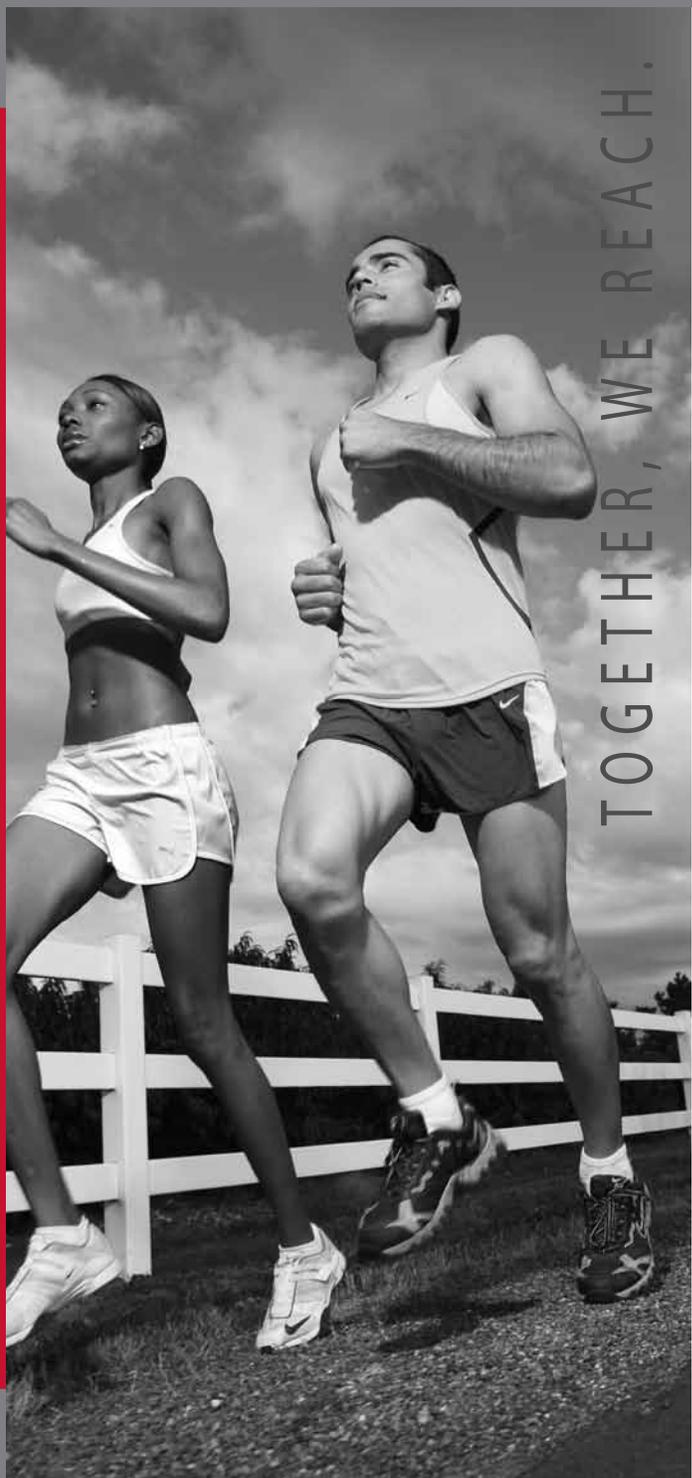


UH REVIEW 2011

Utah's Health: An Annual Review



TOGETHER, WE REACH.

Original Research Articles

- 10** Racial and Ethnic Disparities in Seasonal Influenza Vaccination Among Utah Adults, 2000-2008
Andrew E. Burger, BA; Eric N. Reither, PhD; David W. Ramos, BS; & Sun Young Jeon, BS
- 21** Sexual Activity and Contraceptive Use: A survey of University of Utah Undergraduate Students Aged 18-20
Janet C. Jacobson, MD; Sara E. Simonsen, CNM, MSPH; Katherine Morgan Ward DNP, WHNP; Ashley Lena Havlicak; & David K. Turok, MD/MPH
- 30** Protocol Use in Disease Outbreak Investigations: Applying a Technical Systems Solution to a Natural System Problem
Heidi S. Kramer, MS; Laverne A. Snow, MPH; Matthew Samore, MD; and Frank A. Drews, PhD
- 35** May We Speak to the Lady of the House? Are Women Really the Ones Who Look for Health Information?
Kathleen Digre, MD, Sally Patrick, MLS, Sara Simonsen, CNM, MSPH, Brenda Ralls, PhD, Michael Varner, MD, and Patricia Murphy, PhD
- 40** Preliminary Findings from a Pilot Integrative Obesity and Eating Disorder Intervention
Justine J. Reel, PhD, LPC, CC-AASP; Sonya SooHoo, PhD; Carlie Ashcraft, MS; & Rachel Lacy, MS
- 47** Cancer Survival in Utah: Female Breast, Prostate, Colorectal, Lung and Bronchus, and Melanoma of the Skin, 1995-2006
Antoinette M. Stroup, PhD; C Janna Harrell, MS; Kimberly A. Herget, BA; Rosemary Dibble, CTR
- ## Perspectives
- 58** Awareness of Radon-Associated Health Risks in Utah
Wallace Akerley, Chris Keyser, Sandie Edwards, Rob Wilson, Terry Van Duren, Dylan Akerley, Sarah Tranter, Susan Sharry
- 61** Community Readiness to Prevent Intimate Partner Violence: A University Needs Assessment to Health Education Practice
Jacqueline R. Barco, MS & Justine J. Reel, PhD, LPC, CC-AASP
- 70** Working with Individuals with Intellectual Disabilities in Healthcare Settings: Body Image and Eating Disorder Concerns
Justine J. Reel, PhD, LPC, CC-AASP & Robert A. Bucciare, MSW, LCSW
- 77** **2011 Utah Legislative Review**
- 89** **2011 Utah Health Data Review**

Utah's Health: An Annual Review

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Introduction and Editor's Note

It is with great pleasure that I, on behalf of the 2010-2011 Editorial Board, present the sixteenth volume of *Utah's Health: An Annual Review*. *Utah's Health* is dedicated to publishing original and timely health-related research relating to the State of Utah, and providing an analysis of important health-related data. It is a vehicle for health policy dialogue at both state and national levels and is designed to aid students, researchers, legislators, and health-related professionals in the continual pursuit of health-related knowledge and practice. *Utah's Health* also serves as a health education resource to the general public, and is available online at www.matheson.utah.edu.

As in previous years, *Utah's Health* is comprised of four main sections: Original Research Articles, Perspectives, a Legislative Review, and a Data Review. The Original Research Articles submitted this year are of the utmost quality and demonstrate a high caliber of peer-reviewed scientific research that relates to the health of Utahns. I am most grateful for all of the wonderful submissions that were received.

Journals are a complicated and time-consuming process. They involve perseverance, patience, and sacrifice on the part of numerous individuals and organizations. Appreciation is due to many individuals, not only those involved in the journal directly, but those that continue to engage in research, data collection, and the practice of health itself. First and foremost, I would like to thank the diligent group of authors, contributors, and volunteers that have sacrificed their time and effort to make this journal possible. Their commitment to the research and analysis of health related issues in Utah is the impetus behind the quality of this edition. I am extraordinarily fortunate to have, and extremely thankful for, the guidance of a fantastic group of advisory board members. Their insight and expertise in providing expert reviews and revisions to the numerous articles and data pages is invaluable. I would also like to extend my deepest gratitude to Dr. Richard Sperry for his unwavering support and direction as our faculty advisor.

I greatly appreciate the contributions of a remarkable group of fellow students and editorial board members who excelled in the creation of this work. As the Editor-in-Chief, I extend to each one of them a sincere and heartfelt thank you for their hard work and commitment to the success of this publication. My extra special thanks to Mrs. Sarah Watts-Justice for her diligence and guidance throughout the revision and publication process. In her hands, the journal truly becomes an outstanding blend of art and science.

As a final note, I continue to be surprised at the vast information we have regarding our health and health behaviors, and how little of it we truly take to heart. We as practitioners, researchers, and educators should always remember that in order to truly create and maintain healthy behaviors in our families, communities, and organizations, we must first do so in our own lives. Again this year, this volume is dedicated to the friends, colleagues, relatives, and loved ones we have lost over the past year. May we continue to use our gifts of knowledge, research, and practice for the health, safety, and ever-improving quality of life in our communities, our families, and within ourselves.

JB Flinders, MPH, MBA

Editor-in-Chief

Utah's Health: An Annual Review—Volume XVI, 2011

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Contents

Original Research Articles

- Racial and Ethnic Disparities in Seasonal Influenza Vaccination Among Utah Adults, 2000-2008** 10

Andrew E. Burger, BA; Eric N. Reither, PhD; David W. Ramos, BS; & Sun Young Jeon, BS

- Sexual Activity and Contraceptive Use: A survey of University of Utah Undergraduate Students Aged 18-20** 21

Janet C. Jacobson, MD; Sara E. Simonsen, CNM, MSPH; Katherine Morgan Ward DNP, WHNP; Ashley Lena Havlicak; & David K. Turok, MD/MPH

- Protocol Use in Disease Outbreak Investigations: Applying a Technical Systems Solution to a Natural System Problem** 30

Heidi S. Kramer, MS; Laverne A. Snow, MPH; Matthew Samore, MD; and Frank A. Drews, PhD

- May We Speak to the Lady of the House? Are Women Really the Ones Who Look for Health Information?** 35

Kathleen Digre, MD, Sally Patrick, MLS, Sara Simonsen, CNM, MSPH, Brenda Ralls, PhD, Michael Varner, MD, and Patricia Murphy, PhD

- Preliminary Findings from a Pilot Integrative Obesity and Eating Disorder Intervention** 40

Justine J. Reel, PhD, LPC, CC-AASP; Sonya SooHoo, PhD; Carlie Ashcraft, MS; & Rachel Lacy, MS

- Cancer Survival in Utah: Female Breast, Prostate, Colorectal, Lung and Bronchus, and Melanoma of the Skin, 1995-2006** 47

Antoinette M. Stroup, PhD; C Janna Harrell, MS; Kimberly A. Herget, BA; Rosemary Dibble, CTR

Perspectives

- Awareness of Radon-Associated Health Risks in Utah** 58

Wallace Akerley, Chris Keyser, Sandie Edwards, Rob Wilson, Terry Van Duren, Dylan Akerley, Sarah Tranter, Susan Sharry

- Community Readiness to Prevent Intimate Partner Violence: A University Needs Assessment to Health Education Practice** 61

Jacqueline R. Barco, MS & Justine J. Reel, PhD, LPC, CC-AASP

- Working with Individuals with Intellectual Disabilities in Healthcare Settings: Body Image and Eating Disorder Concerns** 70

Justine J. Reel, PhD, LPC, CC-AASP & Robert A. Bucciare, MSW, LCSW

- 2011 Utah Legislative Review** 77

- 2011 Utah Health Data Review** 89

Original Research Articles

2011

Utah's Health: An Annual Review

Racial and Ethnic Disparities in Seasonal Influenza Vaccination among Utah Adults, 2000-2008

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KEYWORDS

influenza, vaccination, health disparities, race/ethnicity, socioeconomic status (SES)

ABSTRACT

Health inequalities have long been observed among racial/ethnic groups in the United States. Despite initiatives to address health disparities, substantial differences remain. One important area of concern is racial/ethnic disparities in vaccination for the seasonal flu. The seasonal flu is responsible for thousands of deaths each year in the United States, and even more hospitalizations, with billions of dollars drained from the economy due to illness and lost productivity. Seasonal vaccination remains the most simple and effective means of preventing the flu, but millions go unvaccinated every year with notable differences across racial/ethnic groups. Using the Behavioral Risk Factor Surveillance System (BRFSS), we examine vaccination rates among adults from various racial/ethnic groups in Utah during the 2000-2008 influenza seasons. Our analyses demonstrate that flu vaccinations increased significantly for non-Hispanic Whites over this period, but appear to have declined somewhat among Hispanics. Through a series of logistic regression models, we discovered that lower odds of vaccination among Hispanics disappeared after controlling for healthcare coverage and other socioeconomic characteristics. These findings suggest that seasonal influenza vaccination rates can be improved among racial/ethnic minorities in Utah by addressing structural barriers to receiving the seasonal flu vaccination, especially access to healthcare coverage.

Every year influenza infections and related comorbidities account for thousands of deaths in the United States. Effective and safe vaccines for seasonal influenza have been developed and promise to substantially reduce the mortality and morbidity burden of influenza viruses. However, millions go unvaccinated every year in the United States. Past research has identified the existence of disparities in seasonal influenza vaccination, with racial/ethnic minorities experiencing lower vaccination rates than non-Hispanic Whites (Egede and Zheng 2003; Fiscella 2005; Fiscella et al. 2007; Fiscella et al. 2002; Linn, Guralnik, and Patel 2010; Logan 2009; Zimmerman et al. 2003). While inequalities in vaccination have been observed in the past, they are typically based on single year observations. To better understand racial/ethnic disparities and trends in those disparities, this study will examine nine consecutive flu seasons beginning in the year 2000 in the state of Utah. Given the increasingly diverse population in Utah – particularly with a rapidly growing Hispanic population – it is important to understand recent trends and disparities in flu vaccination, which will help identify opportunities to improve public health in the state.

DISEASE BURDEN OF SEASONAL INFLUENZA

Mortality

In a recent publication issued by the Centers for Disease Control and Prevention (CDC), mortality estimates were provided for the 1976-2007 influenza seasons in the United States (CDC 2010a). Deaths resulting from seasonal influenza were estimated to have ranged from a low of 3,349 during the 1986-1987 flu season to a high of 48,614 deaths during the 2003-2004 season. The average level of mortality from influenza during 1976-2007 was around 23,607 deaths per flu season. Using public data available for analysis online from the CDC (2003), we found that the mortality burden of the seasonal flu and pneumonia, which are often associated (see Klugman, Chien, and Madhi 2009), is so great that it was listed as the eighth leading cause of death in the United States from 1999-2007, with an estimated total of 553,629 deaths during that time period. This places influenza and pneumonia above suicide, homicide, liver disease, hypertension, and AIDS in terms of the estimated total number of deaths in the United States during that time period (CDC 2003). Molinari et al. (2007) estimate that 610,660 life-years are lost per annum in the U.S. due to the seasonal flu.

Morbidity

While the mortality burden associated with the seasonal flu has been well characterized in the scientific literature, the morbidity burden, while likely to be great, is harder to estimate. Hospitalizations due to influenza during each flu season may help in estimating the virulence of various flu strains. From

1979 to 2000, an average of nearly 200,000 people was hospitalized each year due to influenza-related illnesses (Thompson et al. 2004). However, because of the varying severity of the seasonal flu, estimates of hospitalizations ranged anywhere from 157,911 during the 1990-1991 flu season to 430,960 during the 1997-1998 flu season. While hospitalization rates were found to be highest among the elderly, young children under the age of 5 also experienced high hospitalization rates – similar, in fact, to those experienced by 50-64 year olds.

Economic Burden

The total economic burden of the seasonal flu is estimated to be nearly \$87 billion annually in the United States (Molinari et al. 2007). An estimated \$6 billion is spent on influenza related hospitalizations, \$6.8 billion on outpatient care, and more than \$16 billion in lost earnings due to illness and loss of life. With an estimated annual 44 million days lost from work due to influenza, the impact of the seasonal flu in terms of lost productivity, absenteeism, and related costs for employers is also substantial (Akazawa, Sindelar, and Paltiel 2003).

