 (0.8%)</td>
</tr>
<tr>
<td>Spermicide</td>
<td>5 (0.5%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Sterilization – male&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Natural family planning</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Other/Withdrawal</td>
<td>6 (0.6%)</td>
<td>2 (0.5%)</td>
</tr>
<tr>
<td>None</td>
<td>48 (4.4%)</td>
<td>14 (3.8%)</td>
</tr>
</tbody>
</table>
(d) Describe the numbers of positive pregnancy tests identified, including stratification by teen status.

There were 145 patients identified as having a positive urine pregnancy test at the primary program site. The majority of patients with positive test were age 20 – 34 years (n = 89), followed by 18 – 19 years (n = 27), and 15 – 17 years (n = 19; Table 9).

Table 9

Positive Pregnancy Tests, Primary Program Site

<table>
<thead>
<tr>
<th>Age</th>
<th>Positive Pregnancy Test (N=145) n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤14 y</td>
<td>2 (1.4%)</td>
</tr>
<tr>
<td>15-17 y</td>
<td>19 (13.1%)</td>
</tr>
<tr>
<td>18-19 y</td>
<td>27 (18.6%)</td>
</tr>
<tr>
<td>20-34 y</td>
<td>89 (61.4%)</td>
</tr>
<tr>
<td>≥ 35 y</td>
<td>8 (5.5%)</td>
</tr>
</tbody>
</table>

y = years

Figure 7 illustrates the proportions of these patients with a positive pregnancy test, by age, for the primary program site. Though the majority of patients were age 20 to 34 years, one-third (33.1%) were teens.
(e) Describe the frequency and types of patient referrals made to other programs and agencies for follow-up care

Table 10 lists the types of referrals identified for Title V patients, females 15 - 44 years at or below 150% of the Federal Poverty Line, who presented for comprehensive exams, including Initial or Annual Exams. Patients seen for episodic visits were not included. Patients most commonly were referred for further Medical Care (11.2%), followed by Medicaid enrollment (10.8%). More than one-third (39.6%) of patients received referrals for Tobacco cessation, Immunization (such as Gardasil against Human Papilloma Virus), Healthy Families or other services.
Table 10

*Referrals for Title V Patients Receiving Comprehensive Exam, All Sites (N = 868 Patients)*

<table>
<thead>
<tr>
<th>Referral</th>
<th>n  (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical care</td>
<td>97 (11.2%)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>94 (10.8%)</td>
</tr>
<tr>
<td>WIC</td>
<td>56 (6.5%)</td>
</tr>
<tr>
<td>Prenatal care</td>
<td>52 (6.0%)</td>
</tr>
<tr>
<td>Behavioral health</td>
<td>49 (5.6%)</td>
</tr>
<tr>
<td>Family planning</td>
<td>32 (3.7%)</td>
</tr>
<tr>
<td>Domestic violence</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>Other (Tobacco cessation, Immunization, Healthy Families, Other)</td>
<td>344 (39.6%)</td>
</tr>
</tbody>
</table>

y = years

**Specific Aim 3:**

Determine the impact of program utilization on risk of an unplanned pregnancy

A logistic regression was performed on a total sample of 60 females, including 30 females with positive pregnancy tests and 30 females with negative pregnancy tests during 2010. The independent variable was the number of clinic visits over the past 14 calendar months, prior to the pregnancy test. The dependent variable was the pregnancy test result,
positive or negative. Patients who had identified they were trying to become pregnant were excluded from this analysis.

Table 11 provides an overview of selected characteristics of each sample. There was no difference in age between the two groups for the Negative Pregnancy Test group (mean ± SD) 25.0 ± 6.4, vs. 23.7 ± 6.9 for the Positive Pregnancy Test group. Among Race/ethnicities, there were slightly more American Indian/Alaskan Native females in the Positive Pregnancy Test group, though this only approached significance (p = 0.05). There were significant differences among family planning methods between the two groups, including the use of Depo-Provera injection (p = 0.03), with higher rates of use for among the Negative Pregnancy Test group. The Positive Pregnancy Test group was significantly more likely to not be using any method of birth control prior to the positive pregnancy test (p < 0.001).
Table 11

*Characteristics of Sample for Impact on Unintended Pregnancy Analysis*

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Negative Pregnancy Test Group</th>
<th>Positive Pregnancy Test Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 30</td>
<td>N = 30</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>25.0 ± 6.4</td>
<td>23.7 ± 6.9</td>
</tr>
<tr>
<td>Range</td>
<td>17 - 42</td>
<td>15 - 38</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>1 (3.3%)</td>
<td>6 (20.0%)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>0 (0%)</td>
<td>1 (3.3%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>21 (70.0%)</td>
<td>17 (56.7%)</td>
</tr>
<tr>
<td>White</td>
<td>8 (26.7%)</td>
<td>6 (20.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>% Federal Poverty Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 100%</td>
<td>28 (93.3%)</td>
<td>29 (96.7%)</td>
</tr>
</tbody>
</table>
Table 12 provides the results of the logistic regression analysis evaluating the impact of program utilization only, as measured by clinic visits over the previous 14 months, on the odds of a positive pregnancy test among women who identified themselves as not seeking a pregnancy. Based on regression modeling, the Odds Ratio was calculated to be 0.87 (95% Confidence Interval, 0.59-1.29, p > 0.05).

