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Acknowledgements

Thank you to all the Department of Health personnel who provided assistance to many authors in locating data for their reports.

Thank you to Dean Jannah H. Mather, Ph.D. of the College of Social Work for making Ms. Grundvig available to this project.

Thank you to Dr. Richard Sperry for his support of this project.
UTAH’S HEALTH: 
An Annual Review

Volume 12: Supplement 
Women’s Health in Utah

http://uuhsc.utah.edu/coe/womenshealth
I am pleased to announce the publication of the Women’s Health supplement to the Utah’s Health Review. Women’s Health provides a current profile of women’s health issues in our state. Dating from pioneer times, Utah has had a long tradition of commitment to women’s health. Early women providers were remarkable: Martha Hughes Cannon was one of the first physicians in the state and also the first woman state senator. Ellis R. Shipp, the first obstetrician in Utah, also founded a school for obstetrics and nurse midwives. Romania Rose Prat Penrose not only established health care for women and children, but was also the first trained ophthalmologist in Utah.

Today, we have no less of a commitment to women’s health. The University of Utah’s National Center of Excellence in Women’s Health Demonstration Project, in collaboration with the Utah State Department of Health, has produced a comprehensive report detailing women’s health issues in Utah. This report provides a collection of current data on some of the most pressing health challenges facing women and their families today. Women’s Health will aid in identifying priorities for research and health care services in Utah.

Within the pages of the Women's Health supplement are numerous data reports on women’s health. Topics include cancer, domestic violence, mental health, abortion, cardiovascular disease, and reproductive health. Also included in the review is a collection of original research articles. Highlighted are diverse topics such as the consequences of obesity, headache, sexual abuse, prescription drug use among Medicaid patients, induction of labor, periodontal disease, etc. A study of the impact of immigrants on our health care system underscores new challenges that face our state.

Health disparities can only be remedied if they are recognized. This report provides information to help track the health behaviors, risk factors, and health care utilization practices of women in Utah. Much of our ability to generate accurate data for the promotion of health research, policy development, and health care reforms to benefit the citizens of Utah comes from our state's online Indicator-Based Information Query System (IBIS). We are proud of the continued collaboration between the University of Utah and the Utah Department of Health that has produced the information contained within these monographs. So, it is with great excitement that we offer the 2007 Women's Health supplement to the Utah Health Review to you to read, share, discuss, analyze, and utilize.

David N. Sundwall, MD
Executive Director
Utah Department of Health
Utah’s National Center of Excellence in Women’s Health Demonstration Project is proud to work with the Utah State Health Department to produce a supplementary volume on Women’s Health in the State of Utah to accompany the annual Utah’s Health Review.

The National Centers of Excellence in Women’s Health were founded by the Office on Women’s Health in the United States Department of Health and Human Services in 1996 to promote women’s health across the life span. The model promotes a dynamic change in women’s health by linking academic programs across medical specialties and disciplines to improve clinical care for women, promote research in women’s health issues, improve education for health care providers, encourage programs to serve the under served, and promote women to leadership positions in Academic Health Centers. The University of Utah joined the program in 2005 and immediately partnered with all of the Schools in the Health Sciences as well as many of the Colleges on Main Campus, and with the State Health Department’s Women and Child Health Division to achieve a multi-disciplinary thrust to improve the health of women in our State.

Our goal is to connect women to wellness. The symbol that we have chosen is a woman holding the “eternal knot”—one of the auspicious symbols of the inter-connection of all things—including health.

We see this supplement as a beginning. While there are obvious gaps in our knowledge, we have tried to assemble topics that are timely and helpful. We hope that this report will spur further interest and collaborations across our State institutions and Universities to increase understanding of the complexity of issues facing the health of women of Utah.

The research working group of the Center of Excellence - under the skillful guidance of Patricia Aikins Murphy, CNM, DrPH, FACNM who holds The Annette Poulson Cumming Endowed Chair in Women’s and Reproductive Health, College of Nursing - has produced an excellent start at benchmarking women’s health in 2007 for the State of Utah. This report brings up further needs for data collection and it is our hope to produce periodic updates on the state of health of the women of Utah.

Kathleen Digre, MD
Director, On behalf of Region VIII National Center of Excellence in Women’s Health Demonstration Project, University of Utah

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Michael Varner, MD  Evaluator
Editor’s Note

We are pleased to release this special supplement on women’s health in Utah as part of the 12th volume of Utah's Health: An Annual Review: Special Supplement on Women's Health in Utah. The editorial board and contributors represent an interdisciplinary group of students, faculty, researchers from the University of Utah, personnel from the Utah Department of Health, and interested advocates for women’s health. This special supplement speaks to the interest in and dedication to women’s health that can be found within our state.

This supplement has three sections:

Original Research and Reviews touch on a variety of topics that impact women’s health, from obesity to prescription drug use to headaches and reproductive health issues.

The Special Topics section addresses the impact of immigrants on the health care system. Because data on women immigrants and their impact on the state’s health care system are difficult to find, this paper is not specific to the women of Utah. However it provides background that can easily be extrapolated to suggest the effects of immigration within the state. Information about the health of refugee women is similarly difficult to obtain; the brief data page represents initial efforts to collate information from a variety of agencies serving this community in Utah. We hope that this preliminary presentation of issues and data will encourage interested parties in the state to begin the process of collecting comprehensive data to address this topic.

The Women's Health Data Reports look at a variety of topics that reflect women's health concerns. We have tried in assembling these pages to go beyond typical emphasis on physical health conditions and have also included aspects of social health that impact Utah women’s lives. Some important topics, such as osteoporosis and bone health, are missing because of the difficulty in finding data to describe them. Others may be missing because of limitations of space and authorship; such topics will be periodically addressed on the University of Utah National Center of Excellence in Women’s Health Demonstration Project’s website at http://uuhsc.utah.edu/coe/womenshealth/.

Many deserve credit for this effort. It would not have been possible without the successful partnership between the University of Utah National Center of Excellence in Women’s Health Demonstration Project and the Utah Department of Health, the hard work of the editorial board, and the dedication of the contributors. We are grateful to the editorial board of Utah's Health: An Annual Review for the opportunity to provide our women's health supplement for this year's review.

We hope to continue this work on a regular basis, and plan future volumes that will address specific issues in women’s health, such as health of Latina and Native American women, as well as special topics such as aging and adolescent health.

Patricia Aikins Murphy, CNM., DrPH and the Editorial Advisory Board
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Original Research and Reviews
Consequences of Obesity on Women’s Health

Yvette D. LaCoursiere, MD, MPH

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University of Utah

Obesity among women of reproductive age is a major health threat in the United States and contributes to the overall morbidity, mortality and costs associated with overweight and obesity. In the year 2000, 117 billion dollars in health care costs and 300,000 deaths were attributed to obesity (Allison, Fontaine, Manson, Stevens, & VanItallie, 1999; Centers for Disease Control and Prevention). Body mass index (BMI), the most commonly used measure to define obesity, is calculated by dividing a woman’s weight in kilograms by her height in meters squared. The International Obesity Task Force defined overweight and obesity using the following classification of body mass index (BMI, defined as kg/m²): <19 underweight, 19-24.9 normal weight, 25-29.9 overweight, 30-34.9 class I obesity, 35-39.9 class II obesity, and >40 class III obesity. (International Obesity Task Force, 1998) Using this classification system, over 127 million American adults are overweight (BMI>25), 60 million are obese (BMI>30), and 9 million are severely obese (BMI>40) (American Obesity Association).

For the first time in over twenty years the number of obese women nationwide did not increase; however the majority of adult American women are still overweight or obese (Ogden et al., 2006). In 2003-2004, 62% of women were overweight or obese, 33% were obese, and 7% were severely obese (Ogden et al., 2006). This is significantly higher than the NHANES data from 1988-94, where the rates were 50%, 26%, and 4.0 % respectively (Flegal, Carroll, Kuczmarski, & Johnson, 1998; Flegal, Carroll, Ogden, & Johnson, 2002).

Overweight and obesity have long been known to increase the risk and severity of many chronic diseases including type 2 diabetes mellitus, cardiovascular disease, hypertension and arthritis (Field et al., 2001). Table 1 provides a list of the major morbidities associated with obesity. While this list of health consequence associated with obesity is extensive, the most dire consequence, mortality, is also increased. The Nurses’ Health Study prospectively studied over 116,000 women who were disease free at enrollment for 24 years. All cause and disease specific mortality increased in this population with increasing BMI, even after controlling for age, smoking, family history, menopausal status, activity and alcohol consumption (Hu et al., 2004).

Obese women, when compared to lean women, are more likely to suffer from endometrial cancer, breast cancer, stress urinary incontinence, gall bladder disease and depression (American Obesity Association, 2002). Also, they are less likely to participate in health care maintenance activities, such as mammograms and gynecologic exams, which may delay the identification of disease and may worsen prognosis (Fontaine, Heo, & Allison, 2001).
There has been little attention paid to the complications of obesity in women of reproductive age. While obesity complications of pregnancy have been studied, significantly less attention has been paid to postpartum and long-term complications in these women. (The paucity of research during the puerperium is not limited to obese women.) National studies which identify trends in body mass indices, including the National Health and Nutrition Examination Survey (NHANES) and the Behavioral Risk Factor Surveillance System specifically exclude pregnant women from their analyses (Flegal et al., 2002; Freedman, Khan, Serdula, Galuska, & Dietz, 2002). Several studies have shown that obese pregnant women are at increased risk for adverse pregnancy outcomes including gestational diabetes, pre-eclampsia, macrosomia, fetal anomalies, intrauterine fetal demise, early neonatal death, induction, cesarean delivery, postpartum hemorrhage, and infection (Cnattingius, Bergstrom, Lipworth, & Kramer, 1998; Ehrenberg, Dierker, Milluzzi, & Mercer, 2002; Jensen et al., 2003; Lu et al., 2001; Sebire et al., 2001; Watkins, Rasmussen, Honein, Botto, & Moore, 2003).

To explore the impact of overweight and obesity during pregnancy in Utah, birth certificate data from 1991 to 2001 were analyzed. Maternal obesity, as defined by the proportion of women with a BMI greater than 30 at delivery has increased nearly 40% over this past decade in Utah (D.Y. LaCoursiere, Bloebaum, Duncan, & Varner, 2004). (See figure 1). A similar increase in the percent of women who were overweight (BMI >25) or obese (BMI >30) prior to pregnancy has also been identified (D.Y. LaCoursiere et al., 2004). In 2001, 40.2% of women were overweight or obese before delivery. The attributable fraction of cesarean delivery in the overweight and obese was 0.388 (95% CI: 0.369 - 0.407) (D. Y. LaCoursiere, Bloebaum, Duncan, & Varner, 2005). This means that after controlling for other factors, nearly 40% of cesarean deliveries in the overweight and obese are due to increased maternal weight. Statewide, among all women having a cesarean in 2001, 1 in 7 is attributable to

<table>
<thead>
<tr>
<th>Table 1 Morbidities Associated with Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II Diabetes</td>
</tr>
<tr>
<td>Renal Cancer</td>
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<tr>
<td>Cardiovascular Disease</td>
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<tr>
<td>Gallbladder Disease</td>
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<tr>
<td>Hypertension</td>
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<tr>
<td>Stress Urinary Incontinence</td>
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<tr>
<td>Hyperlipidemia</td>
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<tr>
<td>Menstrual Irregularities</td>
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<tr>
<td>Arthritis</td>
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<tr>
<td>Carpal Tunnel Syndrome</td>
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<td>Postmenopausal Breast Cancer</td>
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<td>Sleep Apnea</td>
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<tr>
<td>Endometrial Cancer</td>
</tr>
<tr>
<td>Asthma</td>
</tr>
<tr>
<td>Gastrointestinal Cancer</td>
</tr>
<tr>
<td>Depression and poor QOL</td>
</tr>
</tbody>
</table>

There has been little attention paid to the complications of obesity in women of reproductive age. While obesity complications of pregnancy have been studied, significantly less attention has been paid to postpartum and long-term complications in these women. (The paucity of research during the puerperium is not limited to obese women.) National studies which identify trends in body mass indices, including the National Health and Nutrition Examination Survey (NHANES) and the Behavioral Risk Factor Surveillance System specifically exclude pregnant women from their analyses (Flegal et al., 2002; Freedman, Khan, Serdula, Galuska, & Dietz, 2002). Several studies have shown that obese pregnant women are at increased risk for adverse pregnancy outcomes including gestational diabetes, pre-eclampsia, macrosomia, fetal anomalies, intrauterine fetal demise, early neonatal death, induction, cesarean delivery, postpartum hemorrhage, and infection (Cnattingius, Bergstrom, Lipworth, & Kramer, 1998; Ehrenberg, Dierker, Milluzzi, & Mercer, 2002; Jensen et al., 2003; Lu et al., 2001; Sebire et al., 2001; Watkins, Rasmussen, Honein, Botto, & Moore, 2003).

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overweight and obesity. Cesarean delivery rates are shown in figure 2 for women with and without risk factors of diabetes and hypertension. Increases in preeclampsia have also been seen with the rise in maternal overweight and obesity over this same decade (see figure 3). While much of the above information reflects poor outcomes associated with a woman’s weight before pregnancy, excess maternal weight gain during pregnancy also increases the risk of adverse outcomes. The chance of Cesarean delivery, preeclampsia and birth weight over 4000 grams all increase with excessive maternal weight gain in pregnancy. In fact, 40% of women who gain over 35 lbs during their pregnancy are delivered by primary Cesarean delivery (see figure 4).

Utah data have also been used to investigate the association between obesity and postpartum depressive symptoms. To do so we explored the Pregnancy Risk Assessment Monitoring System (PRAMS), a project sponsored by the Centers for Disease Control and Prevention (CDC). PRAMS is a population-based survey of maternal attitudes and experience from preconception through the postpartum period. (Centers for Disease Control and Prevention). The Utah Department of Health (UDOH) participates in this project. One of the questions pertains to the woman’s postpartum mood. She is asked “In the months after your delivery, would you say that you were- Not depressed at all, A little depressed, Moderately depressed, Very Depressed, Very depressed and had to get help?” The response to this question and questions pertaining to stressors were stratified by prepregnancy body mass index. There were 3,439 women included in the analysis. Among overweight and obese women, there was a trend toward more partner associated stress (p=0.057) and they were more likely to report emotional (p<0.001) and traumatic stress (p<0.001). When stratified by BMI categories, the prevalence of moderate or greater depressive symptoms increases at the extremes of BMI (figure 4). After controlling for marital status and income, prepregnancy obesity (BMI≥30) was associated with greater than moderate postpartum depressive symptoms (adjusted odds ratio 1.53 [95% CI:1.15 - 2.02]) (D. Y. Lacoursiere, Baksh, Bloebaum, & Varner, 2006). While limited in its evaluation of depressive symptoms, this database supports the possibility that obese women could be at greater risk for maternal stressors and postpartum depression. Currently a larger prospective study, funded by the National Institutes of Health, is being conducted in our state.

There have been recent studies presenting interesting information on obesity and breast feeding (Oddy et al., 2006) (Li et al., 2005). Increased prepregnancy BMI is associated with shorter breastfeeding duration (Oddy et al., 2006). Maternal obesity and short duration of breast feeding are additive risk factors for childhood overweight (Li et al., 2005). Recently, biologic data support this epidemiologic association between obesity and short duration of breastfeeding. Increased prepregnancy BMI predicts a lower prolactin response to suckling at 48 hours. Prolactin is responsible for stimulating milk production and thus a decrease in responsiveness could lead to a diminished ability to make milk and perhaps contribute to breastfeeding discontinuation (Rasmussen & Kjolhede, 2004). These studies lead to the possibility that an intervention to improve prepregnancy BMI and or maternal weight gain might improve a woman’s ability to breastfeed.
Overweight and obesity significantly impact women’s health. It affects two-thirds of all women nationwide. Rates of overweight and obesity during pregnancy are increasing in Utah. Data from our state suggest that it is likewise influencing women’s reproductive health outcomes. Overweight and obese Utah women are more likely to have gestational diabetes, preeclampsia, Cesarean delivery postpartum depression and large babies. Information also supports that overweight and obese women have more difficulty continuing to breastfeed. Maternal weight during pregnancy not only effects the woman’s outcome, but also that of her child. While information is needed to prevent the untoward effects of increased BMI in women, even more data are necessary on primary prevention of obesity.

**Figure 1. Overweight and Obesity before Pregnancy, 1991-2001.**

![Graph showing overweight and obesity before pregnancy](image)

**Figure 2. Cesarean delivery rates by BMI strata and risks of Diabetes and Hypertension**

![Graph showing cesarean delivery rates](image)
Figure 3. Incidence of preeclampsia, prevalence of BMI>25 and the attributable fraction of preeclampsia secondary to BMI>25.

Figure 4. Outcomes by Pregnancy Weight Gain
Figure 5. Percent with Postparum Depressive Symptoms by BMI Strata

References


Headache and Sexual Abuse in Women in a Headache Clinic in Utah

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Abstract
Headache is a common disorder in women and chronic daily headache is also more common in women. Childhood sexual abuse has been found to be frequent among women who have disabling headache. We wished to determine the frequency of sexual abuse as well as other forms of abuse in a headache clinic in Utah. Methods: Patients filled out a questionnaire using a personal digital assistant (PDA). Patients also completed depression and somatic symptom severity measures. Results: Two-hundred twenty-two women completed the study. The majority of the women had migraine, over half had chronic daily headache. Sexual abuse in childhood was reported in 34% of women; physical abuse was reported in 32% of women, and emotional abuse in 26%. Of those reporting sexual abuse, 41% of women reported occurrences before they were 12 years and 82% reported occurrences as adolescents less than 20 years. Risk for abuse did not follow socio-economic level, number of headaches, but was more prevalent in women with a lower level of education. Depression was common in over one-half of the patients and women who were abused had an increase in depressive indicators. Multiple somatic symptoms were more common in abused women. Migraine headaches occurred in 85.6% of the patients; 43.7% had daily migraine headaches. Some form of violence was experienced by 63.1% of the women. Conclusion: A reported history of abuse is common among women seen in a headache clinic. Clues to identifying women who have been abused are present when there are increased somatic symptoms and depression. Practitioners should be aware that abuse is common and address this with women with headache.

Introduction
Headache is a common disorder in women. In fact, almost twenty percent of all women in the population suffer from migraine (Lipton, Stewart, Diamond, Diamond & Reed, 2001). About 4% of the adult population suffers from some sort of chronic daily headache; however, women again share the burden of daily headache twice as often as men (Scher, Stewart, Liberman & Lipton, 1998; Stewart & Lipton, 1993; Silberstein and Lipton, 2000).
Sexual abuse in childhood has been estimated to occur in 15-25% of women (Leserman, 2005; Howard, 1995). These women are found to have more chronic complaints (pelvic pain, irritable bowel syndrome), use more health care resources (Walker et al., 1999b; Hilden 2004), have more physical symptoms and have an increase in lifetime health problems (Leserman, 2005; Walker et al., 1999a; Roberts, 1996). There is evidence to suggest that a history of childhood sexual abuse may also increase the severity of headache as well as lead to increase in other pain and depression (Felitti, 1991; Domino & Haber, 1997; Emiroglu, Kurul, Akay, Miral & Dirik, 2004). We sought to find the frequency of sexual abuse among women visiting a headache specialty clinic in Utah.

Methods
The study was approved by the IRB. All participants were women seen for evaluation and treatment of headache in the University of Utah Headache Clinic. All participants were examined and diagnosed by specialists in headache (KBD, SB). Women patients who met the following criteria were invited to participate: 1) primary headache disorder defined by the International Classification of Headache Disorders (2004) 2) women over 18 years of age; 3) willingness and ability to perform a self-administered questionnaire on a Personal Digital Assistant (PDA). Women were excluded from the study if they were not able to complete the questionnaire on the PDA or if they were unable to read English.

The patient’s diagnosis and the average number of headache days per month over the previous three months were entered by the headache specialist. The electronic questionnaire was designed with Pendragon® Forms 3.2 computer software (Pendragon Software Corporation, Libertyville, IL). Patients responded to questions on the following topics: age, race, household income, highest educational level attained, age of onset of headaches, impact of headaches on daily life, severity of current depression, and somatic symptoms. The questionnaire collected information on physical abuse, sexual abuse, and ‘fear for life’ (emotional abuse) in time periods: childhood years (≤12 years old), teenage years (13 to 20 years old), adulthood (≥18 years old) and current (within the past year). The participants were asked if they had been the recipient of other abusive behaviors such as: threats, aggression, intimidation, isolation, and coercion. They were also asked if they had stress due to fear of threats or felt they were at risk for future abuse. The participants were asked whether they had witnessed 1) abusive behavior between adults, and 2) drug/alcohol abuse by adults in their childhood home.

The questionnaire also included a disability scale, the Headache Impact Test (HIT-6) (Kosinski et al., 2003) that produces a score ranging from 36 to 78. In this test, there are four levels of disability based on the HIT-6 scores: ‘little or no impact’ for scores less than 49, ‘some impact’ for scores 50-55, ‘substantial impact’ for scores 56-59, ‘very severe impact’ for scores more than 60.

Determination of current (over the prior two weeks) depression was performed using the Personal Health Questionnaire 9 (PHQ-9) (Kroenke, Spitzer & Williams, 2001), that produces a score ranging from 0 to 27. Five
levels of depression severity exist based on the PHQ-9 scores: ‘minimal’ for scores 0-4, ‘mild’ for scores 5-9, ‘moderate’ for scores 10-14, ‘moderately severe’ for scores 15-19, and ‘severe’ for scores 20 and above.

The type and severity of current somatic symptoms (over the prior 4 weeks) was assessed using Personal Health Questionnaire 15 (PHQ-15) (Kroenke, Spitzer & Williams, 2002). The symptoms include: joint or limb pain, dizziness, headaches, back pain, abdominal pain, chest pain, breathing trouble, fainting, gas or indigestion, sleeping trouble, palpitations, menstrual problems, diarrhea (constipation), and sexual pain/problems. In this test, 15 symptoms were graded by the patient as ‘not bothered at all’ (scored as 0), ‘bothered a little’ (scored as 1), or ‘bothered a lot’ (scored as 2). The PHQ-15 reveals four levels of somatic symptom severity: ‘minimal’ for 0-4, ‘low’ for 5-9, ‘medium’ for 10-14, and ‘high’ for 15-30.

Table 1. Demographics of Headache Clinic Population Compared to the State of Utah Population

<table>
<thead>
<tr>
<th></th>
<th>Headache Clinic Population*</th>
<th>Women of Utah Population+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age</td>
<td>40.8</td>
<td>27.8</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>206/222</td>
<td>92.8%</td>
</tr>
<tr>
<td>Other</td>
<td>16/222</td>
<td>7.2%</td>
</tr>
<tr>
<td>Highest Educational Attainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>7/220</td>
<td>3.2%</td>
</tr>
<tr>
<td>High School</td>
<td>65/220</td>
<td>29.5%</td>
</tr>
<tr>
<td>Some college</td>
<td>51/220</td>
<td>23.2%</td>
</tr>
<tr>
<td>College and post-grad</td>
<td>97/220</td>
<td>44.1%</td>
</tr>
<tr>
<td>Annual Household Income++</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>21/209</td>
<td>9.6%</td>
</tr>
<tr>
<td>$20,000–$50,000</td>
<td>62/209</td>
<td>29.7%</td>
</tr>
<tr>
<td>$50,000–$100,000</td>
<td>86/209</td>
<td>41.1%</td>
</tr>
<tr>
<td>Over $100,000</td>
<td>40/209</td>
<td>19.1%</td>
</tr>
<tr>
<td>Average Household number+++</td>
<td>3.2</td>
<td>3.1</td>
</tr>
</tbody>
</table>

*number of women reporting each demographic varies
**women over the age of 25
++Governor’s Office for Planning and Budget. Available online at http://governor.utah.gov/dea/census/stateofutah/utah.pdf. Accessed February 15, 2007; general Utah population (not specific to women)

Patients took about 15 minutes to answer the questions. A security code was entered at the end of the survey, uploaded data to a central database using the PDA, and synchronized to a central database through a Pendragen
SyncServe computer software. The database was kept at the University of Toledo, Ohio which was the primary site for the study.

Data for Utah were transferred to SPSS for analysis. Chi-square test, t-test, and regression were used for analysis. This study was part of a multi-centered study. Only the data from Utah are presented here. Previous publications of the aggregate data include Tietjen et al. (2007).

**Results**

There were 222 women who participated in this study. The ages were 18-72 with a mean age of 40.8. The majority of the women were Caucasian. The vast majority, 97%, had attained high school graduation and many, 44%, had attained a baccalaureate degree or higher. Sixty percent of the women had household incomes more than $50,000 and only 10% had incomes less than $20,000. The number of people in a household ranged from 1-12; the average household size was 3.2. See Table 1 for demographic data and its comparison to the demographic information of women from the State of Utah. The headache clinic population and the female Utah population were found not to significantly differ on race and average number of household members. But the cohort did differ on age ($t=16.351$, $p<0.001$), education ($\chi^2=8.309$, $p<0.01$), and income ($\chi^2=66.611$, $p<0.001$). It was found
that, on average, the headache clinic sample was significantly older, more educated, and had higher income levels than the female Utah population. Some statistics representing only women were unavailable. For these demographic variables (i.e. income and average household number), information from the general Utah population was used for comparison.

The primary headache type was most frequently migraine (190/222, 85.6%), and less frequently: tension-type (5/222, 2.3%), post-traumatic (12/222, 5.4%), and other (15/222, 6.6%). Headaches occurred less than 15 days per month in 101/222 (45.5%) patients and more than 15 days per month in 121/222 (54.5%) patients. Severe headaches were found in 170/222 (76.6%) patients as defined by the HIT-6 test score of over 60. The average HIT-6 score was 63 and the range of scores was 48-76. See figure 1.

The women reported their headaches to begin between the ages of 1 and 61 years with a mean of 21.5 years. Headaches beginning before the age of 20 were experienced by 105 (47.3%) women.

Moderate to severe depression, as determined by the PHQ-9 score of 15 or greater, occurred in 84 (37.8%) women. Minimal or no depression, indicated by a PHQ-9 score of 0-4, occurred in 76 (34.2%) women. See figure 2.

Figure 2. Depression Severity (PHQ-9)

Somatic symptoms were highly prevalent in this group; 161 (72.5%) women had somatic symptoms that the PHQ-15 determined were of medium or high severity. See figure 3.
Thirty-four (15.3%) women currently or in the past abused drugs or alcohol; 13/34 (38.2%) of these women recalled alcohol or drug abuse to be present in their childhood homes. Some type of violent behavior was reported by 140 (63.1%) women—this includes physical, sexual, and emotional abuse, other abusive behaviors, or had witnessed violent behaviors. Fifty-four (54.3%) of these women reported a personal previous history of sexual abuse (76/140).

Physical abuse (as defined as being hit, punched, slapped, kicked, bitten, grabbed choked, by a family member, current or former spouse, or significant other) occurred in 71 (32%) women. These 71 women indicated that they had been physically abused at different ages, so there was a total of 106 reports of abuse. The physical abuse occurred at 12 years of age or younger (29.2%), 13-20 years of age (38.7%), 21 years of age or older (13.5%). Only 3.8% reported current physical abuse. See figure 4.

Sexual abuse was reported to occur in 76 (34.2%) of women. These 76 women indicated that they had been sexually abused at different ages, so there was a total of 107 reports of abuse. The sexual abuse occurred at 12 years of age or younger (41.1%), 13-20 years of age (39.3%), 21 years of age or older (15.9%); rarely was there current sexual abuse (1.9%). See figure 4.

Emotional Abuse/Fear for life (as defined by being hurt or frightened so badly by a family member that they feared for their life) occurred in 57 (25.7%) women. These 57 women indicated that they had been emotionally
abused at different ages, so there was a total of 73 reports of abuse. The emotional abuse occurred at 12 years of age or younger (21.9%), 13-20 years of age (34.2%), 21 years of age or older (38.4%); current emotional abuse occurred in 5.5% of the 57 women. See figure 4.

**Figure 4. Age at which Abuse Occurred**

One hundred and one (45.5%) women reported no sexual, physical or emotional abuse.

While patients with a history of physical or sexual abuse showed no statistical increase in headache frequency when compared to patients with no history of physical abuse and sexual abuse, patients with a history of emotional abuse showed an increase in headache frequency when compared to patients with no history of emotional abuse ($\chi^2=13.553$, $p<0.001$).

Women with a history of physical, sexual, or emotional abuse usually reported more than one type of abuse. Of the women who had physical, sexual, and/or emotional abuse 55/121 (45.5%) had witnessed abusive behavior between adults in their childhood home, whereas 18/10 (18.0%) who had never had abuse, had witnessed abusive behavior in their childhood home. See figure 5.
Other abusive behaviors (independent of physical, sexual, or emotional abuse) were reported by 107 women. In response to questions about these other abusive behaviors, women reported they had been: threatened (51; 45.5%), shown aggression (44; 19.8%); harassed (42; 18.9%); intimidated (71; 31.98%), isolated (53; 23.9%), and controlled/coerced (52; 23.4%).

Table 2 compares the samples of women with no history of physical, sexual, or emotional abuse (N=101) and the sample of women with a history of physical, sexual, and/or emotional abuse (N=121). The two groups did not differ significantly in age, race, income, number of household members, and headache frequency. The sub-sample of women with a history of physical, sexual and/or emotional abuse had significantly different education levels when compared to those who did not experience any abuse ($\chi^2=10.732, p=0.013$).

Table 3 shows the results of linear regression models to fit the somatic symptom severity score (PHQ-15), the depression score (PHQ-9), and the headache-related disability score (HIT-6).

The PHQ-15 score (somatic symptoms) is significantly associated to sexual abuse, emotional abuse, income level and headache frequency. Higher PHQ-15 scores are observed for participants who have had a history of sexual...
and/or emotional abuse and also for those who experience more than 15 headaches a month. The PHQ-15 score seems to be negatively related to income level (i.e., higher income level relates to lower PHQ-15 score) after controlling for all other factors.

The PHQ-9 score (depression) is significantly associated to emotional abuse, income level, and headache frequency. The presence of emotional abuse, increasing income levels, and increasing headache frequency result in higher PHQ-9 scores; this is quantified by the parameter estimates shown in Table 4. Although sexual abuse was not found to be significantly associated with PHQ-9 at the 0.05 level (p=0.056), it was very close to the significance value and we have chosen to leave this factor in. Again, as with the PHQ-15, the PHQ-9 is negatively associated with income level.

The HIT-6 score was found to be significantly associated only with age and headache frequency. Age was negatively related to the HIT-6 score (i.e., older women show lower HIT-6 scores). The headache frequency seemed to be the major predictor of the HIT-6 score.

### Table 3. Significant Correlations between PHQ-15, PHQ-9, and HIT-6

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Predictors</th>
<th>Coefficient Estimates</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-15</td>
<td>Sexual Abuse</td>
<td>2.348**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emotional Abuse</td>
<td>2.210*</td>
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</tr>
<tr>
<td></td>
<td>Income Level</td>
<td>-0.712*</td>
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</tr>
<tr>
<td></td>
<td>Headache Frequency</td>
<td>3.654***</td>
<td>0.223</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>6.749***</td>
<td></td>
</tr>
<tr>
<td>PHQ-9</td>
<td>Sexual Abuse</td>
<td>1.195****</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emotional Abuse</td>
<td>1.417*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Income Level</td>
<td>-0.712*</td>
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<tr>
<td></td>
<td>Headache Frequency</td>
<td>3.654***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>11.655****</td>
<td></td>
</tr>
<tr>
<td>HIT-6</td>
<td>Age</td>
<td>-0.083**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Headache Frequency</td>
<td>4.303***</td>
<td>0.174</td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>64.048***</td>
<td></td>
</tr>
</tbody>
</table>

*P<0.05 **P<0.01 ***p<0.001 ****p<0.06

Physical abuse was not significantly related to PHQ-15, PHQ-9, or the HIT-6.

### Discussion

This study shows that a large number of women in a sub-specialty headache clinic in Utah have had sexual, physical and/or emotional abuse. Sexual abuse was the most frequent at 34%. Most of the sexual abuse occurred before the age of 20. The estimated rate of sexual abuse in the general population is 15-25% (Scher, Stewart,
In chronic headache patients at a specialty clinic, Utah appears to be above this average. Sexual abuse is known to be associated with a poor health status (Leserman, 2005; Walker et al., 1999) as well as more physical symptoms (Tietjen et al., 2007), and a higher utilization of health resources and increased cost to society (Walker et al., 1999). In addition, sexual abuse has been found to be associated with other forms of abuse (physical and emotional) (Dong et al., 2004). In our cohort of 140 patients with some type of abuse, it was common to have other forms as well. We found that almost 21% of the abused women reported all three forms of abuse (sexual, physical and emotional).

As noted in other studies, sexual abuse can occur in any socioeconomic group and education (Swahnberg et al., 2004). In our population, women were from a higher socioeconomic status and had more high school or college experience than our general Utah population.

Headache has been reported to be a major symptom seen in patients who have had sexual abuse. In fact, in one large study of abused women, chronic daily headaches were more than twice as common as in women who were not abused (Felitti, 1991). Early childhood sexual abuse is associated with more headache than in those who have sexual abuse in adulthood (Golding 1999). Chronic headache is associated with depression since 38% of our population had moderate to severe depression. In our population, depression was more severe in those who have had sexual or emotional abuse.

Juang, Wang, Fuh, Lu, and Chen (2004) found that physical abuse in childhood tended to increase the likelihood of chronic daily headache in adolescence. Romans, Belaise, Martin, Morris and Raffi (2002) reported that headache and migraine were definitely correlated with adult physical abuse. Krantz and Ostergren (2000) showed that physical abuse was associated with headache and that women who had physical abuse in childhood or adulthood had an increased likelihood of multiple somatic symptoms In our study, physical abuse was neither associated with headache nor multiple somatic symptoms. Depression is strongly associated with migraine in patients without abuse. In fact, the prevalence of depression among patients with migraine is 14.7/100,000 vs those who do not have migraine (7/100,000) (Hamelsky & Lipton, 2006). Merikangas, Angst, and Isler (1990) and Breslau et al. (2000) and Breslau et al. (2003) found that those with migraine had three times the incidence of depression than those without migraine. Shared genetic and neuro-biologic factors may link migraine and depression (Silberstein, 2001). Walling et al. (1994a) and Walling et al. (1994b) found that early childhood physical abuse predicted depression, anxiety and somatization. Other studies have also found that women experiencing violence have a significantly higher rate of depression (Nicolaidis, Curry, McFarland & Gerrity, 2004). Depression associated with abuse has also been found to be associated with morbid obesity (Felitti, 1991). Depression was found in 38% of our patients. Depression was increased in our patients with sexual and emotional abuse.
An increase in multiple somatic complaints is similar to other studies of women with all forms of abuse (Tietjen et al., 2007; Krantz & Ostergren, 2000). In our study, 96 (80%) of 120 abused women had a ‘medium’ or ‘high’ level multiple somatic complaints. This finding suggests that women with multiple somatic complaints should also be queried about forms of abuse.

Our headache clinic population is similar in several demographics to the state of Utah. The clinic and general population were not significantly different in race and average number of household members. The clinic patients were significantly more educated ($\chi^2=41.611, p<0.001$) and had significantly higher incomes ($\chi^2=30.02, p<0.001$) than the general population of the state of Utah. Nevertheless, our study shows that headaches and abuse affects a wide range of individuals even those who are more educated and of higher economic fortune.

We would make the following recommendations for practitioners who see women who have chronic headache. First, the practitioner should ask about abuse in childhood. Recently two questions were found to predict sexual abuse: (a) "When I was growing up, people in my family hit me so hard that it left me with bruises or marks" and (b) "When I was growing up, someone tried to touch me in a sexual way or tried to make me touch them." (Thombs, Bernstein, Ziegelstein, Bennett & Walker, 2007) These questions had sensitivity 85% and specificity of 88% in predicting sexual abuse. Further, women with multiple chronic health symptoms should also be queried about abuse. Despite many articles about the importance of querying for abuse, only 21% of women with a history of abuse presenting to medical clinics are asked about it (Pearse, 1994).

Treatment for women with headache who have been abused has not been extensively studied. Cognitive behavioral approaches are most frequently used and have the most evidence for success (Leserman, 2005). Behavioral and cognitive therapy are more efficacious in some cases than medications (Payne & Colletti, 1991). Psychotherapy (Martsolf & Draucker, 2005), group therapy (Kessler, White & Nelson, 2003; Talbot et al., 1999), and even inpatient treatment (Stalker, Palmer, Wright & Geotys, 2005) have been used. No single therapy has been found to be superior, however. In general, finding a single medication that completely stops headache is almost impossible. However, every attempt to reduce the migraine headache with standard preventive medications such as beta blockers, calcium channel blockers, and anti-convulsants should be attempted (Goadsby, Lipton & Ferrari, 2002).