Although these figures are striking, the actual disease burden of the seasonal flu is likely to be larger than previously estimated. Several reporting issues contribute to the underreporting of influenza related illnesses and deaths. One reason for the underreporting of deaths from influenza is that “states are not required to report individual seasonal flu cases or deaths of people older than 18 years of age” to the CDC (CDC, 2010d, p. 1). Furthermore, influenza is rarely listed on death certificates of individuals who die from flu related complications, such as pneumonia. Additionally, even when the International Classification of Disease (ICD) codes are implemented to track mortality, research has shown that many deaths caused by influenza tend to be missed, such as cardiovascular or circulatory deaths caused by influenza-related complications (Monto 2008).

EFFECTIVENESS OF INFLUENZA VACCINATION

The high mortality, morbidity, and economic costs associated with seasonal influenza could be reduced through vaccination, which is an effective way to prevent infection (Nichol 2008, CDC 2010b). The CDC recommends that obtaining a flu vaccination should be the first step in preventing the seasonal flu (CDC 2010d). Vaccination against the seasonal flu provides substantial benefits for mothers and young infants (Zaman et al. 2008), as well as healthy children (Jefferson et al. 2005, Manzoli et al. 2007). Among working U.S. adults, vaccination also has substantial health benefits, decreasing upper respiratory illness by 25% and reducing absenteeism due to upper respiratory illness by 43% (Nichol et al. 1995). Vaccination also provides significant benefits for the elderly populations which are par-

ticularly vulnerable to influenza (Nichol et al. 2007, Gross et al. 1995). Even during years where the influenza vaccine (which is prepared before the onset of each flu season) is a poor antigenic match for that season's particular flu strain, health benefits can still be gained through vaccination (Herrera et al. 2007, CDC 2010b). Given the substantial health benefits provided by influenza vaccination, the CDC revised its guidelines in 2010-2011 to recommend that all individuals 6 months of age and older receive an influenza vaccination (CDC 2010b).

Reaching this ambitious new standard will be difficult. Prior goals set by the CDC for vaccinating recommended age groups have been hard to attain (Nichol 2008). Before the 2010-2011 change in protocol, the CDC recommended influenza vaccination only for select groups of the population, such as the elderly or those at particular risk of complications due to the flu (Nichol 2007). However, Lu et al. (2008) found that from 1989-2005, when the CDC focused on these high-risk populations, vaccination attainment goals were rarely met. Indeed, only 69.5% of persons aged 65 and older received the flu vaccine in the United States during the 2007 flu season (Linn, Guralnik, and Patel 2010), demonstrating that considerable gains need to be made in order to achieve the new 2010-2011 standard of universal vaccination of the entire population age six months and older. Important in understanding the barriers to attainment of the CDC goals is an examination of the substantial differences in influenza vaccination rates by race/ethnicity.

BARRIERS TO VACCINATION

Consistently, race and ethnicity prove to be strongly associated with seasonal influenza vaccination (Egede and Zheng 2003, Chen et al. 2007). Fiscella (2005) estimates that if racial/ethnic disparities were eliminated, an additional 1 million elderly minority persons in the U.S. would receive an influenza vaccination each year. Eliminating vaccination disparities could yield remarkable improvements in population health. To illustrate, eliminating vaccination disparities could save an estimated 33,000 years of life per annum among racial/ethnic minorities in the U.S. (Fiscella 2007)

Preventive healthcare services such as flu vaccination are often underutilized by racial/ethnic minorities (Logan 2009). Chen et al. (2007) found that Hispanics tend to cite structural barriers that prevent receipt of the seasonal flu vaccination, including insufficient access to preventive services, lack of transportation, not knowing where to go, and economic costs. These researchers also found that health insurance was a significant predictor of vaccination among Hispanics.

In addition to structural barriers, racial/ethnic minorities may be less informed regarding the severity of the seasonal flu

and the benefits of vaccination. According to Chen et al. (2007), one of the most common explanations among racial/ethnic minorities for not receiving the flu vaccine was a lack of concern about contracting the flu. This suggests that some racial/ethnic minorities may be less likely to go to a health care facility with the intent of receiving just an influenza vaccine (Link et al. 2006). Misinformation and inadequate education about the seasonal flu among some racial/ethnic minorities may contribute to lower rates of vaccination.

Language barriers can also deter vaccination, especially among Hispanics and other racial/ethnic groups with large numbers of recent migrants. Fiscella et al. (2002) presents evidence showing that English-speaking Hispanics with health insurance did not differ significantly from their non-Hispanic White counterparts in terms of receiving an influenza vaccination. However, Spanish-speaking Hispanics with health insurance received flu vaccinations at lower rates than non-Hispanic Whites with insurance.

METHODS AND PROCEDURE

DATA SOURCE

To identify racial/ethnic disparities in flu vaccination in Utah, this study will utilize the Behavioral Risk Factor Surveillance System (BRFSS), which is an annual health survey sponsored by the CDC. The BRFSS is the largest ongoing telephone based survey tracking health-related information of non-institutionalized U.S. adults over the age of 18 (CDC 2008). The BRFSS is administered in Utah by the Department of Health; data are collected monthly on a range of different health topics (Utah Department of Health).

DEPENDENT VARIABLE

The BRFSS measures influenza vaccination by asking respondents if they have received a flu shot during the past 12 months. The respondents' responses were coded as "Yes", "No", "Don't Know", or "Refused." Beginning in 2004, the BRFSS additionally asked respondents if they had received an influenza vaccination through a nasal spray. Since the principal interest of this research is vaccination, not the mode of vaccination, the two variables were combined so that if the respondent responded "Yes" to either or both, they were coded as having been vaccinated during the last 12 months.

Flu Seasons in the BRFSS

The BRFSS presents some unique challenges in accurately linking reports of seasonal flu vaccination to the appropriate flu season. Given the seasonal timing of flu epidemics and the retrospective wording of the flu vaccine question in the BRFSS,

it becomes difficult to identify which flu season the respondent is referring to in his or her responses about vaccinations.

Previous studies of BRFSS data have addressed this issue in a variety of ways. For example, Linn et al. (2010) include all responses from the 2008 BRFSS in their analysis of flu vaccination rates during the 2007 flu season. While this method likely does primarily capture individuals from the 2007 flu season, it certainly also includes respondents who were referring to either the 2006 or the 2008 flu seasons. Furthermore, using any given year of the BRFSS to estimate the previous year's flu season may prove inaccurate since vaccination rates may vary across flu seasons in response to the virulence of flu strains, economic conditions, and other factors. For instance, enhanced media coverage during a given flu season could increase vaccination rates as a larger segment of the population becomes aware of the flu (Ma et al. 2006). Other factors, such as the influenza vaccine shortage of 2004 – in which there was a nearly 50% reduction in the supply of flu vaccine – could also play a role in seasonal differences in vaccination (Zimmerman et al. 2006).

Until the 2009 BRFSS, respondents were only asked whether they had received a flu vaccination in the previous 12 months. Beginning with the 2009 BRFSS, however, information was gathered regarding the month and year of the respondent's last reported flu vaccination. With that information we can accurately determine during which flu season respondents were vaccinated. Flu seasons typically begin in late October or November and can last until the next year's summer (CDC 2010c). Since public influenza vaccinations typically begin before the flu season starts, we will consider respondents who received their vaccine from September of any given year through August of the next year as being vaccinated for that particular flu season. For example, in Table 1 approximately 78% ($n = 3486$) of those who reported receiving a flu vaccine in Utah did so during the 2008 flu season (sometime between September 2008 and August 2009). Approximately 20% ($n = 902$) reported having received

their flu vaccine during the 2009 influenza season, and a little more than 1% ($n = 56$) reported having received their flu vaccine during the 2007 influenza season. Taken together, roughly 22% of respondents referred to flu seasons other than 2008, meaning that they would be misclassified using the methodology adopted by Linn et al. (2010).

Clearly, it is necessary to exercise caution when making assumptions about the ability of a single wave of the BRFSS to accurately depict vaccination rates for a particular flu season. However, dramatic gains in accuracy can be made when restricting the sample by interview month. Among respondents who were interviewed from January to September of the 2009 Utah BRFSS, nearly 98% reported receiving their vaccination during the 2008 flu season. By excluding individuals who were interviewed from October to the end of the 2009 BRFSS, we greatly reduce the number of vaccinations reported for the 2009 flu season, which increases our ability to portray seasonal vaccination rates accurately.

Because vaccination dates are not available in the BRFSS prior to 2009, we propose an alternate method of measuring seasonal vaccination rates based on the respondents' month of interview. Our analyses suggest that by restricting the sample to those interviewed from January to September of each survey year, we will estimate the previous year's seasonal flu vaccination rates with greater precision. To illustrate, we will use responses from individuals interviewed during the months of January through September of the 2001 BRFSS to estimate vaccination rates during the 2000 flu season. Subsequent flu seasons will be coded in a like manner.

This is an imperfect solution, as restricting the sample by interview month will result in the exclusion of about a quarter of the respondents in each survey year. However, those individuals who are excluded are likely to be reporting a flu vaccine for a different flu season and their inclusion would produce error and significantly reduce our ability to evaluate specific flu seasons.

TABLE 1. Influenza seasons in which vaccination was reported, 2009 Utah BRFSS.

Entire Sample Interview Month 01/09 to 01/10			Restricting Vaccination by Interview Month 01/09 to 09/09			Restricting Vaccination by Interview Month 10/09 to 01/10		
<i>Flu Season</i>	<i>n</i>	<i>%</i>	<i>Flu Season</i>	<i>n</i>	<i>%</i>	<i>Flu Season</i>	<i>n</i>	<i>%</i>
2007 ^a	56	1.2%	2007 ^a	56	1.6%	2007 ^a	0	0.0%
2008 ^b	3486	78.4%	2008 ^b	3341	97.9%	2008 ^b	145	14.0%
2009 ^c	902	20.3%	2009 ^c	14	0.4%	2009 ^c	888	85.9%
Total	4444	100%	Total	3411	100%	Total	1033	100%

a. Received influenza vaccination from 01/08-08/08.
 b. Received influenza vaccination from 09/08-08/09.
 c. Received influenza vaccination from 09/09-12/09.

Moreover, exploratory analyses indicate that the data are not biased in any particular fashion by eliminating respondents who were interviewed later in the year.

Like previous research (Lu, Euler, and Callahan 2009), our study selects respondents by time of interview. However, whereas the methodology outlined by Lu et al. (2009) includes respondents interviewed from February to August, we include respondents over a wider interval of time – January through September. This decision is rooted in our analyses of 2009 BRFSS data for Utah, which reveal that our technique retains fully 95.8% of respondents reporting vaccination for the 2008 flu season, compared to 89.3% using the previous standard. We retain these additional BRFSS participants without compromising our ability to categorize them into the correct flu season; 97.9% of the respondents in our sample report receiving their vaccination for the 2008 flu season, which results in a low rate of error that is comparable to the alternative approach. To ensure that this finding is not anomalous, we compared our results against national BRFSS data. The benefits of using interview months January through September are even more pronounced in national data, corroborating our findings for Utah.

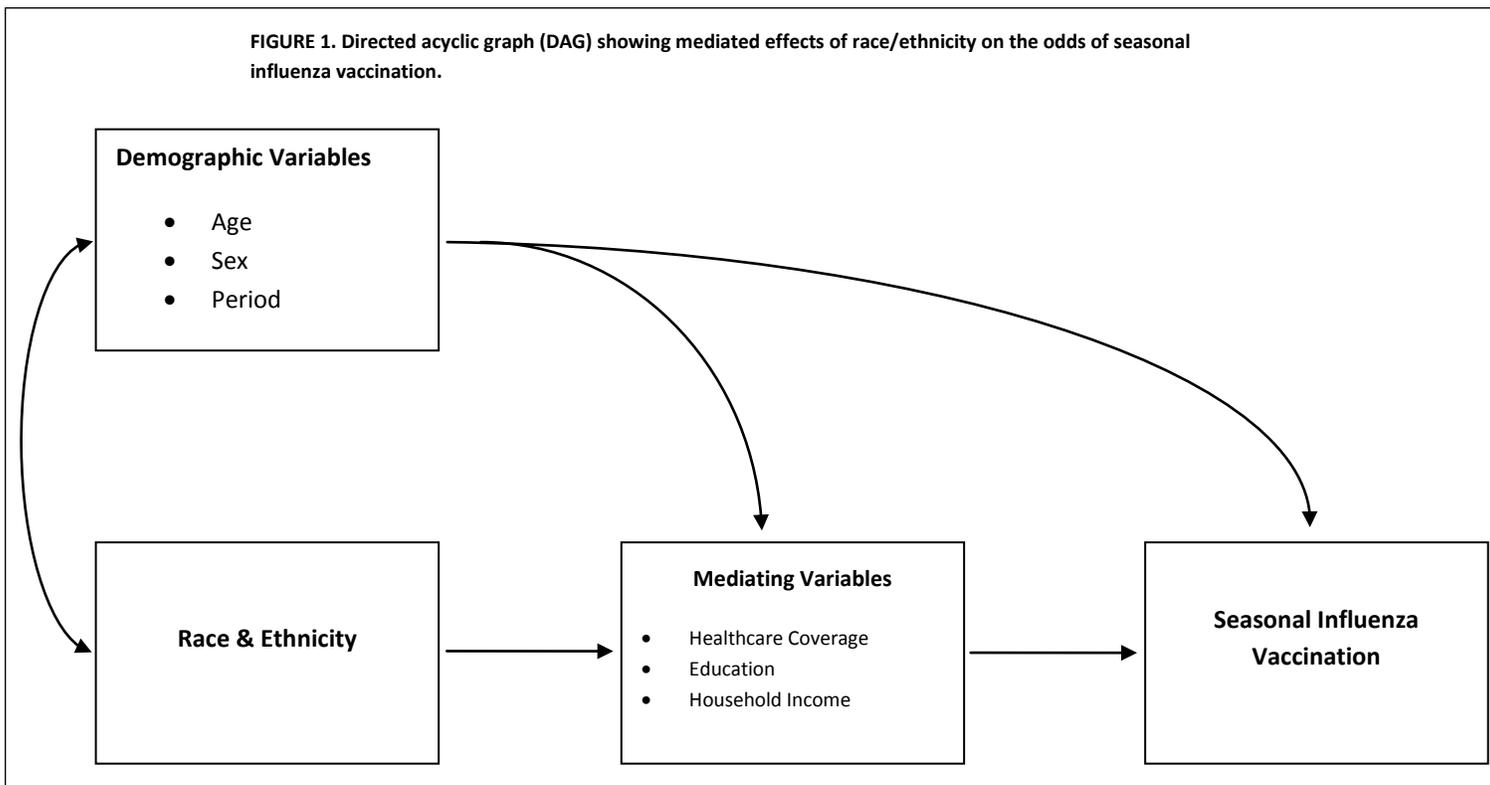
INDEPENDENT VARIABLES

Our chief independent variable is race/ethnicity. Within the BRFSS, racial/ethnic background is coded as White non-Hispanic, Black non-Hispanic, other race non-Hispanic, multiracial

non-Hispanic, and Hispanic. However, due to the low number of respondents in the Black non-Hispanic and multiracial non-Hispanic categories during our period of study, we combine them with the other race non-Hispanic category to create three exhaustive and mutually exclusive racial/ethnic categories: White non-Hispanic, Hispanic, and other non-Hispanic. Although it is difficult to identify precisely which racial/ethnic groups comprise the other non-Hispanic category, we retain them in our analyses for comparative purposes and also to maximize statistical power for some analyses.