<table>
<thead>
<tr>
<th>Prior Family Planning Method</th>
<th>Clinic Visits Over 14 Months</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Contraceptive Pill</td>
<td>8 (26.7%)</td>
<td>4 (13.3%)</td>
</tr>
<tr>
<td>Condom</td>
<td>6 (20.0%)</td>
<td>6 (20.0%)</td>
</tr>
<tr>
<td>Depo-Provera</td>
<td>5 (16.7%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>IUD</td>
<td>4 (13.3%)</td>
<td>1 (3.3%)</td>
</tr>
<tr>
<td>Ring</td>
<td>3 (10.0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>None</td>
<td>2 (6.7%)</td>
<td>18 (60.0%)</td>
</tr>
<tr>
<td>Patch</td>
<td>1 (3.3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Abstinence</td>
<td>1 (3.3%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Note: \( p < 0.05, \quad \) \( p < 0.001 \); SD = Standard Deviation
Table 12

*Results of Logistic Regression Analysis: Impact of Program Visits on Unintended Pregnancy*

<table>
<thead>
<tr>
<th>Model Variable</th>
<th>B (SE)</th>
<th>Exp b</th>
<th>95% CI for Exp b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Visits</td>
<td>-0.14 (0.20)(^a)</td>
<td>0.87</td>
<td>0.59-1.29</td>
</tr>
<tr>
<td>Constant</td>
<td>0.39 (0.63)(^a)</td>
<td>1.48</td>
<td></td>
</tr>
</tbody>
</table>

Note \(R^2 = 5.10\) (Hosmer & Lemeshow), 0.01 (Cox & Snell), 0.01 (Nagelkerke). Model \(X^2(1) = 82.71, \^ap > 0.05\); B = Intercept; SE = Standard Error; Exp b = Odds Ratio; CI = Confidence Interval.
CHAPTER 5: DISCUSSION

The purpose of this study was to perform a formative evaluation of the Coconino County Public Health Services District’s Reproductive Health Program to assess how well this program is being implemented, using the CDC Framework for Program Evaluation in Public Health (1999) and quantitative methodology to examine processes. This section provides a discussion of (1) the extent to which the target population received program services, (2) the quantity, scope, and quality of services provided, and (3) the impact of program utilization on risk of an unplanned pregnancy. Implications of these findings, limitations, and future recommendations are presented.

Program Reach

The Reproductive Health Program provided services to 1,561 patients, including 1,082 females 15-44 years, over 2,575 clinic visits between January 1, 2010 and December 31, 2010. Socio-demographic characteristics including age and gender, race/ethnicity, income level, insurance status, and location of residence are reviewed here. The majority of program patients (69.4%) were females 15-44 years, with the greatest proportion being females ages 20-24 (19.5%). A large number of teens also accessed program services, representing one-third of program patients, and were most commonly females 15-19 years. Based on U.S. Census (2010) data, this program provided services to 3.6% of county females ages 15-44 years, and 5.0% of county female teens ages 15-19 years. Therefore, though the program successfully provided services predominantly to the target population, females 15-44 years, this represented a very small percentage of county females. Though not all county females would be expected to be underserved, i.e. uninsured or
underinsured, the disproportionately high rates of poverty, particularly among females 15-44 years, throughout Coconino County suggest that many potentially eligible females are not accessing services.

Similar to county demographics, there were racially/ethnically diverse patient populations receiving program services. Given the persistent racial/ethnic disparities in socioeconomic status and access to care throughout Arizona, not surprisingly a greater proportion of program patients represented racial/ethnic minority populations (51.2%), than the general population in Coconino County (38.3%), based on U.S. Census (2010) data. This diversity was greater for program females 15-44 years (54.9%), though U.S. Census county data for females 15-44 years was not available for comparison. Compared to U.S. Census data, a greater proportion of Hispanic patients and lower proportion of Native American patients received program services. This finding may be related to immigration legislation and attitudes resulting in Hispanic patients feeling safer receiving care at this program, perhaps related to the lack of any documentation required to access services, compared to other institutions. For example, the local community health center, a Federally Qualified Health Center, requires formal documentation of income and formal denial from Medicaid to access their sliding fee services; Hispanic patients who may be undocumented or have family members who are undocumented may be fearful of these formal processes, particularly in Arizona where immigration is a volatile political subject. Native American patients may have been relying more on free comprehensive care provided through various Indian Health Service sites and other Native American clinics (e.g. NACA, Sacred Peaks). Though race/ethnicity census data was not available for Coconino County females
15-44 years, and only extrapolations can be made, it would be expected that these trends would be similar for this population. Therefore, the Reproductive Health Program provided services to a racially/ethnically diverse population of patients, both program wide, and for females 15-44 years, that was generally comparable to county demographics.

Most of the program patients were underserved. Most patients were at or below 150% of the Federal Poverty Line (FPL), including 92.9% of all program patients and 96.3% of females 15-44 years; no patients were above 250% of the FPL. This finding is consistent with the aims of Title X and Title V programs, targeting patients at or below 100% and 150% of the FPL, respectively, and program mission to provide services to low income populations. However, based on U.S. Census American Community Survey data (U.S. Census, 2010), there are approximately 8,624 women of childbearing age (15-44 years) in Coconino County who are in poverty. This program provided services to approximately only about 11% of these women, indicating potential unmet needs for services which would be expected to increase with Medicaid cuts further limiting services to previously eligible patients. This estimate does not include the females in Coconino County who are over the Federal Poverty Line (FPL) and are either uninsured or underinsured, such as females 101-250% of the FPL, and would be expected to have difficulty affording care. Most of Reproductive Health Program patients were uninsured (77.8%), including 68.9% of females 15-44 years. The high proportion of uninsured program patients raises concern for lack of regular access to care outside the program, which has been routinely observed by this author. Data have consistently demonstrated the role of insurance coverage in improved access to care and health outcomes (IOM, 2002b; McWilliams, 2009).
approximately 15% of these females had private insurance, it is unclear if deductibles and copays would have presented barriers to obtaining care elsewhere, since during the study period, this program was not billing any insurance. Additionally, though another 15% of program females were on Medicaid at the time of this study, it would be expected with the further cuts to Medicaid, that this proportion would decrease, thus increasing the proportion of females 15-44 years who are uninsured in future program years.