The reason for emotional abuse causing increased rates of headache is not clear. Clearly more work is needed to understand the pathophysiology of increased headache in women with all forms of abuse and to determine the best treatment of these disabling headaches.

There are limitations to our study. We do not address any type of abuse in men. We are using a highly specialized population (those going to a headache clinic) so our findings may not be generalizable to all headache.
patients. The study also relied on the woman's recollection of abuse. Nevertheless, this study gives us insight into some women visiting a chronic headache clinic in Utah.

References


Labor Induction Trends in Utah and a Comparison of Maternal and Neonatal Outcomes among Induced Deliveries without an Identified Medical Indication

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Abstract
Induction of labor is a valuable obstetric procedure when indicated by a medical or clinical condition. However, strong debate surrounds the issue of non-medical inductions that are conducted for convenience, and whether or not the benefits outweigh the risks. This research focuses on trends in induction and assesses maternal and neonatal outcomes associated with labor induction, specifically those inductions conducted without identifiable medical indications. In this study, Utah birth certificate records from 1992 to 2005 were used to examine trends. Maternal and neonatal outcomes related to the induction of labor without an identified indication were assessed using only 2005 birth certificate data. When comparing neonatal outcomes, induced and non-induced deliveries were quite similar. However, nulliparous women with induced labor were significantly more likely to have instrumental procedures used to assist with vaginal delivery compared to the non-induced group (22.8% vs. 17.7%). It is the recommendation of this study that women receive a complete disclosure of the risks and benefits associated with the induction of labor before undergoing this obstetric procedure. Future studies are needed to understand why Utah’s induction rate is higher than the national rate.

Introduction
Induction of labor is a valuable obstetric procedure when initiated for a medical reason. For several clinical conditions, the decision to induce labor may be appropriate and lifesaving for mother and child. Although induction of labor has been practiced for many years, the procedure has become more widely used in recent years. Nationally and in Utah, induction rates doubled between 1992 and 2005. However, large proportions of inductions are performed in the absence of any medical or obstetric indication and are considered "elective."
According to the American College of Obstetricians and Gynecologists (ACOG), induction of labor is undertaken when, in the opinion of the physician, the risks of delivery to the mother or the fetus or both, are less than the risk of continuing the pregnancy (ACOG, 1999).

Controversy exists regarding the potential benefit of elective induction at term. Proponents of elective induction argue that they are avoiding potential adverse outcomes associated with postdates, preeclampsia and term intrauterine fetal death of unknown causes (Martin et al., 1978). It was suggested by Macer et al. (1992) that elective induction allows for better planning by the physician, patients, and their families. The anxiety of some women may be reduced by the assurance that their personal physician may be present during the birth of their child. Others advocate elective induction to allow for daytime deliveries with a rested patient and optimal perinatal medical care personnel (Smith et al., 1984). Those opposing elective induction would argue that not only is it generally not recommended by ACOG, but also it is an unnecessary and unnatural process (Macer et al., 1992). There is concern over inducing labor before fetal lung maturity has been achieved (ACOG, 1999).

A number of studies have examined the associations between elective induction and pregnancy outcomes. Although inconsistent, the results are compatible with an association between elective induction and increased risk of cesarean delivery. Some studies have observed this increased risk among all women (Prysak et al., 1998; Glantz, 2005) while others have observed it only among nulliparous women (Seyb et al., 1999; Dublin et al., 2000). Many studies have found that patterns of labor progression differ between women who are induced and those who are not (Hoffman et al., 2006; Vahratia et al., 2005). A higher rate of instrumental delivery has also been observed among induced women compared to those experiencing spontaneous labor (Dublin et al., 2000; Smith et al., 1984). Women who were induced tended to receive greater numbers of intrapartum interventions, such as epidural anesthesia, compared to women experiencing spontaneous labor (Glantz, 2005; Smith et al., 1984). Some research has calculated higher than average length of stay in maternity units among induced women (Vrouenraets et al., 2005; Glantz, 2005), as well as higher delivery costs (Maslow et al., 2000). Other studies found no adverse impact associated with the induction of labor. Smith et al. (1984) found that when careful patient selection is made by an experienced clinician, planned delivery does not jeopardize the outcomes of either the mother or fetus compared to spontaneous labor. This result was similar to that of Cole et al. (1975) who found no evidence that elective induction of labor increased fetal or maternal morbidity.

The purpose of this study was to assess maternal and neonatal outcomes associated with the induction of labor among low risk women who lacked identifiable indications for induction at term.
Methods

Data Sources
To examine induction trends, Utah birth certificate records from 1992 through 2005 were used. Induction of labor was measured by birth certificate item ‘induction’ and identifies all deliveries where induction of labor was attempted, regardless of whether the induction was successful. On the birth certificate record, induction is defined as the initiation of uterine contractions before the spontaneous onset of labor by medical and/or surgical means for the purpose of delivery. Excluded from the study were records of births where stimulation or augmentation of a previously established labor was indicated. The birth certificate does not distinguish between elective and indicated inductions, but it does contain information on most of the medical indications related to induction. Induction rates per 100 live births in Utah were compared with overall U.S. rates.

Maternal and neonatal outcomes related to the induction of labor without an identified indication were assessed using only 2005 birth certificate data.

Study Selection Criteria
The study included women with singleton births clinically estimated to be between 38-40 completed weeks’ gestation. The clinical estimate of gestational age on the birth record is defined as the age in total weeks completed from the last menstrual period date to the date of delivery. Gestational age parameters 38-40 weeks were selected based on a review of the parameters used in recent induction research to identify a low-risk group. The study was also limited to women who gave birth in a hospital. In order to define infants in vertex presentation, women with breech/malpresentations were excluded. To further limit the study to low-risk women, records with one or more listed medical risk factors for pregnancy were excluded. Many of the risk factors in the birth certificate records are recognized by ACOG as indications for induction, and include: pregnancy induced hypertension, premature rupture of membrane, Rh sensitization, acute or chronic lung disease, chronic hypertension, polyhydramnios/oligohydramnios, pre-existing diabetes, gestational diabetes, renal disease, and eclampsia. Examination of previous pregnancy history resulted in the removal of women with previous preterm, macrosomic, or SGA infants, since history of such conditions may point toward an increased risk for similar complications. The remaining group was further reduced to exclude those with certain complications of pregnancy. The complications excluded for were: placenta previa, abruptio placenta, umbilical cord prolapse, incompetent cervix, uterine bleeding, cephalopelvic disproportion, and genital herpes. Several of these listed complications are defined by ACOG as contraindications for induction, and, as such, disqualify the subjects from being considered ‘low risk’. Women diagnosed as febrile were excluded from the study on the basis of the suggestion that the condition could be considered a proxy for "choioamnionitis", which is also a recommended indication for induction by ACOG (MacDorman et al., 2002). The final step in defining the study population was to remove all birth records where the mother was indicated to have had any previous cesarean delivery. This
final study population was divided into two groups: those induced and those non-induced, in order to compare maternal and neonatal outcomes. The flowchart of selection of study participants is presented in Figure 1.

**Study Participants**
During 2005, there were 51,517 resident births in Utah. Of these, only 38,153 women who delivered at a hospital with a single infant in vertex presentation in the gestational age range of 38–40 weeks were initially included for this study. The application of exclusion criteria resulted in a total of 14,809 women as the final study population. Among these, 5,945 women had labor induced and were compared with 8,864 non-induced women.

**Outcomes**
Maternal outcome was measured in terms of incidence of cesarean and instrumental delivery. Instrumental delivery was defined as any use of either forceps or vacuum during a vaginal delivery. Neonatal outcomes of interest included birth weight, Apgar scores at 1 and 5 minutes, the presence of moderate/heavy meconium, birth injury, fetal distress, hyaline membrane disease/ RDS, or assisted ventilation.

**Statistical Analysis**
The analyses performed included descriptive summary statistics, chi square, t-test, and regression. Multivariate logistic regression models were developed to estimate the effect of induction on the risk of cesarean and instrumental delivery while adjusting for potential confounders. Adjusted odds ratios (OR) with 95% confidence interval were generated from regression models. All analyses were performed using SAS version 9.1 (SAS Institute Inc., Cary, NC, USA).
Results

Trend Data
The overall induction (indicated and non-indicated) rate in Utah increased from 16.4% in 1992 to 35.3% in 2005. This represents a 115% increase. Utah's rate is significantly higher than the national average (33.6% vs. 21.2%, 2004 data). The trends in induction rates in Utah and the U.S. are presented in Figure 2.

Figure 2: Induction Rates, Utah vs. United States, 1992-2005


Assessment of Outcomes

Characteristics of Participants
Shown in Table 1 are selected maternal characteristics of women who underwent induction of labor compared with those whose labor was not induced. Women with induced labor were slightly older and had more education compared to the non-induced group. A difference was also noted in the proportion of nulliparous women, which was lower in the induction group compared with the non-induction group (30.3% vs. 42.2%). The induction group had a higher proportion of married women compared to the non-induced group (87.4% vs. 82.1%).

Induction of Labor and Maternal Outcomes
The primary maternal outcomes measured in this study were the risk of cesarean section or instrumental delivery associated with labor induction. A comparison of induced and non-induced women delivering infants by various modes is presented in Table 2.
This study revealed slight differences in cesarean rates between the induced and non-induced group. The primary c-section rate for the induction group was significantly lower compared to the non-induced group (4.1% vs. 5.8%, p< .001). Overall, the use of instruments associated with vaginal delivery was similar in both groups (10.4% vs. 10.0%). However, when analyzed by parity, nulliparous women in the induction group had a significantly higher instrumental delivery rate compared to the nulliparous in the non-induced group (22.8% vs. 17.7%, p<.001; see Table 3).
Table 3: Mode of Delivery by Parity

<table>
<thead>
<tr>
<th></th>
<th>Induced Labor*</th>
<th>Non-Induced Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td><strong>Nulliparous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary cesarean section</td>
<td>196</td>
<td>10.9</td>
</tr>
<tr>
<td>Instrumental vaginal delivery</td>
<td>366</td>
<td>22.8</td>
</tr>
<tr>
<td><strong>Multiparous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary cesarean section</td>
<td>50</td>
<td>1.2</td>
</tr>
<tr>
<td>Instrumental vaginal delivery</td>
<td>227</td>
<td>5.6</td>
</tr>
</tbody>
</table>

NS = not statistically significant
* Induced labor in the absence of an identified

Since instrumental delivery among nulliparous women was correlated with birth weight and maternal age, as well as induction, we used a logistic regression model to adjust for these potentially confounding characteristics. Instrumental delivery was designated as the dependent variable in the logistic model, with group (induction vs. non-induction) as an independent variable, and birth weight and maternal age as covariates. The odds ratio for instrumental delivery adjusted for these confounding factors is shown in Table 4. The nulliparous women in the induced group were 1.36 times more likely to experience instrumental delivery compared to the nulliparous women in the non-induced group, regardless of maternal age or newborn’s birth weight.

Table 4: Risk of Instrumental Delivery among Nulliparous Women Related to Induction

<table>
<thead>
<tr>
<th></th>
<th>Crude Odds Ratio</th>
<th>Adjusted for Birth Weight</th>
<th>Adjusted for Maternal Age</th>
<th>Adjusted for All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumental Vaginal Delivery</td>
<td>1.38 (1.19 - 1.59)*</td>
<td>1.36 (1.17-1.57)*</td>
<td>1.38 (1.19 - 1.60)*</td>
<td>1.36 (1.18 - 1.58)*</td>
</tr>
</tbody>
</table>

*95% confidence interval

Neonatal Characteristics

Neonatal characteristics at birth are presented in Table 5. The average neonatal weight at birth in the labor induction group was 3,416 grams compared with 3,365 grams in the non-induced group (p<.05). In the induced group, a higher proportion of newborns were macrosomic (≥ 4,000 g) compared to newborns in the non-induced group (6.5% vs. 5.8%, p <.05). The prevalence of low birth weight (<2,500 g) neonates were slightly lower in the induced group compared to the non-induced group (0.6% vs. 1.0%, p<.05). There were no significant differences in Apgar scores of less than 7 at either 1 or 5 minutes between the induced and non-induced groups.
Table 5: Neonatal Characteristics at Birth

<table>
<thead>
<tr>
<th></th>
<th>Induced Labor* (n=5945)</th>
<th>Non-Induced Labor (n=8864)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neonatal birth weight (g)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>3415.6 ± 376.2†</td>
<td>3364.9 ± 390.8</td>
</tr>
<tr>
<td>Low birth weight &lt;2500 g</td>
<td>0.6%†</td>
<td>1.0%</td>
</tr>
<tr>
<td>Macrosomic ≥ 4000 g</td>
<td>6.5%†</td>
<td>5.8%</td>
</tr>
<tr>
<td>Apgar Score &lt;7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At 1 minute</td>
<td>5.3%</td>
<td>5.9%</td>
</tr>
<tr>
<td>At 5 minutes</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

* Induced labor in the absence of an identified indication.
† p<.05

**Neonatal Outcomes**

Neonatal outcomes associated with induction are provided in Table 6. The proportion of newborns with birth injury did not differ significantly between the induced and non-induced group (1.1% vs. 1.3%). This study observed that meconium staining occurred more frequently among the non-induced group compared to the induced group (7.1% vs. 3.6%, p<.001). No significant difference in the proportion of newborns with hyaline membrane disease/RDS, assisted ventilation, or fetal distress was observed.

Table 6: Neonatal Outcomes Associated with Induction of Labor

<table>
<thead>
<tr>
<th></th>
<th>Induced Labor*</th>
<th>Non-Induced Labor</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth injury</td>
<td>66</td>
<td>118</td>
<td>NS</td>
</tr>
<tr>
<td>Meconium, moderate/heavy</td>
<td>215</td>
<td>625</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Hyaline membrane disease/RDS</td>
<td>30</td>
<td>37</td>
<td>NS</td>
</tr>
<tr>
<td>Assisted ventilation (&lt;30 min.)</td>
<td>11</td>
<td>12</td>
<td>NS</td>
</tr>
<tr>
<td>Assisted ventilation (&gt;30 min.)</td>
<td>6</td>
<td>18</td>
<td>NS</td>
</tr>
<tr>
<td>Fetal distress</td>
<td>421</td>
<td>570</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS = not statistically significant
* Induced labor in the absence of an identified indication.

**Time and Day of Delivery**

In 2005, the majority of induced deliveries (80%) occurred between 8 AM and 8 PM, compared to 60% among the non-induced (see Table 7). Women who had labor induced were also more likely to deliver on weekdays (Monday – Friday) compared to the weekend, with a preponderance Tuesday – Thursday (see Figure 3). Table 7: Time of Delivery
**Table 7: Time of Delivery**

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Induced*</th>
<th>Non-Induced</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 am - 12 pm</td>
<td>20.5</td>
<td>23.8</td>
</tr>
<tr>
<td>12 pm - 4 pm</td>
<td>36.4</td>
<td>19.0</td>
</tr>
<tr>
<td>4 pm - 8 pm</td>
<td>23.7</td>
<td>16.8</td>
</tr>
<tr>
<td>8 pm - 12 am</td>
<td>9.3</td>
<td>11.1</td>
</tr>
<tr>
<td>12 am - 4 am</td>
<td>7.0</td>
<td>17.1</td>
</tr>
<tr>
<td>4 am - 8 am</td>
<td>3.2</td>
<td>12.2</td>
</tr>
</tbody>
</table>

*Induced labor in the absence of an identified indication.

**Figure 3: Delivery by Day of the Week**

**Discussion**

Induction rates are increasing rapidly both locally and nationally. Increases were seen among women with documented medical indications as well as among women with elective inductions (Yeast et al., 1999). Explanation of the dramatic increase in the incidence of labor induction is certainly complex and may be comprised of numerous contributing factors (Rayburn et al., 2002; Zhang et al., 2002). A suggested primary reason for the rising usage of induction centers on the ability it provides to plan the timing of birth for the physician, patient, and family. Other explanations include the increasing availability of effective cervical ripeners and medical liability concerns associated with continued expectant management, particularly post-term (Rayburn et al., 2002). In addition, the ability to more accurately determine the gestational age of the neonate, and more sophisticated techniques of antepartum fetal surveillance may also contribute to the rising induction rate (Yeast et al., 1999).

In assessing maternal outcomes using 2005 birth certificate data, this study found that the cesarean delivery rate was lower among the induced group compared to the non-induced group. This finding is consistent with the
findings of Cole et al. (1975). However, other previous studies have documented an increased rate of cesarean delivery with elective induction, particularly among the nulliparous (Macer et al., 1992; Smith et al., 1984; Yudkin et al., 1979).

In this study instrumental delivery rates did not differ between the induced and non-induced groups overall. This parallels the finding of Cole et al. (1975), where forceps use was similar in both groups of women, those induced and those experiencing spontaneous labor. Their study also found that the use of epidurals is more commonly associated with elective induction than with women experiencing spontaneous labor. Therefore, it has been hypothesized that it may be epidural analgesia rather than induction that is the causal factor explaining the higher incidence of instrumental delivery among induced women. Wigton et al. (1994) also noted that patients receiving epidurals were more likely to require instrumental delivery. When they controlled for the influence of epidurals, in their analysis, they found no difference in instrumental delivery rates between induced and non-induced groups. This study was unable to control for epidural use because of the unavailability of data. While no differences in instrumental delivery rates were observed in this study between the induced and non-induced groups, when parity was introduced, an increased risk of instrumental delivery was observed among nulliparous women (OR = 1.36, 95% CI 1.18 – 1.58). This is of concern since research has documented a link between instrumental delivery and maternal morbidity such as soft tissue injury/discomfort, maternal hematoma, and pelvic floor injury. Vacuum extraction may also “result in significant fetal injury if misused,” problems such as cephalohematoma, subgaleal hematoma, intracranial hemorrhage, hyperbilirubinemia, and retinal hemorrhage may result (ACOG, 2000).

Comparison of neonatal outcomes showed that women with induced labor without an identified indication had, on the average, infants with higher birth weights. These findings are in accordance with those of Macer et al. (1992). In this study no association was observed between induction of labor and birth injury. However, previous studies, particularly research done by Dublin et al. (2000), found birth injuries were more common among infants born to women whose labors were induced. The greater prevalence of meconium staining among the non-induced group in this study population, was consistent with the findings of previous studies (Dublin et al., 2000; Smith et al., 1984), who found that meconium was present much less frequently in the electively induced group. The findings of no association between induction and low Apgar scores (<7) were also consistent with previous studies (Dublin et al., 2000; Macer et al., 1992; Smith et al., 1984). Overall, in this study, the neonatal outcomes between the induced and non-induced groups were similar.

This study found that the majority of induced women were delivered on weekdays in the afternoon or early evening hours. By contrast, the deliveries of non-induced or spontaneously laboring women were distributed evenly over the 24-hour period. These findings parallel those reported in other studies (Macer et al., 1992; Smith
et al., 1984). In this study women who had labor induced were found to be more likely to deliver on weekdays. This may support the hypothesis that a primary attraction of induction is the opportunity it provides to choose a convenient delivery time.

Several limitations may be noted in this study. The birth certificate contains information on maternal medical risk factors, labor complications, and induction of labor, however, it does not distinguish between elective induction and medically indicated induction. This study assumed that women without medical risk factors and certain selected labor complications may be defined as low-risk, healthy women undergoing induction. It is possible that women may have had other mitigating factors not reported on the birth certificates, such as joint pain, back pain, edema, indigestion, distance from hospital, or psychosocial issues that influenced the physician's decision for induction. Such information may be present in medical charts or in other medical records.

Another limitation is that some information of potential interest in assessing induction of labor is not included in birth certificate data. This information includes items such as Bishop's score for cervical ripening, the different methods of induction, use of epidural analgesia, and length of labor. It is possible that the associations observed in this study between the induction of labor and various maternal and neonatal outcomes may be linked with particular methods of induction only, as mentioned by Dublin et al. (2000). There were also no intrapartum or postpartum complications recorded on the birth certificate, such as hemorrhage, laceration, etc. Incomplete information regarding medical history remains an important limitation of this study and warrants caution in the interpretation of these findings. It is possible that there were other differences between women with induced labor and those with non-induced labor that were unable to be measured in this study.

In conclusion, overall maternal and neonatal outcomes were not adversely affected by induction among low-risk women who lacked an identified indication. However, induction was associated with increased risk for instrumental delivery among nulliparous women in this study. Therefore, it is recommended that all women receive full disclosure of the benefits and risks associated with induction before undergoing this obstetric procedure. Further studies need to be undertaken as Utah's induction rate is significantly higher than the national rate.

References


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We thank Brenda Ralls PhD, Sharon Talboys, MPH, Karen Zinner, MPH, and Tara Johnson, MS for their valuable comments about data analysis and interpretations.
Periodontal Disease and the Risk of Adverse Pregnancy Outcomes

Part I: A Review of Current Literature

Bruce P. Murray, PhD, FACHE, CAE, Shaheen Hossain, PhD, Richard O. Woodward, DDS, Robert Satterfield, MStat, Karen Zinner, MPH

Abstract
During the last decade numerous investigators have studied the posited relationship between periodontal disease in pregnant women and adverse pregnancy outcomes such as premature labor, pre-term deliveries, small-for-gestational age infants, early or late miscarriages, low birth weights and pre-eclampsia. This article presents the results of a comprehensive literature review of these investigations as well as other articles containing similar summaries or commentaries about the studies. The review objective was to ascertain and summarize what the investigators have concluded about this topic. Articles were obtained from the authors’ files, references provided in other publications, articles shared by colleagues, and articles listed in PubMed©, many of which were obtained through interlibrary loans at the University of Utah, Salt Lake City, Utah. The authors identified 67 initial articles. Of those 67, 39 contained original empirical data. Twenty-three of the 39 disclosed positive associations, 5 disclosed no associations, 7 revealed mixed associations (both positive and no associations depending on the variables analyzed). Another 4 articles analyzed, in a preliminary sense, the role of pathogens as potential causal explanations for positive associations. The remaining articles contained summaries or commentaries about previously reported data or impending studies. Despite all of the research that has occurred, clearly there still isn’t sufficient evidence to conclude or explain definitively a causal relationship between periodontitis in pregnancy and adverse pregnancy outcomes. The only definitive conclusion that can be reached is that there is a lot of evidence that women who have had adverse pregnancy outcomes have more of a tendency to have periodontitis than those who do not.
Introduction

The topic of the posited relationship between periodontal disease (periodontitis) in pregnant women and adverse pregnancy outcomes (premature labor, pre-term deliveries, small-for-gestational age infants, early or late miscarriages, low birth weights and eclampsia or preeclampsia) has received a lot of attention among researchers. During the last decade numerous investigators\textsuperscript{1-67} have reported or commented on the results of studies focusing on the topic. The majority of the empirical studies (at least twenty-three \textsuperscript{3-4,10,15,19,22,26,28-29,34,36-38,40,43,47-48,56,58,62,64-65,67}), which include a range of methodological approaches and interventions, from prospective case-control studies to retrospective, non case-control studies using convenience samples, demonstrate to one degree or another a positive association between the presence of periodontal disease in pregnant mothers and diverse adverse pregnancy outcomes. This paper is devoted to a comprehensive literature review of the articles pertaining to this topic.

Methodology for Literature Review

Studies analyzed for inclusion in this literature review were identified from various sources: (1) Personal files of the authors. (2) References listed by previous investigators in their published articles. (3) Articles shared among colleagues. (4) Articles listed through PubMed\textsuperscript{©}, a service of the National Library of Medicine and the National Institutes of Health. Copies of many of the articles were obtained through an interlibrary loan service of the University of Utah, Eccles Health Sciences Library, Salt Lake City, Utah.

The current authors read and examined the articles with the objectives of determining their contents in order to categorize them, i.e., empirical vs. non-empirical, positive associations, no associations, mixed results, summaries of previous studies; and to summarize the key findings and significance of disclosed associations. The current authors believe that the literature reviewed in this paper represents a relatively comprehensive list of studies pertaining to the topic as reported in the scientific literature over the last decade. No attempts were made to eliminate any particular periodicals except for those that may have been published in a foreign language for which English translations were locally unavailable. Table 1 is a numerical summary of the articles reviewed.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|}
\hline
Articles initially identified & 67 \\
\hline
Articles containing original empirical data & 39 \\
\hline
Articles with empirical data disclosing positive associations & 23 \\
\hline
Articles with empirical data disclosing no associations & 5 \\
\hline
Articles with empirical data disclosing mixed associations & 7 \\
\hline
Articles analyzing causal mechanisms via the role of pathogens & 4 \\
\hline
Articles containing summaries or commentaries about previously reported data or impending studies & 28 \\
\hline
\end{tabular}
\caption{Summary of Number of Articles Reviewed}
\end{table}
Results
This section delineates the results of the literature review. Literature is summarized in three categorical areas derived from the review process: (1) Studies Reporting Positive Associations; (2) Studies Reporting No Associations; (3) Studies Reporting Mixed or Equivocal Findings or Summaries of Previous Research Findings.

Studies Reporting Positive Associations
Possibly the first evidence of a positive relationship was reported in 1996 by Offenbacher, et al. A case-control study of 124 pregnant or postpartum mothers, divided into case (preterm low birth weight or PLBW) and control (normal birth weight or NBW) groups, disclosed worse periodontal disease among the former than the latter. The authors concluded that periodontal disease is a statistically significant risk factor for PLBW.

Other studies were reported in 1998. Davenport, et al., examined the relationship between maternal periodontal disease and PLBW. In their case-control study of 177 subjects, it was found that the extent and severity of periodontal disease were higher than predicted and may have reflected elevations in gingival inflammation associated with pregnancy.

Dasanayake, in a 1:1 matched case-control study of 55 pairs of pregnant women, in which control variables were introduced, found that mothers of LBW infants were shorter, less educated, married to men of lower occupational status, had less healthy areas of gingival and more areas with bleeding and calculus, and gained less weight during pregnancy. The author concluded that poor periodontal health of the mother is a potential risk factor for LBW.

In another study of 1,313 pregnant women, Jeffcoat, et al., found that the data showed an association between the presence of periodontal disease at 24 weeks’ gestation and subsequent preterm birth.

In 2001, Offenbacher, et al., again reported on another five-year prospective study of 814 pregnant women. Their aim was to determine whether maternal periodontitis contributed to the risk for prematurity and growth restriction in the presence of traditional obstetric risk facts. The investigators concluded that the study provided evidence that periodontitis and incident progression are significant contributors to obstetric risk for preterm delivery, low birth weight and low weight for gestational age.

Lopez, et al., conducted a randomized controlled study of 400 Chilean pregnant women with periodontal disease, randomly assigning 200 to an experimental group and 200 to a control group. They found that the incidence of PLBW in the treatment group was 1.8% and in the control group was 10.1%. In fact, periodontal disease was the strongest factor related to PLBW. Other factors significantly associated with PLBW were less than six pre-natal visits and maternal low weight gain.
In 2002, Riche, et al.,\textsuperscript{47} reported on their study of 1,020 women, 47 of whom had preeclampsia. They found a strong association between periodontal disease status at enrollment and rate of premature delivery observed among preeclamptic women after adjusting for major risk factors, including maternal race, age, marital status, and use of WIC (women, infants’, children’s’ program) or food stamp services.

To determine if maternal periodontal disease is associated with the development of preeclampsia, Boggess, et al.,\textsuperscript{40} studied 1,115 healthy pregnant women. After adjusting for other risk factors, they observed that active maternal periodontal disease during pregnancy is associated with an increased risk for the development of preeclampsia.

In the ensuing years, other studies have followed. Jeffcoat, et al.,\textsuperscript{38} conducted a pilot study of 366 women, randomized to one of three treatment groups, and compared with an untreated reference group of 723 pregnant women. They noted that performing scaling and root planing in pregnant women may reduce preterm birth.

Radnai, et al.,\textsuperscript{36} conducted a case-control study of postpartum women, 41 in a case group and 44 in a control group. A significant association was found between preterm birth and early localized periodontitis of patients.

A study by Goepfert, et al.,\textsuperscript{34} of a convenience sample of 59 women who experienced a spontaneous preterm birth (SPB) at <32 weeks gestation, versus a control group of 36 women who experienced an indicated preterm birth at <32 weeks gestation, versus 44 women who experienced an uncomplicated term birth (TB) was revealing. The SPB group had significantly more extensive periodontitis than the TB group. Moreover, after controlling for maternal age, race, education, insurance status, parity, history of a SPB and smoking, women with severe periodontitis were almost three times as likely to experience a SPB as those without severe periodontitis.

In 2005, Marin, et al.,\textsuperscript{26} reported on a study of 152 pregnant women, divided into three groups: healthy, gingivitis and periodontitis. They concluded that periodontal disease in normal Caucasian pregnant women, older than 25 years, is statistically associated with a reduction in infant birth weight.

Another study by Moliterno, et al.,\textsuperscript{22} of 151 mothers, 76 in a case group and 75 in a control group, relying upon data from hospital registration records, indicated that periodontitis was a risk factor for low birth weight, similar to other risk factors already recognized by obstetricians.

Coming on the research scene again, Lopez, et al.,\textsuperscript{19} reported the results of a randomized control trial of 870 pregnant women from Santiago, Chile. A treatment group of 580 women received periodontal treatment before 28 weeks gestation. A control group of 290 women received periodontal treatment after delivery. The treatment group had significantly reduced PTLBW.
More recently in 2006, Sadatmansouri, et al., reported the results of clinical trial research of 30 pregnant women (18-35 years of age) with moderate to severe periodontitis, 15 of which receive periodontal treatments and 15 of which did not receive treatments. The authors concluded that periodontal therapy results in a reduction in the PLBW rate.

Results of a prospective study were published by Offenbacher, et al. They studied 1,020 pregnant women who received antepartum and postpartum periodontal examinations. It was found that maternal periodontal disease increased relative risk for preterm or spontaneous preterm births. In fact, periodontal disease progression during pregnancy was found to be a predictor of more severe adverse pregnancy outcome of very preterm birth, independent of traditional obstetric, periodontal and social domain risk factors.

Boggess, et al., also studied prospectively 1,017 women, risk ratio adjusted for age, smoking, drugs, marital and insurance status and preeclampsia. Their conclusion was that moderate or severe periodontal disease in early pregnancy is associated with delivery of a small-for-gestation-age infant.

**Studies Reporting No Associations**
At least five of the empirical studies reported disclose no evidence of relationships between periodontal disease in pregnant women and adverse pregnancy outcomes.

Davenport, et al., reported in 2002 the results of a case-control study of 236 pregnant women cases and a daily random sample of 507 controls. They found no evidence for an association between PLBW and periodontal disease. They concluded that the results do not support a specific drive to improve periodontal health of pregnant women as a means of improving pregnancy outcomes.

In 2004, Moore, et al., completed and reported a prospective study of 3,738 women. They found no significant relationships between the severity of periodontal disease and either preterm or LBW. They observed, however, that there did “appear” to be a correlation between poorer periodontal health and those that experienced a late miscarriage. The major conclusion of the study was that there was no association between either preterm birth or LBW and periodontal disease in the study population.

A study was also conducted by Noack, et al., and reported in 2005. Of 59 pregnant women with a high risk of LBW (suffering from preterm contractions) versus 42 women with no preterm contractions and infants appropriate for date and weight, there were no significant differences between the groups in any aspects of the studied periodontitis parameters. Periodontitis was not noted to be a detectable risk factor for PLBW in pregnant women.
Also reported in 2005 was a study by Lunardelli and Peres. They tested the potential link between periodontal disease in pregnant women and LBW or prematurity. Relying on a population-based, cross-sectional study of 449 parturients in Southern Brazil, they found no association between the variables.

Michalowicz, et al., sought to study the effect of nonsurgical periodontal treatment on preterm birth. Their 2006 reported study of 823 women included random assignment of 413 patients to a treatment group which received scaling and root planning, compared to 410 patients in a control group which received no treatment. The authors concluded that treatment of periodontitis improves periodontal health and is safe, but does not significantly alter the rates of preterm birth, LBW or fetal growth restriction.

Studies Reporting Mixed or Equivocal Findings or Summaries of Previous Research Findings
The remainder of the published articles we analyzed, both empirical and nonempirical reveal mixed findings, focus in a preliminary sense on the study of the role of antigens or pathogens in explaining the relationship, or provide summary commentary (from other literature reviews) about conclusions derived from studies already conducted. For example, Farrell, et al., reported mixed findings in their prospective study of 1,793 women reported never previously smoking. There was, in fact, an association between some measures of periodontal disease and late miscarriage, but no association between periodontitis and preterm birth or LBW in the study population.

In an earlier study Moreu, et al., based on examinations of 96 pregnant women in first, second and third trimester of pregnancy, observed mixed findings. They reported that periodontal disease is a significant risk factor for LBW but not for pre-term delivery.

Buduneli, et al., evaluated the possible link between periodontal infections and PLBW for post-partum women with low socioeconomic characteristics. They found no statistically significant differences between the cases and the controls regarding dental and periodontal parameters. Bacterial load scores, however, were significantly higher in the controls than in the cases.

Similarly, but conversely, Mitchell-Lewis, et al., in a study of 213 pregnant women, with 74 assigned to a treatment group and 90 to a non treatment group, found mixed results. They observed no differences in clinical periodontal status between the two groups. However, PLBW mothers had significantly higher levels of certain bacteria.

Some studies are beginning to identify potential pathogens (organisms) and the potential roles they may play in fostering the relationship. Hill (1998), examined the effects of a complex of bacterial vaginosis microbes and their impact of PLBW. The study provided evidence associating maternal periodontal disease with PLBW taken with the isolation of F. nucleatum, Capnocytophaga, and other oral species from amniotic fluid.
Dasanayake, et al.,\textsuperscript{52} studied 448 women, predominantly African American and socioeconomically homogeneous, using case and control groups. Their data showed that LBW deliveries were associated with a higher maternal serum antibody level against P. gingivalis at mid-trimester. The association remained significant after controlling for smoking, age IgG levels against other selected periodontal pathogens, and race.

One analytical study in 2001 by Madianos, et al.,\textsuperscript{55} of 812 deliveries from a cohort study of pregnant mothers presented measures of maternal periodontal infection using whole chromosomal DNA probes to identify 15 periodontal organisms within maternal periodontal plaque sampled at delivery. A conclusion was proffered: the high prevalence of elevated fetal IgM to C. rectus among premature infants raises the possibility that this specific maternal oral pathogen may serve as a primary fetal infectious agent eliciting prematurity.

A study reported in 2006 by Yiping, et al.,\textsuperscript{9} or 34 pregnant women also provided some direct evidence of oral-utero microbial transmission. The authors stated that their observations suggested a Bergeyella strain identified in the patient’s intrauterine infection originated from the oral cavity.

Some of the reported studies mentioned previously have engendered commentary about the reliability and validity of the investigations, some of it controversial about whether some of the results from different studies are in conflict, or about the need for more skillful appraisals of the methodologies used in the analyses. One commentator, Ahearne,\textsuperscript{31} suggested that “the concept of evidence based dentistry is an honorable one, but the reality is that it can become very confusing for the practicing dentist when different studies ask the same question but come up with different answers.” Ahearne first referred to the study by Moore, et al.,\textsuperscript{35} in which no positive relationship was found between periodontal disease and pre-term birth or LBW. Secondly, he noted that the very same month Radnai, et al.,\textsuperscript{36} asked a very similar question and came to the conclusion that periodontitis was an important risk factor for pre-term birth. The conclusion of the letter was that “if the difference in the outcomes of the studies is due to the difference in the populations studied then, surely it raises some questions about the validity of clinical trials in general.”

In a follow-up research letter, Beckett, et al.,\textsuperscript{25} using “a systematic process of critical appraisal, discovered that one of the studies contained a far more reliable evidence source than the other.” They recommended that “practitioners must develop critical appraisal skills. It is important not to fall into the trap of assuming because a paper is published in a referred journal, it must be sound. . . .”

One interesting study contained an insightful meta-analysis of previous research. Khader and Ta’ani,\textsuperscript{29} in a methodologically sophisticated review of previous studies, utilizing independently abstracted data from the studies, found that periodontal diseases in the pregnant mother significantly increases the risk of subsequent pre-term birth or LBW. Their conclusion was based on two previous case-control studies and three prospective
cohort studies that met prestated meta analysis inclusion criteria. Another interesting conclusion was reached: “there is no convincing evidence, on the basis of existing case-control and prospective studies, that treatment of periodontal disease will reduce the risk of pre-term birth.”