Other independent variables of interest include age, sex, level of education, household income, and healthcare coverage. Age is collapsed into six categories including: 18-24, 25-34, 35-44, 45-54, 55-64, and 65+. Educational attainment is recoded into five categories including: “Less than High School”, “High School Graduate”, “Some College or Technical School”, and “College Graduate.” To create the “Less than High School” category we combined three different responses: “Never Attended School or Only Kindergarten”, “Elementary School (Grades 1-8)” and “Some High School (grades 9-11).” Household income is collapsed into seven different categories. Whether or not the respondent participated in some sort of healthcare plan was assessed through the question, “Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?” to which the

FIGURE 1. Directed acyclic graph (DAG) showing mediated effects of race/ethnicity on the odds of seasonal influenza vaccination.



respondent replied “Yes”, “No”, “Don’t Know”, or “Refused.”

ANALYSIS

To illustrate plausible mechanisms through which race/ethnicity influences the odds of receiving an influenza vaccination, we have constructed a directed acyclic diagram (Greenland, Pearl, and Robins 1999; Shrier and Platt 2008). As shown in Figure 1, we propose that the race effect is mediated primarily through healthcare coverage and indicators of socioeconomic status (specifically household income and education); the “direct” influence of race/ethnicity is therefore expected to attenuate substantially after controlling for these three mediators. Note that we also include a handful of demographic measures as control variables, to account for potential differences between racial/ethnic groups. For instance, Hispanic respondents tend to be younger than their non-Hispanic White counterparts, which could partially account for gross differences in influenza vaccination rates observed between these groups.

All analyses were performed using SPSS 18 and Microsoft Excel 2007. Additionally, the SPSS Complex Samples Module was used to generate point estimates and produce variance estimates. Vaccination rates were estimated for the 2000-2008 influenza seasons for various sociodemographic groups. Difference of proportions tests were subsequently conducted to determine if the differences observed between racial/ethnic groups were statistically significant for each sociodemographic subgroup (e.g., females). Linear regression was also used to summarize trends in vaccination rates over this period of observation for non-Hispanic Whites and Hispanics. Trends

in seasonal vaccination rates among other non-Hispanics were generally similar to Whites and are not shown in the results. Finally, a series of logistic regression models were estimated to assess potential mechanisms through which race/ethnicity affects the odds of influenza vaccination. Model 1 includes demographic control variables, which likely account for some of the raw differences in the odds of influenza vaccination observed between racial/ethnic groups. Model 2 includes presence of healthcare coverage, which potentially represents the single most important structural barrier to influenza vaccination for disadvantaged racial/ethnic groups. Model 3 includes socioeconomic factors (household income and education), which may represent additional mechanisms through which race/ethnicity influences the odds of influenza vaccination.

RESULTS

Influenza vaccination percentages are presented in Table 2 for the 2000-2008 flu seasons by race/ethnicity and sociodemographic subgroups. For most Hispanic sociodemographic subgroups, vaccination rates were significantly lower than their non-Hispanic White counterparts. To illustrate, Hispanic males experienced substantially lower influenza vaccination rates than White males (23.1% vs. 34.6%). A similar disparity was observed for Hispanic females (31.9% vs. 39.5%). Significant differences between Hispanics and Whites were also observed across all income levels, with Hispanics experiencing lower vaccination rates except for the \$50,000-\$74,999 category where Hispanic vaccination rates were higher. Noteworthy differences

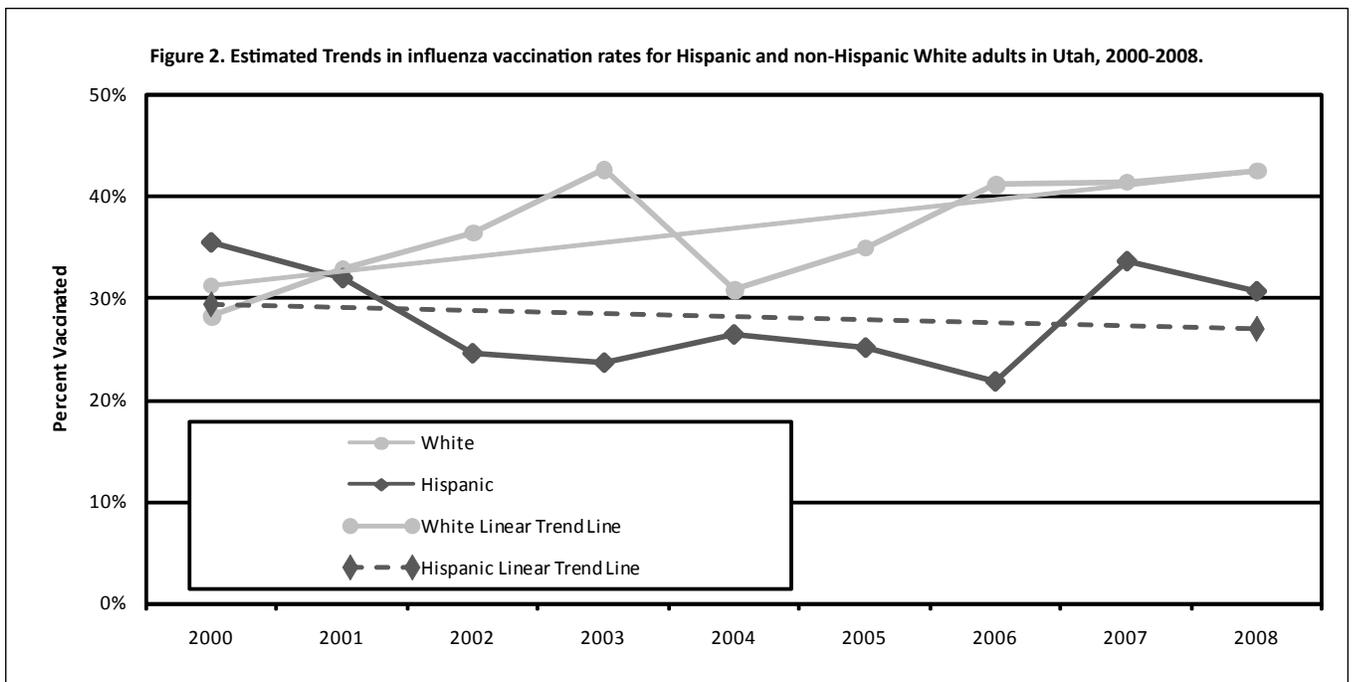


Table 2. Influenza vaccination coverage in sociodemographic subgroups by race: Utah, 2000-2008.

Characteristics	Total Sample			White, non-Hispanic			Hispanic			Other, non-Hispanic		
	n [†]	%	95% CI	n	%	95% CI	n	%	95% CI	n	%	95% CI
Age												
18-24	2,682	24.5	22.4-26.7	2,278	25	22.8-27.5	267	19.9	14.1-27.3	137	25.8	17.2-36.7
25-34	6,353	25.8	24.5-27.1	5,509	25.9	24.6-27.3	567	23.2	19.2-27.7	277	29.1	22.5-36.8
35-44	6,554	27.3	25.9-28.7	5,749	27.4	26.0-28.9	492	24.5	19.8-29.8	313	30.3	24.3-37.0
45-54	6,646	35.9	34.4-37.5	6,070	36.2	34.6-37.8	339	33.7	27.7-40.2	237	34.7	27.4-42.8
55-64	5,541	48.4	46.6-50.1	5,148	49	47.1-50.8	214	39.2***	30.9-48.1	179	44.6	35.2-54.4
65+	7,245	74.2	72.8-75.6	6,857	74.1	72.7-75.5	218	0.749	66.9-81.5	170	78.2	69.9-84.8
Sex												
Male	15,188	33.5	32.5-34.5	13,699	34.6	33.5-35.7	877	23.1***	19.6-27.0	612	32.1	27.5-37.1
Female	19,987	38.8	37.9-39.7	18,043	39.5	38.5-40.5	1,228	31.9***	28.3-35.7	716	36.4	31.4-41.7
Household Income												
<\$14,999	2,435	31.4	28.8-34.1	1,984	33.5	30.5-36.7	295	24.4**	18.6-31.4	156	23.8*	16.7-32.7
\$15,000-\$24,999	4,593	35	32.9-37.1	3,853	37.5	35.2-39.8	531	25.5***	20.4-31.3	209	28.5*	21.6-36.7
\$25,000-\$34,999	3,860	36.9	34.8-39.0	3,400	38.9	36.7-41.1	292	21.6***	16.2-28.3	168	37.3	26.8-49.1
\$35,000-\$49,999	5,915	34.5	32.9-36.2	5,376	35.3	33.6-36.9	311	28.5*	21.4-36.8	228	31.5	24.5-39.4
\$50,000-\$74,999	6,466	34.7	33.2-36.3	6,085	34.4	32.9-36.0	212	43.4**	35.2-52.0	169	33.1	23.7-44.0
>\$75,000	8,311	39.1	37.7-40.5	7,894	39.3	37.8-40.7	184	30.4*	23.0-39.0	233	42.2	33.6-51.3
Education												
Less than HS	2,162	28.3	25.6-31.1	1,436	32.5	29.0-36.1	603	21.8***	17.4-26.8	123	26.8	17.7-38.4
High School	9,983	34.1	32.8-35.4	8,912	35.2	33.8-36.6	695	25.2***	21.2-29.6	376	31.6	25.3-38.7
1-3 Years College	11,702	35.4	34.3-36.6	10,795	35.5	34.3-36.8	476	34.9	28.9-41.4	431	34.2	28.4-40.6
4+ Years College	11,280	41	39.8-42.1	10,559	41.3	40.1-42.5	324	34.8*	28.7-41.4	397	38.7	32.4-45.5
Healthcare Coverage												
Yes	30,903	39.4	38.7-40.1	28,508	39.7	38.9-40.5	1,338	35.9**	32.2-39.8	1,057	37.2	33.3-41.3
No	4,168	17.8	16.3-19.5	3,147	18.4	16.6-20.5	763	15.8	12.8-19.5	258	18.6	13.4-25.1

† = unweighted sample size.

CI = confidence interval.

% and CI are calculated from weighted values.

p values from difference of proportion test (White, non-Hispanic vs. Hispanic/White, non-Hispanic vs. Other, non-Hispanic).

*p<0.05; **p<0.01; ***p<0.001.

between Hispanics and Whites were also observed by education level. For instance, Hispanics with a High School degree or less had vaccination rates that were roughly 10% lower than Whites with similar education. Significant differences were also observed between Hispanics and Whites with four or more years of education, with Hispanics experiencing significantly lower rates of vaccination than their White counterparts.

Age appears to play a very important role in vaccination across all racial/ethnic groups, with younger groups experiencing substantially lower vaccination rates than older respondents. Across all racial/ethnic groups, vaccination rates jump more than 25% from the 55-64 to the 65+ categories. From ages 18-54, estimated vaccination rates were similar among racial/ethnic groups. Across all races/ethnicities, vaccination rates increased with rising age, household income, education, and membership in some form of healthcare coverage plan.

Figure 2 shows flu vaccination trends in Utah for non-Hispanic Whites and Hispanics during the 2000-2008 flu seasons. In general, non-Hispanic Whites tend to exhibit higher annual vaccination rates than Hispanics. Over this period of observation, non-Hispanic Whites also experienced a statistically

significant increase in vaccination rates ($p < 0.05$). Somewhat disconcerting is the negative linear trend observed among Hispanics ($p > 0.05$), which shows that disparities have widened over the past decade. Hispanic vaccination rates generally declined from their high of 35.4% during the 2000 flu season to their lowest point of 21.8% during the 2006 flu season, after which it rebounded.

In Table 3, we present results from a series of logistic regression models that examine the effect of race/ethnicity on vaccination, while controlling for various sociodemographic characteristics. In Model 1 we examined the effect of race/ethnicity while controlling for sex, age, and period of observation. This model indicates that the odds of receiving a flu vaccine were about 18% lower among Hispanics than non-Hispanic Whites ($p < 0.01$). Statistically significant differences by sex were also observed; the odds of flu vaccination were about 17% lower among men ($p < 0.001$). Age was also significantly associated with flu vaccination, with odds of vaccination dramatically increasing with age. Relative to the oldest age group (65+), the odds of vaccination among those in the 55-64 age group were nearly 70% lower ($p < 0.001$). Finally, consistent with our find-

Table 3. Logistic regression estimates of the effect of race/ethnicity and sociodemographic factors on influenza vaccinations for Utah adults, 2000-2008.

Sociodemographic Factors	Model 1			Model 2			Model 3		
	AOR‡	95% CI‡		AOR	95% CI		AOR	95% CI	
Race/ethnicity									
White	1.000			1.000			1.000		
Hispanic	0.819**	0.708	0.947	0.999	0.859	1.161	1.131	0.959	1.333
Other	1.082	0.909	1.288	1.089	0.916	1.293	1.067	0.890	1.279
Sex									
Female	1.000			1.000			1.000		
Male	0.824***	0.772	0.879	0.843***	0.789	0.900	0.810***	0.755	0.869
Age									
65+	1.000			1.000			1.000		
55-64	0.323***	0.292	0.358	0.338***	0.305	0.374	0.301***	0.269	0.338
45-54	0.195***	0.177	0.215	0.204***	0.185	0.226	0.180***	0.161	0.202
35-44	0.132***	0.119	0.146	0.140***	0.127	0.155	0.124***	0.110	0.139
25-34	0.120***	0.109	0.133	0.132***	0.120	0.146	0.119***	0.106	0.133
18-24	0.114***	0.099	0.130	0.130***	0.113	0.149	0.128***	0.110	0.150
Healthcare Coverage									
No				1.000			1.000		
Yes				2.182***	1.927	2.471	1.911***	1.662	2.197
Education									
Less than HS							1.000		
High School							1.254*	1.034	1.520
1-3 Years College							1.338**	1.106	1.619
4+ Years College							1.593***	1.316	1.928
Household Income									
<\$14,000							1.000		
\$15,000-\$24,999							1.083	0.909	1.290
\$25,000-\$34,999							1.213*	1.020	1.442
\$35,000-\$49,999							1.139	0.964	1.345
\$50,000-\$74,999							1.180	0.999	1.395
>\$75,000							1.324**	1.119	1.567
Period									
2000-2008	1.065***	1.052	1.079	1.069***	1.055	1.082	1.066***	1.051	1.080
Valid n.†	35,021			34,920			31,437		

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

‡ AOR, adjusted odds ratio; CI, confidence interval.

† Unweighted sample size.

ings for non-Hispanic Whites in Figure 2, the overall trend in flu vaccination over this period of observation was positive and statistically significant ($p < 0.001$).

In Model 2, we extend the previous model by controlling for healthcare coverage. Most interesting is the disappearance of any statistically significant effect of Hispanic ethnicity on the odds of vaccination ($p = 0.99$) when controlling for healthcare coverage. Among respondents with some form of healthcare, the odds of receiving an influenza vaccination were over two times greater than respondents without healthcare coverage ($p < 0.001$).

Model 3 includes all variables in Models 1 and 2 and also adds education and household income. In this model, the non-significant impact of race/ethnicity is maintained. However, it is interesting to note that controlling for healthcare coverage, education and household income causes the odds of vaccination among Hispanics to reverse relative to Model 1. That is, in Model 3 the odds of vaccination are about 13% higher among Hispanics than non-Hispanic Whites – and this effect approaches a marginal level of statistical significance ($p = 0.14$).

DISCUSSION

As shown through these analyses, there were significant differences in flu vaccination rates across racial/ethnic groups in Utah during the 2000-2008 flu seasons. The main finding to emerge from our study is that Hispanics in Utah were generally vaccinated at lower rates than non-Hispanic Whites. Unfortunately, over the past decade disparities between non-Hispanic Whites and Hispanics in seasonal influenza vaccination have increased. While Hispanic ethnicity appears to play an important role in determining influenza vaccination, its effect is driven primarily by access to some form of healthcare coverage, as well as socioeconomic factors. This is promising news, as it suggests that policies and programs designed to address basic structural barriers like health insurance and education can potentially overcome certain racial/ethnic health disparities, including widening gaps in influenza vaccine coverage in the state of Utah.