Finally, almost all program patients (97.0%), including 99% of program females 15-44 years were from Coconino County, with 92.6% of females 15-44 years from the immediate Flagstaff area. This finding suggests that though this program is a county wide program, the majority of program patients are physically located in Flagstaff, perhaps illustrating the potential barrier of distance from more remote areas in accessing care. The proportions of program patients from adjacent Indian Reservations (1.8%) is consistent with the proximity of those reservations to Flagstaff, and previous experience with patients traveling off the reservation to adjacent metropolitan areas, such as Flagstaff, for care. Of note, just over 2% of program patients came from the Grand Canyon and Page/Fredonia areas, with 1½ to 3½ hours driving distances. Underserved Coconino County residents residing closer to the Flagstaff and Williams clinic sites may be disproportionately represented in larger proportions among program patients, as these residents may be more likely to seek care locally. Underserved residents residing at greater distances from clinic sites may be have barriers related to transportation and therefore less likely to have obtained program services. It is unclear if the target population, county females 15-44 years residing in other areas of the county, outside of the Flagstaff area, are experiencing
barriers in obtaining care and therefore unmet needs, or if in fact community health centers/Federally Qualified Health Centers, and other Indian Health Service sites are adequately meeting that need.

Therefore, the Reproductive Health Program was successful in providing program services to the target population, underserved females 15-44 years in Coconino County, who were racially/ethnically diverse, as Coconino County is, though with limited impact into the wider target county population. Only approximately 11% of county females 15-44 years in poverty (below 100% FPL) and 5% of county teens accessed program services in 2010. These numbers most likely represent an underutilization of program services since many more county women may fall between 100 and 250% of the FPL, and be uninsured or underinsured. Furthermore, over the past 10 years, there has been only limited improvement in teen pregnancy rates in Coconino County (27.6 per 1,000 in 2009, compared to 30.2 per 1,000 in 1999), with rates remaining the same for Native American female teens, and rates of repeat pregnancies among teens 155.0 per 1,000 (ADHS, 2010b). Given the disproportionately high levels of poverty, particularly among women of childbearing age in Coconino County, combined with persistent economic recession, and further cuts to Medicaid and other state maternal-child health programs, it is highly likely that many women who are eligible and desperately need program services are, in fact, not accessing these services. This may be a function of distance, of particular concern for the many rural county residents, lack of knowledge of the program or accessible fee structure (i.e. slides to $0 with no one denied services for inability to pay), or other factors.
Additionally research is needed to more fully explore potential unmet needs and barriers to obtaining needed services.

Program Processes

There were several processes that were evaluated in this formative evaluation to assess the quantity, scope, and quality of program care, including (1) the quantity and type of clinic visits provided, including comprehensive vs. episodic visits, (2) the frequency and types of sexually transmitted infection and pap screenings and positive/abnormal results identified, (3) the types of family planning methods provided and proportion of patients provided each method, (4) the numbers of positive pregnancy tests identified, including stratification by teen status, and (5) the frequency and types of referrals made to other programs and agencies for follow-up care. A discussion of these processes is presented here.

Clinic Visits

Over 2,500 clinic visits (2,575) were provided to program patients at the four program sites, including the primary King Street clinic site, Williams Clinic, county Juvenile Detention Center, and county Jail, not including telephone follow-up or emergency contraception only visits that did not require a nurse or provider visit, as per clinic policy and procedure. Most of these visits (92.3%) and most patients (88.5%) were seen at the primary King Street clinic site, followed by teens from the Juvenile Detention Center (6.3% of visits). Clinic visits could be stratified into comprehensive and episodic visits, significant for the scope or extent of the risk assessment conducted and counseling and/or other services provided. Only approximately one-third of program visits were comprehensive
visits, including initial visits for all female patients new to the program, or annual visits for existing female patients seeking their routine yearly comprehensive visit. All new program patients were required to have an initial exam, which included a comprehensive assessment. The remaining two-thirds of patient visits included family planning (refills, restarts), pregnancy testing only, or sexually transmitted infection counseling/testing and did not include the comprehensive medical and social history review described here, but rather a focused assessment.

Consistent with evidence-based practice guidelines from the CDC’s Preconception Care clinical workgroup (Jack et al., 2008), comprehensive visits, based on encounter history and physical forms and the program logic model, included the following elements identified by Jack et al. as strongly recommended activities (Strength of Recommendation A), and outlined here. Health Promotion activities, as recommended, included family planning, weight assessment, nutrition/folic acid supplementation counseling for women of childbearing age, immunization review, substance abuse and smoking review and counseling, and risk assessment, counseling, and testing for sexually transmitted infections (STIs), as indicated. As recommended, program policy includes Chlamydia testing for all females ≤ age 25, and testing for other STIs based on CDC guidelines (CDC, 2010b) and clinical judgment. During this study period, formal documentation of a Reproductive Life Plan was just being implemented, as recommended in these guidelines, though previous experience suggests this was a routine assessment conducted by the Nurse Practitioner when working with the patient to decide on appropriate family planning options. However, during this study period, the program began formal documentation of the patient’s
Reproductive Life Plan on the problem list, a universal area for communication in the patient chart. As recommended, Medical conditions and Medication were reviewed as part of the medical history, with areas to document referral for further follow-up for further care, such as stabilization, routine management, or for medication change if, for example, patient found to be on a potentially teratogenic medication. As recommended, Family and genetic history was also reviewed as part of the standard history, though focused on general medical conditions such as diabetes and heart disease, rather than potential causes of birth defects. As recommended, a comprehensive Reproductive History was also part of the medical history and included all previous pregnancies, as well as history of family planning methods and outcomes/adverse effects. Psychosocial risk was also included as part of the medical and social history, and as recommended, included a safety assessment, both past and present. As recommended, financial resources were also assessed, though was limited to income level and insurance status, with areas for documenting referral for additional support, such as Medicaid. However, there was no area for documenting assessment of Environmental exposure on the history form, which was recommended by Jack et al.; this item would be recommended to be added to the patient history form.