**Conclusions**
The majority of reported studies indicate a positive association between periodontitis in pregnant mothers and adverse pregnancy outcomes. Although a plethora of research has already occurred, clearly there still isn’t sufficient evidence, however, to conclude a causal relationship between the presence of periodontitis and adverse pregnancy outcomes. The only definitive conclusion that can be reached is that there is a lot of evidence of a positive association of periodontitis with adverse pregnancy outcomes. In other words, those women who have had adverse pregnancy outcomes have more of a tendency to have periodontitis than those who do not. This fact is evident even when various control variables are analyzed as potential explanations or reasons for the relationship. The precise mechanisms or chemical processes that would establish a definitive causal relationship have not yet been unequivocally identified. Further research to identify and isolate causal mechanisms or processes still needs to be undertaken. It would be wise to conduct a prospective case-control study in which an adequate sample of subjects is included, and multiple regression is applied to assess the independent contributions (amount of variance accounted for) of various variables that are known to predispose to adverse pregnancy outcomes.

Despite the lack of conclusive causal explanations, proper prophylaxes should still be encouraged. There isn’t any evidence to suggest that proper prophylaxes won’t be beneficial to pregnant women, and it is likely more prudent to err on the side of prevention rather than doing nothing.

**References**


Abstract
Preterm birth is the major cause of neonatal mortality and morbidity. Recent studies have suggested that there may be an association between periodontal disease and delivery of preterm and or low birth weight infants. This paper summarizes the results of a pilot study conducted to evaluate the relationship between periodontal disease and preterm low birth weight. This study also explores whether providing clinical preventive periodontal intervention can reduce the risk of adverse birth outcomes. The findings of this evaluation study indicate that there are potential avenues which can be explored to develop a cost analysis for periodontal treatment to be included as a covered benefit for pregnant women.

Introduction
Preterm birth (PTB) is a major public health problem. The rate of preterm birth has increased significantly in the last decade. In 2004, 12.5% of the births in the U.S. were preterm (i.e., occurred before 37 weeks of gestation) (Centers for Disease Control and Prevention, 2006). Preterm birth and associated low birth weight (PLBW) represent the major causes of neonatal mortality and morbidity, including neurodevelopmental disabilities, congenital anomalies and behavioral disorders (Vohr et al., 2000). It is estimated that, each year, more than five billion dollars are spent in the U.S. for neonatal care, with the majority of this amount consumed in caring for PLBW infants (Khader, 2005).

Although about half of PTBs have no known risk factors linked with them (Iams et al., 2001), there is emerging evidence of the association between periodontal infection and the risk of PLBW. Studies in this area, using a
variety of research designs, have resulted in varied findings. Offenbacher et al. (1996) found a statistically significant association between periodontal disease in pregnant women and PLBW infants. The authors determined that mothers with periodontal infection had more than seven times the risk of delivering a PLBW infant, even after adjusting for other potential risk factors. Jeffcoat et al. (2001) also found an association between periodontal infection and PTB. A randomized controlled trial concluded that periodontal disease appeared to be an independent risk factor for PLBW and that periodontal therapy significantly reduced the rates of PLBW in the women with periodontal disease (Lopez et al., 2002). On the other hand, several epidemiologic studies have concluded that there was no association between periodontal disease and birth outcomes (Davenport et al., 2002; Moore et al., 2004).

Previous studies have not assessed the association between periodontal disease and PLBW among the Medicaid population. Hence, this Utah pilot study, using a sample of pregnant women enrolled in Medicaid, was undertaken to: 1) understand the extent of periodontal disease among pregnant women; 2) assess the association between periodontal disease and PLBW; and 3) determine the possible benefits of preventive intervention in reducing the risk of PLBW. This project represented an effort to evaluate the current standard of care provided by Medicaid, and was a collaborative endeavor between Health Care Financing (Medicaid) and the Maternal and Child Health Bureau both part of the Utah Department of Health (UDOH).

**Materials and Methods**

**Study Population**
The study population consisted of pregnant women enrolled in Medicaid. Medicaid eligibility for pregnant women in Utah is at 133% of the Federal Poverty Level. Originally this study planned to include three Medicaid Family Dental Plan (FDP) clinics: South Main Clinic in Salt Lake City, Ellis Shipp Clinic in West Salt Lake City, and Provo Clinic. However, during the implementation stage, the study was limited to the South Main dental clinic located in Salt Lake County (the most populous county in Utah). The Institutional Review Board at UDOH reviewed and exempted the study from requiring approval on the basis that the study would serve as a program evaluation “pilot” project. The research group from Medicaid requested that the Department of Workforce Services refer Medicaid eligible pregnant women to this clinic. When women came for their dental visits, they were asked if they would be willing to participate in this pilot study. After the verbal consent was received, the FDP clinic staff administered an intake questionnaire, which included pregnancy history, medical conditions, and demographic information. The completed intake questionnaire containing the subject’s signature served as the final consent for participation in the study. Based on this convenience sample, a total of 460 pregnant women were recruited for this study.
**Measurement of clinical periodontal status**

The periodontal examination was performed using a tool called a PSR™ (Periodontal Screening & Recording, American Dental Association, 1992). The PSR is a specifically designed periodontal probe that features a 0.5mm balled end and a colored band extending from 3.5 to 5.5mm from the tip. A PSR score is determined by assessing how much of the colored band on the PSR probe is visible when the PSR probe is placed in the gingival crevice. The scoring system ranges between 0 – 4. A detailed description of PSR coding is provided in Chart 1. All study participants received a full mouth periodontal assessment. The mouth was divided into sextants--maxillary right, anterior, and left; mandibular left, anterior, and right--and a numeric score was assigned to each area. A dentist, who had been calibrated prior to the study, conducted all clinical periodontal examinations at the project site.

**Chart 1: Description of PSR coding**

<table>
<thead>
<tr>
<th>Score</th>
<th>Diagnosis Criteria</th>
</tr>
</thead>
</table>
| Code 0 | Colored area of probe remains completely visible in the deepest crevice in the sextant.  
- No calculus or defective margins detected  
- Gingival tissues are healthy with no bleeding on probing |
| Code 1 | Colored area of probe remains completely visible in the deepest probing depth in the sextant.  
- No calculus or defective margins detected  
- There is bleeding on probing |
| Code 2 | Colored area of probe remains completely visible in the deepest probing depth in the sextant.  
- Supra- or subgingival calculus detected, and/or  
- Defective margins detected |
| Code 3 | Colored area of probe remains partly visible in the deepest probing depth in the sextant. |
| Code 4 | Colored area of probe completely disappears, indicating probing depth greater than 5.5 mm. |

The criteria used to determine the presence of periodontal disease were based on PSR scores. Study participants with PSR scores under 3 in all sextants were defined as exhibiting no periodontal disease. Women with a score of 3 or greater in one or more sextant(s) were diagnosed as having periodontal disease.
**Study intervention**
After the periodontal assessment, the study participants were screened for intervention eligibility. Only pregnant women between 22 and 26 weeks gestation with periodontal disease were eligible to receive preventive clinical intervention or periodontal treatment. The intervention in this study consisted of dental prophylaxis, including rubber cap polish and periodontal deep scaling. Those women with periodontal disease who received periodontal treatment were defined as the “intervention” group. The intervention group also received instruction in oral hygiene. Those women who were diagnosed with periodontal disease, but who did not return to the clinic to receive the periodontal treatment or did not receive treatment within the 22-26 week window, were defined as the “non-intervention” group. During the planning stage of the study, an anticipated 30% no-show rate for the dental prophylaxis treatment was anticipated. Group designation was recorded in each subject’s treatment chart. The same examiner performed all examinations and measurements.

**Data collection**
The recruitment of study participants was done over a three-year period (October 2003 to September 2006) at the South Main project site. Socio-demographic information, pregnancy and medical history were collected at baseline by a structured intake questionnaire. This collection of information was followed by a clinical full-mouth periodontal examination where a PSR score was recorded. The FDP clinic staff reminded participants of their scheduled periodontal intervention appointments. PSR scores and the types of interventions given were recorded on the subject’s treatment form.

Information on labor/delivery, birth outcome and health of the newborn were collected from birth certificate data. All intake questionnaires and treatment forms were provided to UDOH by the project site dental clinician for data entry and linkage with birth certificate data.

**Study Outcomes**
Gestational age and birth weight were selected as the main birth outcome characteristics of interest. Additionally, birth outcome characteristics were further subdivided into several categories: preterm (<37 weeks gestation), extreme preterm (<32 weeks gestation), low birth weight (LBW, <2,500 g), very low birth weight (VLBW, <1,500 g), and PLBW (<37 weeks gestation and <2,500g). Birth outcomes were determined by linking dental clinic data (intake and treatment forms) with birth certificate data. The calculation of gestational age at delivery was based on the clinical estimate of gestation recorded on the birth certificate. This clinical estimate on the birth record is defined as the age in total weeks completed from the last menstrual period date to the date of delivery.

**Statistical Analyses**
The dental clinic data were merged with birth certificate 2003-2006 data. Since the birth certificate 2006 data were not finalized at the time of analysis, preliminary 2006 birth data (available through Medicaid Data Warehouse) were used for this pilot study. Linkage was performed in multiple cycles using both deterministic
and probabilistic approaches. Analyses for this study included descriptive statistics, chi squared tests, t-tests and logistic regression. All analysis was performed using SAS version 9.1.

**Results**

A total of 460 pregnant women were recruited from the FDP clinic to participate in this pilot study. These dental clinic data were merged with birth certificate data. Deterministic linkage generated 403 matched records from the possible 460 dental clinic records. Use of mother’s name, date of birth (DOB), and infant delivery date generated an additional 14 matched records, yielding a total of 417 cases. Forty-three cases were unmatched due to incomplete information (missing DOB and names), miscarriages, or fetal deaths. Women with multiple gestations were excluded from the analysis. A total of 400 women with singleton births were included in the final study sample. Table 1 summarizes the characteristics of the study participants. The majority (71.7%) of the study participants were 20–29 years old. About ninety-two percent of the participants were white. Thirteen percent

<table>
<thead>
<tr>
<th>Table 1: Demographic Characteristics of Study Participants</th>
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<tbody>
<tr>
<td>Characteristics</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>≤19</td>
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<tr>
<td>20-24</td>
</tr>
<tr>
<td>25-29</td>
</tr>
<tr>
<td>≥30</td>
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<tr>
<td>Education</td>
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</tr>
<tr>
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<tr>
<td>&gt;High School</td>
</tr>
<tr>
<td>Race</td>
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</tr>
<tr>
<td>Non-white</td>
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<td>Ethnicity</td>
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<td>Nulliparous</td>
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<td>Multiparous</td>
</tr>
<tr>
<td>Tobacco use during pregnancy</td>
</tr>
<tr>
<td>Prenatal Care at 1st Trimester</td>
</tr>
<tr>
<td>Previous preterm birth</td>
</tr>
</tbody>
</table>

Number may not sum to total due to missing values.
of the study population was of Hispanic/Latina ethnicity. Close to one in five (18.1%) women smoked during pregnancy. More than three-fourths (77.8%) of women began prenatal care during their first trimester. Approximately five percent of women had a history of previous preterm birth.

A summary of the periodontal disease status of study participants based on PSR scores is presented in Table 2. PSR scores of 0-2 indicate a gingival pocket depth of less than 3.5 mm, and were considered as absence of periodontal disease. Scores of 3-4 indicate a pocket depth of at least 3.5 mm or greater, and were considered as indication of the presence of periodontal disease. More than a third (40.5%) of the participants was diagnosed with periodontal disease.

<table>
<thead>
<tr>
<th>Table 2: Periodontal Disease Status</th>
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<tr>
<td>Presence of periodontal disease</td>
</tr>
<tr>
<td>No (PSR code ≤2)</td>
</tr>
<tr>
<td>Yes (PSR code ≥3)</td>
</tr>
</tbody>
</table>

Women participating in the study diagnosed with periodontal disease were eligible to receive a clinical preventive intervention between 22–26 weeks’ gestation. Of the 162 women with periodontal disease, 108 women received the intervention. The remaining 54 women with periodontal disease who did not receive intervention became the comparison group against which to evaluate the birth outcomes and benefits of the interventions. Table 3 provides the demographic characteristics, and the pregnancy and medical history characteristics of both intervention and non-intervention groups. The average ages of intervention and non-intervention groups were similar. However, there was a significant difference in educational levels between the groups. The intervention group had a higher proportion of women with education beyond high school compared to the non-intervention group (33% vs. 21%, p=.05). The non-intervention group contained a higher percentage of nulliparous women and smokers than the intervention group, although these differences were not statistically significant. Eight women in the intervention group had a history of preterm birth compared to only one in the non-intervention group. The data illustrate that a higher proportion of women in the non-intervention group had urinary tract infections and bacterial vaginosis compared to women in the intervention group, but the differences were not statistically significant. In both groups, all women with infections had treatment, as reported on the intake form.
Table 3: Characteristics of Intervention and Non-Intervention Groups

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Intervention Group* (n=108)</th>
<th>Non-Intervention Group** (n=54)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
</tr>
<tr>
<td>Age</td>
<td></td>
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</tr>
<tr>
<td>≤19</td>
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<td>20-24</td>
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<td>25-29</td>
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<tr>
<td>≥30</td>
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<tr>
<td>Average Age (SD)</td>
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<td></td>
<td>25.4 ±5.5</td>
</tr>
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<tr>
<td>High School</td>
<td>30</td>
<td>28.0</td>
<td>25</td>
</tr>
<tr>
<td>&gt; High School</td>
<td>35</td>
<td>32.7</td>
<td>11</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>95</td>
<td>88.8</td>
<td>49</td>
</tr>
<tr>
<td>Non-white</td>
<td>12</td>
<td>11.2</td>
<td>5</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>13</td>
<td>12.0</td>
<td>6</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>95</td>
<td>88.0</td>
<td>48</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>33</td>
<td>30.6</td>
<td>19</td>
</tr>
<tr>
<td>Multiparous</td>
<td>75</td>
<td>69.4</td>
<td>35</td>
</tr>
<tr>
<td>Tobacco use during pregnancy</td>
<td>25</td>
<td>23.2</td>
<td>15</td>
</tr>
<tr>
<td>Prenatal Care at 1st Trimester</td>
<td>84</td>
<td>77.8</td>
<td>37</td>
</tr>
<tr>
<td>Previous preterm birth</td>
<td>8</td>
<td>7.4</td>
<td>1</td>
</tr>
<tr>
<td>Infections</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Urinary Tract (UTI)</td>
<td>14</td>
<td>13.0</td>
<td>8</td>
</tr>
<tr>
<td>Received treatment for UTI</td>
<td>14</td>
<td>13.0</td>
<td>8</td>
</tr>
<tr>
<td>Vaginosis (BV)</td>
<td>4</td>
<td>3.7</td>
<td>4</td>
</tr>
<tr>
<td>Received treatment for BV</td>
<td>4</td>
<td>3.7</td>
<td>4</td>
</tr>
</tbody>
</table>

Number may not sum to total due to missing values

* Women with periodontal disease and who received periodontal treatment
** Women with periodontal disease and who did not receive periodontal treatment
In order to assess the relationship between periodontal disease and adverse birth outcomes, analysis included women with no periodontal disease (PSR code <2) and those with periodontal disease who received no intervention. We excluded the women with periodontal disease and who received periodontal treatment from this particular analysis. The comparisons of birth outcomes are presented in Table 4. The rates of PLBW were slightly higher among women with periodontal disease (non-intervention group) compared to women without periodontal disease (5.3% vs. 3.9%), however, these differences were not statistically significant even controlling for the effects of smoking. The data shows that there were no significant associations between periodontal disease and adverse birth outcomes (preterm, low birth weight, or preterm low birth weight).

**Table 4: Periodontal Disease and Birth Outcomes**

<table>
<thead>
<tr>
<th></th>
<th>All (n=400)</th>
<th>Women without periodontal disease (n=238)</th>
<th>Non-Intervention Group* (n=54)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm (&lt;37 wks)</td>
<td>8.9%</td>
<td>9.8%</td>
<td>7.9%</td>
<td>.71</td>
</tr>
<tr>
<td>Low birth weight LBW (&lt;2500 g)</td>
<td>6.8%</td>
<td>6.4%</td>
<td>5.3%</td>
<td>.79</td>
</tr>
<tr>
<td>Preterm low birth weight</td>
<td>4.3%</td>
<td>3.9%</td>
<td>5.3%</td>
<td>.70</td>
</tr>
</tbody>
</table>

* Women with periodontal disease and who did not received periodontal treatment

The impacts of periodontal treatment and associated birth outcomes are shown in Table 5. Infants in the intervention group had a higher average gestational age (38.6 ±2.1 vs. 38.3 ±1.9) and a higher average birth weight (3251.8 ±573.7 vs. 3193.8 ±493.9) than in the non-intervention group, but the differences were not significant. Neither preterm nor extreme preterm categories were significantly different when both groups were examined. This pattern was also observed for LBW and VLBW categories. It is possible that the lack of significant differences in birth outcomes, between the intervention group and the non-intervention group, may be attributed to small numbers rather than the effect of periodontal treatment. Interpretations of results are difficult due to these small numbers.
### Table 5: Impacts of Periodontal Treatment

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Intervention Group* (n=108)</th>
<th>Non-Intervention Group** (n=54)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number Percentage</td>
<td>Number Percentage</td>
<td></td>
</tr>
<tr>
<td>Average gestation week (SD***)</td>
<td>38.6 ±2.1</td>
<td>38.3 ±1.9</td>
<td>0.43</td>
</tr>
<tr>
<td>Preterm (&lt;37 wks)</td>
<td>7  6.5</td>
<td>3  5.6</td>
<td>0.82</td>
</tr>
<tr>
<td>Extreme Preterm (&lt;32 wks)</td>
<td>1  0.9</td>
<td>1  1.9</td>
<td>0.62</td>
</tr>
<tr>
<td>Average birth weight g ( SD***)</td>
<td>3251.8 ±573.7</td>
<td>3193.8 ±493.9</td>
<td>0.33</td>
</tr>
<tr>
<td>Low birth weight LBW (&lt;2,500 g)</td>
<td>7  6.5</td>
<td>2  3.7</td>
<td>0.47</td>
</tr>
<tr>
<td>Very low birth weight VLBW (&lt;,1500 g)</td>
<td>2  1.9</td>
<td>1  1.9</td>
<td>1.00</td>
</tr>
<tr>
<td>Preterm low birth weight PLBW</td>
<td>4  3.7</td>
<td>2  3.7</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* Women with periodontal disease and who received periodontal treatment
** Women with periodontal disease and who did not received periodontal treatment
*** Standard deviation

### Discussion

Preterm birth in Utah is of great concern to public health professionals, because preterm infants are at significant risk for serious and lasting health problems. In 2005, of the 51,517 live births in Utah, 10% were preterm. Among the total Medicaid population the preterm rate was higher, at 11%. The state singleton preterm birth rate was 8%, while the Medicaid rate was close to 10%.

The average costs associated with one preterm infant range from $8,000 to more than $70,000 (UDOH, 2005). Based on 2005 hospital discharge data, $165 million were spent statewide on the care of preterm infants. The Medicaid population accounted for 39% of premature births (n=1,981) and consumed more than $63 million (UDOH, 2005). The costs of caring for these numbers of preterm infants are staggering, both in terms of immediate health care dollars and long-term impacts on families and society.

While the economic expense associated with PLBW infants is huge, the cost of providing thorough periodontal intervention is modest. The cost of periodontal treatment that includes dental prophylaxis, scaling, and root planing averages from approximately $32 to $1,000 per patient. Even if providing such periodontal intervention
to pregnant women had only modest impacts on the incidence of preterm birth, the economic savings would be immense.

The UDOH conducted this pilot project as a program management/program evaluation study for the purpose of optimizing service delivery. One of the purposes of this study was to understand the extent of periodontal disease among the Medicaid population of pregnant women in Utah. It was found that more than one third (41%) of women referred for dental care to the study site were diagnosed as having periodontal disease. This study also found no statistically significant association between periodontal disease and risk of PLBW. The data indicated that the periodontal intervention did not significantly alter rates of PLBW.

There are important limitations to keep in mind as the results of this pilot study are compared to those of other studies. The study population was based on a convenience sample without any randomization applied. It consisted only of pregnant women who appeared at the Salt Lake County South Main FDP clinic for dental care and who were willing to participate in this study. Initially this study was planned to include multiple dental clinicians in three FDP clinics. However, this pilot study was only implemented in one site. The participation of only one clinic site greatly prolonged the time required to gather adequate data for analysis. This situation placed an extra burden on one site and limited the possibility of generalizing the findings of the study to the entire Medicaid pregnant population in Utah. The small numbers of women in the intervention and non-intervention groups, made it unfeasible to control for potentially confounding factors. Larger numbers of cases are necessary to provide more reliable estimates of statistical significance.

The results of the pilot study may not be comparable with those of other studies due differences in clinical preventive interventions. Other studies have often included plaque control, scaling, and root planing as preventive interventions (Lopez et al., 2002; Offenbacher et al., 1996). In this UDOH study, rubber cap polish and periodontal deep scaling were offered as interventions. Root planing was not offered. The criteria for the diagnosis of periodontal disease also vary from study to study.

The optimal time for providing dental care to pregnant women for maximum effectiveness in impacting preterm birth is unknown. It is possible that periodontal intervention was delivered too late in pregnancy for maximum impact on birth outcome. Studies have varied in terms of the timing of interventions. Some offered the interventions before 20 weeks’ gestation, while others offered interventions before 35 weeks’. The window of intervention for this study was set between 22-26 weeks. The recommendation made by Michalowicz et al. (2006, p.1893) appears wise, that additional studies are needed to determine “whether the provision of periodontal treatment even earlier in pregnancy or before conception might improve birth outcomes.”
A portion of our study population received antibiotics during pregnancy as treatment for infections. Such antibiotic treatment can confound the effects of periodontal interventions (Jeffcoat et al., 2001; Michalowicz et al., 2006). We were unable to control for type of treatment due to lack of data.

Recommendations
Although the present study disclosed no association between periodontal disease and adverse birth outcomes, other research has established possible connections between oral bacteria and systemic diseases, including PLBW. Hence, it is advisable for public health professionals, clinical practitioners, and health care policy makers to make optimal dental care available to all pregnant women. As a means of prevention, it is prudent for pregnant women to be screened for periodontal disease and referred to periodontal specialists in order to avoid the potential for unfavorable birth outcomes. All pregnant women, and women considering pregnancy, should have dental check-ups, including a gingival evaluation. Dental visits during pregnancy provide an ample opportunity to educate women about the importance of oral health both to their own overall health, and to the overall health of their children. Since the emotional and financial costs of prematurity are immense, caution would recommend easy access to periodontal care for all pregnant women. Such a recommendation is consistent with the health guidelines for pregnant women suggested by the Baby Your Baby and Mind Your Mouth programs at the UDOH. The findings of this evaluation study indicate that there are potential avenues which can be explored to develop a cost analysis for periodontal treatment to be considered for inclusion in a benefits package for pregnant women. Preventive interventions have been shown to be more cost effective than treatment.

In the future, further study using a scientifically oriented research design would be prudent. It would provide an opportunity to address the uncertainties raised by the limitations of this pilot study.

References
Acknowledgements

We thank Andrea Height, FDP clinic staff and Tara Johnson MS, for their valuable assistance with this project.
Prescription Drug Use by Women and Men in Utah Medicaid

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This study in a quick view
Substance use and abuse is a factor of great concern to health care stakeholders. The objective of this study was to characterize pharmaceutical prescription utilization among female compared to male Utah Medicaid patients.

• Analgesics, SSRIs, anticonvulsants, and gastric acid secretion reducers were the drug classes with the highest fill rates among female patients covered by Medicaid in Utah
• The majority of patients used multiple prescription drugs throughout the study period
• The drug class with the highest cost was the antipsychotics, which had a per-patient cost for female patients at only 40% of that for male patients
• Contrary to what was expected based on previous research, the overall per-patient prescription drug cost was not higher among females versus males
• There were differences in drug utilization between age groups; most drug classes showed increasing utilization and cost with increasing age

Background and Introduction
Substance abuse has been formulated as one of the leading health indicators in the Healthy People 2010 framework (U.S. Department of Health and Human Services, 2000). Differences in prescription medication use patterns between males and females have been documented by Roe, et al in a retrospective database analysis of 1,294,295 members of a large pharmacy benefit manager (Roe, McNamara, & Motheral, 2002). Investigators found that compared to men in the United States women generally utilize more medications. This finding has
also been demonstrated worldwide (Obermeyer et al., 2004). Our goal was to evaluate the status of drug usage by women and compare it to that of the men in the Utah Medicaid prescription claims database.

**Study Procedures**

All prescription data for adult patients age 18 and above who were covered for at least 6 months and who filled at least one prescription between January 2005 and September 2006 were used. 70% of the patients were female. Patients were divided by gender and age; age categories were grouped as 18-29, 30-39, 40-49, 50-59, and 60+ years. For each drug class, the proportion of patients that filled at least one prescription within the study period was calculated by gender and age. The top 15 drug classes for each gender-specific age group were reported. The study plan is summarized in Figure 1.

**Results**

**Demographics**

Of all patients eligible for the Medicaid drug plan for at least 6 months during the study period (101,013) 86% were included in this analysis, because they had at least one drug fill during the study period.
Patients between 18 and 29 years constituted the largest group both for women (41%) and men (28%), as shown in Figure 2. 23% of the female patients over 60 and 28% of the male patients over 60 were not older than 64.

Overall, males made up 30% of the study population. However in the age classes between 40 and 59 there was a higher proportion of males (39.5% for the 40 to 49 years old patients and 36.9% for the 50 to 59 year olds) than in the other age groups. The lowest rate of males was found in the 18 to 29 year age group (see Figure 3). This was not surprising given that Medicaid recipients differ in several aspects as the existing entry barriers will favour different populations from one or the other gender.
Absolute Consumption of High Use Drug Classes

Analgesics and narcotics were the drug classes with the highest fill rates and the highest number of users in both gender groups, followed by non-steroidal anti-inflammatory drugs (NSAIDs). The drug classes with the highest cost overall were the anti-psychotics and anticonvulsants.

![Graph showing comparison between male and female study populations for 15 most used drug classes](image)

Figure 1: Comparison between the male (n= 25,976 - upper graph) and the female (n=61,006 - lower graph) study population for three absolute consumption indicators (fills/month, cost, number of patients) for the 15 most used drug classes.

The drug classes used by the highest number of patients were analgesics, NSAIDs, and selective serotonin reuptake inhibitors (SSRIs) among women and the analgesics, NSAIDs, and gastric acid secretion reducers among men. The most obvious difference between men and women in terms of the ranking of drug classes was the use of contraceptives by women (overall rank 12) and the use of thyroid hormones, ranking as the 7th most
used drug class among women. Men displayed a relatively higher use of anti-psychotics, anti-hypertensives, and insulin (see Figure 4).

**Consumption of High Use Drug Classes Relative to Female or Male Population**

Although in absolute numbers, women in the Utah Medicaid prescription database had much higher utilization compared to men, the picture changed when looking at the number of fills per drug class and per patient (see Figure 5). The highest number of fills was registered for the class of analgesics with 4 fills per patient among males and 4.7 fills per patient among females. These numbers correspond to 67% of females and 49% of males having fills for an analgesic (see Figure 6). Anticonvulsants, with 2.3 fills per patient among females and 3.4 fills per patient among males, corresponded to 19 and 23% of female or male patients taking a drug from this class.

Although NSAIDs were associated with a fill rate of 1.7 among females and 1.1 among males, about 48% of females and 31% of males had at least 1 prescription for NSAIDs. Antipsychotic drugs were filled 2.4 times per male patient and 16% of males had at least one fill for an antipsychotic; this was higher than in the female population, which only had 1.1 fill per patient and only 9% had at least 1 fill for an antipsychotic.

![Figure 5: Fills per female or male with at least one drug fill in 21 months](image)

(total n=86,982; Female n= 61,006; Male n = 25,976)
While analgesics were the highest utilized class by the largest number of patients, they were not the most costly. The per-patient cost associated with analgesics was U.S.$186 for females and U.S.$219 for males. Antipsychotic medications had the highest cost per patient at U.S.$ 690 for males versus U.S.$ 278 for females (see Figure 7). This was followed by anticonvulsants at U.S.$391 for males versus U.S.$242 for females. Among females, antipsychotics and anticonvulsants had the highest cost per patient.
The complete ranking for cost in relation to female or male or all Rx users is listed in the table below:

### Table 1: Annual drug cost per user female or male Rx user in Utah Medicaid 2005/2006

<table>
<thead>
<tr>
<th>Drug Classes</th>
<th>GC3 code</th>
<th>Cost (U.S.$/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antipsychotics, (atypical)</td>
<td>H7T</td>
<td>Female 159</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 394</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 229</td>
</tr>
<tr>
<td>Anticonvulsants</td>
<td>H4B</td>
<td>Female 138</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 224</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 164</td>
</tr>
<tr>
<td>Analgesics (incl. Narcotics)</td>
<td>H3A</td>
<td>Female 106</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 112</td>
</tr>
<tr>
<td>Gastric Acid Secret.Red.</td>
<td>D4K</td>
<td>Female 102</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 108</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 104</td>
</tr>
<tr>
<td>SSRIs</td>
<td>H2S</td>
<td>Female 88</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 85</td>
</tr>
<tr>
<td>Lipotropics</td>
<td>M4E</td>
<td>Female 54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 77</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 61</td>
</tr>
<tr>
<td>NSAIDS, COX-Inhibs</td>
<td>S2B</td>
<td>Female 34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 31</td>
</tr>
<tr>
<td>Sedative-hypnotics (non-barbiturate)</td>
<td>H2E</td>
<td>Female 28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 26</td>
</tr>
<tr>
<td>Anti-Anxiety</td>
<td>H2F</td>
<td>Female 17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 17</td>
</tr>
<tr>
<td>Skelet. Musc. Relax.</td>
<td>H6H</td>
<td>Female 17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 17</td>
</tr>
<tr>
<td>ACE inhibitors</td>
<td>A4D</td>
<td>Female 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 15</td>
</tr>
<tr>
<td>beta-Adrenergics</td>
<td>J5D</td>
<td>Female 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 13</td>
</tr>
<tr>
<td>Contraceptives (oral)</td>
<td>G8A</td>
<td>Female 16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 11</td>
</tr>
<tr>
<td>beta-Blockers</td>
<td>J7C</td>
<td>Female 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 7</td>
</tr>
<tr>
<td>Thyroid Horm.</td>
<td>P3A</td>
<td>Female 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 7</td>
</tr>
<tr>
<td>Laxatives, Cathartics</td>
<td>D6S</td>
<td>Female 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All 3</td>
</tr>
</tbody>
</table>
**Age-Related Consumption of High Use Drug Classes in the Female Population**

Among females, the average number of fills per patient within each class was calculated by age group (see Figure 8). The class with the largest number of fills per patient was antipsychotics, with 14.3 fills per patient among patients age 50 to 59. Analgesics, anticonvulsants, thyroid hormones and insulin also had per-patient fill rates of more than 10 in this age group.

There was an increasing number of fills per patient with increasing age in most drug classes up to age 59. There was a drop in fill rates among patients over age 60, most likely due to the fact that a large percentage of that group was only covered by Medicaid for the first 12 months of the study period. In January 2006, with the introduction of Medicare Part D, many patients over age 65 years were no longer covered by Medicaid.

We also found that some drug classes were used more among younger women (e.g. contraceptives) while others were used more among older patients (e.g. antihypertensives, insulins, bone resorption suppressants etc.).

**Figure 8: Fills per female with at least one fill of the drug analysed by each age group (missing columns indicate that the drug class was not among the 15 high use drug class in that age group)**

---

**Cost per Female by Age Group**

The average cost per patient for each drug class is shown in Figure 9. In general, cost per patient tended to increase with increasing age. For example, the per-patient cost of antipsychotics among patients age 18-29 was U.S.$93.70 and among patients age 50-59 was U.S.$623.40 – an increase by a factor of 7.6. This phenomenon can be explained by both higher fill rate per user (see Figure 8) and an increased percentage of patients using this drug class (see Figure 10).
Figure 9: Cost in U.S.$ per female Rx user of the top drug classes in each age group

Figure 10: The share of women in different age groups using the top drug classes
The antipsychotics class was associated with the highest per-patient cost reaching a cost level comparable to that of the overall male population among females age 50 to 59 (U.S.$690 per patient; see Figure 7)

The cost of anticonvulsants, analgesics, and gastric acid secretion reducers started at U.S.$149, 62, and 54 per patient among women age 18 to 29, and increased to U.S.$431, 380, and 372 per patient among women age 50 to 59.

Discussion
Analgesics were the drug class with the highest number of fills for women and men as well as the highest percentage of the study population using them (see Table 2). SSRIs ranked higher for women and anti-psychotics higher for men. The latter, however, had the highest cost impact for both genders.

In a study on prescription drug use and expenditure in California, analgesics were also the most used drug class with 5.3% of the total population having prescriptions (Bymark & Waite, 2001). There are some striking differences between the Utah Medicaid population and the California general population:

• In the California study, antihypertensives (ACE inhibitors, CCBs, beta-blockers) all ranked very high, while none of them was among the ten most used drugs in the Utah Medicaid female population

• Amoxicillin antibiotics were ranked 5 in the Californian study, but did not appear among the highest 15 in Utah

• In the California study, contraceptives (rank 4) and hormone replacement therapy (rank 10) are much more prominent, even in the general population, than among females in the Utah Medicaid population. In Utah, contraceptives were ranked 12 and hormone replacement was only among the top 15 classes among females between 50 and 59. This high variation may be explained, at least in part, by general cultural differences between populations in the 2 states. In addition, California instituted a program, known as the Family Planning, Access, Care and Treatment Program (Family PACT<sup>c</sup>) in 1997 that promotes access to contraceptives for low income families with the goal of preventing unwanted pregnancies and their consequences.

<sup>c</sup> Administated by the Office of Family Planning (http://www.ofp.dhs.ca.gov/)
Table 2: Ranking of drug classes by fill rate, percentage of population using them or cost

<table>
<thead>
<tr>
<th>Ranked by fills / months</th>
<th>Ranked by Percentage of Study Population Using a Drug Class</th>
<th>Ranked by Cost per Rx User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>1 Analgesics</td>
<td>Analgesics</td>
<td>Analgesics</td>
</tr>
<tr>
<td>2 SSRIs</td>
<td>Anticonvulsants</td>
<td>NSAIDs &amp; COX inhib</td>
</tr>
<tr>
<td>3 Anticonvulsants</td>
<td>Antipsychotics</td>
<td>SSRIs</td>
</tr>
<tr>
<td>4 Gastric Acid Secr. Red.</td>
<td>SSRIs</td>
<td>Gastric Acid Secret.Red.</td>
</tr>
<tr>
<td>5 NSAIDs &amp; COX inhib</td>
<td>Gastric Acid Secr.Red.</td>
<td>Anti-Anxiety</td>
</tr>
<tr>
<td>6 AntiAnxiety</td>
<td>Lipotropics</td>
<td>Anticonvulsants</td>
</tr>
<tr>
<td>7 Thyroid</td>
<td>AntiAnxiety</td>
<td>Skelet. Musc. Relax.</td>
</tr>
<tr>
<td>8 Antipsychotics</td>
<td>ACE Inhibitors</td>
<td>Beta-Adrenergics</td>
</tr>
<tr>
<td>9 Lipotropics</td>
<td>NSAIDs &amp; COX inhib</td>
<td>Contraceptives</td>
</tr>
</tbody>
</table>

It is interesting to note that the percentage of patients using any single drug class in the California study was much lower in our analysis; for example, in California 5.3% of the population had prescriptions for analgesics, compared to 58% of Utah patients. This may be due to the fact that we only calculated usage rates among patients who received at least one prescription, while the California study reported rates among the total population. In addition, we can assume that the overall drug use in a Medicaid population with typically low income and high percentages of chronically ill people will deviate from that of a general mix population. The observation that contraceptives and hormone replacement therapy only make a minor contribution to the drug related gender differences is in line with the observations of Roe et al (Roe, McNamara, & Motheral, 2002).

In an analysis by the Agency for Healthcare Research and Quality (AHRQ) of prescription data from the general outpatient population, investigators found that 44.2% of the population bought at least one central nervous system agent (including analgesics), 37.5% bought a cardiovascular agent, 36.9% bought any kind of hormone, 22% an anti-hyperlipidemic and 20.1% a psychotherapeutic agent (Stagnitti, 2006). These were the 5 drug classes producing the highest cost in the general population.