Another key finding in our study is the jump in vaccination rates for each racial/ethnic group that occurs at the age of 65. Aside from being more susceptible to influenza related complications (which could motivate individuals to seek immunization), a likely explanation for the large increase in flu vaccination rates for individuals ages 65 and older is Medicare coverage, which starts at the age of 65 and usually covers the cost of influenza vaccinations. Additionally, since the target age populations for the influenza and pneumococcal vaccination overlap, the CDC strongly recommends that health-care officials

administer the vaccines concurrently which may also increase vaccination rates among those 65 and older (CDC 2002).

We think it is important to note that the sharp drop in vaccination coverage for non-Hispanic Whites during the 2004 season was expected, since that season experienced a serious shortage in flu vaccination supplies (Zimmerman et al. 2006). It is interesting to note however, that the 2004 vaccine shortage did not drive Hispanic vaccination rates any lower – in fact, our estimates suggest that they rose somewhat and the disparity between Hispanics and non-Hispanic Whites narrowed. One explanation for relatively stable vaccination rates among Hispanics during the vaccine shortage could be greater efforts to reach vulnerable populations during this period of time. That is, 2004 could be interpreted as a public health success story. Unfortunately, during subsequent years vaccination rates continued to decline for Hispanics. It wasn't until the 2007 influenza season, when vaccinations supplies had fully recovered, that vaccination rates among Hispanics improved noticeably.

Between non-Hispanic Whites and Hispanics, one of the most important gaps in coverage appears in the 55-64 age group. In this age category, about 39% of Hispanics reported receiving a flu vaccine, as opposed to 49% of non-Hispanic Whites. Addressing this particular racial/ethnic disparity is important given the increased susceptibility of older individuals to flu complications (Nichol 2007). Men of Hispanic descent were also substantially less likely than other groups to receive the flu vaccine, which may point to a need for outreach programs targeted at Hispanic males. Similarly, persons with low income, little education, and no form of healthcare coverage are generally less likely to receive influenza vaccination. Public health stakeholders should take note of these high-risk groups.

CONCLUSION

Reduced disease burden and improved population health can be achieved through routine vaccination for seasonal influenza. Unfortunately, this study demonstrates that there are significant racial/ethnic and sociodemographic disparities in vaccination rates in the state of Utah. Moreover, estimated disparities between non-Hispanic Whites and Hispanics have widened substantially over the past decade. Importantly however, the impact of Hispanic ethnicity on the odds of vaccination appears to be a function of healthcare coverage, education and household income. This lends support to the findings of Chen et al. (2006) which found that structural barriers (such as lack of health insurance) were the greatest impediment to Hispanics in obtaining a seasonal flu vaccine.

With only 58% of Utah Hispanics reporting some form of

healthcare coverage as opposed to 88% of non-Hispanic Whites during the period of observation in this study, it is clear that important gains in influenza vaccination coverage can be made by increasing healthcare coverage among Hispanics. Furthermore, continued efforts to better inform Hispanic males about the benefits of vaccination would be worthwhile. Across all race/ethnicities vaccination rates were very high for the 65+ age group during the 2000-2008 flu seasons. While Utah has done remarkably well in vaccinating this vulnerable age group regardless of race/ethnicity, it has fared less well in terms of reducing racial/ethnic health disparities, which is a primary public health objective outlined in *Healthy People 2020* (U.S. Department of Health and Human Services 2010).

The seasonal flu is a serious disease that carries substantial mortality, morbidity, and economic burdens for the state of Utah. Addressing racial/ethnic disparities in influenza vaccination, especially among Hispanics, will reduce these burdens while simultaneously helping achieve nationally prominent public health objectives. By focusing on initiatives that improve access to healthcare and health insurance and that increase the overall socioeconomic condition of the Utah Hispanic population, the disparity between Hispanics and non-Hispanic Whites in terms of seasonal influenza vaccination could be greatly diminished.

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Sexual Activity and Contraceptive Use: A survey of University of Utah Undergraduate Students Aged 18-20

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KEYWORDS

survey, college student, sexuality, contraception

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ABSTRACT

BACKGROUND

The majority of undergraduate college students ≤ 20 years old are sexually active and nearly all wish to protect themselves against the risks of unplanned pregnancy and sexually transmitted infections (STI). This study investigates levels of sexual activity among University of Utah undergraduates as well as use of contraception and STI protection.

METHODS

A convenience sample of University of Utah students age 18-20 was surveyed using an anonymous web-based questionnaire.

RESULTS

Of 6,176 eligible students 23.3% completed the survey (n=1,441). Among survey respondents, 57.6% reported ever being sexually active and 46.3% reported being currently sexual active. Of those who reported current sexual activity 93.2% were using a method of contraception. However, only 3.7% of those were using a highly effective method and 4.0% reported using no method. Over half of sexually active students report current use of two or more methods of contraception and 38.0% report having used emergency contraception (EC). Of sexually active students 5.5% have been (or had a partner who was) pregnant and 4.8% report having had an STI. Over one-fourth (350, 26.8%) of respondents report having used oral sex in place of vaginal sex and 65 (5.0%) had used anal sex in place of vaginal sex as a method of pregnancy prevention.

CONCLUSION

Sexual activity and associated risks are common among University of Utah undergraduates surveyed. Sexually active students report high use of contraception, multiple methods of contraception, and EC use. There are opportunities for expanding use of highly effective methods of contraception, EC and STI education and testing.

Like all adolescents, teens in Utah mature in a sexually complex society where they are exposed to highly sexualized images in the mainstream media. In the last decade, information for youth on healthy sexuality has become more limited with the expansion of abstinence-only sexuality education which avoids discussions of healthy sexual relationships and pregnancy prevention [1]. Statistics on adolescent sexual practices and outcomes have been reported for decades, but in the current social environment they have generated greater interest. Recent publications on adolescent sexual behavior have expanded to include data on oral sex [2], anal intercourse [3] and masturbation [4].

Data on the sexual behavior of U.S. adolescents has been generated for decades by large national samples including the Youth Risk Behavior Survey (YRBS) [5], the National Survey of Family Growth (NSFG) [6], and the National Longitudinal Study on Adolescent Health [7]. In 1991 54.1% of high-school students reported ever having sexual intercourse with a decrease to 46.0% in 2009. During this time, there was an increase in self-reported condom use at the time of last intercourse from 46.2% in 1991 to 61.1% in 2009 [5]. Data on U.S. adolescent pregnancies have shown a consistent decline for the last 3 decades [8] but reached a nadir in 2005 with 2006 showing an increase in the U.S. rate [1] and further increases in Utah teen pregnancy rates from 2006-2008 [9]. Information on sexually transmitted infections (STIs) show that nationally and in Utah, rates of Chlamydia infection have risen sharply over the last decade, and in Utah, nearly two-thirds of new cases are diagnosed in 15-24 year olds [9].

Data on the sexual behavior of Utah's adolescents and young adults are not available. While the Utah State Department of Health thoroughly reports reproductive health outcomes for adolescents and young adults, it does not report on sexual behaviors for these groups, such as levels of sexual activity, contraceptive use or methods employed to prevent STIs. Unfortunately, the CDC's YRBS is not a source of data on sexual activity among Utah's youth. While Utah is one of 44 states participating in the YRBS program, it is one of four states that does not collect data on sexual behaviors [5].

The majority of studies on adolescent sexual practices have focused on younger ages (15-19 year olds) in part because they are easily accessible in high school classrooms. However, information on the practices of older adolescents is important as they have the highest rates of STIs and unplanned pregnancy and may provide some insight into the practices of those transitioning into mature sexual relationships in young adulthood. In addition, the majority of college students are sexually active, not seek-

ing to become pregnant, with to avoid STI exposure and largely living for the first time with far less adult supervision and greater possibilities for sexual exploration. These factors make early college students a suitable population to study sexual practices at time of transition from adolescence to young adulthood.

The sexual behaviors of Utah's adolescents may differ in important ways from other states and the United States as a whole. As a state with extremely low rates of teen pregnancy and STIs, these differences may provide important information on improving outcomes. If we are to have some impact improving reproductive health outcomes for our State's youth, we need to gather current information on the sexual practices that drive these outcomes. In order to collect such data, we designed an anonymous web-based survey to collect information on rates of sexual activity, contraceptive use and STI protection from a sample of college students in Utah.

METHODS

This research project was a component of an internet based, convenience sample survey of University of Utah undergraduate students, 18-20 years old, who attended high school in the United States. These college students were used to assess young adult and older adolescent sexuality behaviors because of the difficulty in accessing a large group of young adults and adolescents under the age of 18 in this conservative state. The survey was developed by a multidisciplinary group of experts. Questions were developed to address sexuality education, sexual behaviors, contraceptive use, and demographic data. Survey questions regarding contraceptive use were adapted from prior studies by this group of investigators [10].

The survey was initially beta tested with small groups of university students to assess clarity and comprehension. A draft of the survey was piloted in university classroom settings and revisions were made accordingly. The survey participants received a series of three email messages containing a link to a web-based anonymous internet questionnaire via www.surveymonkey.com and were offered entry into a drawing for one of five \$100 gift cards for completion of the survey. Respondent demographics

Table 1. Methods of contraception grouped by typical use failure rates

Highly Effective (<2% failure)	Effective (3-8% failure)	Less Effective (> 8% failure)
Implants	Oral Contraceptive Pills	Condoms (male or female)
IUD	Contraceptive Patch	Withdrawal
Sterilization	Vaginal Ring	Barriers
	Depo-Provera	Spermicide
		Contraceptive Sponge
		Fertility Awareness Methods
		Emergency Contraception

were evaluated midway through data collection and because more females than males had responded, males were oversampled during the mailing of the final invitation to participate in the study. The online survey was conducted between September and December 2008. All study materials and procedures were approved by the Institutional Review Board at the University of Utah (IRB# 00027547).

To collect information about participant's sexual activity, the following questions were included in the survey: "Do you consider yourself to be sexually active?", "Have you EVER had sex with males, females, or both?", "Are you CURRENTLY having sex with males, females, both, or neither?", and "Have you had vaginal intercourse within the last 3 months?". To determine which contraceptives were being used, two questions were asked. These included, "Which methods of birth control have you EVER used (or has a partner EVER used with you)? (Check ALL that apply)" and "What method(s) of contraception are you / your partner(s) CURRENTLY using? (Check ALL that apply)." The questions about contraceptive use were only asked to respondents who reported having a current or previous sex partner.

Contraceptives were categorized according to levels of efficacy based on typical use failure rates reported as the percent of women experiencing unintended pregnancy in the first year of use and are presented in Table 1 [11]. Highly effective methods are those with a pregnancy rate less than or equal to 2% and include etonorgestrel contraceptive implants, intrauterine devices (IUDs), and sterilization. Effective methods were defined as having a pregnancy rate of 3-8% and include oral contraceptive

Table 2. Demographic characteristics of survey participants (University of Utah Undergraduate Students Aged 18-20)

Demographics of Respondents Who Completed Survey (N = 1441)			Composition of Student Population Surveyed
Variable	No.	(%)	(%)
Gender			
Male	542	(37.6)	(42.0)
Female	889	(61.7)	(56.0)
Race			
Native American or Alaska Native	12	(0.8)	(0.7)
Asian	92	(6.4)	(9.3)
Black or African-American	7	(0.5)	(1.5)
Native Hawaiian or Pacific Islander	9	(0.6)	(1.7)
White or Caucasian	1147	(79.6)	(82.2)
Other/Not Specified/Unknown	107	(7.4)	(4.9)
Ethnicity			
Hispanic or Latino	99	(6.9)	(6.6)
Marital Status			
Married	51	(3.5)	*
Divorced	2	(0.1)	*
Single	1286	(89.2)	*
Living with partner or sig other	90	(6.3)	*
Religion			
LDS (Mormon)	491	(34.4)	*
Catholic	148	(10.4)	*
Protestant	63	(4.4)	*
Other	105	(18.2)	*
Unaffiliated	415	(29.0)	*
Place of Birth			
Utah	845	(62.3)	*
Outside of Utah	498	(37.1)	*
State of High School Attendance			

pills, the combined hormonal contraceptive patch, the vaginal ring and Depo-Provera. Less effective methods have failure rates greater than 8% and include male or female condoms, emergency contraception (EC), withdrawal, cervical barrier methods (the cervical cap or diaphragm), spermicide, the contraceptive sponge and fertility awareness methods. No method of contraception and abstinence were considered separate categories.

Students reporting use of more than one method of contraception were placed in the category consistent with the most effective method in use. For example, someone using oral contraceptive pills and condoms was placed in the effective methods group. While use of both methods simultaneously and consistently may be consistent with the failure rates in the highly effective range this has not been well studied. In addition, we were unable to ascertain when more than one method was

Utah	1145	(80.6)	*
Outside of Utah	275	(19.4)	*
Highest Education Level of Parents			
Did Not Finish HS	19	(1.3)	*
HS Graduate or GED	150	(10.4)	*
Some College	370	(25.7)	*
College Graduate	476	(33.0)	*
Attended Graduate School	417	(28.9)	*
Childhood Household			
2 parents living together	1073	(74.5)	*
Parents Divorced	253	(17.6)	*
Single Parent	66	(4.6)	*
Same Sex Parents	2	(0.1)	*
Childhood Community Type			
Rural	215	(14.9)	*
Suburban	972	(67.5)	*
Urban	198	(13.7)	*
Annual Income of Childhood Household			
< \$25,000	53	(3.7)	*
\$25,001 - \$50,000	216	(15.0)	*
\$50,001 - \$75,000	240	(16.7)	*
\$75,001 - \$100,000	263	(18.3)	*
> \$100,000	243	(16.9)	*
Number of Childhood Household Members			
2 or less	84	(5.9)	*
3	192	(13.5)	*
4	387	(27.3)	*
5	309	(21.8)	*
6	210	(14.8)	*
7 or more	236	(16.6)	*

* Data not available for the UU student population

reported if use was simultaneous with each act of intercourse or had been used recently but not simultaneously.

Statistical analyses were conducted using STATA 11 statistical software (College Station, Texas). Respondents were given the response option “I prefer not to answer this question” for each question in the survey. Answers in this category were coded as missing for analysis. Analyses about use of contraceptives were stratified into 3 groups: history of contraceptive use among all respondents who reported having had sex, current use of contraceptives among all respondents who reported having had sex and current use of contraceptives among respondents with a current sex partner. Raw numbers and percentages are reported for demographics and health behaviors. In addition, we report raw numbers, percentages, means, and standard deviations for information on sexual behaviors and pregnancy history among respondents.

RESULTS

There were 6,176 students who met inclusion criteria and received an email inviting them to participate in the survey. Twenty six percent of eligible students (n=1,587) initiated the survey, and 23.3% completed it (n=1,441). A demographic description of the respondents can be found in Table 2. The majority of respondents were single, Non-Hispanic Caucasians who reported being born and graduating from high school in Utah. More females than males completed the survey. Just over 1/3 of respondents (34.4%) reported belonging to the predominant religion in Utah—the Church of Jesus Christ of Latter Day Saints (LDS). The demographic profile of study participants was representative of the greater University of Utah population (see Table 2).

Information on the number and percentage of respondents who report being sexually active varies depending upon the question analyzed. Overall, 46.3% of respondents (n=560) reported being sexually active, while 57.6% (n=700) reported having had a sex partner either in the past or present. This includes 44.0% of respondents (n=534) who reported that they were currently having sex with one or more partners of either sex and 13.7% (n=166) who reported having had sex in the past but who did not have a current partner at the time of the survey.