Importantly, though, evidence of documentation of these elements was not reviewed for program patients during this study period. Previous program experience does reflect a near 100% completion rate of each element on the patient history form with each element reviewed by an RN or NP at the visit and this review documented on the history form; if the patient had initially left items blank, clinical staff would add detailed notes upon review. Therefore, according to encounter documentation tools, including history and physical
forms, the program logic model, and program policies and procedures, comprehensive counters widely included the recommended elements for evidence-based practice. However, it is important to note that compliance with this documentation or the elements included in health promotion education was not assessed. Finally, it is also important to consider that two-thirds of patient encounters in 2010 did not include a comprehensive assessment and counseling, perhaps illustrating potential missed opportunities for evidence-based elements of health promotion.

**STI/Pap Screening**

More than 3,400 sexually transmitted infection and pap testing was performed for the 1,561 program patients. Among 1,561 patients, the most common test was for Chlamydia (n = 1168 tests), with 549 tests performed on females ≤ age 25, followed by gonorrhea (n = 908 tests), and HIV (n = 482 tests), with patients potentially having repeat testing during this study period. Given the increasing Chlamydia rates statewide, particularly among females 15-24 (ADHS, 2010b), it is reassuring that Chlamydia testing was the most prevalent. However, of more than 670 female program patients ≤ age 25, only 549 tests were performed, though it is unclear how many of these patients, for example, had never been sexually active (such as the younger females), or already had a documented negative test in their chart and no new partners since or no concern of infidelity by partner, and how many of these tests reflect repeat testing on the same patient. Of concern are previous findings nationally that suggest low rates of Chlamydia screening among sexually active females 15-25 (Hoover, Tao, & Kent, 2008). The Title X Infertility Prevention Program recommends universal screening for all females ≤ 25 years, as well as covers the
cost of screening and treatment to ensure access to care and sustainability for programs. Additionally, only 482 HIV tests were performed in 2010 for over 1,500 patients. Of concern is that the highest proportion of HIV infections statewide have been observed among younger men and females 20-39, i.e. women of childbearing age, and that 27.1% of all cases did not indicate traditional risk factors (ADHS, 2010b). The U.S. Preventative Services Task Force (2005) recommends universal screening for all patients ages 13-64, regardless of risk factors, though, again, it is unclear if perhaps patients already had their statuses documented in their physical chart from previous testing onsite or at another location. Though, the comprehensive history form does include asking the patient if she/he would is concerned about HIV or would like an HIV test. In 2010, 135 sexually transmitted infections, including Chlamydia, gonorrhea, HIV, and syphilis were identified at the primary King Street clinic site alone. Previous experience indicates a near 100% follow-up and treatment rate for patients, and aggressive, confidential formal communicable disease program with experienced personnel to assist in locating, counseling and treating partners. Program policy and procedure includes the use of expedited partner treatment, typically for Chlamydia, providing the patient with the medication to treat his/her partner(s), to improve treatment rates and decrease risk of further transmission. Importantly, all treatment is provided (i.e. dispensed) to patients and their partners, as indicated, directly from the program sites, which decreases potential barriers for accessing treatment.

Additionally, 43 abnormal paps were identified, including 6 that were high grade or cancerous lesions. The small number of pap tests, 436 program wide suggest that, consistent with evidence-based practice recommendations for pap screening at the time of
the study (ACOG, 2009b), not all women were receiving yearly pap testing. Per program policy, patients needing colposcopy were referred for follow-up care, though clinical decision-making for pap screening and follow-up was not assessed, such as the use of American Society of Colposcopy and Cervical Pathology (ASCCP) evidence-based practice guidelines for abnormal pap screening (ASCCP, 2006).

Finally, as noted, specific criteria for testing for sexually transmitted infections and pap testing was not assessed and it is unclear how clinical decision-making occurred to determine testing. Previous experience demonstrated sexually transmitted infection testing to primarily be at the discretion of the RN or NP seeing the patient, with the exception of universal Chlamydia testing for females 25 or younger and universal HIV testing, and included a risk assessment, such as new partner since the last visit or concern for potential infidelity by partner. Evaluating evidence-based clinical decision-making would be particularly important also for Syphilis, given that only 344 tests were performed program wide, yielding only 4 positives at the primary site alone, but noting the dramatic increase of congenital syphilis rates, an increase of more than 50% between 2006 and 2009, and the devastating, irreversible effects on the fetus, including stillbirth and catastrophic congenital anomalies (ADHS). Previous experience has also revealed that many patients decline syphilis testing since, unlike the previously described tests, this requires a blood draw. It would be important to assess the criteria employed for screening for sexually transmitted infections and identify and compare risk factors for those who test positive in the program population to traditionally recognized risk factors to better tailor
screening and perhaps establish universal criteria or minimum standards within the program; for pap screening, compliance with ACOG guidelines could be assessed.