It has been shown by several researchers, that women in general utilize more drugs than men, that drug cost are also higher for women, and that the ranking of different drug classes differs between women and men. (Obermeyer et al., 2004; Roe, McNamara, & Motheral, 2002; Stagnitti, 2006)
A 'Medical Expenditure Panel Survey Prescribed Medicines' reported that 64% of the total U.S. population had a prescription in 2003. ("2003 Medical Expenditure Panel Survey Prescribed Medicines File", 2005) It is also reported that a higher percentage of the Medicare population (90%) had prescriptions than the non-Medicare population (60%). It was also seen that women represented 55.5% of the Medicare population and caused 58.5% of the Medicare drug expenditure. The general population was composed of 50% women, but they caused 59% of the drug expenditures. In our study, we see that in relation to the 15 drugs used most in the Utah Medicaid population, that male patients represent a higher cost per patient than women (see Table 1). Figure 3 also shows that the gender distribution in Utah Medicaid is significantly different from the distribution in the non-Medicaid populations, with only between 23% (age 18 to 29) and 39.5% (age 40 to 49) being male. Therefore, our results are specific for the type of male or female population being covered for pharmaceutical benefits by Utah Medicaid.

This study reported on the drug consumption rates of women in different age categories. While analgesics remained the most used drug class (about 65 % of all patients) in all age groups, some differences were found in the ranking of the other classes between age groups. For most medications, fill rates increased with increasing age (see Figure 8): Those patients using a drug class seemed to use it more often if they were older. One explanation for that could be that persistency increases with increasing age of the patients. The Utah Medicaid data would have to be analysed in more detail to confirm this assumption.

Limitations

We analysed the prescription claims among in the Utah Medicaid database. The data represent the drug consumption behaviour of a very specific population and cannot necessarily be representative of the general population. In addition, the gender-related findings of this study are restricted to this specific population. For further interpretation, it would be important to understand the demographic, social and health related differences between the female and male populations covered by Utah Medicaid.

In this study drugs were classified according to the Specific Therapeutic Class Code (GC3) published by First Data Bank, Inc. Results may vary if using a different type of classification. For example, different types of antihypertensives will be found in different GC3 groups. If they were pooled into one group, antihypertensives might rank much higher than reported here. For comparability and standardization reasons, we have decided to use the GC3 class without further pooling of data in this study.

Another limitation is related to the changes in the prescription drug coverage for elderly patients. Starting in January 2006, many patients were transferred to the Medicare Part D program and were no longer covered by Medicaid. Therefore, the data for patients over age 60 were only collected for 12 months of the 21 month study.
period. This time difference for a rather large part of the population (see Figure 3) distorted the results for the group over age 60.

References


The Impact of Preventive Care: Public Health Policy Affecting Undocumented Immigrants

Kirsten D. Bradley, BS

Abstract
The United States is facing increasing rates of immigration and increasing numbers of undocumented immigrants. Immigration reform is a current legislative topic and many different approaches have been proposed. Government officials face challenging decisions regarding immigration regulation and public benefits for undocumented immigrants, particularly health care. Most undocumented immigrants are of Mexican descent and many are women with children. Undocumented immigrants demonstrate poorer health than the general population of the United States, and they access the health care system less frequently, with the exception of childbirth-related hospitalizations. Undocumented immigrants have very little access to preventive care, and are frequently afraid of seeking services for which they are eligible because of the threat of deportation.

A number of recent policies have limited undocumented immigrant access to social services such as health care and have resulted in greater cost for more costly emergency procedures, instead of less costly primary care. Future policies should focus on expanding preventive health care coverage for undocumented immigrants, especially prenatal care for women, since it saves money and prevents severe illnesses that can pose public health risks.

Introduction
The United States is a large and diverse nation, and it is a challenge for policies to keep up with the needs of the people. Policy regarding the regulation of immigration into the United States has been particularly poor in recent decades, and there has been a lack of a coherent strategy to provide resources for recent immigrants, particularly undocumented immigrants. In the case of immigrant health care, the interaction between policy, access and use of the health care system, and health outcomes is dynamic and complex.

In several settings, public policy has mandated that providers and institutions limit health care services to undocumented immigrants. These regulations have influenced use of health care and health status, which have in turn influenced policy. Immigrants have responded to policy changes that limit their access with fear and have thus delayed accessing services they need, thereby suffering negative health outcomes (Berk, Schur, Chavez, & Frankel, 2000; Marshall, Urrutia-Rojas, Mas, & Coggin, 2005; McGuire & Georges, 2003; Stati, Hurley, & Katz, 2006; Trossman, 2004). These negative health outcomes are perceived in vastly different ways by policy makers and are used to establish or strengthen issue positions. The interplay between these factors is important to understanding what regulations and resources should be instituted, but it is equally important to find information that accurately portrays the status of immigrants and health care in the United States. It has been unclear for
decades whether or not undocumented immigrants are draining resources from the health care system and to what extent.

People interested in addressing the problems of immigrant health care are found in many levels of government and in public and private organizations, but it has been uncertain whose responsibility it is to develop a solution. Immigration, a nation-to-nation migration, has been a federal issue, but state and local governments have also created and advocated a variety of policies in recent years in response to the seeming inability of the federal government to embrace a uniform plan. The uncertain climate leaves undocumented immigrants unsure about their rights to health care and often afraid of using even the resources for which they are eligible. Ambiguous jurisdiction has also created a complex ethical and legal environment for health care providers.

At a time when immigration law is undergoing major reform, politicians and public health officials can obtain a sense of successful strategies in managing health care problems related to undocumented immigrant access by analyzing the policies of the past twelve years. Both qualitative and quantitative studies of these policies have demonstrated undocumented immigrant access to health care is minimal, that such immigrants are using less health care than U.S. citizens and documented immigrants, and that policies that further limit their access to health care result in negative health outcomes (Berk, Schur, Chavez, & Frankel, 2000; Loue, Cooper, & Lloyd, 2005). Policies that expand undocumented immigrant access to preventive care save money by preventing the need for more costly emergency care, and produce more positive health outcomes (Lu, Lin, Prietto, & Garite, 2000; Marshall, Urrutia-Rojas, Mas, & Coggin, 2005).

Introduction to the Problem of Undocumented Immigration

Composition of United States immigrant population

The United States has always been a country of immigrants, but responding to the needs of increasingly large numbers of new residents has never been more demanding than now. The population of the United States is growing by foreign immigration alone by about 2.8% each year (Weis et al., 2001), and the number of undocumented immigrants coming into the United States is sharply increasing (Rehm, 2003). An immigrant who comes to the United States without documents is an illegal alien resident, dwelling within the country illicitly, and this creates administration and record-keeping problems. About 57% of the 10 million undocumented immigrants that currently reside in the United States are from Mexico (Passel, Capps, & Fix, 2004). Immigration policy has thus been directed toward addressing the influx of crossings of the U.S./Mexican border into the United States. These policies have focused on border patrol efforts and stiffer penalties for border crossers, but they have not been successful at slowing the steadily increasing rate of undocumented immigrants who enter the country each year.
More undocumented immigrants are between ages 18-29 compared to the entire Latino population in the United States (Reed, Westfall, Bublitz, Battaglia, & Fickenscher, 2005). They live in higher rates of poverty and have lower levels of education compared to other Latinos and the general population of the United States (Marshall, Urrutia-Rojas, Mas, & Coggin, 2005). Forty-four percent of noncitizen immigrants are uninsured compared with nineteen percent of immigrants who are U.S. citizens (Prentice, Pebley, & Sastry, 2005).

**Description of Undocumented Immigrants**

In 1993, Governor Pete Wilson of California stated his opposition to public health care funding for undocumented immigrants, even before the introduction of Proposition 187, which he strongly supported. Governor Wilson called for federal legislation to "limit or eliminate the giant magnet of federal incentives that draw foreigners into the county illegally" (Governor Goes Public, 1993). A survey of 972 undocumented Latino immigrants in Fresno, Los Angeles, Houston, and El Paso in 1996-1997 did not support the claim that immigrants come to the United States for free health care and social services. More than half of surveyed immigrants cited jobs/work opportunities as the most important reason they immigrated. The next most common response was to be with family. Less than one percent of respondents considered attaining social services as their primary reason for immigrating. It is unlikely that the respondents would lie about this fact, as they were willing to reveal to interviewers that they were in the country illegally (Berk, Schur, Chavez, & Frankel, 2000).

**Undocumented immigrant health status**

Minorities, immigrants, and people with low incomes are populations more at risk for "poor physical, psychological, and social health" than other populations, according to the United States Department of Health and Human Services (Marshall, Urrutia-Rojas, Mas, & Coggin, 2005). It has been shown that undocumented immigrants are the U.S. population group with the worst health status, a fact that is generally attributed to their high poverty rates and low levels of education (Marshall et al.). Among the diseases affecting undocumented immigrants are communicable infections such as tuberculosis, incidences of which are higher among recent immigrants to the United States than any other population group (Carvalho et al., 2004; Chin et al., 1998).

Undocumented immigrants also face a variety of conditions harmful to mental health, although there has been little research to show whether or not undocumented immigrants are at higher risk for psychiatric disorders than other people. In a 2005 qualitative study, Sullivan and Rehm identified ten themes of mental health stresses affecting undocumented immigrants: failure to succeed in country of origin; dangerous border crossings; limited resources; restricted mobility; marginalization and isolation; blame/stigmatization; vulnerability/exploitability; fear and fear-based behaviors; stress and depression; and poor health.
Health care usage of undocumented immigrants

According to data from the National Health Interview Survey in 1999, 73 percent of Mexican American children are considered by a parent to be in good health by a parent, compared with 85 percent of non-Hispanic White children (Rehm, 2003). Despite the lower perceived health status, Mexican American children are less likely than any other subgroup to have seen a physician in the last year (Rehm). Rehm argues that these data can be generalized to include both documented and undocumented immigrants. Compared with the entire U.S. population, undocumented immigrants visit physicians less frequently and have lower rates of hospital admission (Berk, Schur, Chavez, & Frankel, 2000). Despite poor health, undocumented immigrants are using the health care system less frequently than most American residents—a fact that refutes the claim that illegal aliens abuse health care privileges. The one exception to the lower rates of health care usage among undocumented immigrants is hospitalizations for childbirth. In the Berk et al. study, 3.4 percent to 6.4 percent of undocumented immigrant women had a childbirth-related hospital visit in the study year. This percentage was far higher than that of the total population (1.7 percent). High rates of childbirth among undocumented immigrants have been attributed to the younger age of undocumented immigrants with respect to the total population and to the fact that children born in the United States will become citizens.

Undocumented immigrants use less health care because they have less access to it, and because they fear deportation. Illegal aliens have less access to health care because of their basic demographic factors: they live in poorer areas and are less educated than other population subgroups (Prentice, Pebley, & Sestry, 2005). They are also ineligible for many services or are bogged down by paperwork that they may not understand to determine eligibility when they attempt to access health care. Undocumented immigrants usually have limited ability to communicate in English, which makes accessing the health care system a daunting task. Many immigrants avoid using services other than emergency benefits, even if the state they live in provides preventive care through Medicaid (Prentice, Pebley, & Sestry, 2005). These immigrants are afraid that use of state resources will make them appear as public burdens and increase their chance of being reported to law-enforcement authorities (Prentice, Pebley, & Sestry, 2005). Changes in federal and state policies about provision of health care services to undocumented immigrants have made it unclear whether immigration status will be required of patients seeking preventive care, and have made illegal aliens reluctant to utilize benefits. One undocumented immigrant said of her fear, "I’m afraid to go out and only go when it’s necessary. If it’s not necessary, I don’t go. I feel impotent, like I can’t do anything." (McGuire & Georges, 2003).

Impacts of Restricted Health Care Access for Undocumented Immigrants

Prior to 1996, immigrant eligibility for Medicaid services was determined by individual states. States were providing a range of Medicaid services to both documented and undocumented immigrants who qualified for Medicaid based on low income requirements (Loue, Cooper, & Lloyd, 2005). There was a range of preventive
care options available in some states, though the policies were certainly not coherent or easy to understand. Many health care providers did not even know what services they were allowed to provide. Under the federal Emergency Medicaid program, emergency services were covered, as long as the immigrants met income-eligibility guidelines (Trossman, 2004). In the early 1990s, the state of California was spending large portions of its state Medicaid funding on services, including Emergency Medicaid services, for undocumented immigrants. With no unified federal policy and little federal funding to address the issue, members of the state government attempted to create their own policy solution. In November 1994, Proposition 187, an initiative to restrict access of undocumented immigrants to any health care funding by Medicaid, was passed by California voters by a narrow margin. The proposition was never enforced, due to multiple court challenges, but it enlivened the national debate as to which health policies would adequately address the problem (Ziv & Lo, 1995).

Proposition 187 was eventually overturned as unconstitutional: states were deemed to have no power to regulate immigration, as it violates the due process clause of the Fourteenth Amendment that guarantees all people equal protection of the laws (Loue, Cooper, & Lloyd, 2005). Opponents of the proposition noted that it was unfeasible to ask physicians and nursing staff to enforce immigration policies in clinics and hospitals. Physicians also contended that requiring them to deny health care to patients in need was against their code of ethics. Proposition 187 also led to fear among immigrants who normally access public health care. In 1995, Ziv and Lo noted that a recent survey of 313 patients with active tuberculosis found that more than one fifth of the patients had no immigration documents. Hesitancy of these illegal immigrants to seek care could have created a serious epidemic of tuberculosis. Laws such as Proposition 187 endanger physician ethics, the health of undocumented immigrants, and public health in general.

**Personal Responsibility and Work Opportunity Reform Act**

The issue of undocumented immigrant social service use made its way into national Welfare reform legislation in 1996. The Personal Responsibility and Work Opportunity Reform Act of 1996 was passed by the United States Congress and became effective on July 1, 1997 (Reed, Westfall, Bublitz, Battaglia, & Fickenscher, 2005). The law regulated cash assistance through the newly named Temporary Aid for Needy Families program and placed more restrictions on eligibility for such assistance. It also introduced a new federal policy regarding Medicaid coverage for immigrants who were not U.S. citizens. Undocumented immigrants were no longer considered eligible for federally funded non-emergency health care services through Medicaid. Documented immigrant eligibility was limited as well. Legal immigrants were only considered federally eligible after five years of residence from the time they received legal status. The legislation included a provision that allowed states to provide non-emergency Medicaid services to immigrants who were federally ineligible if they first passed new state legislation providing the state funding for this purpose. State responses to the Personal Responsibility and Work Opportunity Reform Act (PRWORA) varied. Some cut coverage according to the federal plan, and
others, including California, continued Medicaid access, partially in response to the backlash from the plan introduced by Proposition 187.

One of the greatest indicators of the effects of PRWORA is the decreased use of the services for which undocumented immigrants access health care most, namely services related to childbearing, such as prenatal and neonatal care. After the passage of PRWORA, Florida implemented the eligibility restrictions for Medicaid, and thus restricted access to prenatal care, while California did not. In 1999-2001, Fuentes-Afflick et al. interviewed 1,799 postpartum women in California and Florida to compare the effects of the varied implementations of the policy. Three-fourths of undocumented women from California in the study received prenatal care beginning in the first trimester of their pregnancy, whereas only 57% of undocumented women in Florida did. Three times as many undocumented women in Florida received fewer than six prenatal visits, compared to the recommended ten to fifteen. The study demonstrated that the implementation of PRWORA led to decreased use of health care services by undocumented immigrants. It also led to more negative health outcomes for the mothers and infants, including higher rates of low birth weight and premature newborns (Fuentes-Afflick et al.). Prenatal care is a classic example of preventive care that decreases future health problems and the need for more costly secondary care. The United States Department of Health and Human Services notes that, "Adequate access to health care services can improve health outcomes" (Marshall, Urrutia-Rojas, Mas, & Coggin, 2005).

**Illegal Immigration Reform and Immigrant Responsibility Act**

Attempts by the federal government to limit health care and other public benefits for immigrants were made again in 1996. The Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRAIRA) was enacted on September 30, 1996 (Loue, Cooper, & Lloyd, 2005). In addition to stiffer penalties for fraudulent documents and smuggling persons across the Mexican border, the act placed restrictions on immigrant eligibility for Social Security, Food Stamps, and education, and reiterated the restrictions to health care already in place from PRWORA. Though health care access could be expanded per state determination, the federal government provided block grants for Emergency Medicaid services only. IIRAIRA also required public hospitals to verify patient immigration status, even for emergency services, with the United States Citizenship and Immigration Services (USCIS, formerly the INS) prior to Medicaid reimbursement for such services (Rehm, 2003).

With the implementation of IIRAIRA, the sharing of information between the United States Citizenship and Immigration Services (USCIS) and public hospitals became more prominent. California was no exception to this pattern. Illegal aliens who were accessing emergency health care were thus identified and known by USCIS. Immigrants were frightened by the possibility this created for their personal information to be used in enforcing immigration law against them. A critical care nurse in a hospital that sees large volumes of undocumented immigrants relates:
Undocumented workers often change their names every time they visit the hospital out of fear. I remember one man was being treated for a seizure that the ER staff initially thought was an isolated event. After talking with him more, I learned that he had come in with a seizure just the month before but had used another name. I'm always telling people that we are hospital workers and here to take care of them, and not immigration (Trossman, 2004).

Loue, Cooper, & Lloyd (2005) examined the accessibility of prenatal care to 157 women of Mexican ethnicity, including 56 women who were undocumented, after the implementation of PRWGRA and IIRAIRA. The illegal aliens were more likely to delay seeking care than their legal resident and citizen counterparts. Fear and confusion about program eligibility requirements for Medicaid services were cited by participants as a reason for being less likely to seek prenatal care.

The impact of decreased access to prenatal care is devastating from a public health and fiscal perspective. Undocumented immigrants who do not receive prenatal care are four times more likely to have low birth weight and preterm infants than those who receive adequate care (Lu, Lin, Prietto, & Garite, 2000). Their infants are also more likely to suffer from abnormal birth conditions such as infant anemia, birth injury, fetal alcohol syndrome, hyaline membrane disease, seizures, and need for assisted ventilation (Lu et al.; Reed, Westfall, Bublitz, Battaglia, & Fickensch, 2005). California researchers (Lu et al.) calculated that the cost of neonatal care for undocumented immigrants who did not receive adequate prenatal care was $2,341 more than that for an infant whose mother received prenatal care. This cost, as part of labor and delivery services, was covered by the state's Emergency Medicaid program. The average cost of prenatal care for women in the sample who received it was $702 each. Investigators calculated that, on average, every dollar spent on prenatal care saved $3.33 in neonatal care costs. In addition, care for children who lacked prenatal care continues beyond initial neonatal services. Long-term care for low birth weight babies was $3,247 more for those who had not received prenatal care than for those who had. For every dollar spent on prenatal care, $4.63 in long-term care costs was saved for low birth weight babies. These data argue for expanded coverage of less expensive preventive care rather than denial of services and dependency on more expensive emergency care.

Need for Expanded Health Care Access for Undocumented Immigrants

Preventive care
It has become a public health priority of the last several decades to expand access to preventive care in order to reduce negative health outcomes. Undocumented immigrants suffer from delay in seeking access to medical care at a higher rate than any other population subgroup (Berk, Schur, Chavez, & Frankel, 2000). They have very little access to primary care, including dental care. A Missouri Nurses Association member states:
A lot of our patients who are undocumented workers tend to be young-to-middle-aged males. For the most part, they are pretty healthy. We tend to see them for episodic illnesses. But dental care is always a problem. There are just not enough dental providers for our clients. And it may take up to six months to get into the dental clinic, so preventive care is virtually non-existent (Trossman, 2004).

Because they lack such access, undocumented immigrants experience more negative health outcomes and utilize expensive emergency services as a temporary fix.

**Insurance for undocumented children**

Undocumented children remain the most vulnerable subgroup of the immigrant population in the United States. Sixteen percent of undocumented children have not seen a physician in the past two years, compared with seven percent of uninsured white children (Frates, Diringer, & Hogan, 2003). The California Endowment developed a model for providing health insurance for undocumented immigrant children in 2000. The program enrolled thousands of children, and demonstrated increased use of primary care services by such children and their families (Frates et al.), a marker toward future positive health outcomes. This model serves as an example of the direction policy initiatives on immigrant health care should take. Expanded undocumented immigrant health insurance programs would actually save health care money. While some opponents of such an expansion may argue that it would draw more immigrants across the U.S./Mexican border illegally, there are no data to support such a claim. Very few immigrants currently immigrate for the primary purpose of accessing social services, and to assume that their motivations would suddenly change with expanded access to primary health care relies on unfounded logic.

**Conclusion**

There is no easy solution to the problem of dealing with undocumented immigrants in the United States. In order to create a cohesive policy that meets the needs of the government, health care community, and undocumented immigrants, legislators and public health officials must first understand the nature of the population they are regulating. They need to know what factors truly draw illegal aliens into the United States, specifically whether or not they are seeking public services and particularly free health care above other resources. Policy makers should recognize the demographics and descriptions of the population who are accessing these resources and understand exactly what resources they are using. It is important that public administrators know more about the health and health care usage of illegal immigrants in order to make policy decisions that limit or expand access to care. Finally, it is necessary that policy makers understand the immediate and long-term effects of previous policies. A comprehensive analysis of these historical efforts is an important first step in creating more successful future policy.
The health care system pays a tremendous price to address the needs of this population. The costs of not addressing health care needs, especially with regard to primary and preventive care, are even more significant. Public health efforts to develop primary care access and encourage public use of preventive care should be expanded to undocumented immigrant populations. Instead of making policies that create fear and hesitancy in accessing services, government officials should focus on persuading illegal aliens to use those services that keep them in better health and save money on long-term care.

It is ethically, fiscally, and socially responsible to expand federal coverage of health care for undocumented immigrants. Years of limiting and denying access to health care have led to poorer health outcomes and increased cost. Government officials should look toward program models that fully insure low-income residents of the United States without regard to their immigration status. It is the only policy strategy that works. The best way to ensure the health of all Americans is to see that the issue of health care benefits is addressed in terms of prevention of public health problems, rather than with focus on enforcing immigration laws through the health care system.

References


Female Refugee Health Status in Utah 2007

Compiled by Jennifer Paynter

Definition

What is the definition of a refugee?

“A refugee is any person who is outside his or her country of nationality who is unable or unwilling to return to that country because of persecution or a well-founded fear of persecution.”

There are 59 ethnicities and nationalities represented in the state of Utah. More than 53 languages are spoken in Utah by persons of refugee status. This creates potential and existing communication barriers. To compound this matter, some refugee populations, including the Somali Bantu, did not have a written language in their respective countries. This makes telling time, reading calendars to make appointments, and dispensing health promotion literature ineffective.

Healthcare Coverage

Salt Lake City is one of seventeen refugee resettlement cities in the United States with an International Rescue Committee (IRC) office. All persons of refugee status arriving in Utah start with assistance from the International Rescue Committee or Catholic Community Services (CCS) of Utah; this assistance typically lasts the first six to eight months (with some exceptions). Within the first thirty days of refugee resettlement in Utah, these organizations arrange for each person to have a health screening at the Salt Lake Family Health Center. Appropriate referrals are made to specialists for the various chief complaints and abnormal findings. Each person is given a case manager for the first six months and each family is assigned a primary care provider. Medical expenses are guaranteed under Medicaid for the first eight months and may be continued depending on income and family size. Medicaid covers dental care for children less than 18 years of age and pregnant individuals, but does not cover eye care. Bus passes and other transportation accommodations may be provided for transportation to medical appointments. After the initial eight months, persons of refugee status are referred to Asian Association of Utah, Somali Community Development of Utah, Hartland Partnerships and other community organizations for services.

The Utah Department of Health primarily monitors communicable diseases within the state, which includes those individuals of refugee status. Other health issues such as chronic diseases and reproductive health are not monitored. However, significant key trends were that persons of refugee status arriving from refugee camps tended to have not just more medical needs than the general population, but also more severe medical problems. Many refugees do not seek preventive health care services, indicating reasons such as the “lack of these services in
the country of origin, unfamiliarity with these services, and a cultural attitude of seeking health care for symptomatic complaints, not prevention". This can also increase the use of emergent services.

**Current Numbers of Refugees in Utah**


![Refugee Demographics Chart]

**Female Refugee Health Status in Utah**

Specific information about female refugees is collected differently by the different assistance organizations. In 2006, the International Rescue Committee (IRC) reported 42 female refugees who arrived from Somalia, 36 from Mesh Turk Russia, 17 from Burma, 16 from Cuba, 8 from Sudan, 8 from Congo, 6 from Iran, 5 from Liberia, and 1 from Eritrea.

In 2005, Catholic Community Services (CCS) reported 202 female refugees from the following countries: Congo, Liberia, Ethiopia, Eritrea, Somalia, Sudan, Russia, Cuba, Iran and Iraq. In 2002, CCS reported 247 female refugees from the following countries—Congo, Liberia, Somalia, Sudan, Togo, Bosnia, Serbia, Russia, Iran, Iraq, Lebanon, Afghanistan, Pakistan, and Vietnam.
The International Rescue Committee, Catholic Community Services, Asian Association of Utah, Somali Community Development of Utah (SCDU), and Hartland Partnerships, have noted several important trends in regards to the female refugee health status in Utah: (personal communication Terena Jepson of SCDU December 4, 2006). Among African refugees, especially the Somali Bantu, many women have undergone genital circumcision in their home country as an acceptable cultural procedure. This practice can create health issues that need to be handled with cultural sensitivity and necessitate educating women about its risks. Depression and post traumatic stress disorder are noted in this population due to the stressors of fleeing a war torn country, poor conditions in refugee camps, and possible abuse. Knowledge deficits related to contemporary American practices such as general hygiene necessitate health education.

Positive efforts, like the Health Access Project and Hartland Partnerships, are being made to connect female refugees with accessible healthcare, but improvements can be made. Increased attention to issues surrounding reproductive health are needed. Increased educational outreach efforts to help refugees better comprehend organ systems and not just symptoms are also needed. Classes on nutrition and immunizations are desired to reach more mothers and or care providers.

References


Women’s Health Data Reports
Utah and U.S. Women’s General Demographics

Compiled by Karen Zinner, MPH

Population
In 2005, Utah had a household population of 2.4 million equally distributed among women and men. The overall median age was 28.5 years. Thirty percent of the total population was under 18 years and 8 percent was 65 years and older. In 2005, the United States had a household population of 288.4 million 51% females and 49% males. The overall median age was 36.4 years. Twenty-five percent of the total population was under 18 years and 12% was 65 years and older. Based on the total 2005 female population in Utah the distribution was 25.2% for age birth-14, 46.3% for the reproductive ages of 15-44 and 28.5% of women over 44 years of age. The U.S. distribution tended toward an older population with only 20.1% age birth-14, 41.1% reproductive age and 38.8% over 44 years of age.¹

The overall racial distribution among Utah women is White (93.8%), Asian (2.0%), American Indian/Alaska Native (1.3%), two or more races (1.3%), Black or African American (0.9%) and Native Hawaiian or Other Pacific Islander (0.7%). The overall racial distribution among U.S. women is White (74.3%), Black or African American (12.8%), Asian (4.4%), two or more races (1.9%), American Indian/Alaska Native (0.8%) and Native Hawaiian or Other Pacific Islander (0.1%). Women of Hispanic origin make up 10.1% all females in Utah and 13.9% nationally.¹

Education
The percent of Utah women over age 17 with less than a high school education was 10.3%. The rate for high school graduation (which includes equivalency) was 28.5%, some college 39.6% and Bachelor’s degree or higher was 21.6%. Of the women with at least a Bachelor’s degree or higher, 23.3% had a graduate or professional degree in Utah compared to 33.8% nationally. Educational attainment in the U.S. was 15.6% for less than high school, 30.2% for high school graduation, 29.9% for some college and 24.3% for a Bachelor’s degree or higher.¹ Utah appears to have a much larger proportion of females with some college but the rates drop when compared to the U.S. in obtaining a least a Bachelor’s degree or higher.

Families
Utah’s average household size was 3.1 people, compared to 2.6 in the U.S. Families made up 75% of the households in Utah. This figure includes both married-couple families (62%) and other families (13%). Non-family households made up 25% of all households in Utah, comprised mostly of people living alone. Female

householders with no husband present made up 69% of the ‘other family’ category which included non-married households. In the U.S., families made up 67% of the households which included both married-couple families (50%) and other families (17%). Other families with a female householder made up a larger proportion for the U.S. at 73%.¹

**Marriage and Divorce**

Marriage and divorce rates are the number of marriages or divorces per 1,000 persons in the population. The marriage rate was 9.6 compared to 7.4 for the U.S. There were 58.5% of females 15 years and over that were married in Utah compared to 51.0% in the U.S. Slightly fewer single females, never married, were found in Utah (24.5% vs. 25.5%). Utah also had fewer divorced females than the U.S., 10.0% in Utah compared to 11.5% nationally. Utah’s 2004 divorce rate was similar to that found in the U.S. (4.0 vs. 3.7).²

**Income**

The median annual household income in the past 12 months (inflation adjusted dollars) for Utah in 2005 was $47,934 compared to $46,242 in the U.S. Utah’s median household income has generally kept pace with that in the U.S. because Utah’s households are larger and the per capita income in Utah is lower than the U.S. ($20,814 vs. $25,035). For females over the age of 14 working within the past year the median income was lower for Utahns ($14,969 vs. $18,651).³

**Poverty**

Poverty takes into account both income and family size, and has both immediate and long-lasting effects on health. Income provides an assessment of the financial resources available to individual persons or families for basic necessities (e.g., food, clothing, and health care) to maintain or improve their well-being. Ten percent of Utahns were living in poverty. Eight percent of all families and 25% of families with a female head of household with no husband present had incomes below the poverty level. Females living at or below the federal poverty level in Utah were highest among the 18-34 year age group at 43.0%. Females under 18 years of age comprised 28.3% of females living below poverty while there were 22.0% of the 35-64 year old age group living in poverty and the lowest rate was among 65+ year old females (6.7%). The U.S. rates for females living in poverty by age group were not the same as Utahns. There were 30.5% under age 18, 30.1% age 18-34, 28.5% age 35-64 and 11.0% over age 64.¹
Stroke in Women
Compiled by Susanne Cusick, BS, and Barbara Larsen, MPH, RD

Background
Every year stroke strikes approximately 750,000 Americans killing 160,000. This year over 100,000 U.S. women under age 65 will have a stroke. Stroke is the third leading cause of death in the United States and in Utah and twice as many women will die this year from a stroke than from breast cancer.

A stroke is an attack on the brain. This can occur in two ways, the first is when a blood clot blocks an artery (a blood vessel that carries blood from the heart to the body), this is called an ischemic stroke and occurs in about 83% of cases. Ischemic strokes can be caused by the build up of fatty deposits that line the vessel walls. The second kind of stoke is called a hemorrhagic stroke, a bleed, and occurs when a weakened blood vessel breaks, causing an interruption in blood flow to the brain. Hemorrhagic strokes happen in about 17% of stroke cases. Increased time from stroke symptom onset to treatment is associated with increased morbidity and death. Unfortunately, studies show that women are more likely to delay seeking treatment for stroke than are men and therefore, have a higher risk for death and disability.

The HP 2010 goal for stroke is: Reduce stroke deaths to 48 per 100,000 population.

Risk Factors
There are many risk factors for stroke; some that you can change and some that you can not. While Utah is a healthier state than many others, there is room for improvement. Of Utah women, 18 years of age and older, in 2005:

1. 20.2% had High Blood Pressure (greater than or equal to 120/80).
2. 29.5% had High Blood Cholesterol (a total blood cholesterol level of 240mg/dL or higher)
3. 9.3% Smoked
4. 5.8% had Diabetes.
5. 46.1% were Physically Inactive (did not get enough exercise, a total of 30 minutes a day most days of the week).
6. 47.4% were Overweight or Obese (BMI greater than or equal to 25).
Hidden Risks for Women
Women under the age of 55 have other risk factors that include; migraine, birth control pills, hormone replacement therapy, and clotting disorders. Women who are on any of these therapies or suffer from either condition should be aware that they can increase the likelihood of having a stroke and that controlling other risk factors can decrease the chance of having a stroke. Risk factors are cumulative, reducing even one risk can greatly lower your chances of having a stroke.

Utah Women and Stroke
The age-adjusted percentage of adults age 18 and older who reported ever having a stroke was similar between males and females between 2001 and 2005 (2.0% for males and 2.1% for females). However, during this same time period, Utah women had a higher age-adjusted stroke mortality rate (54.4/100,000) when compared to men (46.4/100,000). In Utah, between 2001 and 2005, 60.7% of stroke deaths were in women.

Although in 2005, the age-adjusted hospitalization rates were higher for Utah males (16.4 per 10,000) than females (14.6 per 10,000), the actual number of women hospitalized for stroke in Utah exceeded that for men, 1490 versus 1380, respectively.


Age-adjusted to 2000 U.S. standard population
Rates prior to 1999 multiplied by ratio of 1.0588 for comparability
Common Warning Signs of Stroke

• Sudden numbness or weakness in the face, arms, or leg—especially if it is on one side of the body only
• Sudden vision loss or blurriness in one or both eyes
• Sudden loss of balance, dizziness, or coordination
• Sudden trouble walking
• Sudden confusion or trouble with your speech.

Services

Eighty percent of all strokes are preventable. Knowing your risk factors and controlling those that you can will help to prevent you from having a stroke. Maintain a healthy blood pressure, cholesterol, weight, and be physically active. If you smoke—quit. To learn more about stroke, warning signs, and recovery you can visit:

National Stroke Association: www.stroke.org

American Stroke Association: www.strokeassociation.org

Utah Heart Highway: www.hearthighway.org

References


Heart Disease in Women

Compiled by Barbara Larsen, MPH, RD

Background
Coronary heart disease (CHD) is the most common type of heart disease. CHD occurs when the arteries that supply blood to the heart muscle become hardened and narrowed due to the buildup of plaque in the arteries. This buildup of plaque is called atherosclerosis. Plaques are a mixture of fatty substances including cholesterol and other fats. Blood flow and oxygen supply to the heart can be reduced or even fully stopped by a growing plaque. Plaques may also rupture and cause blood clots that block arteries.¹

CHD can lead to a heart attack or to angina. Angina is another word for chest pain or discomfort that occurs when the heart muscle is not getting enough blood. Over time, CHD can weaken the heart muscle and lead to heart failure, a serious problem where the heart cannot pump blood the way that it should. For persons with CHD, treatment involves addressing those factors that put them at risk for CHD and heart attack. Lifestyle changes may help reduce risk. However, medicines and medical treatments are also often needed to treat high blood cholesterol, high blood pressure, irregular heart beats, blood flow, and other potential problems.²

The HP 2010 goal for coronary heart disease is: Reduce coronary heart disease deaths to 166 per 100,000 population.³

Risk Factors
There are many risk factors for heart disease; some that you can change and some that you can not. While Utah is a healthier state than many others, there is room for improvement. Of Utah women, 18 years of age and older, in 2005:⁴

1. 20.2% had High Blood Pressure (greater than or equal to 120/80).
2. 29.5% had High Blood Cholesterol (a total blood cholesterol level of 240mg/dL or higher)
3. 9.3% Smoked
4. 5.8% had diagnosed Diabetes.
5. 46.1% were Physically Inactive (did not get enough exercise, a total of 30 minutes a day most days of the week).
6. 47.4% were Overweight or Obese (BMI greater than or equal to 25).
Facts about Heart Disease in Women

• Heart disease is the number 1 killer of women in Utah and around the world.

• Heart disease accounts for one-third of all deaths among women.

• In 2003, coronary heart disease claimed the lives of 233,886 females compared with 41,566 lives from breast cancer and 67,894 from lung cancer.

• 38 percent of women compared with 25 percent of men will die within one year after a heart attack.

• Nearly two-thirds of American women who die suddenly of a heart attack had no prior symptoms.

• CVD ranks first among all disease categories in hospital discharges for women.

• Low blood levels of "good" cholesterol (high density lipoprotein or HDL) appear to be a stronger predictor of heart disease death in women than in men in the over-65 age group; high blood levels of triglycerides (another type of fat) may be a particularly important risk factor in women and the elderly.

• Misperceptions still exist that CVD is not a real problem for women.

• Diagnosis of heart disease presents a greater challenge in women than in men.

• Hormone therapy should not be used to prevent heart disease. In women with heart disease, it should not be used to prevent further disease because it increases the risk of blood clots.

Common Warning Signs of Heart Attack

Some heart attacks are sudden and intense, where no one doubts what's happening. But most heart attacks start slowly, with mild pain or discomfort. Often people aren't sure what's wrong and wait too long before getting help. Here are signs that can mean a heart attack is happening:

• Chest discomfort - Most heart attacks involve a discomforting feeling in the center of the chest that lasts more than a few minutes, or that goes away and comes back. It can feel like uncomfortable pressure, squeezing, or pain.

• Discomfort in other areas of the upper body - Symptoms can include pain or discomfort in one or both arms, the back, neck, jaw or stomach.

• Shortness of breath - May occur with or without chest discomfort.