Among all respondents who reported being sexually active at the time of the survey (n=560), 93.2% reported using at least one method of contraception. Overall, the most common methods of contraception used by sexually active respondents, either alone or in combination with other methods, included condoms

Table 3. Abstinence & Methods of Birth Control by Level of Efficacy Reported by University of Utah Undergraduate Students Aged 18-20

Efficacy Level of Birth Control Method	Ever Used Contraception Among Respondents Who Have Had Sex (N = 696)	Current Contraception Use Among Respondents Who Have Had Sex (N = 667)	Current Contraception Use Among Respondents With a Current Sex Partner (N = 521)
	N (%)	N (%)	N (%)
Highly Effective	25 (3.6)	20 (3.0)	19 (3.7)
Effective	490 (70.4)	362 (54.3)	331 (63.5)
Less Effective	155 (22.3)	162 (24.3)	142 (27.3)
Abstinence	5 (0.7)	54 (8.1)	8 (1.5)
None	21 (3.0)	69 (10.3)	21 (4.0)

Table 4: Sexual Activity Status & Current Number of Birth Control Methods Reported by University of Utah Undergraduate Students Aged 18-20

Number of Current Birth Control Methods	Respondents Who Have Had Sex (N = 667)		Respondents With A Sex Partner at the Time of Survey (N = 521)	
	Frequency	Percent	Frequency	Percent
	One Method	290	(43.5)	213
Two Methods	220	(33.0)	203	(39.0)
Three Methods	79	(11.8)	75	(14.4)
Four Methods	9	(1.4)	9	(1.7)
None	69	(10.3)	21	(4.0)

(61.3%), oral contraceptives (52.6%), withdrawal (28.1%), and abstinence (5.5%).

Table 3 shows that of the 667 University of Utah students ages 18 to 20 who reported having had sex and who answered the questions on current contraceptive use, only 3.0% were using a type of birth control that was highly effective. Most students (54.3%) were using effective forms of birth control, 24.3% were using less effective forms of birth control, 8.1% were abstaining and 10.3% were not using any form of birth control. When comparing the results among all individuals who reported having had sex with those of individuals who reported having a sexual partner at the time of the survey, the latter group had slightly greater use of very effective (3.7%) and effective (63.5%) methods (see Figure 1). Use of multiple methods of contraception was common (Table 4).

Among college students who report having had sex, only 4.8% reported having been diagnosed with an STI and only 5.5% reported ever being pregnant or getting a woman pregnant (see Table 5). The most common STIs were human papilloma virus, chlamydia, and herpes. When asked about sexual behavior, 350 (28.4%) of respondents answered they had used oral sex in place of vaginal sex and 65 (5.2%) had used anal sex in place of vaginal sex as a method of pregnancy prevention. For sexually

active respondents 92.2% had opposite sex partners, 5.9% had same sex partners and 1.9% had both opposite sex and same sex partners. Of students with same sex partners, 78.1% were male and 22.0% were female (Table 5).

Current sexual activity (Table 6) was reported more frequently by females (48.8%) than males

(41.8%), non-LDS affiliated college students (56.8%) than LDS affiliated college students (26.6%) and students who attended high school outside of Utah (54.7%) vs those who attended high school in Utah (44.3%). Current contraceptive use (Table 6) was reported more frequently by females (93.0%) than males (82.7%), similarly among non-LDS and LDS affiliated college students (89.7% and 88.4% respectively) and more frequently among students who attended high school outside of Utah (94.5%) vs (88.0%). The non-response rates for survey questions ranged from 0.1% (Are you male or female?) to 53.4% (What method(s) of contraception are you / your partner(s) currently using?).

DISCUSSION

This survey of college students in Utah establishes a baseline to begin understanding sexual and contraceptive practices among those transitioning to young adulthood. University of Utah students aged 18-20 report relatively low rates of sexual activity, unplanned pregnancy and STIs relative to comparative national samples. The 57.6% of our sample reporting ever having had sex and 46.3% who are currently sexually active are fewer than that reported by the YRBS for both 12th grade and college students in other states. For 12th graders, the portion of the YRBS closest in age to our sample, the most current published data were collected in 2009. Sexually activity increases at each year when adolescents are surveyed, thus we would expect our sample (18-20 year olds) to report higher rates of sexual activity than 12th graders. However, in 2009, 62.3% of 12th graders reported ever having sexual intercourse and 49.1% reported being currently sexually active (defined as sexual intercourse within the 3 months preceding the survey). Only one version of the YRBS

Table 5: Pregnancy and Sexual Practice Reported by University of Utah Undergraduate Students Aged 18-20, Who Report Having Had Sex

PREGNANCY DATA		
	Frequency	Percent
History of Pregnancy	39	(5.5)*
History of Abortion	15	(2.1)*
History of Miscarriage	15	(2.1)*
Respondents with Children	9	(1.3)*
	Mean	Standard Deviation
Age at time of Pregnancy	17.3	(4.3)
SEXUAL ACTIVITY DATA		
	Frequency	Percent
Sexually Active	560	(46.3)
Has One or More Current Sex Partner(s)	534	(44.0)
Had Vaginal Intercourse within Last 3 Months	549	(45.2)
Ever Used Oral Sex to Avoid Pregnancy	350	(28.4)
Ever Used Anal Intercourse to Avoid Pregnancy	65	(5.2)
Sex of Partners		
Opposite Sex Partner(s)	642	(92.2)
Same Sex Partner(s)	41	(5.9)
Partners of Both Same and Opposite Sex	13	(1.9)
	Mean	Standard Deviation
Age at Time of First Intercourse	16.9 yrs	(1.7 yrs)
Number of Sexual Partners in Past 12 Months	2.1	(3.6)
Number of Sexual Partners in Lifetime	3.8	(4.3)

*The denominator is all respondents who answered the question "Have you ever been pregnant before / gotten a woman pregnant?" (n=704)

included college students and the data were collected in 1995. In this survey, 79.5% of college students aged 18-24 reported ever having sexual intercourse and 62.1% reported current sexual activity (intercourse within the 3 months preceding survey) [12]. Of note, our sample may under represent males aged 19-20 because of members of this group who are participating in LDS missions. We did not attempt to contact members of this group as they were not enrolled students at the time of the survey. Due to the conservative sexual nature of this under-represented group, we would expect even lower rates of reported sexual activity. This would likely have driven the overall percentage of sexually activity reported down even further.

While levels of sexual activity are low among our sample compared to national norms, use of contraception among those who are sexually active is consistent with data from the YRBS. Though use of the most effective methods among currently sexually active students is low (3.6%), the large majority of sexually active students are using reliable methods of contraception. Several practices might decrease the risk of unplanned pregnancy in this group. The use of multiple methods of contraception

is encouraging and the majority of sexually active students in our sample report this. In the National Survey of Family Growth (NSFG) males aged 15-19 reported using dual methods 24% of the time at last sexual intercourse. University of Utah students who are currently sexually active compare favorably with this figure as 55.1% report using two methods or more. If these multiple methods are used consistently, this could significantly increase contraceptive efficacy and reduce unplanned pregnancies.

In addition, use of EC is high with 38.0% reporting having used dedicated emergency contraceptive pills or combined oral contraceptive pills for EC. This is more than twice the figure reported in a recent study of Pennsylvania college students [13]. The high use of EC suggests the importance of educating students regarding use of EC within 12 hours of intercourse when it is most effective. Students should also know that EC is best used as a back-up method. Additionally, students should know that over time, the lowest rates of pregnancy are associated with forgettable methods of contraception (methods with little possibility for user error once inserted including IUDs and the contraceptive implant). Unfortunately, use of no method of contraception appears to be consistent with NSFG data for this age group with approximately 10% of University of Utah students reporting this behavior.

The use of oral sex and anal intercourse to avoid vaginal intercourse is an effective strategy to prevent pregnancy; however, engaging in these behaviors carries the risk of STIs. Young people are less likely to use a barrier method for STI protection during these behaviors [14], increasing the risk of STI transmission [15]. In addition, the currently sexually active Utah college students we sampled actually used condoms less frequently than 12th graders sampled in the YRBS (45.1% vs. 55.0%). These factors, especially when viewed from the perspective of increasing STI rates in Utah, demonstrate the need for greater STI education for young people and the need to encourage STI testing on campus. We do not have specific statistics on frequency of anal sex but 5% report using this activity to prevent pregnancy. The frequency of this behavior may be similar to the 10% reported among adolescents [16] and the 20% reported in a recent study of college students [4]. This behavior along with the high use of EC may indicate that students' access to effective methods of contraception may be falling short of the need and better access to contraception and especially the most effective methods is desirable. There are few options for students to

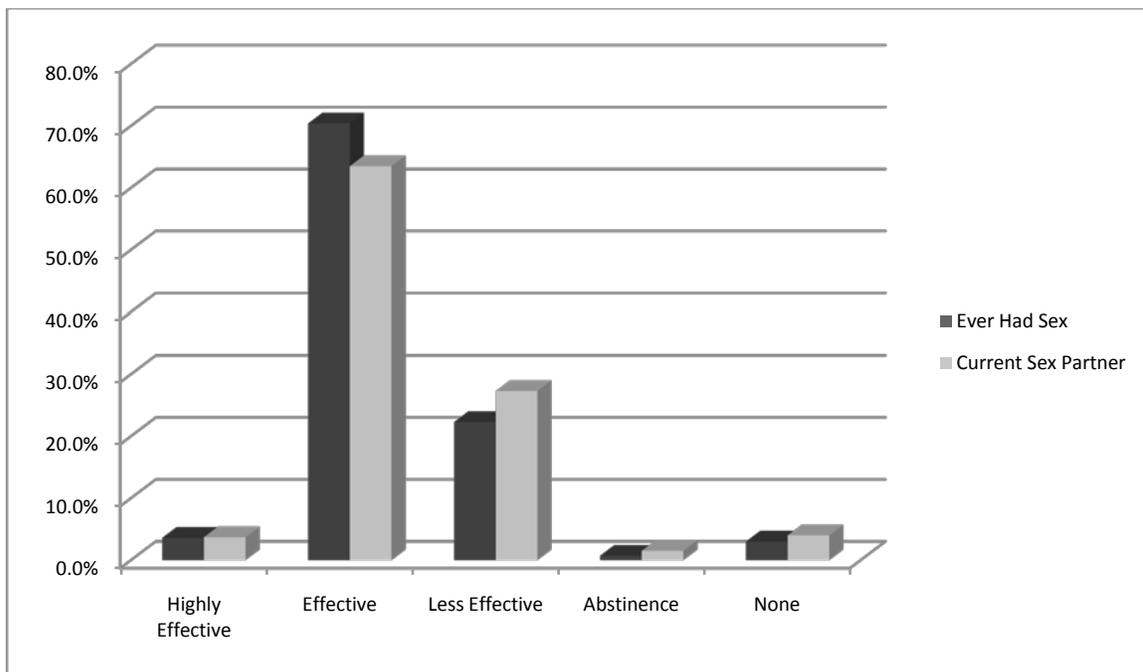
receive the best methods of contraception due to lack of insurance coverage. However, the use of IUDs may be easily expanded when financial obstacles are removed as demonstrated in a survey of EC users from Salt Lake City who were offered the copper IUD [17]. Based on the number of students who have enrolled in trials of IUDs at the University, increased availability may be warmly received by this group.

Like any survey of sexual behavior, this study is subject to reporting bias. The potential underreporting of sexual activity and over reporting of contraception and STI protection are examples of social desirability bias when study participants provide inaccurate information that will be viewed favorably by others [18]. A recent example of this came from a study that found that more than 10% of STIs confirmed by urine PCR came from young adults who reported abstaining from

Table 6: Current Sexual Activity and Contraceptive Use by Gender, Latter Day Saint Religious Affiliation, and High School Location

	Current Sexual Activity = Yes	Current Sexual Activity = No	P value
Male (N = 435)	182 (41.8%)	253 (58.2%)	0.048
Female (N = 771)	376 (48.8%)	395 (51.2%)	
Latter Day Saint = Yes (N = 421)	112 (26.6%)	309 (73.4%)	< 0.001
Latter Day Saint = No (N = 789)	448 (56.8%)	341 (43.2%)	
High School in Utah = Yes (N = 974)	431 (44.3%)	543 (55.7%)	0.004
High School In Utah = No (N = 236)	129 (54.7%)	107 (45.3%)	
	Contraceptive Use = Yes	Contraceptive Use = No	
Male (N = 225)	186 (82.7%)	39 (17.3%)	< 0.001
Female (N = 443)	412 (93.0%)	31 (7.0%)	
Latter Day Saint = Yes (N = 146)	129 (88.4%)	17 (11.6%)	0.453
Latter Day Saint = No (N = 525)	471 (89.7%)	54 (10.3%)	
High School in Utah = Yes (N = 525)	462 (88.0%)	63 (12.0%)	0.152
High School In Utah = No (N = 146)	138 (94.5%)	8 (5.5%)	

Figure 1: Current Birth Control Use by Efficacy for Current Contraceptive Users and Currently Sexually Active Contraceptive Users



Highly effective is less than or equal to a 2% pregnancy rate, effective is a 3-8% pregnancy rate and less effective is anything greater than an 8% pregnancy rate.

sexual activity during the previous 12 months and greater than 5% of these positive STI samples came from participants who reported never having penile/vaginal sex [19]. Of note, students in our study were given the choice to participate in the survey, had no obligation to finish the survey, and were given the option "I prefer not to answer this question" for each query. Accordingly, this may have reduced reporting bias where students may not have answered questions rather than providing inaccurate information but may have increased selection bias where those less likely to be sexually active might have started the survey and not continued.

Internet based surveys are also limited by relatively low response rates. While only 26% of those who received the email invitation to the survey responded, this is considered an average response for an internet survey [20] and still yielded usable responses from over 1,400 participants. In other studies utilizing convenience samples to assess university students' sexual practices and beliefs the response rates are comparable to ours [21, 22]. A study of sexual activity and contraception sampling in a Utah population invites concerns of limited external validity.

A common perception is that people in Utah are more religious than the rest of the country and the majority of Utah residents belong to a single religious group. However, the survey showed this in not the case as 66% of respondents considered themselves to be part of an organized religion, and 29% had no religious affiliation. A national poll of all adults shows that 83% practice some form of organized religion and only 16% are unaf-

iliated. When breaking the groups down by age, the national data shows that one-quarter of all adults 18-29 are unaffiliated [23]. However, one must consider that the University population itself could potentially be less religious than the general adult population, and may pose a limitation when translating these results to the general young adult population. The influence of abstinence only sex education is not addressed in this manuscript but will be addressed in a forthcoming one devoted to the specific relationship between sources of sexuality education and its relationship with sexual knowledge and practice.

This data set provides novel information on the sexual and contraceptive practice of University of Utah undergraduates transitioning to young adulthood. This sample is not representative of all University students or all State residents in this age group; however, it does provide some information to indicate that sexual activity is likely less frequent and contraceptive use overall is similar to other U.S. college students with greater use of EC and multiple contraceptive methods. Providing students with greater access to the most effective methods of contraception and increasing knowledge of STI exposures may further reduce STIs and unplanned pregnancies in Utah's young adults. While this data set supplies important information regarding the sexual practices of some young adults in Utah, like almost all adolescent sexuality studies it does not address the ultimate marker of sexual health, the development of mutually loving, respectful, and pleasurable relationships [24].