Family Planning

The Reproductive Health Program was successful is providing, including dispensing, a wide range of family planning options for women of childbearing age who were not presently seeking a pregnancy. These primary methods ranged from hormonal methods with a range of delivery systems, such as the oral contraceptive pill, patch, ring, implant and Depo-Provera injection, to intrauterine devices, including both the hormonal Mirena and non-hormonal copper ParaGard, to condoms and abstinence counseling. Providing a wide range of options is consistent with recommendations by the IOM (2011b) for women’s health services. The most common methods for females 15-44 years included oral contraceptive pills (36.9%), followed by condoms (15.4%), and Depo-Provera injection (12.6%), with less than five percent of these women who were not seeking a pregnancy not using method; these rates were comparable for female teens 13-19 years. No patients employed Natural Family Planning, though this was a program option. Only 6.8% of female teens 13-19 years opted for abstinence, though this is encouraged for teen program patients. These methods did not include a secondary method, such as condoms used in addition to the primary methods, e.g. to decrease the risk of STIs. Importantly, these findings illustrate a wide range of options for women of childbearing age. Previous discussions and correspondence with state Title X program staff revealed the broader commitment from Title X at state and Federal level to increase the options available to program women and decrease the risk of these lower income women having less access to
affordable family planning based on their income. This included, for example Reproductive Health Program working with state Title X administrators to participate in a program for 100% subsidized costly Mirena IUDs for low income program patients who desired the Mirena, but otherwise could not afford them. This subsidy meant that programs, such as the county Reproductive Health Program could afford to offer this as a viable option for program patients. Finally, the program’s ability to dispense all family planning methods onsite further decreases potential barriers, such as related to cost, transportation, or confidentiality, particularly for teens, that may prevent patients from obtaining family planning methods.

Positive Pregnancy Tests

There were 145 patients with positive pregnancy tests identified at the primary program site, which provided the opportunity for timely pregnancy counseling to minimize potential pregnancy risks, such as avoiding alcohol use and smoking, provision of folic acid supplements, and referral for follow-up care. This counseling is particularly important, given the large proportion of poverty-level patients in Coconino County, low levels of insured program patients, either through private insurance or Medicaid, and documented barriers to accessing timely prenatal care, even among Medicaid eligible patients (Rosenberg, Handler, Rankin, Zimbeck, & Adams, 2007). For many patients, this counseling provides a critical opportunity for timely risk assessment and counseling that they may not otherwise have had access to. The majority of positive pregnancy tests (61.4%) were to females 20-34 years of age. Eight positive pregnancy tests were to women 35 years or older, considered advanced maternal age and at increased risk for pregnancy.
complications, and further benefitting from timely referral for care. Of particular concern was the numbers of pregnancies identified among teens. One-third of positive pregnancy tests (n = 48) were identified among teens, including 27 females 18-19 years, 19 females ages 15-17 years, and two females ages 13-14 years. This translates into approximately 13% of program teens ages 13-19 experiencing a pregnancy. If fact, this may be an underestimate, since this does not include positive pregnancy tests from the Juvenile Detention Center or Williams Clinic. This proportion is larger than the calculated population-based rate of 2.8% based on ADHS (2010b) data. Based on family planning data also described above, 16 sexually active females teens 13-19 years used no method or withdrawal/other, and 53 relied solely on condoms, which are less effective in preventing pregnancy than hormonal methods and must be used properly and consistently. Importantly, not using any method is associated with an 85% risk of pregnancy at one year, compared to 15% with condom use, and 8% for oral contraceptive pills, patches, or ring (Trussell, 2007). Only 25 teens (6.8% of program female teens) chose abstinence, despite a program focus on encouraging abstinence among program teens. This study did not examine the relationship between the Reproductive Health Program and county’s Teen Pregnancy Prevention Program, which has different staff and located separately from the clinical services area of the Reproductive Health Program. These data suggest the need for further exploration into these teen pregnancy rates and increased collaboration to better understand and address teen pregnancy.
Referrals

Documented referrals for further care beyond what was available through the Reproductive Health Program were evaluated for all females 15-44 years who were at or below 150% of the Federal Poverty Line and received a comprehensive exam during the study period. There were 725 referrals for 868 patients, with some patients potentially having received multiple referrals, though previous experience demonstrates a typical referral rate of up to 1 or 2 referrals per patient. The most common reason for referral was Medical Care (11.2%), health care that was not able to be provided through the Reproductive Health Program such as diabetes screening or follow-up care for a chronic illness, followed by Medicaid enrollment (10.8%). These findings highlight the limited scope of care that is provided through the Reproductive Health Program. Though the comprehensive assessment provided through the program serves to identify potential health risks that need further evaluation or management, the program is not a comprehensive primary care program, necessitating referral to another primary care site, such as the local community health center, for further care. In 2010, this represented nearly 100 women formally referred for additional health care services. These referral rates may also reflect a large proportion of uninsured, low-income women receiving these medical referrals, with 11.2% of women receiving referrals for further health care services, compared to 10.8% of women receiving referrals for Medicaid enrollment. This finding is of particular concern for the ability of these women to access further care, given increased
barriers in accessing care for the uninsured, and Medicaid cuts that would be expected to further decrease eligibility, even among those below the poverty level.