• Other signs - May include breaking out in a cold sweat, feeling nauseated or lightheaded.
Heart attack symptoms can be different for men and women
As with men, women’s most common symptom is chest pain or discomfort. But women are somewhat more likely than men to experience some of the other common symptoms, particularly shortness of breath, nausea/vomiting, and back or jaw pain.

Services
Knowing risk factors and controlling those that can be controlled will help to prevent heart attacks. Maintain a healthy blood pressure, cholesterol, weight, and be physically active. If you smoke—quit. To learn more about heart disease, heart attack warning signs, and recovery you can visit:

American Heart Association: www.AmericanHeart.org

National Heart Lung and Blood Institute: www.nhlbi.nih.gov

Utah Heart Highway: www.hearthighway.org

References
Cholesterol Awareness

Compiled by Craig Beck

Cholesterol is necessary for the formation of many hormones and as a structural component in the body’s cells. When cholesterol levels rise above that required by the body, the excess tends to be deposited in blood vessels—a condition called atherosclerosis. As a result, blood flow to organs and tissues is reduced which can lead to a variety of serious health issues including myocardial infarctions and cerebrovascular accidents. Risk factors for elevated cholesterol levels include a family history of high cholesterol, being overweight, inactivity, and eating a diet high in animal fat. Smoking, diabetes, and hypertension compound these risk factors.

Figure 1: Cholesterol Awareness Utah – 2005. Source: Behavioral Risk Factor Surveillance System
The accepted first step to reducing this risk is having blood cholesterol levels checked every five years. In fact, as part of the Healthy People 2010 program, the national government established an objective to increase the number of adults who have had their cholesterol checked in the most recent five years. In 2005, slightly more than 30 percent of Utah women surveyed reported never having their cholesterol checked.

When compared to 2001 data, this represents a slight increase in the proportion of women who have never had their cholesterol checked. The comparison between 2001 and 2005 also shows a slightly lower proportion of women who have had their cholesterol checked within the last 5 years.

Another Healthy people 2010 objective is to reduce the number of adults who have high total cholesterol levels. Although fewer women reported having tests completed, the proportion of females being told their cholesterol was high increased in 2005 compared to 1995.
Figure 3: Told Had High Cholesterol, Utah – 1995 vs. 2005. Source: Behavioral Risk Factor Surveillance System

While fewer women are having their cholesterol checked, the proportion of women who have been tested and have been told their cholesterol is high is increasing. These results show that cholesterol continues to be a major health issue for women in Utah. It is strongly recommended that all women contact their health care provider to get their levels tested.
Statin Treatment of Diabetic Patients in Utah Medicaid

Compiled by Anke-P. Holtorf, PhD, MBA; Joanne LaFleur, PharmD, MSPH; David Servatius; Brent Jeffries, PharmD Candidate; CarrieAnn McBeth, PharmD; Diana Brixner, RPh, PhD

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Background
There is strong evidence supporting the benefit of statin use in diabetic dyslipidemia for the prevention and treatment of cardiovascular disease (CVD). 1 The Adult Treatment Panel (ATP III) guidelines, an evidence-based report authored by the National Cholesterol Education Program, recommend that statin therapy be initiated in diabetic patients without regard to baseline blood cholesterol in all patients over the age of 40.2

Diabetic women, in particular, are at high risk of developing CVD. It has been documented that, in women, diabetes is associated with a worsening of dyslipidemia,3 which is a significant contributor to CVD.4 Diabetic women have a significantly higher rate of death due to CVD than nondiabetic women,5 and a significantly higher CVD risk than diabetic men.3

In this study we characterized the proportion of diabetic Utah Medicaid recipients that were receiving statin treatment as recommended by American Dietetic Association (ADA) guidelines. We also compared the proportions of men and women receiving this preventive treatment.

Methods
All patients age 40 and above receiving benefits under Utah Medicaid between January 1, 2005 and September 30, 2006 were included if they were diagnosed (as defined by the 9th revision of the International Classification of Diseases [ICD-9]) or treated for diabetes (identified by First DataBank Specific Therapeutic Category codes). The proportion of women or men who received at least one prescription for a statin during the study period was determined by using pharmacy claims data.

Medication possession ratios (MPRs) were calculated for those patients who were covered throughout the whole study period as an indicator for adherence to the statin therapy. The MPR reflects the percentage of days the patients had statins available in relation to the entire study period.

Results

A total of 4416 females and 2017 males over the age of 40 were identified as having diabetes (see Figure 1). Of these, 68.6% of the diabetic patients were female. This proportion is similar to the gender distribution in the overall Utah Medicaid prescription claims database (67% female, 33% male).

Approximately half of the diabetic patients received statin treatment as recommended by ADA guidelines. There was no difference in the percentage of male or female diabetics receiving statins (see Figure 2).

The overall medication possession rate in the patients who have been continuously eligible for Medicaid coverage and received statin during the study period (2223 women, 1015 men) was 85.9% for women and 88% for men. The proportions of patients with an MPR less than 0.5 were 19.4% of women and 15% of men.
Summary
Only half of the diabetic women over 40 covered by Utah Medicaid received preventive treatment with a statin. Those who received prescriptions for statins showed relatively high adherence as measured by MPR. In this study, no differences were observed between the diabetes prevalence and statin treatment ratio of male or female diabetic patients.

Figure 3: Medication possession rates for male or female patients with continuous Medicaid eligibility for prescription drugs throughout the study period
Breast Cancer
Compiled by Candace Hayden, BS

When all cancers are taken into consideration, breast cancer has the highest rate of occurrence in women in the United States (see figure 1). These rates have been true since the mid-1950s. Only recently has lung cancer surpassed breast cancer in mortality rate in the United States.1 However, women in Utah still have a higher mortality rate due to breast cancer, rather than lung cancer,2 most likely due to Utah’s low rate of smoking tobacco. Utah is ranked the fifth lowest state for deaths due to invasive breast cancer.5 Utah’s breast cancer incidence and mortality rates have remained relatively stable over the past decade (see Figure 2).

A recently published study concluded that breast cancer incidence rates have dropped by approximately 7% from 2002 to 2003. This decrease is the largest decline seen in over a decade. The study offered the decline of hormone replacement therapy in post-menopausal women as the major contributing factor. The decline in incidence rate of breast cancer was even higher among women aged 50 and older; their rate dropped by 15% during the same time period. Hormone replacement therapy usage has dropped approximately 30% since the Women’s Health Initiative study, published in 2002, concluded that hormone replacement therapy increased women’s risk of developing breast cancer, among a plethora of other health problems.3
In the United States, mortality rates due to breast cancer have decreased by an average of 2.3% per year from 1990-2002.1 This reduction is most likely due to increased screening mammograms and detection of breast cancer at an earlier stage in the disease process. Women in the U.S. have a 12.67% lifetime risk of developing breast cancer.4 Lifetime risk assessments refer to the risk of developing a disease during one’s lifetime.

When race and ethnicity are considered, white women have the highest incidence rate of breast cancer when age groups are pooled. Black women have significantly higher incidence rates of breast cancer before age 40 compared to white women. After age 50, black women have a significantly lower incidence rate when compared with white women. Black women are more likely to be diagnosed with breast cancer at a more advanced stage of disease than white women and, therefore, are more likely to die from breast cancer. These differences are likely due to disparities in insurance coverage and socioeconomic status. American Indian women and Asian/ Pacific Islander women have lower incidence rates of breast cancer than white women. Hispanic women have a lower incidence rate of breast cancer than non-Hispanic women.6

Known risk factors for breast cancer include, family history, genetics (BRCA1 and 2 which account for approximately 5-10% of breast cancer cases), long menstrual time (early menstrual start or late menopause), obesity, hormone replacement therapy, oral contraceptive use, never having children, and having a first birth after age thirty.1

Mammography is the first line for early detection. The American Cancer Society recommends that women aged 40 and older receive mammograms every one to two years. Once women are 50 and older, annual mammograms are recommended. Younger women should perform self-examinations monthly and get regular examinations by a health care provider. Maintaining a healthy body weight, breast feeding, and maintaining an active lifestyle may help to reduce the risk of developing breast cancer.1

References
Cervical Cancer

Compiled by Candace Hayden, BS

Since the advent of the Pap test, cervical deaths have steadily decreased since 1955, and are still continuing to decrease today. The Pap test can detect abnormal cells in the cervix including precancerous lesions that may develop into invasive cancer. Today, the American Cancer Society estimates that less than 10,000 cases of invasive cervical cancer will occur in the United States in 2006.

Hispanic women in the U.S. have markedly higher cervical cancer rates than their non-Hispanic white counterparts. Some estimates of cervical cancer rates in Hispanic women are nearly twice the rate of non-Hispanic white women. Women of African-American heritage experience cervical cancer at almost a 50% higher rate than white women of non-Hispanic descent.

Utah’s cervical cancer rates are lower than the collective United States rate. From 1994-2003, Utah women averaged an incidence rate of 6.8 per 100,000 person-years versus the United State’s average of 9.3 per 100,000 person-years. When this rate is broken down into racial/ethnic groups, our state’s differences mirror the national statistics fairly closely, with Hispanic women suffering the greatest proportion of the disease burden. See figures 1 and 2 for details.

Survival rates for invasive cervical cancer are very promising, ranging from 92% 5-year survival rates for detection at the earliest stage, to 73% 5-year survival rate for all stages of detection combined.

Risk factors for cervical cancer can be categorized into alterable factors and unchangeable factors. Alterable factors include unsafe sexual behaviors that lead to infection of human papillomavirus (HPV), smoking, obesity, physical inactivity, and vegetable and fruit deficient diets. Unchangeable factors include family history of cervical cancer, older age, and having already been infected with a cancer-causing strain of HPV.

Recently the FDA approved the vaccine Gardasil which has been shown to prevent four types of HPV infections, namely strains 6, 11, 16, and 18. Strains 6 and 11 cause about 90% of genital warts, while strains 16 and 18 cause around 70% of cervical cancers. This vaccine is recommended for girls aged 9-11, before they become sexually active. It is recommended that females up to the age of 26 receive a “catch up” vaccine. It has not been shown to be cost-effective in women over the age of 30. Once a woman has been infected with HPV there is no cure for the infection. However, many women who become infected with HPV are able to clear the infection with no

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Figure 1. Age-Adjusted Incidence Rates (Per 100,000 person/years) of Cervical Cancer in Utah Residents vs. U.S. average by Race, Years 1994-2003. Source: SEER Database, 13 Registries

<table>
<thead>
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Figure 2. Graphic representation of the table above illustrating disparities in disease burden by race between Utah residents and U.S. average of cervical cancer rates. Source: SEER Database, 13 Registries

Figure 3. Age-Adjusted Incidence and Mortality Rates of Cervical Cancer Rates in Utah Females. Source: IBIS

Lingering effects, showing that merely being infected with HPV does not mean that cancer will develop. There is disparate information in the literature as to whether all cervical cancers are caused by an HPV infection (as the American Cancer Society states) or whether just most of cervical cancers are caused by HPV (as the National Cancer Institute states).

Regular Pap tests and vaccination are the two best ways to prevent the development of cervical cancer. The frequency of testing and ages at which testing should begin and end should be discussed with your physician. Living a safe and healthy lifestyle including practicing safe sex, maintaining a healthy weight, physical activity, eating at least five fruits and vegetables daily, and not smoking are all ways that may help prevent cervical cancer.¹
Colorectal Cancer

Compiled by Candace Hayden, BS

Excluding skin cancer, colorectal cancer is the third most commonly diagnosed cancer in females in the United Stated and second most common in Utah. Cancer of the colon and rectum are very closely related and have many features in common. For this reason, researchers simply refer to them collectively as colorectal cancer. Death from colorectal cancer has decreased over the past decade. This reduction is largely attributed to increased screening procedures called colonoscopies that detect colorectal cancer at an early stage. It is quite common for doctors to find polyps, which are benign or non-cancerous tumors. These polyps, if left in the colon, can develop into colon cancer. Screening colonoscopies allow physicians to remove these polyps before they become malignant or cancerous.¹

If colorectal cancer is detected before it has spread to other areas of the body, 5-year survival rates are greater than 90%. However, less than 40% of colorectal cancers are discovered at this early stage. Once the cancer has spread to the other areas of the body, (metastatic colorectal cancer), 5-year survival rates are less than 10%.

Some risk factors for colorectal cancer cannot be changed. These risk factors include being over the age of 50, family history of colorectal cancer, having a history of colorectal polyps, chronic inflammatory bowel disease such as Crohn’s disease and ulcerative colitis, and genetic mutations. (Inflammatory bowel disease is quite different from the more common irritable bowel syndrome which does not increase risk of colorectal cancer.) Other risk factors for colorectal cancer can be changed by altering behavior and improving lifestyle patterns. These risk factors include obesity, high fat and high animal-source diets, physical inactivity, smoking, and heavy alcohol use.¹

Researchers have been studying genetic mutations in colorectal cancer. They have recently identified nearly 200 mutated genes that are linked to cancer by tumor initiation, tumor growth, cancer spread, and cancer control.² Only about 20% to 30% of people with colorectal cancer have a family history of the disease and only 5% to 10% of those with a family history have an inherited genetic susceptibility.¹,³

Researchers at the University of Utah recently discovered a molecule that is associated with some colorectal cancers. By genetically disabling this molecule called adenomatous polyposis coli (APC) in zebrafish, researchers were able to protect them from the effects of genetic mutation.⁴

Many times colorectal cancer has very ambiguous symptoms or no symptoms at all. For this reason, it is recommended that all people over the age of 50 see a physician for a complete physical exam, including a digital rectal exam, stool testing for occult bleeding, and colonoscopy or flexible sigmoidoscopy.
Screening colonoscopies are usually recommended every 3-5 years. People at higher risk for developing colorectal cancer such as genetic mutations, family history, or other colorectal conditions may need to be screened at an earlier age than the general population.\textsuperscript{1,3}

Insurance coverage seems to play a sizable role in whether people get screened for colorectal cancer. Due to the cost of screening colonoscopies, those who do not have health insurance coverage do not usually get screened. In Utah residents aged 50 years and older, those with health insurance are twice as likely to get screening colonoscopies as those without health insurance.\textsuperscript{5}

Demographics also seem to play a role in whether Utah residents get screening colonoscopies. Those individuals living in non-urban areas (considered either rural or frontier) average 2\% to 15\% less likelihood for screening colonoscopies in the past five years than their urban counterparts.\textsuperscript{5}

Racial/ethnic disparities exist in both incidence and mortality rates of colon cancer victims. Black women have higher incidence and mortality rates of colorectal cancer than any other racial/ethnic group of females in the United States while Hispanic women have the lowest incidence and mortality rates. However, in Utah, Hispanic women have the second highest rate of colorectal cancer, following black women. See figures 2 and 3 for details.\textsuperscript{6}

\textbf{Figure 1. Age-Adjusted Incidence and Mortality Rates of Colorectal Cancer Rates in Utah Females. Source: IBIS}
Figure 2. Age-Adjusted Incidence Rates (Per 100,000 person/years) of Colorectal Cancer in Utah Women vs. U.S. average by Race, Years 1994-2003. Source: SEER Database, 13 Registries

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Figure 3. Graphic representation of the table above illustrating disparities in disease burden by race between Utah residents and U.S. average of colorectal cancer rates. Source: SEER Database, 13 Registries

References

Endometrial Cancer
Compiled by Candace Hayden, BS

Endometrial cancer refers to cancer that originates in the uterus (also called uterine cancer). Anywhere from 90% to 95% of endometrial cancers begin in the glandular cells of the uterus and are referred to as adenocarcinomas. The remaining five to ten percent of endometrial cancers arise outside of the glandular cells. These cancers include uterine sarcomas, stromal sarcomas, malignant mixed mesodermal tumors, and leiomyosarcomas.1,2 The information regarding risk factors and survival rates sited in this document refer to adenocarcinomas only. However, the statistics on incidence and mortality both at the state and national level (shown in figures 1, 2, and 3) refer to all types of uterine cancers. These divergences were impractical to remedy due differing data collection and reporting practices between organizations.

Lifetime risk of being diagnosed with endometrial cancer is about 1 in 38 (less than 3%). The 5-year survival rates vary depending on stage of diagnosis but when averaged together, 5-year survival is about 84%.1 Utah’s overall endometrial cancer incidence rate is slightly lower than the national rate (23.5 per 100,000 person-years vs. 24.3 per 100,000 person-years). When broken down into racial/ethnic categories, disparities exist between groups. White women experience a higher rate of endometrial cancer compared to black women, however, black women are more likely to die from endometrial cancer than white women. Women of Hispanic, American-Indian, Alaskan, Asian, and Pacific Island heritage experience lower rates of endometrial cancer than white and black women.3 Asian/Pacific Islanders in Utah do not follow this national pattern perfectly having the second highest rates of endometrial cancer. See figure 1 for details.

Risk factors for endometrial cancer include early menarche (before age 12), late menopause (after age 52), never having children and having very few children, obesity, family history of endometrial cancer, diabetes, gall bladder disease, high blood pressure, and a diet high in animal fats. Other risk factors include ovarian disease such as polycystic ovarian syndrome, ovarian cancer, breast cancer, endometrial hyperplasia, pelvic radiation therapy, estrogen replacement therapy, and tamoxifen use.1,2

Endometrial cancer usually occurs after menopause and does not occur very often in younger women. Abnormal vaginal bleeding is the most common symptom associated with endometrial cancer but does always mean a woman has cancer. Often times there are no symptoms of the disease.2

Figure 1. Age-Adjusted Incidence Rates (Per 100,000 person/years) of Endometrial Cancer in Utah Residents vs. U.S. Average by Race, Years 1994-2003. Source: SEER Database, 13 Registries

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Figure 2. Graphic representation of the table above illustrating disparities in disease burden by race between Utah residents and U.S. average of endometrial cancer rates. Source: SEER Database, 13 Registries

Figure 3. Age-Adjusted Incidence and Mortality Rates of Endometrial Cancer Rates in Utah Females. Source: IBIS
Lung Cancer
Compiled by Candace Hayden, BS

Lung cancer has the highest mortality rate of all cancers in the U.S. It accounts for more deaths per year than breast, prostate, and colorectal cancers combined. In all states, overall cancer rates are declining, however, lung cancer rates in American women are still on the rise. Experts believe the incline may be reaching a plateau over the last two years due to a decrease in smoking rates. Utah’s lung cancer rates (both incidence and mortality rates) are significantly lower than the national average. In 2002, Utah’s incidence and mortality rates were less than half that of the United States. These lower rates are almost certainly due to our state population’s lower smoking rates. From 1998 to 2002, Utah was ranked lower than any other state in incidence and mortality rates due to lung cancer. (See figure 1).

Nearly 80,000 women are estimated to die of lung cancer this year in the United States. For reasons still unclear to researchers, women are at an increased risk of developing lung cancer than men when exposed to the same levels of tobacco smoke over time. This increased risk is especially true in low-level exposure to cigarettes. Although survival rates have improved over the last three decades, lung cancer still has a relatively poor prognosis. On average only about 15% of patients diagnosed with lung cancer survive for five years after diagnosis.
Cigarette smoking is the most significant risk factor for developing lung cancer. Between 85% to 95% of all lung cancer cases are attributed to smoking. Other risk factors include environmental and/or occupational exposures such as asbestos and radon. Secondhand smoke poses a significant risk in the development of lung cancer as well, especially when a person is exposed during childhood. There has also been evidence to show that genetics play a role in the risk of developing lung cancer.

Unfortunately, there are no early detection tests that have been shown effective in improving mortality rates in lung cancer. In 2002, the National Cancer Institute began a clinical trial to determine if CT scans can detect lung cancer at an earlier stage and in turn, decrease mortality rates.

An important aspect of lung cancer is the stigma that comes with the diagnosis. Since most lung cancer victims are smokers, many people feel that lung cancer is a self-inflicted and, therefore, a deserved disease. This social stigma leads to lung cancer victims feeling guilt and shame which in turn leads to a decreased desire to see a physician for treatment. Non-smokers find it difficult to understand the powerful addiction of cigarettes. Many experts believe that this stigma has been a major influence leading to a severe lack of research funds to tackle the problem of lung cancer. Although lung cancer kills more Americans than any other cancer, funding for research is among the lowest for any cancer. (See figure 2).

Figure 3. Line graph showing incidence rates and mortality rates in Utah Females due to Lung Cancer. Source: IBIS
Ovarian Cancer
Compiled by Candace Hayden, BS

Ovarian cancer is the eighth most common cancer in females in the United States, excluding non-melanoma skin cancer. It accounts for approximately 20,000 deaths per year nationally. In Utah, ovarian cancer rates are approximately the same as national rates. However, Utah’s death rates due to ovarian cancer were approximately 1% lower than the national mortality rate (8.2% vs. 9%).

Lifetime risk of developing ovarian cancer is 1.5%. Upon diagnosis of ovarian cancer, less than half (about 45%) of women will survive longer than five years. However, if the ovarian cancer is detected early and has not spread to the surrounding tissue, 5-year survival rates are approximately 94%. Unfortunately, only about one in every five cases of ovarian cancer is detected at an early stage. Ovarian cancer incidence rates have decreased by about 0.7% per year since 1985.

In Utah, ovarian cancer incidence and mortality rates have remained approximately stable from 1993 to 2005.

Risk factors for ovarian cancer include family history, being over age 55, never having children, and menopausal hormone replacement therapy. Family history of ovarian cancer means having a mother, daughter, or sister with ovarian cancer. Links have been made between breast, uterine, colorectal, melanoma, thyroid, and pancreas cancers. Genetic mutations such as BRCA1 and BRCA2 are sometimes seen in women with ovarian cancer. White women have higher incidence rates and mortality rates of ovarian cancer compared to black women. (See figure 2)

A new study published in December 2006 showed a decrease of ovarian cancer in women who live in sunnier regions of the world. Researchers attributed this to vitamin D production which occurs in the body when exposed to sunlight. Researchers caution that people should not over expose themselves to sunlight as skin cancer is a far more common disease than ovarian cancer. Researchers state that people with fair skin need less than 15 minutes per day with less than 50% of their skin exposed for the maximum benefit. Studies are being done to assess whether vitamin D supplements are as effective as naturally occurring vitamin D made in the body.

There are no screening tests proven to be effective for early diagnosis of ovarian cancer. The signs and symptoms of ovarian cancer can be ambiguous and difficult to distinguish from benign conditions. Symptoms may include abdominal bloating, pelvic pain, vaginal bleeding, back or leg pain, and intestinal discomforts and abnormalities. Annual gynecological exams by a physician are recommended because doctors are sometimes able to feel abnormalities in the ovaries and other reproductive organs. It is sometimes very difficult to detect abnormalities.

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because the organs are deep within the pelvis and not easily palpable. Studies are being conducted by the National Cancer Institute to evaluate possible screening methods that may help to diagnose this cancer early and decrease mortality rates.\textsuperscript{2}

**Figure 1.** 1993-2003 Ovarian Cancer Incidence Rates (top line) and Deaths (bottom line) in Utah Women. Source: IBIS.

**Figure 2.** 2003 United States Ovarian Cancer Incidence Rates by Race. Source: NCI
Utilization of Mammogram Screening and Pap Tests
Compiled by Karen Zinner, MPH

Background
Breast cancer is the most commonly occurring cancer in U.S. women (excluding basal and squamous cell skin cancers) and the leading cause of female cancer death in Utah. Deaths from breast cancer can be substantially reduced if the tumor is discovered at an early stage. Clinical trials have demonstrated that routine screening with mammography can reduce breast cancer deaths by 20% to 30% in women aged 50 to 69 years, and by about 17% in women aged 40 to 49 years. Recent research suggests that ultrasound may be a better screening tool for some women. Pap smears are another screening that is recommended for women.

Healthy People 2010 Objective 3.13: Mammograms
- Adults receiving within past 2 years (age adjusted, females aged 40 years and older) U.S. Target for 2010: 70% Utah Target for 2010: 80% in 2010

Healthy People 2010 Objective 3.11b: Pap test – Women aged 18 years and older who received a Pap test within the preceding 3 years U.S. Target for 2010: 90%

Figure 1. Percent of Women receiving Preventive Mammograms and Pap Tests Utah, 1994-2004. Source: Behavioral Risk Factor Surveillance System, Center for Health Data, IBIS, Utah Department of Health
Risk Factors
The most important risk factor for breast cancer is increasing age. Other established risk factors include personal or family history of breast cancer, history of abnormal breast biopsy, early age at onset of menses, late age at onset of menopause, never having children or having a first live birth at age 30 or older. Associations have also been suggested between breast cancer and oral contraceptives, long-term use of hormone replacement therapy, obesity (in post-menopausal women), alcohol, and a diet high in fat. The American Cancer Society recommends that women aged 40 or older have an annual mammogram, while the National Cancer Institute, the U.S. Preventive Services Task Force, and the U.S. Department of Health and Human Services recommend that women 40 years or older undergo mammography every 1-2 years. Women who are at higher than average risk of breast cancer should seek expert medical advice about whether they should begin screening before age 40 and the frequency of that screening. It is recommended that women over age 21 get a Pap test and pelvic exam every 1 to 3 years.

Utah data vs. U.S. How are we doing

Services/Hotlines
The Utah Cancer Control Program (UCCP) provides free to low cost clinical breast exams and mammograms to women who meet age and income guidelines. Eligible women with abnormal screening exams are offered diagnostic evaluation by participating providers. In addition, the UCCP provides education about the need for early detection and the availability of screening services, performs outreach to eligible women, uses an annual reminder system, collects outcome data and disseminates information about breast cancer. As of July 1, 2001, the UCCP is able to refer Utah women in need of treatment for breast and cervical cancers and precancerous lesions for full Medicaid benefits. The women must meet all requirements as outlined in the National Breast and Cervical Cancer Treatment Act.
Depression Among Older Women
Compiled by Emogene Grundvig, MSW

Background
Older women are more at risk of experiencing depression than older men. Each year, approximately, 6 million adults, 65 years of age and older, suffer from depression, and only ten percent receive treatment for the condition (See figure 1). In the Diagnostic and Statistical Manual of Mental Disorders-IV-TR, the criteria for mental health professionals to diagnosis severe depression or a Major Depressive Episode in an individual includes: “five (or more) of following symptoms have been present during the same 2-week period and represent a change from previous functioning;

• depressed mood most the day…
• markedly diminished interest or pleasure in all, or almost all, activities most of the day…
• significant weight loss or weight gain when not dieting, or decrease or increase in appetite…
• insomnia or hypersomnia…
• psychomotor agitation or retardation…
• fatigue or loss of energy…
• feelings of worthlessness or excessive or inappropriate guilt…
• diminished ability to think or concentrate, or indecisiveness…
• recurrent thoughts of death, recurrent suicidal ideation…”

For this diagnosis, the individual needs to experience the above symptoms nearly everyday.
Figure 1. Depression and Treatment of American Adults 65 Years and Older. Source: Geriatric Mental Health Foundation.

Utah Data

In a 2002-2003 Utah Behavioral Risk Factor Surveillance System Survey, 11.0% of Utah women ages 65-74 reported experiencing seven or more poor mental health days in the past month compared to 3.5% of Utah men in the same age group. This percentage is comparable to the national average for women in this age group, at 11.5%, but is less than the national average for men, at 6.2%. As shown in Figure 2, the same trend applies for older age groups (Figure 2).³

Figure 2. Percentage of Older Adult Who Reported Poor Mental Health. Source: Utah Department of Health.
Risk Factors
Depression in later life often co-exists with other physical disabilities and illnesses, such as diabetes, stroke, heart disease, and cancer. Psychological, emotional, and physical consequences of depression can be extremely damaging and potentially life threatening to older women who suffer from it. Further symptoms often include back pain, muscle aches, joint pain, chest pain, headaches, fatigue, sleeping problems, changes in appetite or weight, persistent sadness, excessive crying, hopelessness, helplessness, and thoughts of death or suicide, or suicide attempts.

Services
Depression is a treatable condition, which is highly responsive to treatment. For further information on depression contact your family doctor.

References
Mental Illness and Women

Compiled by Lori Smith, LCSW

Background
Past research has focused on women’s mental health disorders being related primarily to childbirth. Postpartum depression research continues with new information constantly emerging; however, information is now available to show that women may suffer mental health issues as a result of many different contributing factors and disproportionately suffer from a variety of mental health disorders, including depression, anxiety, phobias and post-traumatic stress disorder (PTSD).

Scientists have discovered a connection between various biological and psychosocial factors to mental health and mental illness in both women and men, and are finding that mental health issues affect women differently than men. For example, women have depression more often than men, and are depressed in different ways. (See figure 1). Research shows that before adolescence and late in life, females and males experience depression at about the same frequency. Because the gender difference in depression is not seen until after puberty and decreases after menopause, scientists hypothesize that hormonal factors are involved in women’s greater vulnerability. Women also are more likely to be the victim of a violent crime such as rape and domestic abuse, which in turn increases the likelihood of mental health issues.

Common mental health disorders

Figure 1. Mental Disorders Among Adults Aged 18 and older by sex 2001-2003. Source: National Comorbidity Survey Replication (NCS-R)

*Anxiety disorders include panic disorder, phobias, obsessive-compulsive disorder, and generalized anxiety disorder.

**Mood disorders include major depressive disorder, bipolar disorders, and dysthymia.
Women and men may suffer from the same types of mental disorders; however, as previously stated, women suffer from depression and anxiety at a higher rate than men. In addition, women are more likely to be victims of intentional injury crimes, which contribute to the higher incidence of depression and anxiety specifically anxiety related to PTSD.

Research completed by the U.S. Department of Health and Human Services Health Resources and Services Administration in 2003 found that 23% of women had experienced an anxiety disorder during the past year, compared to 14% of men. The most common anxiety disorders experienced by women include specific phobias, social phobia, PTSD and generalized anxiety disorder (GAD).

More than 17 million Americans experience depression every year. Over half are women. In fact, women experience depression twice as often as men and they often experience it earlier, longer, and more severely. Higher rates of depression in women may be linked to biological and social differences. The same research found that mood disorders, such as depressive disorder and bipolar disorder are also more common among women than men. The study found that 11.6% of women experienced a mood disorder as opposed to 7.7% of men.

Women are more likely than men to experience depression in association with other conditions such as eating disorders, anxiety, and stress. On the other hand, men tend to have depression associated with alcoholism, antisocial behaviors, obsessive-compulsive personalities, and self-centered behaviors. A study completed by the U.S. Department of Health and Human Services, Health Resources and Services Administration in 2003 found that nearly one-quarter of new mothers suffer mild depression, 9.7% show moderate and 6.5% show symptoms of severe depression.

Women’s Mental Health in Utah
Data from the Utah’s Health Status Survey in 2004 indicated that 22% of Utah women report below average mental health. In 2005 20% of the women queried indicated that for 7 or more of the past 30 days their mental health had not been good. Data from 2004 indicated that 16% of women queried about general mental functioning felt that they accomplish less.

Low general mental functioning suggests feelings of depression, despair, anxiety, etc. When looking specifically at issues related to depression and focusing on maternal depression the numbers bear out. For example, postpartum depression affects more women in their reproductive years than does gestational diabetes (2.2%), pregnancy associated hypertension (5.6%), and even preterm birth (9.5%), yet it receives much less detection, treatment and research.

In Utah, a quarter of all women who delivered a live birth reported feeling moderately depressed, very depressed, or very depressed and had to get help during 2000-2002. (See figure 2). Utah’s prevalence of postpartum
depression is higher than what much of the literature indicates (25% compared to 10-20%). In a recent analysis of PRAMS data, the Centers for Disease Control and Prevention (CDC) discovered that 62% of Utah women who delivered a live birth during 2000 reported low to moderate levels of depression. Utah ranked highest among the six states compared. These data are of tremendous concern to those working in maternal and child health because of the health implications that they may have for women and their infants throughout the state.


<table>
<thead>
<tr>
<th>Depression Level</th>
<th>Percentage</th>
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<tr>
<td>Not depressed</td>
<td>44.40%</td>
</tr>
<tr>
<td>Slightly depressed</td>
<td>30.60%</td>
</tr>
<tr>
<td>Moderately depressed</td>
<td>18.10%</td>
</tr>
<tr>
<td>Very depressed</td>
<td>4.20%</td>
</tr>
<tr>
<td>Very depressed and needed help</td>
<td>2.70%</td>
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Summary
Mental disorders in women are increasing at an alarming rate. An understanding of the common mental health issues, their symptoms and recommended treatment is imperative. Mental illness is a very treatable disorder. The evidence for treatment being more effective than placebo is overwhelming. The degree of effectiveness tends to vary, depending on the disorder and the target population. Recovery is variously called a process, an outlook, a vision, and a guiding principle. There is neither a single agreed-upon definition of recovery nor a single way to measure it. But the overarching message is that hope and restoration of a meaningful life are possible, despite serious mental illness.

References
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U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Mental Health Topics, Women, Violence and Trauma, 2006 at: http://mentalhealth.samhsa.gov/topics/explore/womenandtrauma/

U.S. Department of Health and Human Services, Health Resources and Services Administration. Women's Health USA 2006. Rockville, Maryland: U.S. Department of Health and Human Services, 2006. This publication is available online at www.hrsa.gov/womenshealth


Postpartum Depression
Compiled by Joanne McGarry

Background
The literature indicates that 10-20% of women suffer from postpartum depression (PPD) after childbirth. The onset of PPD usually occurs within twelve weeks after delivery; if it is not detected early and is left untreated symptoms can last 1-2 years.\textsuperscript{1,2}

There are a variety of interventions available to treat PPD, such as education, support, therapy and medication.\textsuperscript{3} However, these interventions are disappointingly underused. The Healthy People's 2010 goal is to increase the percentage of adults with recognized depression who receive treatment to 50% (current measure 23%). This objective (18-9b) is not limited to women experiencing postpartum depression, but certainly includes them.

Risk Factors
PPD is a debilitating illness that affects women of all types. However, higher rates of PPD are reported among women who:

• Have low education
• Are of race other than white
• Are unmarried
• Are on Medicaid
• Have a lower socioeconomic status
• Have an unintended pregnancy
• Experience abuse
• Experience significant life stressors
• Have a history of depression

Utah Data
Utah PRAMS 2004 data (Pregnancy Risk Assessment Monitoring System) indicates that 14.7% of Utah women who delivered a live birth reported PPD. A quarter (25.5% N=1666) of women with less than high school education reported PPD, compared to 8.5% (N=1109) of women who completed college. (See figure 1).

Figure 1. Percentage of Women Who Reported Postpartum Depression, by Maternal Education-- Utah PRAMS 2004

Of the women who reported PPD, 39.5% reported seeking help for the depression. Women who had a history of seeking help for depression during pregnancy were the most likely to seek help postpartum (72.8% vs. 24.9%).

Surprisingly, women who lived in rural communities also had higher rates of seeking help for their depression (49.4% vs. 35.3%). (See figure 2).
Figure 2. Among Women Who Reported Postpartum Depression, The Percentage of Women Who Sought Help, by Urban/Rural Residency-- Utah PRAMS 2004

Services
Maternal and Child Health Library: A virtual guide to MCH information Knowledge Path: Postpartum Depression: mchlibrary.info/KnowledgePaths/kp_postpartum.html

The Macarthur Initiative on Depression and Primary Care at Dartmouth & Duke: www.depression-primarycare.org/. 
Suicide
Compiled by Emogene Grundvig, MSW

Background
Suicide is an unfortunate and potentially preventable public health issue. Men complete suicide with four times the frequency of women, but women attempt suicide three times more often than men.\(^1\) In 2002, 31,655 U.S. adults completed suicide,\(^1\) and 132,353 were hospitalized for attempting suicide (See figure 1).\(^2\)

Utah Data
Suicide is the leading cause of death in Utah. In 2001, it ranked as the second cause of death for persons aged 10-34 years and the primary cause of death for those 35-44 years.\(^3\) The Utah Department of Health Violence and Injury Prevention Program (VIPP) reports from 1999-2003 Utah had the 8th highest suicide rate in the United States.\(^3\) Suicide rates are higher in Utah when compared to the national suicide rates among all age groups. In Utah, the rate of suicide is 13.74 per 100,000 which is higher than the national rate of 10.66 per 100,000.\(^4\) Additionally, the Department of Health indicates that from 1999-2003, Utah men completed suicide five times more frequently than Utah women with 1,563 men completing suicide compared to 293 women (see figure 2).\(^4\)

The Utah Department of Health VIPP reports that the men’s most commonly used method to complete suicide in Utah is the use of a firearm at 64%; whereas, the most commonly used method used by women is poisoning at 39%.\(^5\)

Risk Factors
Common risk factors that increase the likelihood that an adult will attempt or complete suicide include a prior suicide attempt, depression, substance abuse, recent death of a loved one, financial loss, serious physical illness,
perception of poor health, changes in social roles, hopelessness, and isolation. Further, common protective factors that mitigate the possibility of suicide among adults include limited access to firearms, family and community support, clinical services for mental and physical health, religious and cultural beliefs that reject suicide, and skills in problem solving and conflict resolution.