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Protocol Use in Disease Outbreak Investigations: Applying a Technical Systems Solution to a Natural System Problem

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public health, protocols, decision making

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ABSTRACT

BACKGROUND

Disease outbreaks affect millions of Americans every year and have potentially large health and financial costs. To manage the scope and diversity of diseases public health agencies rely on the use of protocols when conducting disease outbreak investigations. Protocols and checklists provide a good fit for dealing with situations in technical systems where there is little variation. However, disease outbreaks occur in natural systems that are characterized by their unpredictability. Understanding the effectiveness and limitations of protocol use in disease outbreak investigations is important to improving investigation outcomes.

METHODS

We conducted a study that included semi-structured interviews with public health disease outbreak professionals to investigate the benefits and limitations related to the use of protocols in managing disease outbreaks.

RESULTS

Participants perceived significant benefits from the use of protocols; however, they were quick to note the limitations of protocols. The perceived limitations can be classified into three groups based on root causes: 1) Protocols are underspecified, 2) Protocols become outdated and 3) Protocols are ambiguous.

CONCLUSIONS

The issues of protocol use in the natural system of disease outbreak investigations can be addressed by a collaborative effort to improve disease outbreak investigations in at least three ways.

Every year disease outbreaks affect millions of Americans. A few of these disease outbreaks receive national attention. Examples include the 2010 and 2009 salmonella outbreaks—the 2010 outbreak was linked to eggs and the 2009 outbreak

was linked to peanuts and peanut butter. In addition to the risk of illness and possible death, huge financial costs can result from implicating food sources in enteric disease outbreaks—e.g., millions of eggs were recalled [1] and more than 2000 products containing peanuts and peanut butter were recalled by over 50 manufacturers [2].

In the United States, large disease outbreaks are investigated and managed by state and local health departments in conjunction with the U.S. Centers for Disease Control and Prevention (CDC). Aside from the larger outbreaks, many smaller, localized outbreaks are managed on a daily basis by local and state health departments. As a first step in outbreak detection the health departments must be informed. Utah has more than 70 diseases defined as “reportable.” Due to the quantity and variability of these reportable diseases, the state and local public health agencies rely on protocols in the form of disease investigation plans and guidelines.

Use of checklists and protocols. Checklists are used in a wide range of areas as cognitive aids to support a person in completing a task. The use of checklists was pioneered in aviation to manage the growing complexity of modern aircraft and to produce reliable performance of the human operator. Protocols have a similar function as checklists; disease investigation plans are protocols used in public health. Disease investigation plans are a procedural method that prescribes the design and implementation of essential steps in the investigation. Disease investigation plans often include information describing the disease and epidemiology (e.g. clinical description, causative agent, laboratory identification, incubation period and period of communicability), public health control measures, and case investigation (e.g. reporting, outbreak definitions and case management). As with guidelines in other aspects of health care, disease investigation plans focus on assistance in making decisions and education [3].

Benefits of protocols. There are multiple benefits to the use of protocols such as the disease investigation plans: Protocols serve as a repository of background information and actions to be taken—thus simplifying the conceptualization and recall of information [4]. A well structured protocol often allows people who are not experts in a task to perform that task at a level that is similar to that of an expert [5]. In addition protocols can be effective in error prevention and performance management [6-8]

Limitations of checklists and protocols in a natural system context. There are a number of limitations that potentially may be associated with the use of checklists and protocols in public health. The domain and context of a protocol's application is an important aspect of protocol use that has not yet received suf-

ficient attention. The use of checklists was pioneered in aviation which can be conceptualized as a technical system. However, when managing a disease outbreak, a public health investigator deals with a biological or natural system (disease) at the core. Disease outbreaks are characterized by their unpredictability. Protocols and checklists provide a good fit for dealing with situations where there is little variation. For example, the displays in a cockpit of an aircraft, or the steps to manage an emergency in that cockpit do not change; therefore a checklist can be applied consistently. However, in disease outbreaks many idiosyncrasies have to be taken into account, including the context of the illness and the evolution of infectious diseases. As a consequence, one disease outbreak investigation will not be identical to another. Clearly there are differences between the technical system context of aviation and natural system context of public health disease investigations.

Understanding the differences between natural and technical systems may cast some light on the effectiveness and limitations of protocol use. There are at least three distinguishing factors between natural and technical systems. The first is *adaptability*. A natural system adapts by evolving as the context and environment changes. A technical system is created by a purposeful, intentional design process. The second distinguishing factor is the *transparency* of the system. Natural systems are opaque and usually not very well understood, where technical systems are designed in such a way that they are transparent, (i.e., relationships between components are static and easy to understand). The third distinguishing factor applicable to technical and natural systems is *predictability*. A consistent, transparent technical system is designed to be easy to understand and maintain, making prediction possible. Natural systems are difficult to understand because of their opaque and adaptive nature and consequently are difficult to predict.

The investigation of disease outbreaks happens in a dynamic and complex environment. In the context of public health an outbreak investigator is dealing with a natural system that affects members in a community. A situation of opposing requirements is established: protocols should yield clear recommendations, yet protocols must also be sufficiently flexible to accommodate complex dynamic situations.

We conducted a study to examine the tensions/issues that exist when applying the technical systems solution of checklists and protocols to a natural system problem. Our overall goal is to find ways to improve disease outbreak investigations. The term protocol as used in the interviews could include state disease investigation plans or guidelines, CDC published guidelines or other formal or informal guidelines used in the course of an investigation.

 METHOD

Participants. Study participants were employees of state and local health departments in urban and rural jurisdictions in Utah and Nevada. Participants included epidemiologists, microbiologists, environmental health scientists, nurses and physicians. All participants were involved in communicable disease prevention, surveillance, investigation, facility inspection and enforcement and/or case management. These professionals ranged from department directors to frontline staff.

Procedures. Forty-one semi-structured interviews were conducted as part of a study approved by the University of Utah Institutional Review Board. Signed consent was obtained from each participant. The design of the interview process was refined by conducting a number of pilot interviews.

The interview consisted of two parts. The first part focused on protocol use. (See Table 1 for a high level presentation of interview questions.) In the second part of the interview participants conducted a simulated outbreak investigation using an enteric disease scenario. The focus of this paper is protocol use, and the results of the second part of the interview will be presented elsewhere. All interviews were digitally recorded, and professionally transcribed. The first part of the interview was coded using qualitative research techniques. A coding schema was developed through iterative sessions to assure agreement based on identified categories. The inter-rater reliability was 80% agreement on the codes used across interviews. Coding was done by reading the interviews and marking sections with the defined codes. This paper is based on in-depth analysis of codes relating to protocol use and information resources.

 RESULTS

Thirty-eight of the 41 participants (93%) described a situation where ambiguity or confusion was present in the context of using a protocol. Ninety-three percent of the participants mentioned issues with the availability, evaluation or reliability of information. These coded quotations were further analyzed for specific references to protocol use. From this analysis two categories emerged; 1) Perceived benefits of protocols; and 2) Perceived limitations of protocols. The perceived limitations were further classified into three groups based on root causes: 1) Protocols are underspecified, 2) Protocols become outdated; and 3) Protocols are ambiguous. These classifications are discussed in detail below.

Table 1. Interview Questions

What infectious communicable diseases do you investigate most often?
Have you ever considered excluding someone from work or school due to an infectious disease-related issue? (Depending on the participant's role, this question may be modified to ask if they have ever considered closing a restaurant or closing a pool.)
Did protocols or guidelines exist?
How did the protocols help you make decisions?
Were there any problems in following the protocol?
Was the protocol specific enough for the situation?
What are the limitations of the use of protocols or guidelines in the context of your work?

Perceived benefits of protocols. Participants identified a number of benefits from using protocols:

- Provide valuable *information* on the organism, incubation period and transmission of the diseases.
- Define *roles* for disease investigation actions.
- Provide a *rationale* for recommended action.
- Save time by being a *repository* of information (questions to ask, priorities and case definitions).
- Give the actions taken credibility and acts as a defense for actions taken.

The benefits of protocols clearly involve accessibility of information needed for the investigation; protocols structure the investigation in terms of steps and roles taken and provide accountability, because they are based on scientific findings and knowledge of diseases.

Perceived limitations of disease investigation protocols. Despite the fact that protocols have a number of benefits, participants also identified challenges and limitations of protocol use. Three root causes of these challenges and limitations are underspecification, obsolescence and ambiguity. These issues are outlined below.

Underspecification. The first root cause of protocol limitations is that **protocols are underspecified**. Specifically, participants revealed the following issues:

- Protocols may not define who is *responsible* for the actions to be taken.
- *Rationale* is not always given for recommended actions.
- *Timelines* for recommended actions may be inconsistent or nonexistent.
- "Unusual" illnesses are required to be reported and investigated; however, a specific protocol, laboratory test for confirmation, or agreed upon intervention may not exist for *rare or new diseases*.
- Protocols lack guidelines on how to ensure patient *compliance* with recommend actions.
- Protocols are based on individual diseases and do not provide guidelines for *prioritizing* investigation actions

when there are simultaneous outbreaks. Implicit and inconsistent *priorities* are set for investigating diseases based on factors such as prevalence, transmission risk or illness severity.

- Protocols may not include “*best practice*” as defined by experts.

Underspecification in the protocols is a significant concern. A majority of features that were identified as making protocols beneficial are problematic when that information is missing. Specifically, it appears that *information* on roles, responsibilities for actions and adequate, consistent timelines along with providing rationale for intervention are both strengths and weaknesses of protocols. Other important underspecification issues raised by participants related to the *lack of information* on how to identify and respond to rare diseases, identify and standardize use of best practices and issues regarding compliance.

Obsolescence. The second root cause of protocol limitations is that **protocols can become outdated**. The following were discussed by participants as contributing to protocol obsolescence:

- Diseases may *evolve*.
- *New* antibiotics, laboratory tests and vaccines are created.
- *New information* is discovered or received on the *efficacy* of vaccines and the sensitivity and specificity of confirmatory tests.
- Treatment *recommendations* change.
- Diseases listed as “*reportable*” change.
- Political and social *priorities* change.

Some of the above factors reflect changes in technology and progress in medical science. These changes require modifying existing protocols and the development of new protocols. In addition, the biological changes of diseases as a result of adaptation creates a situation where protocols potentially lose their applicability. Competition for time and resources may not permit protocols to be modified within an appropriate timeframe.

Ambiguity. The third protocol limitation—**protocol ambiguity**—relates to the difficulty in predicting and defining the conditions where the protocols will be applied. The following factors were identified as contributing to ambiguity:

- Protocols assume valid information and timely diagnosis and reporting. Often the information reported to the health department is *unreliable* and the receipt of case reports often *does not allow time* for appropriate intervention.
- The *terms* used in the protocols may be ambiguous or hard to define (e.g., exposure, contact, and enhanced surveillance).

- Recommended actions may be based on information that is difficult to *assess* (e.g., vaccination levels and population immunity).
- Recommended actions may be based on conditions that are *subjective* (e.g., anticipated patient compliance, patient hygiene or patient comprehension).

Ambiguity in protocol use appears to be a serious issue. The protocol may appear to clearly state the conditions under which actions should be taken; however, the terminology, limitations in accessibility and reliability of information, and subjective assessment of conditions are problems that lead to ambiguity. This ambiguity undermines some of the benefits of protocol use.

DISCUSSION

The results of this study indicate that participants have contradictory perceptions of disease investigation protocols. It is very clear that outbreak investigators appreciate the benefits of having resources that help in their investigations of the dozens of reportable diseases; however, participants were also quick to point out the limitations of the protocols. Note that topics listed as benefits are also noted as problems when they are underspecified (e.g. definition of roles, rationale, timelines and guidelines for investigation). This contradiction might be indicative of the fact that the level of development of protocols varies, thus creating variability in the utility of individual protocols. One of the recommendations based on this result is to perform regular protocol audits that identify the potential problems individually and to implement measures that remedy these weaknesses. However, to make these audits effective, in addition to subject matter experts, Human Factors experts should be involved to evaluate the cognitive limitations and implications of protocols.

One cognitive implication related to remediating underspecification is that in complex systems developers of protocols cannot foresee all the possible scenarios [9]. Even if it were possible to foresee all possible scenarios, the assimilation of the amount of information necessary would likely result in cognitive overload and a rejection or potential misuse of such a comprehensive protocol.

The other limitations of protocols in the context of public health are even more difficult to address; this difficulty is related to the fact that public health deals with a natural system at its core. Many of the assumptions related to the use of protocols are carried over from their origins in technical systems. This is illustrated by the implicit assumption of disease investigation protocols that disease characteristics can be defined and recommended actions will result in predictable and favorable outcomes. However, these assumptions do not take into account

the level of uncertainty that is inherent to information in this context, the fact that the results of interventions differ in their efficacy and that often no clear evidence is available that would allow for a conclusive diagnosis.

Protocol use in public health is also plagued by unreliable information, inappropriate timing, ambiguous terms, lack of access to information and the subjective interpretation of cues. Clearly, these issues cannot be resolved by creating an updated or more complete version of the protocol. These issues are inherent to the issue of protocol use in a non-technical domain. Additionally, although protocols for both technical and natural systems often require information to be updated, diseases adapting to changing conditions pose a serious challenge for maintaining outbreak investigation protocols.

Varying levels of investigators' expertise is another important aspect that affects the use of protocols. The incidence of diseases does not occur with equal prevalence. Consequentially, investigators may become very familiar with some diseases. When investigators have experience investigating a disease they may not reference the protocol. Therefore, any changes or details in the protocol may be missed and the protocol serves only a limited function. However, in the case of rare or "unusual diseases," disease protocols have the potential to play a significant role as a substitute for expertise. Unfortunately these are the protocols that may not have been developed, or that do not get updated because of low prevalence of the disease. Thus, there is clearly a need for a rational, more structured approach that guides protocol development for rare outbreaks.

Overall the results of this study indicate that there are intrinsic challenges in the context of protocol development for public health. Some of these challenges can be addressed by

public health professionals collaborating with human factors engineers, biomedical informaticists and software engineers. Human factors engineering can play a role the development of criteria for effective protocols and extend the focus of problem-solving beyond the content of protocols. In addition, human factors engineers can work with biomedical informaticists and software engineers to develop decision support software to facilitate investigators using what they know about the outbreak to move to resolving unknowns and explore options for action. By studying and gaining an understanding of the nature of ambiguities and other factors, such tools could be structured to present information that is filtered to apply to the current circumstances. By tailoring the presentation of information to current circumstances the number of vague, non-specific recommendations could be replaced by targeted, clear recommendations thus increasing compliance with protocol use [10].

In conclusion, the issues of protocol use in the natural system of disease outbreak investigations can be addressed by a collaborative effort to improve disease outbreak investigations in at least three ways:

- 1) Perform protocol audits that identify the potential problems of individual protocols and to implement measures that remedy these weaknesses.
- 2) Distinguish the differences (adaptability, transparency, and predictability) in the contexts of natural and technical systems. Leverage the benefits gained from the use of protocols in technical systems while addressing the limitations when applied to natural systems.
- 3) Apply an understanding of the benefits and limitations of protocol use to the creation of tools to support cognitive effort and decision making.

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May We Speak to the Lady of the House?

Are women really the ones who look for health information?

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Article written on behalf of the Utah
Women's Health Information Network

ABSTRACT

Health messages directed towards the woman in a household may have the greatest leverage for influencing other household members. There is a widely held assumption that women, more than men, seek out health information that is used to make health-related decisions for others. However, little empirical documentation is available to confirm this idea. The Utah Women's Health Information Network (UWIN) added questions to a subsample of the 2009 statewide Behavioral Risk Factor Surveillance System (BRFSS) to test whether this assumption could be validated. Analyses were limited to respondents who reported either their husband or wife as the person who usually sought out health information (n=589). Findings showed that 74.0 percent of respondents reported that the primary health information seeker for the household was the wife. Proportions varied only slightly by the sex of the respondent, household income or the presence of children in the household. This study supports the notion that health messages communicated to women may have a broad reach and can positively impact the health of others in the household.