With the advent of the Affordable Care Act, there has been a greater focus on preventative health care services and less fragmentation of care. This is particularly important for underserved patients who experience barriers, such as affordability and accessibility, in obtaining care. However, this focus demands reconsideration of the traditional role Title X clinics, such as the Reproductive Health Program, in providing reproductive health services. For Reproductive Health Program patients needing additional primary care outside of reproductive health, care is fragmented and requires obtaining care from an outside source, typically the local community health center that offers services on a sliding fee. Recommendations by national Title X affiliates include potential formal partnerships with area community health centers (Coleman, 2011). This partnership would serve to decrease fragmentation and improve continuity and access for both program patients and community health center patients. Potential models for collaboration have been suggested and may include cross referral, an expedited formal referral process between two independent entities, a contractual collaboration, with specific services contracted between entities, or, more extreme, a corporate merger with the reproductive health program formally becoming part of the community health center (Gold, 2011). Collaboration on some level may serve to build capacity to better meet the needs of underserved women of childbearing age in the county, through maximizing existing resources, such as clinic sites, staffing, and potential sources of federal, state, and local revenue.
Program Impact on Prevention of Unplanned Pregnancy

To assess the impact of program utilization on the odds of an unintended pregnancy for program patients, a logistic regression was performed. Numbers of clinic visits over the previous 14 months was evaluated as a predictor of a positive pregnancy test outcome among 60 program females not seeking a pregnancy. The Odds Ratio for unintended pregnancy was 0.87 (95% Confidence Interval 0.59-1.29, \( p > 0.05 \)), indicating a lower risk of unintended pregnancy with increasing visit frequency. With every increase in visit number, the odds of an unintended pregnancy decreased by a factor of 0.87, or almost 10%. However, this was not significant, as evidenced by the 95% Confidence Interval crossing 1.0, as well as not significant \( p \)-value. Additional model parameters evaluating model fit reinforce the inefficiency of this model of visit frequency in predicting pregnancy test outcome among program patients, including the model’s large \( \chi^2 \) (82.71) very small Cox & Snell \( R^2 \) (0.01) and Nagelkerke \( R^2 \) (0.10), and non-significant Hosmer & Lemeshow test (\( \chi^2 = 5.10, \ p > 0.05 \)). The analysis was adequately powered and included a sample size of 60, greater than the required 54 for a power of 0.8, or 80% chance of detecting a difference between patients with planned and unplanned pregnancies, with a moderate effect size (0.15) at a level of significance of 0.05. Therefore, additional factors must be impacting or more strongly related to odds of an unintended pregnancy.

Comparison of the two sample groups demonstrated significant differences, particularly among family planning methods between the two groups. Patients in the Positive Pregnancy Test group, patients with an unplanned pregnancy, were significantly more likely to not be using any method of birth control (60.0% vs. 6.7%, \( p < 0.001 \)).
Patients in the Negative Pregnancy Test group were significantly more likely to be using Depo-Provera ($p < 0.05$), highly effectively effective in preventing pregnancy. It is possible that the efficacy rates of these methods are directly reflected in the risk of unintended pregnancy, with the more effective method associated with decreased risk, though this sample was not powered to evaluate additional variables in the regression model.

However, real world efficacy rates are also impacted by clinical practice, such as patient recall, prescribing practices, and potential delays and barriers related to clinic systems, in addition to patient level factors such as ease of use and compliance. How patients are scheduled for follow-up and timing of starting and continuation of family planning methods, such as the window for repeat Depo-Provera injection and recall schedule, may impact real world effectiveness. Women in a California family planning program who received a 1 year supply of oral contraceptive pills, as opposed to a 1 or 3 month supply, had a 30% reduction in the risk of unplanned pregnancy (Foster, Hulett, Bradsberry, Darney, & Policar, 2011), illustrating the impact of prescribing and dispensing practices of risk of unintended pregnancies. It is possible that logistical barriers, such as transportation and travel to the clinic, as well as organizational barriers, such as appointment scheduling, were mitigated with this extended dispensing practice. In addition, certain methods may also be more effective for certain types of patients, related to length of time method available (e.g. numbers of pill packs provided or time window for repeat Depo Provera injection, or longer acting intrauterine devices or implants), availability of clinic appointments in light of patient schedules and availability, including ability to get time off from work, as well as patient factors related to ease of use,
remembering to use, satisfaction with method, and ability to return to clinic for
continuation. Therefore, patient, provider, and program level factors may impact risk of
unintended pregnancy need to be more fully explored to improve and ensure patient-
centered access to appropriate and acceptable family planning methods.

Finally, though each patient had indicated that they were not actively seeking a
pregnancy, it is unclear if some of these women, particularly those not using any method of
birth control, were in fact intentionally ambivalent about preventing a pregnancy and
therefore not actively seeking to prevent a pregnancy. Previous experience has revealed a
number of patients in a variety of practice settings not actively trying to get pregnant, while
not actively trying to prevent a pregnancy, deciding to “see what happens.” This finding
further reinforces the need for universal preconception care and improvements in health
status for all women of childbearing age, as well as the importance of more accurately
identifying those women who truly are not intending to become pregnant. Establishing a
Reproductive Life Plan aims to do this.