The psychological and emotional consequences of depression can be extremely damaging and potentially life threatening to the women and men who suffer from it. Each year, approximately, two-thirds of suicides are related to a major depression episode. Also, persons who are depressed are 50% more likely to attempt/complete suicide than those who are not.

**Services**
If you or someone you love is contemplating suicide, contact the National Suicide Prevention Lifeline at 1-800-273-8255. For immediate help dial 9-1-1.

**References**


Suicide in Later Years
Compiled by Emogene Grundvig, MSW

Background
The frequency of women completing suicide generally declines after the age of 60.\(^1\) However, older adults have the highest frequency of completed suicides in the United States.\(^2\) In 2001, 5,393 adults 65 years and older completed suicide, with 85% of them men, and 15% of them women (See figure 1).\(^3\) Further, older adults encompass 12.4% in the United States population, but account for 16.7% of all completed suicides.\(^1\)

Older adults generally use extremely lethal methods to complete suicide. Firearms are the most commonly used method. Older men use firearms to complete suicide approximately twice as often as older women with 73% for men compared to 34% for women. Additional commonly used methods include hanging and poisoning.\(^1\)

Utah and U.S. Data
Elderly white males have the highest risk of completing suicide with an average of 32 suicides per 100,000 each year.\(^1\) Further, 85% of suicides among older adults are completed by men, which is 5.5 times greater than suicides completed by elderly women.\(^1\) Comparably, in Utah men aged 55 and older were seven times more likely to complete suicide than women.\(^2\)

In 2003, the suicide rate in Utah for persons aged 55 and older was approximately 20.1 per 100,000 and for those 85 and older the rate was 22.7 per 100,000. Further, across all age groups, Utah’s suicide rate is the tenth highest in the nation.\(^2\)

Risk Factors
Common risk factors that increase the likelihood than an older adult will complete suicide include social isolation, recent death of a loved one, serious physical illness, perception of poor health, and changes in social roles.\(^1\)
Further, common protective factors that mitigate the possibility of suicide among the elderly include family and community support, clinical treatment for mental and physical health, religious and cultural beliefs that reject suicide, and skills in problem solving and conflict resolution.\(^2\)

The psychological and emotional consequences of depression can be extremely damaging and potentially life threatening to the older women and men who suffer from it. One of the primary causes of suicide among older adults is depression that goes undiagnosed and/or without treatment. Persons diagnosed with a major depressive disorder are 50% more likely to complete suicide than the general population.\(^4\) Additionally, approximately, 20% of older adults that complete suicide had an appointment with a physician within the prior 24 hours of the incident, 41% had a visit within the last week, and 75% within the last month (See figure 2).\(^5\)

**Services**

If you or someone you love is contemplating suicide, contact the National Suicide Prevention Lifeline at 1-800-273-8255. For immediate help dial 9-1-1.

**References**


Women, Incarceration and Serious Mental Illness in Utah State Prison System

Compiled by Kristin G. Cloyes, PhD, RN; Jose Abarca, BSW; Emogene Grundvig, MSW; and Janelle Bassett RN, MN

Women with Mental Illness and the Growth of the U.S. Prison Population
In the United States, there are two distinct groups that constitute the fastest growing element of the incarcerated population: women and persons with mental illness. The U.S. Bureau of Justice Statistics (BJS) reported that in 2005, 95,096 women were incarcerated in state prisons, compared to 82,058 in 2001 and 57,263 in 1994.1 Recent years have seen a similar rise in number of persons with mental illness incarcerated in U.S. state prisons. At present, more than 700,000 people with mental health problems live in state prisons, or 56% of the entire U.S. state prison population.2 Women in State prisons have higher rates of mental health issues compared with male prisoners, with 73% of the female state prisoner population expressing symptoms of mental disorder, compared to 55% of the male population.2 Further, in 1999 the BJS reported the highest frequency of mental illness among white women in State prison. In State facilities, approximately, 29% of white women, 22% of Hispanic women, and 20% of African American women were categorized as mentally ill.3 This brief report highlights this intersection by describing the mental health, offense and recidivism status of incarcerated women with serious mental illness (SMI) in the UT State prison system. In addition to citing statistics published at the national and state levels, we also report on pilot data and preliminary findings of our ongoing study of recidivism, serious mental illness and prison and community-based treatment in Utah State prisoners released from prison 1998-2002.4

Women in Utah Prisons: Rates of Incarceration and Demographics
In 2004, Utah ranked 35th in its female incarceration rate, with 42 female inmates per 100,000 female residents.5 In 2006, 570 women were housed in Utah State Prison compared with 30 women in 1977.5 Women now comprise 9% of the Utah prison population, a higher ratio than the U.S. average of 7%.1 As of May 2006, women of minority status represented slightly over 2% of the overall Utah prison population, with the following distribution by racial and ethnic category: Asian/Pacific Islander, 0.18%; African American, 0.48%; Native American/Alaskan Native, 0.27%. White women currently represent 7% of the total prisoner population in the Utah State system.4

The descriptive statistics reported in this and the next section were generated from a sub-sample of women identified as seriously mentally ill (SMI)6 who were released from Utah State Prison 1998–1999 (N = 246).
Of these women, 226 were identified as White (92%), 11 as African American (4.5 %), 1 as Asian (0.4%), 1 as Pacific Islander (0.4%), and 5 as Alaskan Native (3.3 %). Fourteen percent of this sub-sample was identified as Hispanic, while 86% were not. The average and median age of first incarceration in state prison for women with SMI was 30 years of age, with a range from 17 to 61. However, the most frequent age of first incarceration in our sample was 24 (20 women or 8.2%) and the next most frequent was 31 (6.9%) with 33 (6.5%) and 34 (6.1%) close behind. This highlights the interesting point that the frequency distribution for age of first incarceration had a distinct bimodal pattern, with age of first admission clustering in the mid-twenties and the early to mid-thirties (Figure 1). The average and most frequent number of total prison admissions through 12/31/2002 for this sample was 3 (26%) with a range of 1 (18%) to 9 (0.4%) admissions.

Psychiatric Diagnoses and Symptoms
In addition to collecting data related to demographics, incarceration patterns and recidivism, we also collected data related to psychiatric diagnoses, symptoms and treatment for women with SMI in our 1998-1999 sub-sample. Sixty percent of women prisoners with SMI were screened for mental illness as part of the prison admission process while 40% were not. Of those screened, 9% were flagged as positive for mental illness requiring follow-up evaluation. Further, 98% of those who received follow-up clinical evaluation were diagnosed as mentally ill. By far, the most common DSM-IV psychiatric diagnosis of these women is Major Depressive Disorder, with 144 or 59% of women in our sample having this diagnosis recorded in their prison medical charts. The second most common psychiatric diagnosis in this sample was Bipolar Disorder (55 women or 22%). Finally, individual chart reviews for all women with SMI showed that in 44% of charts, staff had recorded significant symptoms of serious mental illness such as mania, hallucinations, delusions, disorganization, self-isolation, poor hygiene and compulsive behaviors.

Recidivism Rates for Women Parolees with a Mental Illness
Overall, recidivism rates for both women and men are higher in Utah than the national average, due in part to stricter and more intensive monitoring of parolees than might be practicable in states with larger offender populations. Our larger study sample includes all persons released from Utah State Prison 1998-2002, and identifies those who meet study criteria for SMI. In our sample of Utah State prisoners, 87% of women with SMI and 84% of men with SMI are released to parole, so our initial analyses of recidivism have focused on parolees. For 1998-2002, the average percentage of men and women with SMI who returned to prison within 36 months of release was 77%, compared with 62% for non-SMI men and women. Analyzing the women’s data separately, we found that 72% of women with SMI released from Utah State Prison between 1998 and 2002 returned within 36 months, nearly one and a half times the percentage for women without SMI (49%).
Primary Offense of Conviction: Alcohol and/or Drug Related and Violent Offenses

Across the U.S., the crimes for which women are primarily incarcerated are alcohol and drug-related offenses. BJS states that in 2000, 1 in 3 women were imprisoned for a drug-related crime and roughly 50% of women imprisoned in State prisons were under the influence of drugs or alcohol at the time of their offense. A Utah Commission on Criminal and Juvenile Justice Study (CCJJ) reported in 2006 found that 62.5% of Utah women are incarcerated for a drug-related offense, and 77.6% of women committed their crime while under the influence of alcohol or drugs. When examining the data related to primary offense for our sample of women prisoners with SMI released from Utah State prison, we found the following: For the five year period 1998-2002, the average percentage of women parolees with both SMI and an alcohol and drug related primary offense was 56%, compared with 63% for women parolees without SMI, 29% for men parolees with SMI, and 38% for men parolees without SMI. Thus percentages of alcohol and/or drug related primary offenses are high for both SMI and non-SMI women when compared with the male population. During 1998-2002, the average percentage of women parolees with SMI and violent offenses was 11%, compared with 8% for women without SMI. The difference in percentages of women parolees both with and without SMI who committed violent offenses is notable, when compared with male parolees, with average percentages of 32% (SMI) and 28% (non-SMI), respectively. Data related to primary offense are summarized in Table 1.
### Table 1: Percentages of Parolees with Alcohol/Drug and Violent Primary Offenses

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<tr>
<th></th>
<th>% Alcohol/Drug Offense</th>
<th>% Violent Offense</th>
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<tbody>
<tr>
<td>Females with SMI</td>
<td>56%</td>
<td>11%</td>
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<tr>
<td>Non-SMI Females</td>
<td>63%</td>
<td>8%</td>
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<tr>
<td>Males with SMI</td>
<td>29%</td>
<td>32%</td>
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<tr>
<td>Non-SMI Males</td>
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<td>28%</td>
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<tr>
<td>Total SMI</td>
<td>36%</td>
<td>27%</td>
</tr>
<tr>
<td>Total Non-SMI</td>
<td>40%</td>
<td>27%</td>
</tr>
</tbody>
</table>

### References


4. The research study described here is supported by funding from the Utah Commission on Criminal and Juvenile Justice, the University of Utah Research Committee (Faculty Research Seed Grant) and the University of Utah College of Nursing Research Committee.


6. Cloyes et al. Assessment of Psychosocial Impairment in a Supermaximum Security Unit Sample. Crim Just and Behav 2006: 33(6): 760-81. For details on how the published algorithm for SMI was adapted and applied in this study, contact Dr. Cloyes.


8. In calculating the percentages of women and men with and without SMI with violent primary offense, we included the offense categories of murder, person and first and second degree felony, registerable sex offenses.
Race and Low Birth Weight in Utah

Compiled by Jane M. Dyer, CNM, FNP, MS, MBA

Background
The relationship between race and low birth weight (LBW) is complex and a growing perinatal concern throughout the U.S. and in Utah for parents, health care professionals, health care systems, educators, and legislators. LBW disproportionately affects certain races/ethnicities, especially non-Hispanic blacks and Asian/Pacific Islanders. Barriers to information and care for minority populations include financial, language/cultural, and geographic. Certain characteristics of Utah’s population place it a greater risk for a higher incidence of LBW: rapidly increasing racial minority populations especially Asian/Pacific Islanders, young and rapidly increasing general population, a high birth rate, a few densely populated urban areas with easily accessible assisted reproductive technology, and large expanses of rural/frontier areas with few health care providers. LBW births account for 10% of all U.S. health care costs related to children. Providing education, health care and child care to children of LBW from infancy to age 15 costs the U.S. $5.5 to 6 billion annually. When compared to normal weight infants, health care costs in Utah are 6 times higher for LBW babies weighing and almost 85 times higher for Very Low Birth Weight (infants weighing less than 1500 grams - VLBW) infants.

LBW, babies weighing less than 2500 grams, includes babies born before 37 weeks (preterm or premature – 60% of all LBW babies) and small babies born at term (small for gestation age – SGA and intrauterine growth retardation - IUGR). LBW infants can belong to one or both groups and face unique potential complications.

Healthy People (HP) 2010 objectives and goals specifically address reducing the incidence of LBW and preterm births. The U.S. HP 2010 goal is to reduce LBW to no more than 5% of live births and VLBW to no more than 0.9% of live births. Utah is failing to meet the HP 2010 goals.

Risk Factors
Racial minority groups are more likely to have conditions that are associated with LBW. These include late entry into prenatal care, history of a previous LBW baby, lower income, lower education level, higher incidence of teen pregnancy, smoking, low maternal weight gain, short inter-pregnancy interval, and maternal and fetal medical conditions. Other risk factors include multiple births (twins, triplets, etc.), maternal age of over 40, and assisted reproductive technologies for infertility problems. Some of the maternal medical conditions associated with LBW are high blood pressure, infections, uterine anomalies, placental insufficiency, and cardiac, kidney, or lung problems. Fetal conditions include defects from genetic or environmental causes.
Utah Data: How are we doing?
The overall incidence of LBW and the rates in certain racial groups continues to rise nationally and in Utah. Between 1981 and 2003, the rates of premature births and LBW in the U.S. and in Utah increased.\(^4\)

Table 1. Changes in Preterm and LBW Rates, Utah and the U.S., 1994 and 2004

<table>
<thead>
<tr>
<th></th>
<th>US Preterm</th>
<th>Utah Preterm</th>
<th>US LBW</th>
<th>Utah LBW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>11.00%</td>
<td>8.90%</td>
<td>7.30%</td>
<td>5.90%</td>
</tr>
<tr>
<td>2004</td>
<td>12.50%</td>
<td>10.90%</td>
<td>8.10%</td>
<td>6.70%</td>
</tr>
</tbody>
</table>

Since 1989, the actual number of all LBW babies born in Utah dramatically increased from 2,015 in 1989 to 3,520 in 2005 (6.83% of all live births).\(^5\)

Table 2. Actual Number of LBW Babies in Utah, 1989, 1996, and 2005

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>2,015</td>
</tr>
<tr>
<td>1996</td>
<td>2,791</td>
</tr>
<tr>
<td>2005</td>
<td>3,520</td>
</tr>
</tbody>
</table>

The incidence of LBW in Utah’s growing racial minority population is consistently higher than Utah’s white population over the last four years.\(^6\)
Table 3. Percent of LBW Births by Maternal Race in Utah

![Bar chart showing percent of LBW births by maternal race from 2002 to 2005 for different racial categories: White, Black or African American, American Indian or Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, Other Racial Entries, and Unknown.]

Summary
National, state, and local entities are attempting to address the issues that surround LBW. Local organizations, such as the Utah March of Dimes and certain provider groups, are attempting to increase access to prenatal care. Departments within the Utah State government produce educational materials for providers and women to prevent LBW, conduct perinatal morbidity and mortality reviews, provide limited prenatal care funding through the Baby Your Baby Program (BYB), provide supplemental food and nutritional education through the Women, Infants, and Children (WIC) Program, and collect birth certificate and Pregnancy Risk Assessment Monitoring System (PRAMS) data to guide interventions. After failing to meet the HP 2000 goals, the Utah State Department of Health (UDOH) addressed the rising incidence of LBW in its Report on Low Birth Weight in Utah in 1999. Almost all of the challenges identified in this report remain the challenges in 2007.

References
Preterm Birth
Complied by Sara Ellis Simonsen, RN, MSPH, and Michael Varner, MD

Preterm birth, defined as the birth of an infant at less than 37 completed weeks of gestation, is a serious public health problem in Utah and the United States. Infants born prematurely are at increased risk for morbidity and mortality when compared to infants born at term. Neonatal and infant mortality rates increase proportionally with decreasing gestational age, and preterm birth is the leading cause of infant mortality in the United States for non-anomalous liveborns. In Utah, approximately 80% of neonatal deaths occur in premature infants.

Preterm births are on the rise in both Utah and the United States, as illustrated by data in Figure 1. In Utah, preterm birth occurs less frequently than in the United States.

Healthy People 2010’s goal regarding preterm birth is that no more than 7.6% of deliveries should occur prior to 37 weeks gestation; in Utah, 10.8% of live births were preterm in 2004, as compared to 8.9% in 1994. Thus, the preterm birth rate increased by 21.3% in Utah between 1994 and 2004. More importantly, when accounting for the increasing number of overall deliveries each year in Utah (38,271 in 1994 and 50,653 in 2004), the number of babies born prematurely increased by 60.9% during the same interval.

Risk factors for preterm birth include maternal health status, obstetric and family history, gynecologic health, multiple gestations, low pre-pregnancy weight/BMI, preeclampsia, presence of a birth defect, maternal tobacco, alcohol, and drug use, minority race/ethnicity, low socioeconomic status, chronic stress, young/advanced maternal age, marital status, and occupational and environmental exposures. In Utah, preterm birth occurs most frequently among African American and American Indian/Alaskan Native women. The proportion of preterm births occurring in Utah African American women is 44% greater than the proportion occurring in Utah Caucasian women, a finding consistent with national statistics (see Figure 2). Teenage mothers and women with advanced maternal age are also at increased risk for preterm birth (see Figure 3). Data for Figures 2 and 3 is from the Utah Department of Health’s Indicator Based Information System for Public Health Birth Query Module.

The complications associated with preterm birth cost billions of dollars in direct costs and unrealized potential each year in the United States alone. The economic burden associated with preterm birth in 2005 was $26.2 billion, with an average cost of $51,600 per premature infant. These figures do not include long-term burdens or lost potential. Prevention of preterm birth is imperative if we are to reach the Healthy People 2010 goal. Risk factors for preterm birth that are most likely to be impacted by public health interventions include inadequate prenatal care, smoking, drug and alcohol use, inadequate weight gain, and poor diet.
Figure 1. Preterm Births (<37 Weeks Gestation) as a Percentage of Live Births: Utah and the United States, 1994-2004. Source: March of Dimes Perinatal Statistics Website

Figure 2. Preterm Births (<37 Weeks Gestation) as a Percentage of Live Births by Race/Ethnicity*: Utah, 2002-2005. Source: Utah Department of Health’s Indicator Based Information System

*Race/Ethnicity groups are not mutually exclusive.
Figure 3. Preterm Births (<37 Weeks Gestation) as a Percentage of Live Births by Age Group: Utah, 1996-2005. Source: Utah Department of Health’s Indicator Based Information System

References
Prenatal Care in the First Trimester

Compiled by Karen Zinner, MPH

Background
Women who receive early and consistent prenatal care (PNC) enhance their likelihood of giving birth to a healthy child. Health care providers recommend that women begin prenatal care in the first trimester of their pregnancy. Healthy People 2010 Objective 16.6a: Prenatal care beginning in first trimester U.S. Target for 2010: 90% Utah Target for 2010: 90%

Risk Factors
Pregnant teens 15-19 years of age have a number of risk factors including:

- low level of education
- race other than White
- Hispanic ethnicity
- being unmarried
- lower socio-economic status
- lack of health insurance
- smoking or drinking prior to pregnancy
- unintended pregnancy

Women who recognize their pregnancy later than nine weeks of gestation are less likely to get early prenatal care. Lack of health insurance affects both the timing and frequency of prenatal care visits, resulting in poor pregnancy outcomes such as premature birth, low birth weight, and complicated delivery. Availability of family planning services is another system factor that reduces the risk of unintended pregnancy. If a pregnancy is planned, a woman is more likely to seek early and adequate prenatal care.

Utah data vs. U.S. How are we doing

The Utah rate had been consistent for the last few years and in 2005 the rate increased slightly. The Utah rate in 2005 (78.8%) was below that of the nation (83.9%).

Services/Hotlines
The Utah Department of Health Baby Your Baby Program sponsors a statewide media campaign and provides information and referral services to pregnant women in Utah. The Baby Your Baby toll-free hotline can be reached by dialing 1-800-826-9662. The hotline is open weekdays from 8:00 a.m. to 5:00 p.m. Its operators can provide information, referrals, assistance in finding financial aid and access to community health care services. A pregnancy risk line is available to pregnant women. The Pregnancy Risk Assessment Monitoring System (PRAMS) collects and analyzes data to identify characteristics of Utah women and their utilization of prenatal care.
Obesity and Pregnancy
Compiled by Laurie Baksh, MPH

Background:
Studies show that obese pregnant women are at increased risk for gestational diabetes, preeclampsia, eclampsia, cesarean section, macrosomia, instrumental delivery, fetal distress, antepartum stillbirth, and early neonatal death. Obese women have been found to have longer labor, are more likely to have inadequate contraction patterns during labor, and are more likely to receive labor induction and augmentation.

Utah Data:
Healthy People 2010 goal 19-2 is to decrease the proportion of adults who are obese to 15 percent. Utah Vital records data indicate that in 2005, 14.5% of women with a live birth were obese before becoming pregnant, an increase of 30% since 1994. Utah is very close to exceeding the Healthy People goal among its pregnant women.

Risk Factors:
An analysis of Utah PRAMS data found that women who were obese prior to pregnancy were more likely to be older, of a race other than white, multiparous, and living at a lower poverty level. The analysis also found that
Obese Utah women were at increased risk of developing diabetes or hypertension, delivering a macrosomic infant, having labor induced, having their infant admitted to the newborn intensive care unit, and reporting postpartum depression. Vital Records data show that the highest rates of obesity in pregnant women are among the Pacific Islander and Native American women.

**Services**

As weight loss is not recommended during pregnancy, weight issues should be addressed with women before they become pregnant. Body Mass Index should become a recorded measure on patient charts and reproductive aged women who have high weights should be counseled about achieving a healthy weight before pregnancy and their risks during pregnancy if they are at an unhealthy weight. Intermountain Health Care has published guidelines on the medical management of obesity; the document is available online at: https://kr.ihc.com/ext/Dcmnt?ncid=520199293

**References**


Fetal Death

Compiled by Shaheen Hossain, PhD

Background
Fetal death is a major public health problem. It accounts for more than half of all perinatal deaths. The World Health Organization defines fetal death as “death prior to the complete expulsion or extraction from its mother of a product of human conception, irrespective of the duration of pregnancy.” Although this definition of fetal death is the most frequently used, it is by no means the only definition. The Centers for Disease Control and Prevention recommend reporting fetal deaths occurring at 20 weeks of gestation or greater. This policy is only a guideline and reporting practices vary among states.

Risk Factors
Several studies have established an association between fetal death and maternal age.\(^1\)\(^2\) Other studies have shown that the risk factors for the occurrence of fetal death include previous stillbirth, congenital malformations, multiple gestations, grand multiparity (>5 prior births), no prenatal care, pre-pregnancy obesity, smoking and

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![Graph showing fetal death rate by maternal age in Utah, 1992-2005.](image-url)
maternal medical conditions such hypertension, preeclampsia, diabetes, and abruptio placenta.

Analysis of Utah Fetal Death data 1992-2005 indicate that risk of fetal death was higher in younger (≤19) and older women (≥35), and risk increased with advancing maternal age.

Utah Data vs. U.S. (How are we doing?)
The fetal mortality rate in Utah is lower than the national rate, however, it is still above the Healthy People 2010 goal of 4.1 (Objective No. 16-1a). Although the rate decreased significantly over past decades, the problem of fetal mortality remains immense. During 2005 alone, 260 infants were stillborn in Utah.


Recommendation
It has been estimated that close to half of all fetal deaths have no identifiable causes. In order to decrease fetal mortality rate, it is essential to understand the etiology of fetal death. Such etiology will direct public health actions and will also influence future preconceptional counseling, pregnancy management, and neonatal care management. Preventive strategies should target research, improve fetal death surveillance and reporting, and educate practitioners in identifying women at risk.3 The National Institute of Child Health and Human Development recently awarded grants to five sites for population-based studies on fetal death. The Division of Maternal-Fetal Medicine at the University of Utah is one of the sites that will focus on studying stillbirth.

Maternal Mortality

Compiled by Lois Bloebaum, BSN, MPA

Background
Maternal mortality is an important health indicator reflecting a nation’s health status. Though maternal mortality has decreased by 99% since the 1900s, maternal deaths currently remain significant events. Maternal deaths in Utah are classified as either pregnancy-associated (PA) or pregnancy-related (PR). A pregnancy-associated death is the death of any woman from any cause while pregnant or within one year of termination of pregnancy. A pregnancy-related death is defined as a subset of pregnancy-associated deaths resulting from 1) complications of the pregnancy, 2) the chain of events initiated by the pregnancy or 3) aggravation of an unrelated condition by the physiologic or pharmacologic effects of the pregnancy. This expanded definition used by the Utah Department of Health (UDOH) is different than that used by the National Center for Health Statistics’s definition and has been promoted by the Centers for Disease Control and Prevention to more clearly reflect the problem. Maternal death surveillance is carried out by the Perinatal Mortality Review Program (PMRP) of the UDOH.

Methodology
The PMRP is a public health approach to improving perinatal outcomes. Through individual case reviews with a committee of perinatal healthcare professionals, opportunities for prevention are identified. This report outlines characteristics of maternal deaths in Utah from 1995-2002 and compares these results to a previous analysis completed for a period from 1982-1994. Maternal mortality rates were calculated by identifying the number of maternal deaths, then dividing by the total number of live births registered in the state of Utah during the time periods with the quotient being multiplied by 100,000.

Utah Data
From 1982-1994, there were 62 maternal deaths reviewed resulting in a mortality rate of 12.8/100,000 live births. From 1995-2002, 61 maternal deaths were reviewed resulting in a mortality rate of 16.9/100,000 live births. The increase in maternal deaths from 1995-2002 may be attributable to improvements in pregnancy mortality surveillance over this time period. In 1995, the UDOH established the PMRP through which improved identification of maternal deaths was made a priority.

Among the 61 maternal deaths from 1995-2002, 32 deaths were categorized as pregnancy-associated and 29 as pregnancy-related. Injury, embolism, and cardiac events were the three leading causes of maternal deaths during this time period. Injury was the leading cause of all pregnancy-associated deaths, while embolism was the leading cause of all pregnancy-related deaths. Similar results were obtained in the 1982-1994 time period.
Leading Causes and Classification of Maternal Deaths Utah, 1995-2002

<table>
<thead>
<tr>
<th>Cause</th>
<th>Total</th>
<th>PA</th>
<th>PR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suicide</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Accident</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Motor vehicle accident</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Homicide</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Embolism</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonary embolism</td>
<td>7</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Amniotic fluid embolism</td>
<td>5</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Cardiac</td>
<td>11</td>
<td></td>
<td></td>
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<tr>
<td>Cardiomyopathy</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Congenital</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Adult respiratory distress syndrome</td>
<td>7</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Preeclampsia/eclampsia</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intracranial hemorrhage</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>HELLP* syndrome</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Malignancy</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disseminated intravascular coagulopathy</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Placenta accreta</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Infection</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Undetermined</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

PA = Pregnancy associated, PR = Pregnancy related

*HELLP = hemolysis, elevated liver enzymes, low platelets

Risk Factors
The risk of maternal mortality increases with progressive maternal age. The rate of mortality was lowest in women ages 20-24 years, and increased in a linear trend for all older age groups. In this analysis, maternal mortality rates were also noted to be highest among the underweight and obese women. Of the 61 maternal deaths from 1995-2002, approximately one-third of women had a pre-pregnancy body mass index (BMI) categorized as overweight (BMI=25-29) or obese (BMI >29).

Services
The Utah Department of Health continues to implement the PMRP in an effort to identify opportunities for preventing future maternal deaths. The Reproductive Health Program of the UDOH utilizes PMRP findings to inform the development of policy and program decisions to improve the health of Utah women and their infants.
Unintended Pregnancy

Compiled by Laurie Baksh, MPH

Background
Unintended pregnancy is a major public health problem. Women who experience an unintended pregnancy are less likely to seek timely and adequate prenatal care or to breastfeed their infant and are more likely to smoke or drink during their pregnancy.¹

Utah Data
Healthy People 2010 goal 9-1 is to decrease the proportion unintended pregnancy to 30 percent. Utah PRAMS data indicate that in 2004, 31.4% of women with a live birth reported their pregnancy as unintended. Of the women who reported their pregnancy as unintended, 56.8% indicated they were using a method of birth control at the time of conception. The methods these women reported are noted below.

Self Reported Methods of Birth Control Use among Women with an Unintended Pregnancy. Source: Utah PRAMS Data, 2004

Of the remaining 43.2% of women with an unintended pregnancy who were not using some form of birth control, the reasons indicated were as follows:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I didn’t mind if I got pregnant</td>
<td>23.6%</td>
</tr>
<tr>
<td>I thought I could not get pregnant at that time</td>
<td>39.8%</td>
</tr>
<tr>
<td>I had side effects from the birth control method I was using</td>
<td>12.9%</td>
</tr>
<tr>
<td>I had problems getting birth control when I needed it</td>
<td>13.0%</td>
</tr>
<tr>
<td>I thought my husband or partner or I was sterile</td>
<td>11.1%</td>
</tr>
<tr>
<td>My husband or partner didn’t want to use anything</td>
<td>13.9%</td>
</tr>
</tbody>
</table>

Risk Factors:
Although Utah is very close to achieving the Healthy People goal, there are subgroups of women with significantly higher rates of unintended pregnancy. Utah PRAMS data from 2004 indicate that women who are less than 20 years of age (71.2%), have less than a high school education (50.9%), are of non-white race (40.6%), are of Hispanic ethnicity (37.6%), are unmarried (66.9%), are uninsured (47.9%), and who report physical abuse before pregnancy (72.8%) have significantly higher rates of unintended pregnancy. Women with an unintended pregnancy are also more likely to report postpartum depression (10.7% vs 23.8%).

Services:
The Community Health Centers and Planned Parenthood clinics in the state offer low cost contraceptive services. In 2006, the FDA allowed over/behind the counter distribution of emergency contraception. Currently, it is not known how widely available emergency contraception is in the state.
Adolescent Births
Compiled by Karen Zinner, MPH

Background
Research indicates that bearing a child during adolescence is associated with long-term difficulties for the mother, her child, and society. These consequences are often attributable to the poverty and other adverse socioeconomic circumstances that frequently accompany early childbearing.

Risk Factors
Compared to babies born to older mothers, babies born to adolescent mothers, particularly young adolescent mothers are at higher risk of low birthweight and infant mortality. These babies are more likely to grow up in homes that offer lower levels of emotional support and cognitive stimulation, and they are less likely to earn a high school diploma. For the mothers, giving birth during adolescence is associated with limited educational attainment, which in turn can reduce future employment prospects and earning potential. Adolescent mothers age 15-19 reported that 71.2% of their pregnancies were unintended of which 87.7% of women aged 15-17 and 63.5% of women aged 18-19 reported their pregnancy as unintended in the 2004 Pregnancy Risk Assessment and Monitoring Survey (PRAMS). The highest risk ethnic group for teen births is Hispanic females who have a birth rate almost four times higher than Non-Hispanic females.
Utah data vs. U.S. How are we doing
Utah's adolescent birth rate has been lower than the United States' overall rate during the 1990s, but is higher than some other states. In 2004, the most recent year that national rates are available, Utah's 15-19 year old adolescent birth rate was ranked seventeenth. Utah's adolescent birth rate has declined over the past decade as have national rates.


Services/Hotlines
Prevention of teen pregnancy includes programs to encourage sexual abstinence and family planning services. A detailed report on adolescent pregnancy in Utah has been published by the Utah Department of Health and can be accessed on the internet www.health.utah.gov/cash.

The Utah Department of Health funds eight abstinence-only community-based projects for youth 9-14 years throughout the state with federal abstinence education monies.

Infertility in Utah, 2004 - 2005

Complied by Joseph Stanford, MD, MSPH; Sara Ellis Simonsen, RN, MSPH; Laurie Baksh, MPH

Infertility is typically defined as a lack of pregnancy among couples who have had one year of sexual intercourse without using contraception. Worldwide, millions of couples suffer from infertility. Population-based surveys from the United States and Great Britain indicate that between 8 and 10% of women suffer from impaired fertility; however, as far as we know, less than half of women seek medical treatment for this condition. Couples with infertility may experience emotional distress and devastation when their childbearing desires and expectations are not realized. Infertility may also be an indicator of underlying health problems that can lead long-term consequences such as heart disease or cancer. In addition, couples who receive infertility treatment have increased risk for multiple gestations, preterm birth, birth defects, growth restricted infants, and possibly children with developmental delays, perhaps depending upon the type of treatment received. Thus, infertility is an important public health issue for couples in Utah and worldwide.

Despite the importance of infertility, there has been little population-based assessment of its incidence, treatment, and outcomes. In Utah, assessment of time to pregnancy and utilization of infertility services among women who have had a live birth was incorporated as of 2004 as part of the Pregnancy Risk Assessment and Monitoring System (PRAMS). PRAMS is an ongoing, population-based surveillance system designed to identify and monitor maternal health and behaviors before, during, and after pregnancy. Surveys are conducted in both English and Spanish. A stratified random sample of women who have delivered a live-born infant in Utah are identified and contacted 2-6 months postpartum with over-sampling of women with lower education levels and women who have delivered low birth weight infants. The data presented in this report are from the 2004 - 2005 PRAMS surveys, and include responses from 3789 questionnaires, weighted to represent the 98,636 women with births that occurred in Utah in 2004 and 2005 (a weighted response rate of 88.5% was achieved). Some of the questions are asked only to women who reported they were trying to get pregnant at the time of the conception leading to the current pregnancy; after weighting, the data represent the 57,806 Utah women (60.0%) who were trying to get pregnant and who delivered a live born infant 2004/2005.

Data from three PRAMS questions about fertility are included in this report. These questions are as follows:

1. Did you receive treatment from a doctor, nurse, or other health care worker to help you get pregnant with your new baby? [This question was only asked to women who reported that they were trying to get pregnant at the time of the current pregnancy.]
2. Did you use any of the following treatments during the month you got pregnant with your new baby? (Check all that apply) [This question was only asked to women who reported that they were trying to get pregnant at the time of the current pregnancy.]
   a. Fertility-enhancing drugs prescribed by a doctor (fertility drugs include Clomid, Serophene, Pergonal, or other drugs that stimulate ovulation)
   b. Artificial insemination or intrauterine insemination (treatments in which sperm, but NOT eggs, were collected and medically placed into a woman’s body)
   c. Assisted reproductive technology (treatments in which BOTH a woman’s eggs and a man’s sperm were handled in the laboratory, such as in vitro fertilization [IVF], gamete intrafallopian transfer [GIFT], zygote intrafallopian transfer [ZIFT], intracytoplasmic sperm injection [ICSI], frozen embryo transfer, or donor embryo transfer)
   d. Other medical treatment

3. How many months had you been trying to get pregnant? [This question was asked to all women.]
   a. 0 to 3 months
   b. 4 to 6 months
   c. 7 to 12 months
   d. 13 to 24 months
   e. More than 24 months

In 2004 - 2005, 5.5% of all women giving birth in Utah received some type of infertility treatment. Restricted to women who reported they were trying to get pregnant, 10.0% of women utilized infertility treatment. The proportion of women receiving infertility treatment increased with age (see Figure 1). As expected, the proportion of births complicated by twins was higher among women who received infertility treatment. Approximately 7.2% of Utah women who were trying to get pregnant and used infertility treatment gave birth to twins, in comparison with 1.3% of women who were trying to get pregnant and did not utilize infertility treatment. In 2004 - 2005, nearly 40% of multiple births in Utah occurred in women who were using infertility treatment.
The most common type of infertility treatment used by Utah women in 2004/05 was fertility enhancing drugs (60%). In contrast, 11.7% received assisted reproductive technology (ART) (see figure 2). “Other” types of treatment, used by 18.7% of women, include drugs such as glucophage or surgical treatments for conditions such as endometriosis.

Among those who did not receive infertility treatment, 85% reported that they had been trying to get pregnant for 6 months or less, and 93.4% had been trying for 12 months or less. This is consistent with other studies of time to pregnancy. Among women who were trying to get pregnant and received infertility treatment, 47% had a self-reported time to pregnancy of 12 months or less (see figure 3). This is an interesting time to pregnancy distribution because current guidelines for infertility treatment recommend that couples wait at least 12 months before initiating treatment, unless the woman is 35 years of age or older. Unfortunately, we are unable to examine the time to pregnancy data among women age ≥ 35 who utilized infertility treatment due to sample size limitations.

There are several limitations to this analysis. The PRAMS data are only collected on women who have a pregnancy resulting in a live birth. Thus, women with infertility who never become pregnant or women who suffer a miscarriage will not be included. This results in an underestimation of the true impact of infertility on Utah women. Further, because of the small sample size, we were unable to stratify results by race/ethnicity. Although the information on utilization of infertility treatment is only collected for women who report that they were trying to get pregnant, it seems unlikely that there would be many women who received treatment but did not report trying to get pregnant. Finally, these data capture self-reported infertility treatment and time to pregnancy and are not validated by medical record reviews. Women’s interpretations of questions about infertility treatment may vary. In particular, there is uncertainty of the interpretation of the time to pregnancy question. Although it is a standard question used in retrospective surveys to assess time to pregnancy, in this PRAMS survey, it immediately follows the question about receiving treatment. Therefore, the interpretation of this question by women who received treatment could be how long they tried to get pregnant prior to treatment, during treatment, or both. However, the interpretation who did not receive treatment remains relatively straightforward.