Individuals are becoming increasingly proactive about taking charge of their health due, in large part, to the wealth of readily accessible information that empowers them to make informed choices. Health topics are often featured in written media, particularly in women's magazines, and health issues are frequently discussed on radio and television programs. The Internet is an especially popular source of health information (Baker, Wagner, Singer et al., 2003; Powell and Clarke, 2006). At least half of all

Internet users report that they have looked for health information online (Cline and Haynes, 2001; Fox and Jones, 2009). An estimated 60 to 100 million people in the U.S. look for health information online at least monthly (Weaver, Mays, Weaver, Hopkins, Eroglu, & Bernhardt, 2010). Searches can be focused on finding information for one's own health, or they may reflect concerns for others in the household. Individuals are searching for information on illness or injury, or on preventive care topics such as school immunizations. Many health information seekers (about 70%) report they look for disease information so they can engage in more meaningful discussions with their physicians (Fox, Rainie, Horrigan, Lenhart, Spooner, Burke, Lewis, Carter, 2000). Almost half (47%) of seekers report the information they find on the Internet influences their treatment decisions (Fox and Jones, 2009; Fox et al., 2000).

There is an assumption in the public health arena that women often take on the role of gathering health information for their families and use this information to influence decisions for the entire household. Thus, reaching the woman of the household with health messages may have the greatest leverage by influencing not only her own health but also the health of other household members. Despite this widely held belief that women are the gateway to household health, limited empirical documentation is available to confirm this idea.

A few studies have examined gender differences in searching for health information, and all support the notion that women, more than men, are likely to search for such information (Cline & Haynes, 2001; Fox & Jones, 2009; Hupfer & Detlor, 2006; National Cancer Institute, 2005; Powell & Clarke, 2006). This pattern persists whether information is sought online, through written media (such as books or magazines), through visits to the local library, or through dialogues with providers (Courtright, 2005; Gollop, 1997; Liu & Huang, 2008; National Cancer Institute, 2005). The same pattern is found whether the search is for health information in general or limited to looking for health information about a single disease. About 60 percent of women (but only 40 percent of men) have sought information about cancer online (National Cancer Institute, 2005). Similarly, in a study of patients who had been diagnosed with an ischemic coronary event, women were much more likely than men to express the need for more information on managing their condition (Stewart, Abbey, Shnek, Grace, & Irvine, 2004).

Not only are women more likely to seek information about their own health care, studies show they are more likely than men to search for health information regarding other family members. For example, in a study of men with prostate cancer, wives of the patients reported a greater need for information about the cancer than the patients themselves (Echlin & Rees,

2002; Krol van Dam, Horenblas, Meinhardt, & Muller, 2000). Women tend to be the ones who seek health information for issues that concern the younger members of the household (Kaiser, 2003).

Despite these published studies, little information is available to specifically quantify the extent to which women are the ones who seek out health information used to make health decisions for the household overall. This type of information could be especially important when there are two potential decision makers in a household, such as the husband and wife.

This study, therefore, address two research questions, "Among married individuals, is the husband or the wife more likely to be the one who searches for and gathers information to make health decisions for household members?" and "Does the spouse identified as the primary health information seeker vary by selected household characteristics?"

DATA AND METHODS

Data were drawn from the 2009 Utah Behavioral Risk Factor Risk Surveillance System (BRFSS), conducted by the Office of Public Health Assessment, Utah Department of Health. BRFSS data are collected annually through telephone interviews among a sample of more than 10,000 randomly selected, non-institutionalized, civilian adults aged 18 and over. A three-month subsample (October through December) of the 2009 BRSSS was used for this study.

The Women's Health Information Network (UWIN), a state-wide partnership of the University of Utah, Utah Department of Health, Utah Navajo Health Systems, and Utah Association of Community Health, was charged with helping Utah residents improve their health behaviors through a series of interventions that include broad dissemination of information about disease prevention, physical activity, and nutritious eating habits. In designing its interventions, UWIN accepted the premise that women are keys to reaching others in the household, but sought empirical evidence to support this assumption. The following question was added to a three-month subsample of the BRFSS.

"Now think about gathering information to make health decisions for the people living in your household. Of the adults currently living in your household, who is the person most likely to look for and gather that information?"

Response options included the respondent himself or herself, husband, wife, son, daughter, grandmother, grandfather, or other household member. In most instances, the sex of the person named as the primary health information seeker ("seeker") was easily discernible. When necessary, BRFSS interviewers asked for clarification about the sex. For example, if the re-

spondent answered “my grandparent,” the interviewer probed to determine whether the grandparent was the grandfather or grandmother.

For this study, we were only interested in responses where both males and females had a reasonably equal chance of being named as the seeker. For example, in female-headed households, it would be unlikely that a male would be reported as the seeker. In order to eliminate situations such as this, our sample was limited to respondents who were married and who reported either themselves or their spouses as the seeker.

Our final sample for this study included 589 adult respondents, comprised of 296 males and 293 females, who reported being married. Analyses were conducted using SUDAAN software package Version 10.0.1 and SAS Version 9.2. Data were weighted to reflect the geographic, age, and sex distribution of the Utah population and adjusted for the probability of selection.

Two questions are routinely included in BRFSS that ask about annual household income and the presence of children less than age 18 years in the household. Because these questions addressed characteristics that applied to the household (as opposed to the respondent only), we also looked to see if either of these household characteristics influenced which spouse was reported as the seeker.

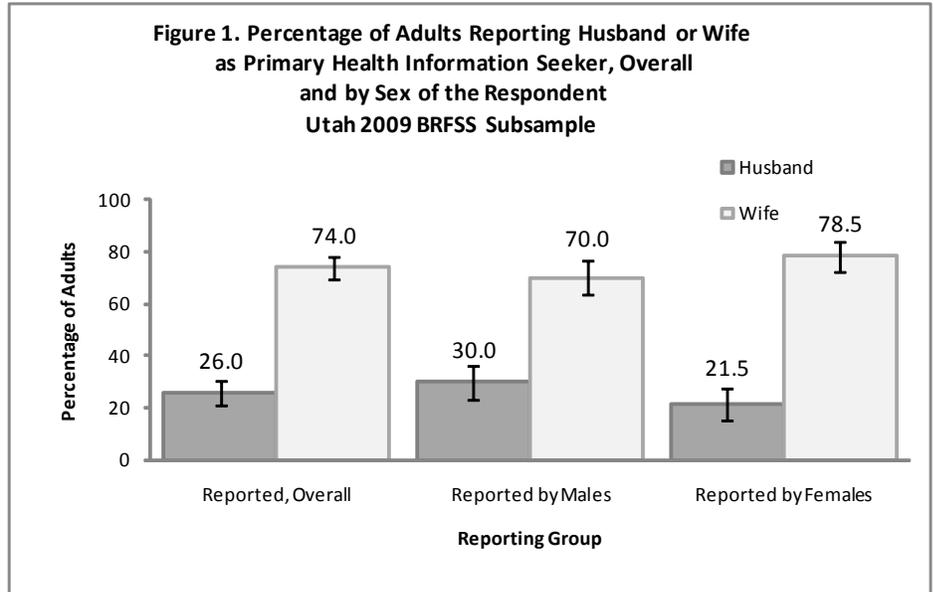
Variables were defined as follows:

Seeker: A two-category variable used to identify which spouse was more likely to look for and gather health information to make decisions for other household members, (1) husband and (2) wife. Responses for which the respondent reported himself or herself as the seeker were recoded as husband or wife, depending on the sex of the respondent.

Annual household income: A two-category variable, (1) less than \$50,000 and (2) \$50,000 and over.

Presence of children: A two-category variable, (1) no children in the home less than 18, and (2) at least one child in the home less than 18 years of age.

Simple descriptive analyses were used. Cross-tabulations were used to identify statistically significant differences in reporting the wife versus the husband by the sex of the respondent and by each of the two household characteristics. Chi-squares were used to determine statistical significance, with a 95 percent confidence interval.



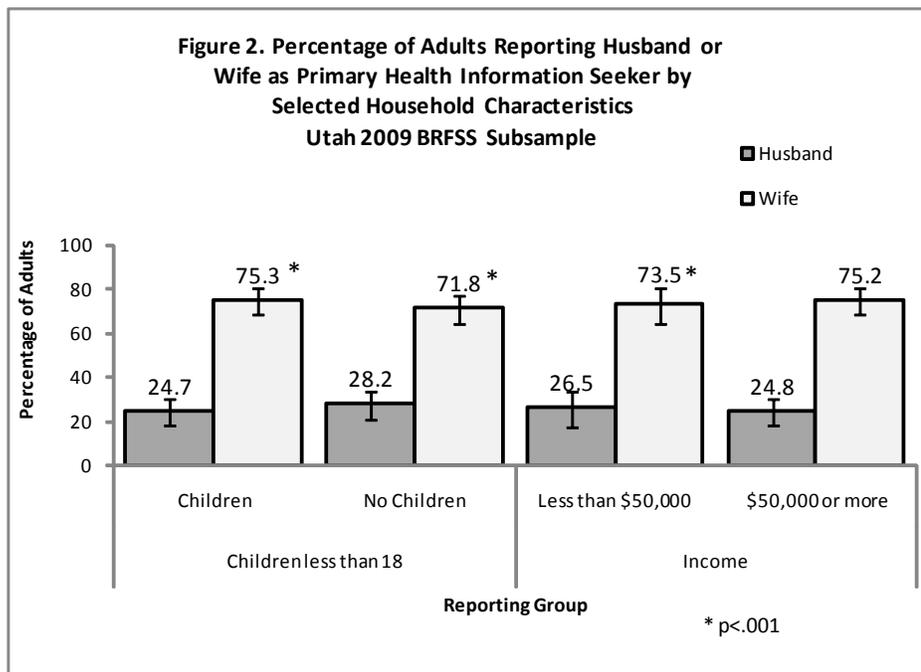
FINDINGS

Findings overwhelmingly supported the wife as the seeker for the household. In the overall sample, that included both males and females, 74.0 percent reported the wife was the seeker, while 26.0 percent reported the husband ($p < .001$) (Figure 1). Among females, close to 80 percent (78.5%) reported they (“wife”) were the seeker, while only 21.5 percent of females reported the husband was the seeker ($p < .001$). Among males, 70 percent (70.0%) of males reported the wife was the seeker, while 30 percent (30.0%) reported they were the seekers.

The presence of children less than age 18 in the household affected these proportions only slightly. With children in the household, 75.3 percent of respondents reported the wife was the seeker, compared to 24.7 percent who reported the husband ($p < .001$) (Figure 2). The absence of children in the household had little influence on which spouse was reported as the seeker. Almost 72 percent (71.8%) of respondents in households with no children reported the wife as the seeker, compared to 28.2 percent reporting the husband ($p < .001$).

Similarly, there was little change in the pattern when examined by income. For respondents in households with less than \$50,000 annual income, 73.5 percent of respondents reported the wife was the seeker, with 26.5 reporting the husband ($p < .001$). Among respondents residing in households with an annual income of \$50,000 or higher, 75.2 percent of respondents reported the wife was the seeker, and 24.8 percent reported the husband ($p < .001$).

In sum, in all cases, about three-fourths of respondents reported the wife was the seeker, regardless of the sex of the



respondent providing the information, the presence of children in the household, or annual household income.

LIMITATIONS

This study has several notable limitations. First, the available data include respondents from separate households, and we were not able to compare responses for husband and wife in the same household. Second, it is possible that even though the respondent was married, his or her spouse does not reside in the same household (Note: there is an option for “separated” in BRFSS, for married couples living apart and married. Separated respondents were not included in the analysis). Third, the data did not allow any accounting for individual characteristics that might have affected the outcomes, such as differences in the husband’s or wife’s education and employment status. Also, we were not able to assess cultural variations that may have a strong influence on which spouse is the seeker. Finally, a few respondents stated the health information searches were shared equally by husband and wife. While the percentage of responses citing both spouses was small (less than two percent), the omission of this information may have eliminated the opportunity to obtain some interesting findings.

DISCUSSION

The findings clearly indicate a greater propensity of women to be the health-information seekers for the household. In all cases, the wife was reported more often than the husband as the primary seeker of health information. While there was slight variation in the patterns when examined by household income

or by the presence of children in the home, variations were minimal.

Because women tend to seek health information for themselves as well as for others, health professionals may want to take advantage of the opportunity to leverage the influence women may have on the health of men, children, and aging parents. Packaging information and designing health messages for women that incorporate the broader health needs of family members may have substantial health benefits for others that have not fully been recognized. Health professionals may also want to ensure that information is available for women at all levels of health literacy and take steps to validate that the information obtained is well understood and meaningful.

These findings are not meant to suggest that interventions that encourage health-seeking activities for men are not important. Men still are the health information seekers in more than one-fourth of households. A large proportion of women work outside the home and men are assuming a greater share of domestic responsibilities (Boal, 2011). It is important to keep in mind that men’s role as health information seekers may become increasingly important in the future.

More studies are needed in this area. Studies that include paired spouses to examine the consistency of reporting between husband and wife are needed to further validate these initial findings. In addition, studies that address not only health-seeking behaviors, but also the understanding and application of health information, would assist health care professionals in their efforts to design and develop health messages that can be interpreted correctly and used effectively.

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Preliminary Findings from a Pilot Integrative Obesity and Eating Disorder Intervention

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ABSTRACT

BACKGROUND

The purpose of this paper is to present the preliminary findings from a pilot integrative obesity and eating disorder prevention program in Salt Lake City, Utah.

METHODS

The aims of this study were addressed using a quasi-experimental pre and post-test design. Twenty-five adolescent females comprised the treatment and control group for this pilot integrative obesity and eating disorder prevention program. *Full of Ourselves PLUS (FOO+)* was implemented over 7 weeks to promote healthy self-image, nutrition and physical activity by combining the curricula from evidence-based *Eat and Live Well*¹ and *Full of Ourselves*².

RESULTS

The average age of the 11- 16 year olds was 13.13 (SD = 1.59) and a majority of the females were Caucasian (75%). There were no significant differences between the treatment and control groups at pretest. For post-test results, the FOO+ group reported significantly higher scores on Body-Esteem Appearance subscale than the control group. Although there were no other significant differences, the FOO+ participants had higher waist circumference, reported higher scores on body-esteem weight subscale, total physical activity, and intuitive eating, and took more steps on the weekends, but ate less fruits and vegetables than the control group. One person in the FOO+ group went from being categorized as “overweight” to “healthy weight.”

CONCLUSIONS

This exploratory study represents an initial effort to integrate obesity and eating disorder interventions. Future studies should include more participants and consider adding a parent education component to the overall intervention.

It is estimated that Utah spends \$393 million annually in medical costs associated with obesity. While Utah obesity rates for 2009 were estimated at 23.5% of the state's adult population, 11% of Utah youth (9th to 12th grade) were overweight and 9% were obese.³ Eighteen percent of Utah youth eat five or more fruits and vegetable servings per day as recommended by the USDA, and only 48% of Utah youth meet current physical activity recommended levels.³

Adolescent obesity is considered a major public health concern in the United States that leads to increased risk for health and psychological consequences, chronic disease and adulthood obesity.⁴ Focusing on weight loss in attempts to address climbing obesity prevalence rates has contributed to a "dieting mentality" among adolescents and their parents. "Concern has arisen that this weight focused paradigm is not only ineffective at producing thinner, healthier bodies, but also damaging, contributing to food and body preoccupation, repeated cycles of weight loss and regain, distraction from other personal health goals and wider health determinants, reduced self-esteem, eating disorders, other health decrement, and weight stigmatization and discrimination" (Bacon & Aphramor, 2011, p. 2). The national Youth Risk Behavior Surveillance System survey of more than 14,000 high school students found that 60% of females were trying to lose weight.⁵ Larson and colleagues (2009) determined that females using unhealthy weight control behaviors reported lower intakes of healthful dietary components (e.g., fruits, vegetables) and less frequent meals.⁶ In accordance with the Healthy People 2020 objectives to increase fruit and vegetable consumption, reduce overweight and obese adolescents, obesity prevention efforts continue to be a priority for Utah. However, Healthy People 2020's objective, "to reduce the proportion of adolescents who engage in disordered eating behaviors in an attempt to control their weight" underscores the need to promote healthful eating and exercise in a sensitive way.⁷ Therefore, the purpose of this study was to promote healthy nutrition and exercise while also promoting positive self-esteem and body image.