Implications to Nursing Practice

This evaluation demonstrates the leadership role of professional nurses in
providing critical safety net preconception care services to underserved women of
childbearing age in Coconino County, and in ensuring access to quality services. This
evaluation provided the opportunity to assess the quality of care in the context of evidence-
based practice, provide accountability of program services and outcomes provided by
professional nurses, and identify potential areas to increase the safety and effectiveness of
the program to improve outcomes and mitigate health disparities. Focusing on mitigating
health disparities at a community or population level, particularly in the context of organizations, health policy, and economic realities is consistent with professional elements outlined in the American Nurses’ Association’s Nursing’s Social Policy Statement (2010). Ensuring access to quality care is a key feature of the social contract between professional nurses and patients in the community (American Nurses’ Association). This evaluation was performed in the context of the ecological framework (Institute of Medicine, 2002a), recognizing the range of individual through broader systems and policy level factors that impact health outcomes, such as socioeconomic status, health provider shortages, and dramatic cuts to Medicaid and Maternal Child Health funding that impact women of childbearing age in Coconino County. Findings from this evaluation can be used to improve existing public health systems, such as the county’s reproductive health program and potential partnerships with other existing programs and institutions, and policies related to access to care and continuity of care to improve accessibility, continuity, and sustainability. Employing a broader systems and policy level approach has been recommended in professional nursing to successfully address health disparities (Browne & Tarlier, 2008; Logsdon & Davis, 2010; Reutter & Kushner, 2010), and serves to build capacity to meet the needs of underserved women of childbearing age to improve outcomes.

Limitations

This study was a program evaluation design, tailored to the identified needs of program stakeholders and available resources to perform this evaluation, and therefore not designed to be generalizable. However, findings may be applicable to other public
reproductive health programs, particularly Title X and Title V programs. Additionally, this program evaluation was not designed to be a comprehensive assessment of all aspects of program implementation. The lack of an electronic health record, which is presently in the process of being implemented, hindered data collection among all sites. Documentation of patient education elements was not reviewed, limiting the ability to make generalizations about the scope of counseling actually provided to program patients. Finally, this evaluation does not qualitatively assess patient perceptions related to the program, such as satisfaction, expectations, understanding, or perceived barriers and needs.

Conclusions and Recommendations

This formative program evaluation of the Coconino County Public Health Services District Reproductive Health Program provides an assessment of how well this program is providing reproductive health services to the target population, low-income women of childbearing age in Coconino County. Consistent with the CDC Framework for Evaluation in Public Health (1999), findings and recommendations are being shared with program staff through an executive summary and presentation. Program participants, as intended, are predominantly underserved, i.e. low-income, uninsured, women of childbearing age, though reach throughout the county was limited. Preconception care elements, including health promotion and risk reduction activities, are being provided consistent with evidence-based practice recommendations. Despite a wide range of family planning options, program patients experience unplanned pregnancies, which were particularly problematic among teen patients, demanding a greater focus on assessing needs and barriers. Patient referrals for further medical care, potential barriers for accessing care,
and opportunities for collaboration to mitigate barriers illustrate the role of broader environmental and systems level determinants outlined in the ecological model of health (IOM 2002, 2003a). These findings provide accountability for Advanced Practice Nurses who provided quality, evidenced-based preconception care services in these Nurse Practitioner run program sites. These findings also provide opportunities to further improve the quality and accessibility of this care, including sustainability through further evaluation and exploration of program implementation. Doctor of Nursing Practice prepared professional nurses are particularly suited to take a leadership role in program improvement, accountability, and sustainability through patient, systems, and policy level interventions to ensure equitable access to quality preconception care services, consistent with the professional roles outlined by the American Association of Colleges of Nursing (2006).

Finally, recommendations to improve program implementation are outlined here:

(1) Improve program reach. Further assessment is needed to identify barriers, needs, and unmet needs of the women of childbearing age in Coconino County, particularly among rural and teen actual and potential program participants.

a. Conduct a survey of existing program patients, including teens, to assess barriers to accessing program services (e.g. transportation, clinic times, appointment availability), and health needs (primary care, specialty care, education topics). This could be provided to all patients presenting for
care during one month, to be completed during the visit, while waiting to be seen, and turned in after the visit.

b. Conduct a survey of community partners within the county, such as Head Starts, Health Start, WIC, Planned Parenthood, and other community health centers to assess their experiences and perceptions of unmet needs for preconception care for women of childbearing age in Coconino County. This data would also be used to identify potential collaborations (item 5).

c. Conduct of survey using purposive sampling for women of childbearing age across Coconino County, including metropolitan and rural areas, to assess access to preconception care services, including availability, accessibility, satisfaction, barriers, and health promotion needs. For teens, partnering with school nurses, health education classes, or other youth activities would need to be explored.

(2) Evaluate clinical decision making for STI/pap screening. Further assessment is needed to evaluate consistency with evidence-based practice and develop program practice consensus guidelines, tailored to program patients as indicated

a. Provide an in-service to program staff to review current guidelines for STI and pap screening and county epidemiology for STIs

i. Chlamydia (CDC, 2010b; USPSTF, 2007), including universal screening for all women age 25 or younger
i. HIV (CDC, 2010b; USPSTF, 2005), including universal screening for all program patients

ii. Syphilis (CDC, 2010b), including at-risk patients

iii. Pap screening in accordance with ACOG (2011), follow-up in accordance with ASCCP (2007)

iv. Other STIs (CDC, 2010b), including Gonorrhea, Hepatitis B & C, Herpes, and others identified by clinical staff

b. Identify patient risk factors that may indicate enhanced screening that may be different from CDC guidelines. Perform a logistic regression of socio-demographic characteristics and traditional risk factors outlined by the CDC to assess risk of STI to assess if additional risks demonstrated in program population.

c. Conduct survey of NP and RN staff to assess clinical decision-making, including identification of risk factors, in determining which patients are screened for which STIs.

d. Perform chart review of abnormal paps to assess management; compare with established guidelines (ASCCP).

e. Conduct meeting(s) of NP and RN staff to review above findings and develop consensus on minimum standards of care for STI and pap screening.