Despite these limitations, the PRAMS data give us important insight into infertility in Utah.

Infertility treatment is relatively common among Utah women, and is involved in over 5% of births. The utilization of infertility treatment is more common among older women. Twins occur frequently among women who use infertility treatment. Fertility enhancing drugs are the most common type of infertility treatment used by Utah women. The atypical time to pregnancy distribution among women who received infertility treatment indicates that treatment may be initiated as early as 1-3 months after couples begin trying to become pregnant.
delay in treatment initiation may result in similar pregnancy outcomes for many of these women, while reducing the risks of multiple gestations and the associated poor neonatal outcomes that may occur with the utilization if infertility treatment. Further longitudinal research is needed to understand the optimal timing of fertility treatment, and the long term consequences of infertility treatment on neonatal outcomes and development.

**Figure 1: Percentage of Utah women with a live birth in 2004 who received infertility treatment**

**Figure 2: Type of fertility treatment used by Utah women receiving infertility treatment resulting in a live birth, 2004 (Treatment types are not mutually exclusive)**
Figure 3: Time to Pregnancy Among Utah Women Trying to Get Pregnant, 2004

References

Access to Contraceptives in Utah

Compiled by Sarah E. Johnson, BS

Background
The United States Department of Health and Human Services’ Healthy People 2010 program established the goal: 70% of all pregnancies in the U.S. will be intended by 2010. Utah is close to achieving this goal with only 31.4% of births reported as unintended. Approximately 13% of unintended pregnancies occur among women not using contraceptives, but not intending to become pregnant. The rate of unintended pregnancies among those not using contraceptives demonstrates the role contraceptives will play in reducing unintended pregnancies. Utah’s rate of unintended pregnancies could be further reduced by increased access to and funding for all types of FDA approved contraceptives.

Utah ranked 48th among the 50 states in a 2006 Guttmacher report on contraceptive access. The report analyzed state funding for contraceptives, policies about contraceptives, and contraceptive services availability. Utah has relatively limited “safety net” funding for family planning services; although the state receives Title X funding for contraceptive services for low-income women, there is no state funding designated for family planning services. Further, over the past eight years the Utah State Legislature has refused to pass a bill mandating insurance coverage for all FDA approved contraceptives in Utah. Both the failure to change state policy and the failure to maintain or increase family planning funding at both state and federal levels has made it more difficult for Utah’s women to access contraceptives, plan their families and prevent unintended pregnancies.

Utah Data: How are we doing?
Of the 31.4% of unintended pregnancies in Utah 43.2% occurred among women who did not use any sort of birth control method at the time they became pregnant. Among those women not using contraceptives, 13% said that they did not use contraceptives because they had problems getting it when she needed it. Furthermore, 43% of those women not using contraception also reported having no insurance or Medicaid before becoming pregnant.

Opponents to mandated prescription contraceptive coverage argue that the state and businesses would incur difficult financial burdens. Insurers make similar claims. Providing full contraceptive coverage in employment-based health care plans would cost employers, at most, only $21.40 per employee per year. For employers with plans that currently provide no contraceptive coverage, the average cost of adding it, -- if employers contributed

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80 percent of the cost – would be $17.12 per year or $1.43 per month.\textsuperscript{4} A pregnancy, on the other hand, can cost as much as $10,000 per year.

\textbf{Summary}

Utah has made great strides to improve the rate of unintended pregnancies in Utah. These efforts would be furthered by improved access to contraceptives. Utah’s Women whose contraceptives are not covered by their employer can call Planned Parenthood at 801-322-5571.

Abortion

Compiled by Holly Hilton, BS

2005 Utah Resident Abortions: 3,279. Over the last decade Utah has maintained lower abortion rates than those of the nation (see chart 1). The rate represents the number of abortions per 1,000 women between the ages of 15 and 44. While both Utah rates and national rates have been decreasing, Utah rates remain on average nearly one third that of the national rate. Utah rates for the decade peaked in 1996 at 6.9; they have decreased to 6.0 and remained constant from 2002 to 2004. Although the population of women aged 15 to 44 has been increasing along with the number of births and abortions, the abortion ratio (the number of abortions per 1,000 births) has been decreasing over the last decade, as shown in table 1.

Requirements for an abortion increased over the last decade. In 1993, a mandatory 24 hour waiting period was introduced. The patient must also receive “face to face” consultation at least 24 hours prior to the procedure covering: the affect of the procedure on the fetus, the risks and alternatives to having an abortion, including information on adoptions services; the age and development level of the fetus at the time of the procedure; and the medical risks of maintaining the pregnancy to term. As of May 1, 2006, abortion providers are required to obtain consent from a parent or legal guardian of a minor prior to the procedure.

Table 1 gives the estimated population of women between the ages of 15 and 44 and the total number of resident abortions from the years 1995 to 2005. Chart 2 breaks down the total resident abortions into four year range age groups for 2004 and shows women between the ages of 20 and 24 represented the highest age group obtaining abortions in 2004, at 1,187 reported residential abortions. The age group with the lowest number of abortions was 45 and over, at nine, followed by 15 and under, at ten.

The number of abortion providers decreased 43% in the last decade. In 1996 there were seven abortion providers in Utah, in 2000 there were four. These abortion providers are in urban areas, and 93% of Utah counties do not have an abortion provider. Provo-Orem is the only metropolitan area without an abortion provider.

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5U.C.A. 76-7-304 and U.C.A. 76-7-305

* Number of abortions per 1,000 women aged 15-44 years.


<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated Resident b</th>
<th>Resident a</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>463,847</td>
<td>39,554</td>
<td>3,292</td>
</tr>
<tr>
<td>1996</td>
<td>475,709</td>
<td>42,056</td>
<td>3,293</td>
</tr>
<tr>
<td>1997</td>
<td>486,592</td>
<td>43,009</td>
<td>3,140</td>
</tr>
<tr>
<td>1998</td>
<td>492,370</td>
<td>45,125</td>
<td>3,237</td>
</tr>
<tr>
<td>1999</td>
<td>498,067</td>
<td>46,243</td>
<td>3,160</td>
</tr>
<tr>
<td>2000</td>
<td>528,738</td>
<td>47,331</td>
<td>3,279</td>
</tr>
<tr>
<td>2001</td>
<td>539,202</td>
<td>47,915</td>
<td>3,372</td>
</tr>
<tr>
<td>2002</td>
<td>546,951</td>
<td>49,140</td>
<td>3,300</td>
</tr>
<tr>
<td>2003</td>
<td>554,908</td>
<td>49,834</td>
<td>3,338</td>
</tr>
<tr>
<td>2004</td>
<td>563,115</td>
<td>50,653</td>
<td>3,379</td>
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<tr>
<td>2005</td>
<td>572,213</td>
<td>51,517</td>
<td>3,279</td>
</tr>
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</table>

* Number of abortions per 1,000 births
Chart 2. Number of Abortions by Age of Woman 2004

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of Abortions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 15</td>
<td>10</td>
</tr>
<tr>
<td>15-19</td>
<td>507</td>
</tr>
<tr>
<td>20-24</td>
<td>1,187</td>
</tr>
<tr>
<td>25-29</td>
<td>755</td>
</tr>
<tr>
<td>30-34</td>
<td>495</td>
</tr>
<tr>
<td>35-39</td>
<td>284</td>
</tr>
<tr>
<td>40-44</td>
<td>98</td>
</tr>
<tr>
<td>45 and over</td>
<td>9</td>
</tr>
<tr>
<td>Unknown</td>
<td>34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,507</strong></td>
</tr>
</tbody>
</table>
Emergency Contraception in Utah
Compiled by Angie Stefaniak, MPA

Background
Emergency contraception (EC) is a birth control method that works by preventing pregnancy after an act of unprotected intercourse. Currently, two forms of emergency contraception are available: pills containing hormones and copper-T intrauterine device (IUD).¹ It is estimated that half of the 3.5 million unintended pregnancies that occur each year in the United States could be prevented if EC were easily accessible and used,² and the number of abortions each year could also be cut by as much as half.³ The Department of Health and Human Services Healthy People 2010 goal is to increase the proportion of pregnancies that are intended to 70 percent.

For decades, EC has been prescribed for women following unanticipated sexual activity, contraceptive failure, or sexual assault to reduce the risk of pregnancy. In the mid-1960s physicians prescribed high dose estrogen to prevent pregnancy in a survivor of sexual assault. In the early 1990s, about one third of EC prescriptions were for rape survivors. By the end of the 1990s EC was recognized as a safe and effective method for all women at risk of unintended pregnancy.

Until the late 1990s EC was commonly known as the “morning after pill.” This term is a misnomer because treatment involves more than one pill, can be taken within five days after unprotected intercourse, and should not be confused with medication abortion because EC cannot terminate an established pregnancy.⁴

Before September 1998, no dedicated EC product had been approved, labeled and marketed in the U.S., and EC was available only through the “off-label” use of oral contraceptive pills. In September of 1998 the FDA approved the application to market the first dedicated EC product, the PREVEN™ Emergency Contraceptive Kit. In 1999 the FDA approved the first progestin-only EC – Plan B®. Plan B® is the EC most widely used, and last year the FDA announced its approval of the sale of Plan B® over the counter to women and men 18 and older.⁵

National and Utah Data
According to a survey conducted by the Henry J. Kaiser Family Foundation and SELF Magazine in 2003, women’s awareness and use of EC remains low nationally, but is steadily increasing. They report roughly two-thirds of women “know that there is something they can do to prevent pregnancy” in the event of contraceptive failure or unprotected sex. Only about one in 20 women reported ever having used EC.⁶ Table 1 shows the percentage of women who have ever used EC has increased annually from 1% in 1997 to 6% in 2003.
Table 1. Percentage of women who have ever used emergency contraception – nationally

<table>
<thead>
<tr>
<th>Year</th>
<th>1997</th>
<th>2001</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>1%</td>
<td>2%</td>
<td>6%</td>
</tr>
</tbody>
</table>

In Utah, data about EC use are harder to identify. The Utah Department of Health says it does not collect information on EC use. In addition, Barr Pharmaceuticals, Inc and Duramed Pharmaceuticals, Inc. the manufacturers and suppliers of Plan B, are unable to provide the total number of Plan B prescriptions distributed or written in the state of Utah.

To date, the most comprehensive data available for EC use in Utah comes from the state’s largest prescriber of EC - Planned Parenthood Association of Utah (PPAU). Chart 1 shows the total increase each year from 2000-2006. According to the data in Table 2, EC use has steadily increased annually (2003-2006) in all age groups. Women age 20-24 used EC more than any other age group. Age breakdowns are not available for years prior to 2003. These prescriptions represent those written for immediate consumption, and those written in advance of need. PPAU says that although they do provide EC prescriptions for future need, the majority of prescriptions provided are for immediate use.

Once called America’s “best-kept secret” the slow, but steady increase in EC prescriptions is most likely due to a combination of factors:

- The release of dedicated EC products: PREVEN™ and Plan B®;
- Organized education efforts by groups such as Planned Parenthood and the pharmaceutical manufacturers of EC; and
- Increased awareness of EC by providers and women.

Summary
EC use has increased steadily both nationally and locally. However, although options for and information about EC have increased in the past decade, further efforts and research are needed to build a comprehensive picture of the number of women accessing emergency contraception, the reasons EC is used and what, if any, impact EC has on unintended pregnancy and abortion rates in Utah. As Plan B® becomes available without a prescription to women and men over 18 it is important to gather and analyze data on how over the counter access impacts unintended pregnancy rates as well.
Information about Plan B can be found at: www.Go2PlanB.com and www.plannedparenthood.org.

**Chart 1. Plan B Use in Utah by Year 2000-2006.**
Source: Planned Parenthood Association of Utah

<table>
<thead>
<tr>
<th>Year</th>
<th>Plan B Use in Thousands</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Total</td>
<td>11.2</td>
<td>18.2</td>
<td>27.5</td>
<td>34.4</td>
<td>43.0</td>
<td>46.3</td>
<td>52.0</td>
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**Table 2. Plan B Prescriptions in Utah 2003-2006 by Age and Year**

<table>
<thead>
<tr>
<th>Age</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>under 15</td>
<td>166</td>
<td>200</td>
<td>205</td>
<td>233</td>
<td>804</td>
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<tr>
<td>15-17</td>
<td>7,658</td>
<td>8,431</td>
<td>8,287</td>
<td>8,855</td>
<td>33,231</td>
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<tr>
<td>18-19</td>
<td>9,797</td>
<td>12,449</td>
<td>12,671</td>
<td>13,594</td>
<td>48,511</td>
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<tr>
<td>20-24</td>
<td>11,729</td>
<td>15,340</td>
<td>17,297</td>
<td>19,706</td>
<td>64,072</td>
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<td>25-29</td>
<td>3,302</td>
<td>4,274</td>
<td>5,220</td>
<td>6,368</td>
<td>19,164</td>
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<td>30-34</td>
<td>1,036</td>
<td>1,375</td>
<td>1,596</td>
<td>2,074</td>
<td>6,081</td>
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<tr>
<td>35-39</td>
<td>473</td>
<td>589</td>
<td>642</td>
<td>761</td>
<td>2,465</td>
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<tr>
<td>40-44</td>
<td>190</td>
<td>298</td>
<td>275</td>
<td>354</td>
<td>1,117</td>
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<tr>
<td>45-49</td>
<td>70</td>
<td>80</td>
<td>105</td>
<td>99</td>
<td>354</td>
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<tr>
<td>50-54</td>
<td>6</td>
<td>9</td>
<td>19</td>
<td>36</td>
<td>70</td>
</tr>
<tr>
<td>Unknown</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>34,433</td>
<td>43,047</td>
<td>46,317</td>
<td>52,083</td>
<td>175,880</td>
</tr>
</tbody>
</table>

**References**


5. Ibid

Chlamydia and Gonorrhea

Compiled by J. Anne Tumsatan, BA, and Timothy E. Lane, BS, LEHS

Chlamydia and Gonorrhea are common sexually transmitted diseases. They are both bacterial infections that can be acquired by sexual contact or by mother to newborn contact at birth. Women infected with chlamydia or gonorrhea may have discharge, painful urination, lower abdominal pain, or bleeding between menstrual periods. Men infected with chlamydia may have some discharge. Men infected with gonorrhea may have discharge as well as painful and frequent urination, or swollen genitalia. With 75% of infected women and 50% of infected men showing no signs of infection, chlamydia is largely asymptomatic which can lead to unknowingly infecting a partner or to not treating the infection. Gonorrhea may also be asymptomatic for both genders as well. Both infections can be easily treated with antibiotics. However if left untreated, the infections can develop into pelvic inflammatory disease or cause complications during pregnancy in women. In men, untreated infections may cause inflammation of the testis and prostate or infertility.¹

In 1996, there were 1,201 newly reported chlamydia cases and 93 newly reported gonorrhea cases among Utah women. Whereas, in 2005, there were 3,081 newly reported chlamydia cases and 319 newly reported gonorrhea cases among Utah women. (See Fig. 1 and 2) From 1996 to 2005, there has been an increase of over 100% in the number of reported chlamydia cases in Utah women; and an increase of over 200% in the number of reported gonorrhea cases in Utah women. These increases may be due to better screening tests and reporting, more people being tested, and possibly more disease in our communities. The higher number of reported infections among women than men may be due to the higher occurrence of screenings among women. The age group most afflicted by gonorrhea and chlamydia nationwide and in Utah are the 15-29 year olds. (See Fig. 3) In 2005, 68% of Chlamydia cases in Utah were among those between 15 and 24 years old.²

To reduce the increasing number of Chlamydia and gonorrhea infections, regular screening and examinations as well as latex condom usage are advised for those at risk. If being treated for an infection, avoid sexual intercourse until treatment is complete. Monogamous sexual relationships also lessen the risk of infections. However, the most effective prevention measure is abstinence.³

Many of the County Health Departments throughout Utah have an STD clinic or offer STD testing.

For more information, please visit the Utah Department of Health STD testing site at health.utah.gov/cdc/std/std_test.htm or call the Utah Department of Health at 801-538-6171.

**Figure 1.** Reported Chlamydia cases in Utah, by gender 1996-2006. Source: Utah Department of Health

![Chart showing reported Chlamydia cases in Utah, 1996-2006](chart1.png)

*provisional data as of 1/11/07

**Figure 2.** Reported Gonorrhea cases in Utah, by gender 1996-2006. Source: Utah Department of Health

![Chart showing reported Gonorrhea cases in Utah, 1996-2006](chart2.png)

*provisional data as of 1/11/07
Figure 3. Chlamydia Cases per 100,000 Persons by Age and Sex, Utah, and Nationwide 2005. Source: Utah Department of Health

*Chlamydia Cases per 100,000 Persons by Age and Sex, Utah, 2005*
Rape and Sexual Violence against Women in Utah

Compiled by Dianne Fuller, MS, APRN, SANE-A, and Emogene Grundvig, MSW

Rape is the only violent crime in Utah with a rate that exceeds the national average. For 2005 the FBI Uniform Crime Reporting Program data shows a national rate for forcible rape of 31.7 per 100,000 inhabitants, while Utah specific data shows a rate of 37.3 per 100,000 inhabitants. These data place Utah as 17th highest in the nation for forcible rape in 2005. This reported data does not distinguish between male and female nor age specific reports and relies on crimes reported to law enforcement agencies.

Legal definitions of crimes related to sexual violence vary from state to state, making accurate national comparisons difficult. For this report, rape is defined as forced sexual penetration. All other forced or non-consenting encounters are referred to as sexual violence or sexual assault. Child Rape and sexual assault are not specifically addressed in this report.

The CDC estimates that in 2002 only 39% of victims of rape and sexual violence reported the crime to law enforcement. This under reporting contributes to inaccuracies in estimates of the true magnitude of this crime. In 2005 the Utah Commission on Criminal and Juvenile Justice (CCJJ) produced a report “Rape in Utah – A Survey of Utah Women About Their Experience with Sexual Violence.” This survey showed that only 9.8% of women in Utah who were assaulted reported the crime to law enforcement.

The 2005 Utah CCJJ report showed that 12.7% of respondents reported being raped in their lifetime. It also showed that in Utah “nearly 1 in 3 women will experience some form of sexual violence during their lives”. Additionally, there was no relationship found between race or income with regards to sexual victimization. This telephone survey of women 18 and above defined rape as forced oral sex, forced anal sex, object rape, sexual battery or attempts of any of these various sexual assaults, or forced to engage in sexual intercourse with a current or past husband, or forced into intercourse when they could not give consent (under the influence of drugs or alcohol, or drugged without their knowledge.) The results of this report supported accepted national statistics that 1 in 4 women will be victims of sexual violence in their lifetimes.

Rape and sexual violence have significant consequences on the health of the individuals who are victims of these crimes. These consequences include multiple issues with long term consequences including physical (gynecological, sexually transmitted diseases, pregnancy, urological, gastrointestinal, headaches, back pain,
chronic fatigue, etc), psychological (post-traumatic stress disorder or PTSD, suicide and suicide attempts, fear, anxiety, sleep disturbances, depression, etc.) socioeconomic (disability, work hours lost), social disturbances in relationships (isolation, less likely to be married), and changes in health behaviors (increased high risk sexual behavior, smoking, alcohol and drug use). The Utah CCJJ report of 2005 showed that women who have been sexually victimized “scored negatively on several measures of health and mental health”, were “much more likely to meet the diagnostic criteria for Post Traumatic Stress Disorder” and were “more likely to rate their health as being poor”.

We have a number of resources for care and crisis intervention for victims of sexual violence in our state. A statewide crisis line 1-888-421-1100 is sponsored through the State Health Department. This line will link victims with crisis intervention and referrals closest to their community. Additionally, specialty trained Sexual Assault Nurse Examiners are available in 18 of our 29 counties to provide care and forensic evidence collection following report of sexual assault and rape.

To combat the crisis of crimes of sexual violence and reduce the impact of this violence on the health of women in our state we must focus on prevention.

Although not all men are perpetrators, almost all perpetrators of sexual violence are men. The CCJJ survey again supported national data showing that 96.6% of respondents were attacked by a male. We must address prevention and social change beginning with the youngest children and continuing throughout the life span.

Figure 1. Reported Sexual Assault

![Figure 1. Reported Sexual Assault](image)

Number of women per 100,000

Figure 2. Health Measures by Sexual Assault History: 2005 CCJJ survey – Utah

![Figure 2. Health Measures by Sexual Assault History: 2005 CCJJ survey – Utah](image)

% of women with diagnosis by history
Appropriate Services for Rape Victims in Utah Hospitals

Compiled by The Utah Sexual Assault Safety Project

**Background**
A recent study by the Utah Commission on Criminal and Juvenile Justice\(^1\) indicated that 12-13% of Utah women reported being raped at some point in their lives. Nationally, CDC estimates suggest that 1 in 6 women (16.6%) report experiencing an attempted or completed rape at some point in their lives.\(^2\) In 2003, 793 rapes were reported in Utah. Since it is estimated that only 20% of victims report the crime to law enforcement in the state\(^1\), the actual number may approach 4,000 rapes each year. The consequences of rape include unwanted pregnancy and sexually transmitted disease, including HIV. An estimated 5% of sexual assaults result in pregnancy, and 33% may result in sexually transmitted disease.\(^3\) Public health and other expert recommendations include counseling all sexual assault patients at risk of pregnancy about emergency contraception and providing it as an option on-site. Treatment for sexually transmitted diseases should also be discussed and offered.\(^3\)

**Methods**
In order to determine if Utah hospitals are meeting these standards, a coalition of health care and advocacy groups (the Utah Sexual Assault Safety Project) contacted all 42 Utah hospitals with emergency departments. Surveys were completed with 41 of those hospitals. Telephone interviews were conducted with

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emergency room personnel most familiar with the protocols for sexual assault patients. Most often this was a sexual assault nurse-examiner (SANE nurse) or the nurse manager. The survey consisted of 10 open- and close-ended questions designed to determine the services that are provided routinely to victims of sexual assault.³

**Results**

Only 60% of sexual assault victims receive consistent and appropriate services on-site. (See Figure 1).

Most Utah hospitals are providing treatment for sexually transmitted diseases (STD) to sexual assault victims. (See Figure 2).

![Figure 2: PROVISION OF PROPHYLACTIC STD MEDICATIONS FOR RAPE VICTIMS IN UTAH⁴](image)

**Summary and Needs**

Hospital emergency departments are often the first contact victims have when seeking help, and it is therefore critical that emergency room personnel provide rape victims with comprehensive services that include emergency contraception as well as the diagnosis and treatment for sexually transmitted diseases. This survey indicates that there is room for improvement: 40% of the emergency departments in Utah do not consistently meet the standard for treating rape victims.

The Utah Sexual Assault Safety Project will provide information and training to hospitals that do not currently provide comprehensive services to victims. There should be additional funding and training to increase the number of SANE nurses where primary treatment occurs.

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Dating Violence
Compiled by Emogene Grundvig, MSW

Background
Recent statistics indicate that dating violence has increasingly become a problem in the United States. Dating violence can be defined as, “consisting of verbal, emotional, psychological, physical, or sexual abuse of one person by another in a dating relationship.” Additionally, 40% of adolescent girls ages 14-17 know someone their age who has been physically abused by a dating partner, and 33% of adolescent girls report experiencing physical violence themselves from a dating partner (Figure 1).2

Utah Data
One form of dating violence, that has increasingly become a problem, is drug facilitated sexual assault. In Utah, drug-induced rape has increased among adolescents. A Utah Commission on Criminal and Juvenile Justice study conducted in 2005 found that 1.8% of Utah women reported being a victim of a drug facilitated sexual assault.3 In the United States, drug facilitated rapes are responsible for 70% of sexual assaults reported among adolescent and college aged women, and 38% of those women are between the ages of 14 and 17 (Figure 2).2

Figure 1. Physical Violence Among Adolescent Dating Relationships. Source: The National Center for Victims of Crime.

Figure 2. Percentage of Drug Facilitated Sexual Assault Reported among Adolescent and College Aged Women.2
Many drug facilitated sexual assault perpetrators used drugs such as alcohol, gamahydroxybutyrate (GHB), rohypnol, and ketamine to weaken or incapacitate their victims.¹

The Physical and Psychological Consequences of Dating Violence
The psychological and physical consequences of dating violence can be extremely damaging and potentially life threatening to its victims. Victims of dating violence may have physical injuries such as lacerations, broken bones, bruises and internal bleeding. Various other physical ailments may include gastrointestinal problems, gynecological issues, headaches, central nervous system disorders, and circulatory or heart problems.⁵ Adolescents who are subject to dating violence often experience serve psychological consequences such as depression, Post Traumatic Stress Disorder, anxiety, low self-esteem, severe fear of intimacy, and an inability to trust men.⁶ Additionally, victims of dating abuse are more likely to have substance abuse problems, eating disorders, poor academic achievement, engage in risky sexual behaviors, and attempt, or complete suicide. Dating violence may often be the precursor to domestic violence, and adolescents in abusive relationships often transfer abusive behavior into future relationships.⁷

Services
If you suspect dating violence, contact the Utah Domestic Violence Link Line at 1-800-897-LINK (5465), or the National Domestic Violence Hotline at 1-800-799-7233.

References
Elder Abuse
Compiled by Emogene Grundvig, MSW

Background
Of all the baby girls born in 2001, 50% will live to be 100 years of age. Additionally, persons 80 years of age and older are the fastest growing population in our society, which raises concern because of the increasing problem of elder abuse.\(^1\) Utah Code defines elder abuse as “…abuse, neglect, or exploitation of an elder adult,” who is a person 65 years of age or older. For Utah, elder adults are categorized as “vulnerable adults,” or one who may have difficulty “providing personal protection; providing necessities such as food, shelter, clothing, or mental or other health care; obtaining services necessary for health, safety or welfare; carrying out activities of daily living; managing the adult’s resources; or comprehending the nature and consequences of remaining in a situation of abuse, neglect or exploitation.”\(^2\) Further, Utah has a mandatory reporting law such that anyone who knows about but does not report elder abuse is “…guilty of a class B misdemeanor.”\(^2\)

Utah Data
In 2004, Utah’s Adult Protective Services (APS) received approximately 3,500 referrals, of which 2,431 were for elder maltreatment of both men and women. Of these referrals 59% of the elderly individuals involved were women and 44% of these women had experienced a prior referral. Forty-five percent of the allegations were for neglect, 33% for abuse, and 22% for exploitation (Figure 1).\(^3\) In terms of the elderly (those individuals 60 years and above) who were involved in a referral to APS, 14% were ages 60 to 69, 22% were ages 70 to 79, 24% were ages 80 to 89, and 6% were 90 and older. Thus, the risk of elder maltreatment increases with age.\(^3\)

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\(^1\)Power Point presentation given by Chuck Diviney at the College of Social Work at the University of Utah, Spring 2006.
\(^3\)A Multivariate Analysis of Eight Years of Utah Data on Elder Abuse and Neglect: Grant Proposal. College of Social Work at the University of Utah.
Risk Factors
Certain characteristics make the elderly an easy target of abuse. These characteristics include: loneliness, cognitive impairment/dementia, physical impairment, misguided trust, and isolation. In addition, 30% of the victims are physically handicapped, 14% have mental health issues, 12% have family violence/discord, and 10% are developmentally delayed. As shown in Figure 2, other indicators are noted as well.¹

Figure 2. Factors Contributing to Elder Abuse. Source: Adult Protective Services.

The Physical and Psychological Consequences of Elder Abuse
There are certain physical indicators that an elderly person is being abused: unexplained bruises/burns, dehydration/malnutrition, soiled clothing/linen, and isolation. Additionally, there are indicators of neglect (by self or others): untreated bedsores/sores, decayed teeth, dirty clothing/environment, availability of necessities (food, water, sanitary needs), isolation, and death. Indicators of exploitation are unusual bank activity, recent changes in property title(s), new acquaintances living with the elder, sudden increase in debt, and decrease in lifestyle.¹ Women who are subject to elder abuse, often experience severe psychological consequences such as a low self-esteem, limited social skills, fear, shame, guilt, depression, Post-Traumatic Stress Disorder, and alienation.⁴

Services
If you suspect elder abuse or neglect, contact Adult Protective Services (APS) Intake at: 1-800-371-7897. If a vulnerable adult is in immediate danger, dial 9-1-1 or your local law enforcement agency.
Domestic Violence
Compiled by Emogene Grundvig, MSW

Background
Domestic violence is one of the most common crimes in the United States. Each year, 1.5 million women in the United States are physically assaulted by an intimate partner, and 10 million children will observe intimate partner violence in their families. Utah Code defines domestic violence as “…any criminal offense involving violence or physical harm or threat of violence or physical harm, or any attempt, conspiracy, or solicitation to commit a criminal offense involving violence or physical harm, when committed by one cohabitant against another.” Further, Utah Code requires health care professionals to identify victims of domestic violence, and to intervene on their behalf.

Utah Data
In Utah, domestic violence is one of most rapidly escalating violent crimes. The Utah Department of Health’s Violence and Injury Prevention Program (VIPP) estimates that each year, 40,000 Utah women are physically abused by an intimate partner and 194,000 women experience emotional abuse. Further, the Utah Division of Child and Family Services (DCFS) stated that in 2005, 4,678 allegations of domestic violence were reported. It is estimated, that 1 in 5 Utah children will hear or witness verbal abuse, and 1 in 14 children will hear or witness physical abuse. In 2005, DCFS reported that 2,686 women (45%), 3,173 children (54%), and 32 men (1%) utilized domestic violence shelters in Utah (Figure 1).

Figure 1. Utah’s Domestic Violence Shelter Occupants in 2005. Source: Utah Division of Child and Family Services.

Figure 2. Female Victims of Homicide by an Intimate Partner, Utah and the U.S. 1994-1999 Source: Utah Department of Health.
Psychological and physical consequences of domestic violence can be extremely damaging and potentially life threatening to its victims. In 2000, the Utah Intimate Partner Violence Death Review Team (IPVDRT) found that in Utah from 1994-1999, 49% of female victims of homicide were murdered by their male intimate partner. This percentage is higher than the national average of 39% (Figure 2).

The Physical and Psychological Consequences of Domestic Violence
Although, a vast number of domestic violence incidents do not result in death, the victims of such violence may have physical injuries such as lacerations, broken bones, bruises and internal bleeding. Various other physical ailments may include: gastrointestinal problems, gynecological issues, headaches, central nervous system disorders, and circulatory or heart problems. Women who are subject to domestic violence often experience serve psychological consequences such as depression, Post Traumatic Stress Disorder, anxiety, low self-esteem, severe fear of intimacy, and an inability to trust men. In a 2005 Dan Jones & Associates study, it was reported that one in ten Utah women have considered harming themselves, and one in seventeen women have attempted suicide due to their experiences with domestic violence.

Services
If you suspect domestic violence, contact the Utah Domestic Violence Link Line at 1-800-897-LINK (5465), or the National Domestic Violence Hotline at 1-800-799-7233. If immediate help is needed dial 9-1-1 or your local law enforcement agency.

References
Obesity in Women
Compiled by Laurie Baksh, MPH

Background
Women in Utah are becoming heavier and obesity is emerging as a major public health crisis. Obese adults are at increased risk for developing hypertension, high cholesterol, type 2 diabetes, coronary heart disease, stroke, asthma, osteoarthritis, and cancers of the colon, breast, endometrium, kidney and esophagus. Only smoking exceeds obesity as the leading cause of preventable death in the U.S. The Healthy People 2010 goal is for no more than 15% of adults to be obese. In females, Utah exceeds this goal by more than 5%.

Obesity is calculated using the Body Mass Index (BMI), which is a measure of body fat based upon height and weight and applies to both men and women. Obesity is defined as having a BMI of 30 or greater.

Figure 1: Obesity Rates for Females Ages 18 - 65. Utah BRFSS Data, 1995 - 2005

Obesity rates among Utah women are slightly than lower the U.S. rates, 20.2% in Utah vs. 23.5% in the U.S. in 2005. The U.S. rate has increased 57.8% since 1995 while Utah’s rate has increased 49.6% in the same time period.

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1 BMI is calculated with the following formula: (weight in pounds/height in inches^2) X 703.
Utah data vs. the U.S. How are we doing
Behavioral Risk Factor Surveillance System (BRFSS) data from 2005, indicate that 20.2% of women aged 18 – 65 reported a Body Mass Index (BMI) of 30 or greater. Rates of obesity were lowest in females aged 18 – 34 and highest in those aged 50 – 64.

Risk Factors
Eating and exercise habits play into weight management. 2005 Utah BRFSS data show that 79.8% of women reported no physical activity and 44.8% said they did not meet recommendations for moderate or vigorous physical activity (30 minutes of moderate activity five times per week or 20 minutes of vigorous activity three times per week). Only 29.1% of women report eating five or more fruits and vegetables a day. Twice daily fruit consumption was reported by 38.4% of women and consumption of vegetables three times a day by 28.6% of women. The high rates of obesity combined with the low rates of fruit/vegetable consumption and low exercise cross all races/ethnicities.

Table 2: Obesity, Eating and Exercise by Race/Ethnicity 2005 Utah BRFSS Data

Services
In May 2006, the Utah Department of Health, in conjunction with Governor Huntsman, published “Tipping the Scales Toward a Healthier Population: The Utah Blueprint to Promote Healthy Weight for Children, Youth, and Adults.” This publication offers comprehensive strategies for obesity prevention from families to health care systems. The publication can be found at health.utah.gov/obesity/docs/ObesityBlueprint.pdf.
Insurance Coverage among Utah Women

Compiled by Lois Bloebaum BSN, MPA

**Background**

Women without health insurance are less likely than those with coverage to receive preventive healthcare services at appropriate ages. Receipt of preventive healthcare services such as prenatal care, mammograms and PAP screenings are correlated with improved outcomes and decreased morbidity and mortality; and yet the percentage of Utah women with insurance coverage to pay for these preventive healthcare services is declining.

**How are we doing? (Utah data versus the U.S.)**

Over the past ten years, the percentage of persons in Utah and in the U.S. who lacked insurance coverage has increased. United Health Foundation’s (UHF) America’s Health, State Health Rankings 2005 report ranks Utah 23rd among states for percentage of residents with health insurance.1 According to the 2005 Utah Health Status Survey (HSS) 14.8% of adult Utah women are uninsured, a 37% increase since 2001 (10.8%).


Lack of insurance coverage may be affecting Utah women’s compliance with recommended preventive health screenings; only 69.1% of women (age 40 & over) received a mammogram in the past two years and only 80.1% of

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women received a pap smear in the past three years according to Behavioral Risk Factor Surveillance System (BRFSS) data compared to 75.9% and 86.4% respectively across the nation as a whole.

Another women’s preventive healthcare service that may be affected by lack of insurance coverage is early entry into prenatal care for pregnant women. According to Utah PRAMS (Pregnancy Risk Assessment Monitoring System) data, over 20% of Utah women entered prenatal care after the first trimester and the most commonly cited reason was “I didn’t have insurance or enough money to pay for care”. The Healthy People 2010 goal for early entry into prenatal care is set at 90%, a benchmark that Utah has yet to reach.

Risk Factors
The 2005 Utah HSS data indicate that the characteristics of Utah women who are more likely to be uninsured include:

- Lower education levels
- Lower socioeconomic levels
- Being unmarried
- Being of Hispanic ethnicity
- Being unemployed and/or a student

Insurance Coverage among Utah Women by Ethnicity, 2005. Source: Utah Department of Health’s Health Status Survey
What is being done to address?
The Utah Department of Health administers programs to improve insurance coverage, such as Medicaid, the Baby Your Baby program, the Primary Care Network (PCN), and the new program “Utah’s Premium Partnership” (UPP), a program designed to help make health insurance more affordable for working individuals and families.

The UDOH, through its Office of Primary Care and Rural Health, also has recently awarded thirty-six health care agencies $1.4 million in grants to increase their capacity to provide primary health care to medically underserved individuals not eligible for CHIP, Medicaid, Medicare, private insurance or the Primary Care Network. The Utah Department of Health administers programs to improve insurance coverage, such as Medicaid, the Baby Your Baby program, the Primary Care Network (PCN), and the new program “Utah’s Premium Partnership” (UPP), a program designed to help make health insurance more affordable for working individuals and families.
Falls and Fall-Related Injuries
Compiled by Jason Kidde, MS and Robin Marcus, PT, PhD

Background/Significance
In the United States, approximately 10,000 annual deaths result from falls in people age 65 or older, and this same population accounts for 87% of all emergency room fractures.\(^1,2\) Although men and women report similar fall rate statistics according to the Utah Behavioral Risk Factor Surveillance Survey (BRFSS) data, women incur 75-80% of all fall related hip fractures and this risk increases with advancing age.\(^1,2,3\) One fourth of individuals who sustain hip fractures die within one year and nearly 50% never return to their prior level of independence.\(^1\) Additionally, individuals who fall often undergo significant psychological hardship, resulting in the fear of falling and a consequent reduction in physical activity.\(^2\) This sedentary behavior not only decreases quality of life and increases risk for falls, but it is also counterproductive for those who suffer from co-morbidities that are mitigated by physical activity. Considering that 41.3%...
of respondents in the BRFSS study reported poor health prior to falling, this issue is not trivial.³

Risk Factors
Increasing age is associated with injury-related falls. Women experience more fall-related injuries than men.¹,²,³ Furthermore, muscle weakness, balance problems, diminished vision, blood pressure medications and medications causing drowsiness all increase the incidence of falls in this population. Approximately half of all falls occur within the individual’s home due to environmental obstacles such as icy steps, uneven ground, loose electrical cords, throw rugs, and other miscellaneous objects which may leave an individual prone to tripping. Considering that both physical and environmental factors increase fall risk, fall prevention programs must be multifaceted for maximal effectiveness.²

Figure 3. Utah Fall-Related Hospitalizations, 2000-2004. Source: Falls Fact Sheet, Utah Department of Health Violence and Injury Prevention Program, 2005

Prevention Programs
The most effective fall prevention programs include the combination of pharmacologic modification, physical therapy/exercise interventions, and environmental modifications. The Centers for Disease Control (CDC) examined fall prevention programs nation wide, categorizing them based on the extensiveness of addressing fall risk factors. The “exceptional” programs were categorized as those that “provide comprehensive education about preventing falls, home assessments and/or safety checklists, and access to home repairs.” Eighteen programs

qualified for this distinction in 12 states, including one in Price, Utah.\textsuperscript{2} Addressing the physical signs of aging with exercise should also be advocated. More information on how to reduce your risk of falls is available at: www.cdc.gov/ncipc/pubres/toolkit/falls%20BrochCOLORpanels.pdf

The Skeletal Muscle Exercise Research Facility (SMERF) and University Rehabilitation and Wellness Clinic at the University of Utah are currently conducting both clinical programs and research in the area of fall prevention. www.health.utah.edu/pt/research/index.html

Figure 4. Nonfatal Fall Injury Among Men and Women Aged 65 and Older, United States and Utah, 2001-2004. *Source: IBIS-PH website for emergency visit data and CDC WISQARS website.

Age Adjusted Nonfatal Fall Injury Rates Among Men and Women Aged 65 Years and Older, United States and Utah, 2001–2004

*Utah state data is taken from the following source: IBIS-PH website for emergency visit data. National data is taken from the following source: CDC WISQARS website. Compiled by Albert Wang, Injury Epidemiologist, Utah Dept. of Health, Violence and Injury Prevention Program.


Smoking
Compiled by Karen Zinner, MPH

Background
Tobacco use remains the leading preventable cause of death and disease in the United States. Smoking claims more than 440,000 lives each year. It has been shown that smoking increases the risk for chronic lung disease, coronary heart disease, and stroke, as well as cancer of the lungs, larynx, esophagus, mouth, and bladder. In addition, smoking contributes to cancer of the cervix, pancreas, and kidneys. Exposure to secondhand smoke increases the risk for heart disease and lung cancer among nonsmokers. The Healthy People 2010 goal is to reduce the proportion of females who smoke cigarettes from the baseline of 22% in 1997 to the 2010 target of 12%.

Risk Factors
Cigarette smoking is more common among persons with lower levels of formal education, and among those in lower income groups. Smoking increases the risk for chronic lung disease, coronary heart disease, and stroke, as well as cancer of the lungs, larynx, esophagus, mouth, and bladder.

Percentage of Adult Females that Currently Smoke by Education Level, Utah 2005. Source: Behavioral Risk Factor Surveillance System, Center for Health Data, IBIS, Utah Department of Health

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<th>Education</th>
<th>Percentage of Adult Females</th>
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<td>18.8%</td>
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<td>High School or GED</td>
<td>12.7%</td>
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<td>Some Post High School</td>
<td>8.5%</td>
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<tr>
<td>College Graduate</td>
<td>4.4%</td>
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Utah data vs. U.S. How are we doing
Utah's adult smoking rate has been the lowest in the nation for many years. In 2005, Utah's adult smoking was 11.2% compared to the national rate of 20.6%. For adult females Utah's rate is 9.3% compared to 19.2% nationally.

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<td>U.S.</td>
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<td>19.2%</td>
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Services/Hotlines
The TRUTH campaign uses television, radio, billboard, and print media to target mainstream and high risk youth, adults, pregnant women, Native Americans, Hispanics/Latinos, and rural populations. The campaign's goals are to counter tobacco industry messages, inform Utahns about quitting services, and reinforce and support local tobacco control efforts. Quitting services available to Utahns include a toll-free Tobacco Quit Line (1-888-567-TRUTH), a web-based quitting service (utah.quitnet.com), free quitting medications and counseling services for uninsured tobacco users and tobacco users on Medicaid, and group-based quitting classes for adults and youth in local communities. Efforts to protect nonsmokers from secondhand smoke focus on strengthening tobacco-free policies in apartment complexes, workplaces, schools, and outdoor venues frequented by children.

The Utah Tobacco Quit Line and Utah's online quitting program offer assistance in quitting tobacco use to Utah adults and teens. For services and information call the Utah Tobacco Quit Line at 1-888-567-TRUTH or visit Utah's online tobacco cessation support program at utahquitnet.com.
Chronic Alcohol Consumption

Compiled by Karen Zinner, MPH

Background
Chronic alcohol consumption is an indicator of potentially serious alcohol abuse, and is related to driving under the influence of alcohol. Females who drink more than seven drinks per week or more than three drinks per occasion are at increased risk for abuse. The question from the BRFSS to compare Utah and the nation is as follows: A drink of alcohol is 1 can or bottle of beer, 1 glass of wine, 1 can or bottle of wine cooler, 1 cocktail or 1 shot of liquor. During the past 30 days, how often have you had at least one drink of any alcoholic beverage? On the days when you drank, about how many drinks did you drink on the average? The Healthy People 2010 (related) goal is to reduce the proportion of females who engage in high risk alcohol consumption activities from the baseline of 72% in 1992 to the 2010 target of 50%. The Healthy People 2010 target for binge drinking in adults (ages 18 years and older) is 6.00% or less.

<table>
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<tr>
<th>Education</th>
<th>Percentage of Females Binge Drinking having five or more drinks on one occasion.</th>
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<tr>
<td>Below High School</td>
<td>9.0%</td>
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<tr>
<td>High School or GED</td>
<td>6.1%</td>
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<td>Some Post High School</td>
<td>4.1%</td>
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<tr>
<td>College Graduate</td>
<td>2.9%</td>
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Risk Factors
Binge drinking is a problem nationally, especially among males and young adults. Alcohol abuse is strongly associated with injuries and violence, chronic liver disease, fetal alcohol syndrome, and risk of other acute and
chronic health conditions. Heavy drinking among women of childbearing age is a problem because of the risk for prenatal alcohol exposure. Birth defects associated with prenatal alcohol exposure can occur during the first 6 to 8 weeks of pregnancy before a woman knows she is pregnant. According to CDC estimates, approximately 76,000 deaths in the U.S. in 2001 were attributable to excessive alcohol use. In 2005 only 1.1% (N=570) of pregnant women stated they had consumed any alcohol during their pregnancy.

Utah data vs. U.S. How are we doing
The percentage of adults who reported being a heavy drinker in the past 30 days was substantially lower in Utah than in the U.S. for all years reported from 2001 to 2005. In 2005, 4.9% of U.S. adults reported heavy drinking in the past 30 days while in Utah only 2.9% reported heavy drinking. For females nationally 4.0% indicated heavy drinking and in Utah it was only 2.5%.

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<td>Male</td>
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<td>Utah</td>
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<td>3.3%</td>
<td>4.0%</td>
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Heavy is defined as adult men having more than two drinks per day and adult women having more than one drink per day.

**Services/Hotlines**
Utah Cares is a free, confidential on-line tool that helps find state and community services. It is available at www.utahcares.utah.gov. Or dial 2-1-1 for state and community service information. Code 2-1-1 can now be accessed from anywhere in the state of Utah. 211 Info Bank, a program of Community Services Council, is a free information and referral line for health, human and community services. 211 provides information and referral on many topics.
HIV/AIDS

Compiled by J. Anne Tumsatan, BA

HIV, human immunodeficiency virus, is an infection that over time leads to the development of AIDS, or acquired immunodeficiency syndrome. The virus destroys the cells of the immune system eventually leading to a weakened immune system that easily succumbs to other infections and disease. Those infected with HIV may generally appear healthy and asymptomatic until the infection develops into AIDS. People get infected with the virus through contact with infected body fluids. Women generally acquire HIV through sexual contact with infected individuals or intravenous drug use. Pregnant women with HIV can infect their babies during pregnancy, at birth and through breast feeding. Treatment can be used to prevent transmission of HIV/AIDS to the baby.

Through October 31, 2006, there were 156 female HIV positive cases reported, which accounts for 18% of the HIV positive infections in Utah. The total AIDS cases, those who have progressed to AIDS based on low CD4 counts, among Utah females reported to date is 238, which accounts for 10% of the AIDS cases in Utah. Both HIV positive infections and AIDS cases for Utah women are below the nationwide trends which are 29% of HIV infections nationwide are women; and 18% of AIDS cases nationwide are women.¹

Of the HIV/AIDS cases among women in Utah, the mode of transmission has shifted from intravenous drug use to heterosexual contact. In 1996, 39.6% of the HIV/AIDS cases were transmitted through heterosexual contact; and through 2006 transmission of HIV/AIDS through heterosexual contact rose to 42% of cases among Utah women. (See Fig. 2) There also has been an increase of women not specifying the mode of transmission from 4.3% of cases through 1996 to 15% of cases through 2006.²

Abstaining from sexual activities and illicit drug use are the best prevention measures. To prevent transmission of HIV/AIDS, those at risk should always use a condom, never share needles, and get tested. Other prevention measures are having monogamous sexual relationships and getting tested if you have had unprotected sex with previous partners.

Many of the County Health Departments throughout Utah as well as other organizations offer HIV counseling and testing. For more information, please visit the Utah Department of Health HIV counseling and testing site at health.utah.gov/cdc/hiv_testing.htm or call the Utah Bureau of Communicable Disease Control at 801-538-6096. Free testing is available through the Utah AIDS Foundation: 801-487-2323 and the Harm Reduction Project: 801-355-0234.
Figure 1. Reported HIV/AIDS cases in Utah, by gender 1996-2006. Resource: Department of Health: 2004 HIV/AIDS Epidemiological Profile

Figure 2. Reported HIV/AIDS Cases Among Utah Females by Risk Group. Source: Women's Health in Utah 1996 and Utah Department of Health: 2006 Utah HIV/AIDS Year-End Surveillance
References


Women and Diabetes

Compiled by Lois Bloebaum BSN, MPA

Background
Diabetes has reached epidemic proportions in the U.S., with almost 21 million Americans (7.0% of the U.S. population) having diabetes. While there is little gender difference in the prevalence of diabetes among the U.S. adult population (10.5% for males and 8.8% for females), there are important reasons to place a women’s health emphasis on the disease. Women generally play the primary role in food choices and preparation for their families; therefore prevention efforts focused on women may impact other family members. Women are also at risk of developing gestational diabetes which can affect pregnancy outcomes. Women who are diagnosed with gestational diabetes have an increased risk of developing type 2 diabetes later in life.

How are we doing? (Utah data versus the U.S.)
The prevalence of diabetes has increased, both nationally and in Utah. Several factors contribute to the rise including increasing rates of obesity and sedentary lifestyles, improvement in medical care of people with diabetes leading to longer a lifespan, changing population demographics, and, finally, a 1997 change in the key diagnostic criterion (fasting blood glucose >126mg/dl) which has contributed to an increased number of people who were clinically diagnosed.

According to Behavioral Risk Factor Surveillance data, an estimated total of 5.9 million adult women (aged 18 or older) in the U.S. have been diagnosed with diabetes. In Utah, approximately 42,000 adult women have been diagnosed with diabetes. The percentage of adult women in Utah compared to the U.S. adult women is depicted in the Figure 1. While the rate in Utah remains less than the national rates, it has increased over the past decade and is cause for concern.
**Risk Factors**

Anyone can develop diabetes, but the risk is greater for those who are older, overweight or obese, physically inactive, or members of a minority racial or ethnic group. According to the American Diabetes Association, 9.7 million or 8.8% of all women aged 20 years or older have diabetes although nearly one third of them do not know it. The prevalence of diabetes is at least 2 to 4 times higher among non-Hispanic Black, Hispanic/Latino American, American Indian, and Asian/Pacific Islander women than among non-Hispanic white women. The prevalence of Hispanic/Latino Americans in Utah has risen considerably over the past 2 decades and undoubtedly will increase rates of diabetes in the state.

The highest rates of diabetes are seen in American Indian and Alaska Native persons. The American Diabetes Association reports that 99,500, or 12.8% of American Indians and Alaska Natives aged 20 years or older who received care from IHS in 2003 had diagnosed diabetes. Taking into account population age differences, American Indians and Alaska Natives are 2.2 times as likely to have diabetes as non-Hispanic whites.¹

**What is being done to address this problem?**

A large multi-center study, The Diabetes Primary Prevention (DPP) study which was funded through a wide partnership of federal agencies showed that weight loss and participation in regular physical activity can decrease the risk for diabetes.³ The DPP trial studied over 3,000 people who already had impaired fasting glucose and were therefore at an increased risk for developing diabetes. The study found that participants who engaged in moderately intense physical activity for 30 minutes per day and lost five to seven percent of their body weight decreased their risk of diabetes by 58 percent.

The Utah Department of Health’s Diabetes Prevention and Control Program strives to increase public awareness of the warning signs, symptoms, and risk factors for developing diabetes. In addition, the program also promotes improved management of diabetes for those already diagnosed through various media campaigns.

**References**


Utah’s Health: An Annual Review | Special Supplement: Women’s Health in Utah

Women’s Health Information and Services
<table>
<thead>
<tr>
<th>Organization and Address</th>
<th>Director</th>
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<td><strong>Baby Your Baby</strong></td>
<td><strong>Marie Nagata</strong> Program Manager</td>
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<td>Utah Department of Health</td>
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<td>Salt Lake City, Utah 84116</td>
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<td><strong>Centers for Disease Control - Women's Health</strong></td>
<td><strong>Yvonne T. Green</strong></td>
<td>404-498-2300</td>
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<td><strong>Genetic Science Learning Center</strong></td>
<td><strong>Louisa Stark PhD</strong></td>
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<td>US Dept Health &amp; Human Services Office on Women's Health</td>
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<td>8270 Willow Oaks Corporate Drive Suite 301</td>
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<td><strong>IBIS-PH</strong> (Public Health Data Resource)</td>
<td><strong>Lois M. Haggard PhD</strong></td>
<td>801-538-9455</td>
<td>ibis.health.utah.gov/home/welcome.html</td>
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<td><strong>Maternal and Child Health Library</strong></td>
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<td>202-784-9770</td>
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<td><strong>National Center of Excellence in Women's Health</strong></td>
<td><strong>Kathleen Digre MD</strong></td>
<td>801-585-9971</td>
<td>uuhsc.utah.edu/coe/womenshealth/resources/women.html</td>
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<td>Seniors.utah.gov</td>
<td>Nels Holmgren Executive Director</td>
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<td><a href="http://www.utah.gov/living/seniors/">www.utah.gov/living/seniors/</a></td>
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| TOXNET Databases of Toxicology and Environmental Health       | Martha Szczur Acting Associate Director | 888-FIND-NLM    | toxnet.nlm.nih.gov/cgi-bin/sis/search         |
| National Library of Medicine Specialized Information Services|                                       |                 |                                              |
| 2 Democracy Plaza, Suite 510                                 |                                       |                 |                                              |
| 6707 Democracy Blvd., MSC 5467                               |                                       |                 |                                              |
| Bethesda, Maryland 20892                                     |                                       |                 |                                              |

| ToxTown Environmental Health Tutorial                         | Martha Szczur Acting Associate Director | 888-FIND-NLM    | toxtown.nlm.nih.gov/                         |
| National Library of Medicine Specialized Information Services|                                       |                 |                                              |
| 2 Democracy Plaza, Suite 510                                 |                                       |                 |                                              |
| 6707 Democracy Blvd., MSC 5467                               |                                       |                 |                                              |
| Bethesda, Maryland 20892                                     |                                       |                 |                                              |

| UCARE (resources for caregivers)                              | Nels Holmgren Executive Director      | 888-826-9790    | www.ucare.utah.gov/                         |
| Utah State Department of Human Services                       |                                       |                 |                                              |
| 120 North 200 West                                           |                                       |                 |                                              |
| Suite 325                                                     |                                       |                 |                                              |
| Salt Lake City, UT 84145                                     |                                       |                 |                                              |

| University Health Care - Women's Health                       | Loris Betz MD, PhD CEO University Health Care | 801-581-2121 | healthcare.utah.edu/healthinfo/adult/women/ |
| 50 North Medical Drive                                       |                                       |                 |                                              |
| Salt Lake City, Utah 84132                                   |                                       |                 |                                              |

| Utah Center for Multicultural Health                          | Owen Quiñonez MD Program Coordinator   | 888-222-2542    | health.utah.gov/cmh/                        |
| Utah Health Department                                        |                                       |                 |                                              |
| 288 North 1460 West                                          |                                       |                 |                                              |
| Salt Lake City, Utah 84116                                   |                                       |                 |                                              |

| Utahhealthnet - Women's Health Issues                         | Sally Patrick Project Director         | 800-866-5534    | utahealthnet.org/information/topics/womens_health_issues/ |
| Spencer S. Eccles Health Sciences Library                     |                                       |                 |                                              |
| 10 North 1900 East                                           |                                       |                 |                                              |
| Salt Lake City, Utah 84112                                   |                                       |                 |                                              |

| Womenshealth.gov                                             | Wanda Jones PhD                        | 800-994-9662    | www.4woman.gov/                             |
| U.S. Department of Health and Human Services                 |                                       |                 |                                              |
| Office on Women's Health                                     |                                       |                 |                                              |
| 200 Independence Avenue, SW Room 712E                        |                                       |                 |                                              |
| Washington, DC 20201                                         |                                       |                 |                                              |

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Health Information Directory
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<td>AARP – Utah State Office</td>
<td>Robert Ence</td>
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<td>6975 Union Park Center (1160 East)</td>
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<td>Midvale, Utah 84047</td>
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<tr>
<td>Adolescent Health – University Health Care – Clinic 6</td>
<td>Nicole Mihalopoulos MD</td>
<td>801-587-7574</td>
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<td>Nels Holmgren</td>
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<td>Alcohol/Drug Detoxification Center – A program of Volunteers of America, Utah</td>
<td>Kevin Chapman</td>
<td>801-363-9400</td>
<td><a href="http://www.voaut.org/">www.voaut.org/</a></td>
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<td>252 West Brooklyn Avenue (1025 South)</td>
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<td>American Cancer Society, Utah Chapter</td>
<td>Rose Desay</td>
<td>801-483-1500</td>
<td><a href="http://www.cancer.org">www.cancer.org</a></td>
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<tr>
<td>941 East 3300 South</td>
<td>Regional Vice President</td>
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<td>Association for Utah Community Health (AUCH)</td>
<td>Bette Vierra</td>
<td>801-974-5522</td>
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<td>Baby Your Baby Hotline</td>
<td>Marie Nagata</td>
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<td><a href="http://www.babyyourbaby.org">www.babyyourbaby.org</a></td>
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<td>Bear River Health Department</td>
<td>Lloyd Verentzen</td>
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<td>Saundra Buys MD</td>
<td>801-587-4241</td>
<td><a href="http://www.hci.utah.edu/group/breastCancer/breastCancerIndex.jsp">www.hci.utah.edu/group/breastCancer/breastCancerIndex.jsp</a></td>
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<td>Ed Nelson MD</td>
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<td>Cardiology - Preventative Cardiology Program</td>
<td>Karen Segerson MD</td>
<td>801-581-4182</td>
<td>healthcare.utah.edu</td>
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<td>Central Utah Public Health Department</td>
<td>Robert Resendes</td>
<td>435-896-5451</td>
<td><a href="http://www.centralutahhealth.com/">www.centralutahhealth.com/</a></td>
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<td>Centro de la Familia de Utah</td>
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<td>801-521-4473</td>
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<td>Children Justice Centers – Office of the Utah Attorney General</td>
<td>Mark L. Shurtleff</td>
<td>800-244-4636</td>
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<td>Children with Special Health Care Needs Bureau</td>
<td>Harper Randall</td>
<td>800-829-8200</td>
<td>health.utah.gov/cshcn/</td>
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<td>Clinicas de Buena Salud (See Website for all Community Health Centers)</td>
<td>Dexter Pierce</td>
<td>435-723-8276</td>
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<td>Community and Family Health Services</td>
<td>George Delavan MD</td>
<td>(801-538-6901)</td>
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<td>Community Services Council (CSC)</td>
<td>Jim Pugh Executive Director</td>
<td>801-978-2452</td>
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<td>Davis County Health Department</td>
<td>Lewis R. Garrett Director of Health</td>
<td>801-451-3315</td>
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<td>Dental Clinic at University Hospital</td>
<td>Craig Olson</td>
<td>801-581-2220</td>
<td>healthcare.utah.edu</td>
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<td>Division of Epidemiology and Laboratory Services</td>
<td>Teresa Garrett Division Director</td>
<td>801-538-6129</td>
<td>health.utah.gov/els/</td>
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<td>Division of Water Quality - State Dept of Environmental Quality</td>
<td>Walter L. Baker</td>
<td>801-538-6146</td>
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24-hour emergency spill line: 801-536-4123
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<td>Domestic Violence Information Line</td>
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<td>Domestic Violence Victim Assistance (DVVA) - A Program of Legal Aid Society of Salt Lake, Inc</td>
<td>Stewart Ralph</td>
<td>801-238-7170</td>
<td><a href="http://www.lasslc.org/programs_domestic_violence.html">www.lasslc.org/programs_domestic_violence.html</a></td>
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<td>Eye Health-John A. Moran Eye Center</td>
<td>Randall Olson MD</td>
<td>801-581-2352</td>
<td><a href="http://uuhsc.utah.edu/moraneyscenter">uuhsc.utah.edu/moraneyscenter</a></td>
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<td>Fatigue Consultation Clinic</td>
<td>Lucinda Bateman MD</td>
<td>801-359-7400</td>
<td><a href="http://www.fcclinic.com">www.fcclinic.com</a></td>
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<td>Fourth Street Clinic (healthcare for the homeless)</td>
<td>Adi Gundlapalli Medical Director</td>
<td>801-364-0058</td>
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<td>Habitat for Humanity of Southwest Utah</td>
<td>Launa Butler Executive Director</td>
<td>435-674-7669</td>
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<td>Headache Clinic- University Health Care</td>
<td>Kathleen Digre MD</td>
<td>801-585-6387</td>
<td><a href="http://healthcare.utah.edu">healthcare.utah.edu</a></td>
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<td>Healthinsight</td>
<td>A. Scott Anderson CEO</td>
<td>801-892-0155</td>
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<td>Healthy Utah</td>
<td>Kathy Paras Program Manager</td>
<td>888-222-2542</td>
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<td>Huntsman Cancer Institute</td>
<td>Mary C. Beckerle Executive Director</td>
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<td>International Rescue Committee (IRC)</td>
<td>Patrick Poulin</td>
<td>801-328-1091</td>
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<td>Michael Hales</td>
<td>800-662-9651</td>
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<td>132 Penman Lane, Bountiful, Utah 84010</td>
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<td>Neurology Department - University Health Care</td>
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<tr>
<td>Oral Health Program</td>
<td>Steven J. Steed</td>
<td>801-538-9177</td>
<td>health.utah.gov/oralhealth/</td>
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<tr>
<td>Utah Department of Health</td>
<td>State Dental Director</td>
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<tr>
<td>Osteoporosis/Bone Density Program – University</td>
<td>Amy Powell MD / Timothy</td>
<td>801-587-7109</td>
<td>healthcare.utah.edu</td>
</tr>
<tr>
<td>Health Care</td>
<td>Beals MD / Co-Directors</td>
<td>1-866-850-886</td>
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<tr>
<td>Department of Orthopaedics</td>
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<td>590 Wakara Way</td>
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<td>Salt Lake City, Utah 84108</td>
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<tr>
<td>People Helping People</td>
<td>Kayleen Simmons</td>
<td>801-583-4175</td>
<td><a href="http://www.mentors4women.org">www.mentors4women.org</a></td>
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<tr>
<td>(Assistance for Single Mothers)</td>
<td>Executive Director</td>
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<td>205 North 400 West</td>
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<td>Salt Lake City, Utah 84103</td>
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<td>Organization and Address</td>
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<td>Planned Parenthood Assoc. of Utah</td>
<td>Karrie Galloway CEO</td>
<td>801-532-1586</td>
<td><a href="http://www.plannedparenthood.org/utah/index.htm">www.plannedparenthood.org/utah/index.htm</a></td>
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<td>Pregnancy Risk Line</td>
<td>Julia Robertson Project Director</td>
<td>800-822-BABY (in Salt Lake City: 801-328-BABY)</td>
<td><a href="http://www.pregnancyriskline.org/">www.pregnancyriskline.org/</a></td>
</tr>
<tr>
<td>Prevent Child Abuse Utah</td>
<td>Anne S. Freimuth Executive Director</td>
<td>1.800.CHILDREN; 801.393.3366</td>
<td><a href="http://www.preventchildabuseutah.org">www.preventchildabuseutah.org</a></td>
</tr>
<tr>
<td>Psychiatry – University Health Care</td>
<td>Clara Michael MD Faculty</td>
<td>1-866-850-8863</td>
<td>healthcare.utah.edu/medicalServices/</td>
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<tr>
<td>Rape Recovery Center</td>
<td>Heather Stringfellow Executive Director</td>
<td>801-467-7273</td>
<td><a href="http://www.raperecoverycenter.org/">www.raperecoverycenter.org/</a></td>
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<tr>
<td>Reproductive Health Program</td>
<td>Lois Bloebaum</td>
<td>801-538-9970</td>
<td>health.utah.gov/rhp/</td>
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<tr>
<td>RxConnect Utah</td>
<td>Sicilia Richins Program Manager</td>
<td>866-221-0265</td>
<td>health.utah.gov/rxconnectutah/</td>
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<tr>
<td>Safe Place (shelter for youth)</td>
<td>Lorri Lake Coordinator</td>
<td>801-269-7500</td>
<td><a href="http://www.slcoyouth.org/html/SafePlace.html">www.slcoyouth.org/html/SafePlace.html</a></td>
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<tr>
<td>Salt Lake City Housing Authority</td>
<td>Rosemary Kappes</td>
<td>801-487-2161</td>
<td><a href="http://www.hasaltlakecity.com/">www.hasaltlakecity.com/</a></td>
</tr>
<tr>
<td>Salt Lake Valley Health Department (SLVHD)</td>
<td>Gary Edwards Executive Director</td>
<td>801-468-2700</td>
<td><a href="http://www.slvhealth.org/">www.slvhealth.org/</a></td>
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<tr>
<td>Services for People with Disabilities</td>
<td>George Kelner Acting Director</td>
<td>800-837-6811</td>
<td><a href="http://www.dspd.utah.gov/index.htm">www.dspd.utah.gov/index.htm</a></td>
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<td>Organization and Address</td>
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| **Spencer S. Eccles Health Sciences Library**  
University of Utah  
10 North 1900 East  
Salt Lake City, Utah 84112 | Wayne J. Peay | 866-581-5534 | library.med.utah.edu/ |
| **Southeastern Health Department**  
190 East Center Street  
Blanding, Utah 84511 | Dave Cunningham  
Director of Health | 435-678-3309 | www.health.state.ut.us/lhd/seast/index.html |
| **Southwest Utah Public Health Department**  
168 North 100 East  
St. George, Utah 84770 | David Blodgett  
Director and Health Officer | 435-986-2545 | www.swuhealth.org/ |
| **Stroke Center - University Health Care**  
175 North Medical Drive  
Room 3204  
Salt Lake City, Utah 84132 | Elaine J. Skalabrin MD | 801-587-9935 | healthcare.utah.edu |
| **Suicide Crisis Hotline**  
(Nationwide)  
Kristin Brooks Hope Center  
615 7th Street NE  
Washington, DC 20002 | Reese Butler  
President | 800-SUICIDE | hopeline.com/ |
| **Summit County Public Health Department**  
85 North 50 East  
Coalville, Utah 84017 | Steve Jenkins | 435-336-3223 | www.summitcountyhealth.org |
| **Tooele County Health Department**  
151 North Main Street  
Tooele, Utah 84074 | Myron E. Bateman  
Director of Health | 435-843-2300 | www.tooelehealth.org/ |
| **Tricounty Health Department**  
(Daggett, Duchesne and Uintah Counties)  
147 East Main  
Vernal, Utah 84078 | Joseph Shaffer  
Department Director and Health Officer | 866-275-0246; 435-781-5475 | www.tricountyhealth.com/ |
| **University Health Care**  
50 North Medical Drive  
Salt Lake City, Utah 84132 | Loris Betz MD PhD  
CEO | 801-581-2121 | healthcare.utah.edu |
| **University of Utah; Certified Nurse-Midwives and Nurse Practitioners; BirthCare HealthCare**  
Madsen Clinic  
555 South Foothill Blvd  
Salt Lake City, Utah 84112 | Leissa Roberts MS CNM | 801-581-4014 | www.nurs.utah.edu/practice/practices.htm |
| **University of Utah; Certified Nurse-Midwives and Nurse Practitioners; BirthCare HealthCare**  
Clinic 4 – University Hospital  
50 North Medical Drive  
Salt Lake City, Utah 84132 | Leissa Roberts MS CNM | 801-581-4014 | www.nurs.utah.edu/practice/practices.htm |
<table>
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<tr>
<th>Organization and Address</th>
<th>Director</th>
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<tr>
<td>University of Utah; Certified Nurse-Midwives and Nurse Practitioners; Birthcare HealthCare Ellis R. Shipp Clinic 4535 South 5600 West West Valley City, Utah 84120</td>
<td>Leissa Roberts MS CNM</td>
<td>801-963-7357</td>
<td><a href="http://www.nurs.utah.edu/practice/practices.htm">www.nurs.utah.edu/practice/practices.htm</a></td>
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<tr>
<td>Utah Cancer Control Program Utah Department of Health 288 North 1460 West Salt Lake City, UT 84114</td>
<td>Katheryn Rowley Program Director</td>
<td>800-717-1811</td>
<td><a href="http://www.utahcancer.org/index.htm">www.utahcancer.org/index.htm</a></td>
</tr>
<tr>
<td>Utah Commission for Women and Families 140 East 300 South Salt Lake City, Utah 84114</td>
<td>Carol Walker Executive Director</td>
<td>801-468-0174</td>
<td><a href="http://www.governor.state.ut.us/women/">www.governor.state.ut.us/women/</a></td>
</tr>
<tr>
<td>Utah County Health Department 589 South State Street 151 South University Ave. Provo, UT 84601</td>
<td>Joseph K. Miner Executive Director</td>
<td>801-851-7000</td>
<td><a href="http://www.utahcountyonline.org/dept/Health/">www.utahcountyonline.org/dept/Health/</a></td>
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<tr>
<td>Utah Domestic Violence Council 205 North 400 West Salt Lake City, Utah 84403</td>
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<td>801-521-5544</td>
<td><a href="http://www.udvc.org">www.udvc.org</a></td>
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<tr>
<td>Utah Department of Health 288 North 1460 West Salt Lake City, Utah 84116</td>
<td>David N. Sundwall MD Executive Director</td>
<td>801-538-6111</td>
<td>health.utah.gov/</td>
</tr>
<tr>
<td>Utah Nurses Association 4505 South Wasatch Blvd #290 Salt Lake City, Utah 84124</td>
<td>Donna Ellason President</td>
<td>800-236-1617</td>
<td><a href="http://www.utahnurses.org/portal/default.asp">www.utahnurses.org/portal/default.asp</a></td>
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<td>Utah Public Health Association P.O. Box 16048 Salt Lake City, Utah 84116</td>
<td>Ilene Risk</td>
<td>801-534-4638</td>
<td><a href="http://www.upha.org/index.htm">www.upha.org/index.htm</a></td>
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<td>Utah State Division of Substance Abuse and Mental Health 120 North 200 West, Room 209 Salt Lake City, Utah 84103</td>
<td>Michael Crookston Chair</td>
<td>801-538-3939</td>
<td><a href="http://www.hsmh.state.ut.us">www.hsmh.state.ut.us</a></td>
</tr>
<tr>
<td>Utah State Library Division 250 North 1950 West, Suite A Salt Lake City, Utah 84116</td>
<td>Donna Jones Morris</td>
<td>801-715-6777</td>
<td>library.utah.gov/</td>
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<td>Utah State Library for the Blind and Disabled 250 North 1950 West, Suite A Salt Lake City, Utah 84116</td>
<td>Bessie Oakes Program Manager</td>
<td>800-662-5540</td>
<td>blindlibrary.utah.gov/</td>
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<tr>
<td>Utah Tobacco and Prevention Program Utah Department of Health 288 North 1460 West Salt Lake City, Utah 84116</td>
<td>H. Borski Program Manager</td>
<td>877-220-3466</td>
<td><a href="http://www.tobaccofreeutah.org">www.tobaccofreeutah.org</a></td>
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<td>Valley Mental Health Crisis Hotline 5965 South 900 East Salt Lake City, Utah 84121</td>
<td>Debra Falvo Executive Director</td>
<td>801-261-1442</td>
<td><a href="http://www.vmh.com/">www.vmh.com/</a></td>
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<td>Valley Mental Health</td>
<td>Debra Falvo</td>
<td>801-263-7100</td>
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<td>5965 S 900 E</td>
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<td>Suite 420</td>
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<td>P.O. Box 142106</td>
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<td>Wasatch County Health Department</td>
<td>Phil Wright</td>
<td>435-654-2700</td>
<td><a href="http://www.co.wasatch.ut.us/health">www.co.wasatch.ut.us/health</a></td>
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<td>55 South 500 East</td>
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<td>Weber-Morgan Health Department</td>
<td>Gary House</td>
<td>801-399-7100</td>
<td>www1.co.weber.ut.us/health</td>
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<td>477 23rd Street</td>
<td>Executive Director</td>
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<td>Ogden, Utah 84401</td>
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<td>Women, Infants and Children Program</td>
<td>Nan Streeter</td>
<td>877-WIC-KIDS</td>
<td>health.utah.gov/wic/</td>
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<td>Women’s Health Clinic-University Health Care</td>
<td>Jennie VanHorn</td>
<td>801-585-2111</td>
<td>uuhsc.utah.edu/coe/</td>
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<td>Madsen Clinic</td>
<td>MD</td>
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<td>womenshealth/clinical/</td>
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<tr>
<td>555 South Foothill Blvd</td>
<td>Medical Director</td>
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<td>Youth Crisis Center, Iron County (Shelter for abused children)</td>
<td>Paul Arnold</td>
<td>435-586-1704</td>
<td><a href="http://www.jjs.utah.gov/shelter-care.htm">www.jjs.utah.gov/shelter-care.htm</a></td>
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<td>1692 West Harding Ave</td>
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<td>Cedar City, Utah 84720</td>
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<td>Youth Crisis Center, Washington County (Shelter for abused children)</td>
<td>Tammy Fullerton</td>
<td>435-656-6100</td>
<td><a href="http://www.jjs.utah.gov/shelter-care.htm">www.jjs.utah.gov/shelter-care.htm</a></td>
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<td>St. George, Utah 84770</td>
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<td>YWCA of Salt Lake City</td>
<td>Anne Burkholder</td>
<td>801-537-8600</td>
<td><a href="http://www.ywca.org/site/">www.ywca.org/site/</a></td>
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<tr>
<td>322 East 300 South</td>
<td>CEO</td>
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NATIONAL CENTER OF EXCELLENCE IN WOMEN’S HEALTH
DEMONSTRATION PROJECT REGION VIII

The University of Utah Health Sciences Center
30 North 1900 East Room 2B-111
Salt Lake City, UT 84132

This publication is also available online at: http://uuhsc.utah.edu/coe/womenshealth/