(3) Determine factors related to increased risk of unplanned pregnancy.
a. Perform logistic regression with larger sample to evaluate socio-demographic (age, race/ethnicity, %FPL, zip code/distance from primary site), family planning method, and clinic follow-up characteristics (prescribing practice, recall window, visit frequency and type over 26 months) for (i) all program females 15-44 years, and (ii) program teens 15-19 years. Use documented Reproductive Life Plan in chart to assess if planned or unplanned pregnancy.

b. Conduct survey, preferably qualitative, or quantitative with room for qualitative responses to determine potential knowledge deficits and barriers to accessing and adhering to planned family planning method; stratify also by teen status.

(4) Develop a community advisory council to better tailor program services to target population. Use of a community advisory council would serve to go beyond providing a voice to community members (Wallerstein & Duran, 2008), and enable community partnering to inform program interventions to improve reach, accessibility, appropriateness (including cultural), and effectiveness to improve outcomes. This would also serve to empower (Butterfloss & Kegler, 2002) and build the capacity of the community to actively participate in promoting the health of their community (Beeker, Guenther-Grey, & Raj, 1998; Norton, McElroy, Burdine, Fleix, & Dorsey, 2002). A detailed review for this proposal has previously been reported (Pacheco, 2010).
(5) Explore formal partnerships with community providers. This may include partnering to increase access to services in communities farther from Flagstaff.

a. Explore collaboration with local community health centers to streamline referral process, decrease barriers for care, and promote continuity of care.

b. Explore greater collaborative role with county Teen Pregnancy Prevention Program (TPP) to address teen pregnancy. Designate a task force of program and community members to work directly with TPP program staff.
APPENDIX A:

COUNTY REPRODUCTIVE HEALTH PROGRAM LOGIC MODEL
<table>
<thead>
<tr>
<th>Inputs</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short-term Outcomes</th>
<th>Intermediate Outcomes</th>
<th>Long-term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funders</td>
<td>Risk assessments and exams</td>
<td>Patient encounters</td>
<td>Patients aware of risks &amp; health strategies</td>
<td>Improved health behaviors</td>
<td>Improved health status &amp; outcomes</td>
</tr>
<tr>
<td>Program staff</td>
<td>Counseling</td>
<td></td>
<td>Decreased risk STI</td>
<td>Decreased prevalence of STIs</td>
<td>Decreased morbidity</td>
</tr>
<tr>
<td>Referral agencies</td>
<td>Screening &amp; testing</td>
<td>Identification &amp; treatment, e.g. STIs</td>
<td>Prompt diagnosis &amp; treatment</td>
<td>Improved health; decreased pregnancy risks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Family planning</td>
<td>Reproductive Life Plan (RLP) identified</td>
<td>Patients receive family planning and counseling consistent with RLP</td>
<td>Planned pregnancies</td>
<td>Desired number and spacing of children</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range family planning methods provided</td>
<td>Decreased risk and incidence of unplanned pregnancy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B:

IRB DOCUMENTATION
HSPP Correspondence Form

Date: 03/09/12
Investigator: Christy L. Pacheco, Doctoral candidate
Advisor: Sally Reel, PhD, RN
Project No./Title: 12-0145 Program Evaluation of a County Reproductive Health Program
Current Period of Approval: NA

IRB Committee Information
Administrative Action: Administrative Review – New Project
FWA Number: FWA00004218

Documents Reviewed Concurrently
F200: Application for Human Research (signed 01/23/12)
VOTF (version 01/23/12)
Site Authorizations:
   Coconino County Public Health Services District’s Reproductive Health Program
Data Collection Instruments:
   Data Collection Questions
Other (define):
   PI CV
   COI Determination

Determination

* Not Research as defined by 45 CFR 46.102(d): As presented, the activities described above do not meet the definition of research as cited in the regulations issued by the U.S. Department of Health and Human Services which state that “research means a systematic investigation, including research development, testing and evaluation, designed to contribute to generalizable knowledge.”

Mariette Marsh, MPA, CIP
Chair Designee, IRB2 Committee
UA Institutional Review Board

03/09/12
Date

Reminders: No changes to a project may be made prior to IRB approval except to eliminate apparent immediate hazard to subjects.

Arizona’s First University – Since 1885
APPENDIX C:

SITE AUTHORIZATION LETTER
January 19, 2012

University of Arizona  
Human Subjects Protection Program  
1615 E. Helen St.  
P.O. Box 245137  
Tucson, AZ 85724

Dear Human Subjects Protection Program Members:

This is to certify that Christy Pacheco, MSN, RN, FNP-BC has permission to perform a program evaluation of the Coconino County Public Health Services District’s Reproductive Health Program in partial fulfillment of the requirements for the Doctor of Nursing Practice at the University of Arizona College of Nursing.

Ms. Pacheco has been granted full, unrestricted access to program policies and procedures, databases, laboratory records, patient medical records, and reports to complete this project. This study will be physically conducted at our primary clinic location in the Health and Community Services building at 2625 North King Street in Flagstaff, though may include data from our satellite clinics in Flagstaff and Williams.

I understand that Ms. Pacheco will be conducting this program evaluation with IRB approval from the University of Arizona.

Sincerely,

Kimbal Babcock, MPH  
Senior Manager, Clinical Services
APPENDIX D:

COPYRIGHT PERMISSION
March 6, 2012

Christy Pacheco
4710 Camino de los Vientos
Flagstaff, AZ  86004-0901

Dear Ms. Pacheco:

You have requested permission to reprint the following material copyrighted by the National Academy of Sciences in a dissertation:

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Thank you,

Barbara Murphy
Permissions Coordinator
National Academies Press
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