Two existing, evidence-based obesity (i.e., *Eat and Live Well*) and eating disorder (i.e., *Full of Ourselves*) prevention programs were integrated to create a community-based intervention for adolescent females called *Full of Ourselves PLUS (FOO+)*. The *Eat and Live Well (ELW)* program promotes physical activity through playful, interactive activities (e.g., relay races, yoga) that do not require competitive sport skills, nutrition lessons based on the USDA Dietary Guidelines (e.g., food pyramid), and hands-on preparation of a healthy snack (e.g., fruit smoothies).¹ The *Full of Ourselves (FOO)* curriculum included interactive discussions and role plays about size

discrimination, the role of media in promoting beauty ideals, and strategies to cope with bullying. Although FOO was designed as an eating disorder prevention program that promotes self-esteem and girls' leadership, the lessons reinforce healthful behaviors (e.g., mindful eating) and communication.² A full description of the FOO+ intervention is provided elsewhere.⁸ Adolescent females who enrolled in the treatment group engaged in 75-minute weekly sessions designed to improve physical activity, nutritional habits and body image with the following aims:

Aim #1: To determine whether 10 weeks of FOO+ changes Body Mass Index (BMI) and waist circumference.

Hypothesis #1: It is hypothesized that the FOO+ group will decrease BMI/waist circumference significantly more than the control group at post-test.

Aim #2: To determine whether 10 weeks of FOO+ increases physical activity.

Hypothesis #2: It is hypothesized that the FOO+ group will increase physical activity more than control group at post-test.

Aim #3: To determine whether 10 weeks of FOO+ leads to improved body-esteem.

Hypothesis #3: It is expected that participants of FOO+ will report significantly higher body-esteem scores than control group at completion of the program at post-test.

Aim #4: To determine whether 10 weeks of FOO+ improves nutritional habits.

Hypothesis #4: It is hypothesized that more participants in the FOO+ group will eat more fruits and vegetables than the control group at post-test.

METHOD

PARTICIPANTS

English speaking females aged 11-17 were recruited from community organizations (e.g., Boys and Girls Clubs) to participate in either the control or treatment group based on convenience. Twenty-five females aged 11-16 years ($M=13.08$; $SD=1.41$) enrolled in the study with 10 participants receiving the FOO+ program and 15 participants serving as the control wait list group. The 25 participants self-identified themselves as Caucasian (72%) or Latina/Hispanic (28%) and weighed an average of 119.37 pounds ($SD=21.58$) with a BMI of 21.74 ($SD=3.40$). Evaluations using measures described below were taken at pre- and post-test periods.

The treatment group attended 88% of sessions and 6 of 10 treatment participants attended 100% of program sessions.

Table 1. Demographic, Anthropometric, Nutritional Habits, Body Esteem, Intuitive Eating, and Physical Activity Characteristics at Baseline

	Overall Group (N = 16)	FOO+ (n = 6)	Control (n = 10)	t or χ^2 value
Demographic				
Age (year) [Mean (SD)]	13.13 (1.59)	13.17 (1.72)	13.10 (1.60)	-0.08
Ethnicity, n (%)				
Caucasian	12 (75.0)	2 (33.3)	10 (100.0)	8.89**
Hispanic	4 (25.0)	4 (66.7)	0 (0.0)	
Anthropometric [Mean (SD)]				
Height, inches	158.56 (5.87)	154.33 (4.98)	161.10 (4.96)	2.64*
Weight, lbs	123.23 (20.52)	117.53 (21.97)	126.65 (19.97)	0.85
BMI-for-Age, n (%)				
Obese	1 (62.0)	1 (16.7)	0 (0.0)	3.81
Overweight	7 (43.8)	2 (33.3)	5 (50.0)	
Healthy weight	7 (43.8)	2 (33.3)	5 (50.0)	
Underweight	1 (62.0)	1 (16.7)	0 (0.0)	
Waist Circumference, cm	78.72 (9.17)	79.17 (11.50)	78.45 (8.15)	-0.15
Nutritional Habits, n (% yes)				
Eat vegetables	9 (56.2)	6 (60.0)	3 (50.0)	-
Eat fruits	9 (60.0)	8 (80.0)	4 (66.7)	-
Body-Esteem Scale [Mean (SD)]				
Appearance	2.73 (0.71)	2.62 (1.02)	2.80 (0.50)	0.41
Weight	2.59 (0.82)	2.71 (0.99)	2.53 (0.76)	-0.42
Attributions	1.85 (0.63)	1.90 (0.21)	1.82 (0.80)	-0.30
Intuitive Eating Scale [Mean (SD)]				
Unconditional permission to eat	3.49 (0.77)	3.89 (0.79)	3.24 (0.68)	-1.74
Eating for physical reasons	3.20 (0.79)	3.40 (0.97)	3.08 (0.70)	-0.77
Reliance on internal hunger cues	3.56 (0.69)	3.67 (0.99)	3.49 (0.48)	-0.41
Total composite score	3.45 (0.59)	3.68 (0.72)	3.31 (0.48)	-1.25
Physical Activity [Mean (SD)]				
PAQ-A summary score	2.67 (0.73)	2.95 (0.65)	2.50 (0.75)	-1.20
Steps Per Day (pedometer)				
Weekdays	7246.75 (3205.32)	6248.01 (3796.24)	7846.00 (2837.80)	0.96
Weekend	8425.43 (4755.80)	8027.00 (6642.30)	8664.50 (3607.71)	0.25

Note. * $p \leq .05$. ** $p \leq .01$.

Unfortunately, pedometer evaluation data was insufficient and unusable for 4 treatment participants at post-test. Three control group participants did not complete post-test representing an attrition rate of 20%, and 2 other control participants completed the surveys but neglected to return their pedometers at post-test. Thus, the final sample size used to analyze the complete data was 16 (i.e., 6 in the FOO+ group and 10 in the control group).

The average age of the 16 participants was 13.13 ($SD=1.59$). The majority of the participants was Caucasian (75%), and weighed an average of 123.23 ($SD=20.52$) with a BMI of 22.20 ($SD=3.24$). Although there were no significant differences between groups on age, weight, BMI, nutritional habits, and

physical activity characteristics at baseline, the participants in the FOO+ group were older, ate more vegetables and fruits at baseline, had higher self-reported physical activity, had lower number of steps per day, and had higher waist circumference than the participants in the control group. However, there were significantly more Caucasian participants in the control group than the FOO+ group, and they were significantly taller. The control group had more participants categorized as “overweight” and “healthy weight” than the FOO+ group, but the FOO+ group had more participants categorized as “obese” and “underweight”, but the results were not significant. See Table 1 for descriptive statistics baseline demographic, anthropometric, nutritional habits, and physical activity characteristics.

MEASURES

Anthropometric characteristics. A Tanita scale was used to assess body weight and a Seca stadiometer was used to assess the height of all the participants to calculate body mass index (BMI). After calculating the BMI, the BMI was plotted on the CDC age and sex specific growth charts for girl ages 2 to 10 years old to obtain the BMI-for-Age percentile and weight status category.⁹ According to CDC, children and adolescents with a BMI equal to or greater than 95th percentile is considered obese; children and adolescents with a BMI 85th to less than 95th percentile is considered overweight; children and adolescents with a BMI 5th percentile to less than 85th percentile is considered healthy weight; and children and adolescents with a BMI less than 5th percentile is considered underweight.³ Waist circumference, surrogate measure for abdominal fat, was assessed using a Gullick II tape measure following the Academy of Sports Medicine protocol.¹⁰ The Dietary Intake Questionnaire has been shown to be a reliable and valid tool to assess fruit and vegetable intake among adolescents.¹¹

Nutritional habits. Fruit and vegetable intake were assessed using a modified version of the Dietary Intake Questionnaire.¹¹ Participants were asked, "Did you eat any fruits yesterday at school during lunch time?" and "Did you eat any vegetables yesterday at school during lunch time?" In order to provide participants with the maximum number of fruit and vegetable options, the researchers created a list of fruits and vegetables with accompanying pictures. In addition to dietary intake, intuitive eating was measured with the Intuitive Eating Scale (IES).¹² Specifically, IES measured unconditional permission to eat, eating for physical rather than emotional reasons, and reliance on internal hunger and satiety cues with 21-item on a 5-point Likert scale (1 = *Strongly Disagree* and 5 = *Strongly Agree*). After reverse scoring the scale of the negative items, unconditional permission to eat, eating for physical rather than emotional reasons, and reliance on internal hunger and satiety cues subscales, and the total IES composite score were created. Sample items included, "I stop eating when I'm full (not overstuffed)" and "I trust my body to tell me what to eat." The reliability coefficients (Cronbach's alpha) for this study were: Unconditional Permission to Eat (9 items) = .87; Eating for Physical Reasons Rather Than Emotional Reasons (6 items) = .88; Reliance on Internal Cues (6 items) = .86; total composite score (21 items) = .90.

Body image. The Body Esteem Scale for Adolescents and Adults¹³ was used to measure participants' evaluation of their body and appearance using 23 items on a 5-point Likert-type scale (0 = *Never* to 4 = *always*). After reverse scoring the scale of the negative items, Appearance, Weight, and Attribution subscales were created. Sample items include, "I really like what

I weight" and "I like what I look like in pictures." Researchers have found the BES to be reliable and valid among adolescents.¹³ The Cronbach's alphas for this study were: Appearance (10 items) = .88; Weight (8 items) = .88; Attribution (5 items) = .54.

Physical activity. Steps per day were assessed using the Dig-walker SW-Series Yamax pedometer, which has been shown to be reliable and valid in assessing step counts in adolescents.¹⁴ To measure 7-day recall of physical activity, the Physical Activity Questionnaire for Adolescents (PAQ-A)¹⁵ was used to assess general levels of physical activity for adolescents in grades 9 to 12 and approximately 14-19 years of age, providing a composite physical activity score derived from 8 items that are scored on a 5-point scale. Sample items included, "In the last 7 days, during your physical education classes, how often were you very active (playing hard, running, jumping, throwing)?" and "On the last weekend, how many times did you do sports, dance, or play games in which you were very active?" Kowalski and colleagues (2004) have found the PAQ-A to be reliable and valid. The internal consistency of the PAQ-A in this study for the 8-items was .84.

STATISTICAL ANALYSIS

All analyses were conducted using SPSS version 17.0. Descriptive statistics and frequencies were conducted on pretest and post-test demographic, anthropometric, nutritional habits, body esteem, intuitive eating, and physical activity characteristics to screen for missing data, outliers, and data entry errors. Independent *t*-tests were calculated to determine differences between the FOO+ and control groups for baseline continuous demographic, anthropometric, body-esteem, intuitive eating, and physical activity characteristics. Chi-square tests were calculated to determine differences between the two groups for the baseline categorical variables (i.e., ethnicity and nutritional habits). Given that the design of this study was quasi-experimental, univariate or multivariate analysis of covariance determined group differences across waist circumference, body-esteem, intuitive eating, and physical activity items using the pretest score as a covariate if the groups did not differ on the mean pretest scores.¹⁶ For the categorical nutrition items and BMI weight categories, chi-square tests were conducted to determine differences between groups at post-test and McNemar test was conducted to determine within-subject differences. Fisher's Exact Test was used to report whether the treatment group significantly ate more vegetables and fruits than the control group at post-test because some cells had fewer than 5 counts in the cell. Grand mean imputation was used to handle missing data for the all continuous variables except for the pedometer data.

 RESULTS

Anthropometric Characteristics

There were no significant differences between the FOO+ group and control group for post-test BMI weight categories. One participant in the FOO+ group moved from being categorized as “overweight” to “healthy weight” after receiving the intervention. For waist circumference, ANCOVA showed that FOO+ group had values higher ($M = 81.67$, $SD = 8.45$) than the control group at post-test ($M = 79.43$, $SD = 8.64$), but the difference was not statistically significant [$F = 0.98$ (1), $p = .17$, eta squared = $.07$, power = $.15$].

Body Esteem

Multivariate analysis of covariance revealed that the participants in the FOO+ group had statistically significantly higher scores on the BES-appearance subscale ($M = 3.05$, $SD = 0.83$) than the control group at post-test ($M = 2.81$, $SD = 0.49$), [$F = 8.83$ (1), $p = .01$, eta squared = $.45$, power = $.77$]. For BES-weight subscale, FOO+ group had higher scores on the BES-weight subscale ($M = 2.94$, $SD = 0.85$) than the control group ($M = 2.54$, $SD = 0.86$), [$F = 0.45$ (1), $p = .52$, eta squared = $.04$, power = $.09$], but it was not statistically significant. On the other hand, the FOO+ group had lower scores on the BES-attribution subscale ($M = 1.78$, $SD = 0.74$) than the control group ($M = 1.88$, $SD = 0.54$), [$F = 1.00$ (1), $p = .34$, eta squared = $.08$, power = $.15$], but it was not statistically significant.

Intuitive Eating

Multivariate analysis of covariance showed that the participants in the FOO+ group had higher scores on the overall intuitive eating composite ($M = 3.98$, $SD = 0.69$) than the control group ($M = 3.46$, $SD = 0.61$), [$F = 0.63$ (1), $p = .23$, eta squared = $.06$, power = $.11$] at post-test. The FOO+ group reported higher scores on the IES subscales than the control group. For IES-unconditional permission to eat, FOO+ group had higher scores ($M = 3.96$, $SD = 0.78$) than the control group ($M = 3.43$, $SD = 0.60$), [$F = 0.02$ (1), $p = .45$, eta squared = $.00$, power = $.05$]. The FOO+ group had higher scores on the IES-eating for physical reasons rather than emotional reasons subscale ($M = 3.93$, $SD = 0.85$) than the control group ($M = 3.22$, $SD = 1.01$), [$F = 2.11$ (1), $p = .09$, eta squared = $.17$, power = $.26$]. For IES-reliance on internal cues, FOO+ group had higher scores ($M = 4.08$, $SD = 0.74$) than the control group ($M = 3.65$, $SD = 0.56$), [$F = 0.59$ (1), $p = .23$, eta squared = $.06$, power = $.11$]. However, these results were not statistically significant.

Nutritional Habits

Although not statistically significant (Fisher's Exact Test, $p =$

$.12$), the control group ate more vegetables (77.8%, $n=7/9$) than the FOO+ group (33.3%, $n=2/6$). Similarly, the control group ate more fruits (90%, $n=9/10$) than the FOO+ group (66.7%, $n=4/6$), but this was not statistically significant (Fisher's Exact Test, $p = .30$). However, although not statistically significant, McNemar test showed that a higher proportion of participants in the FOO+ group ate vegetables at pretest (50%, $n=3/6$) than post-test (33%, $n=2/6$), but the same proportion of people ate fruits at pretest and post-test (67%, $n=4/6$).

Physical Activity

Self-reported physical activity (PAQ-A). Although not statistically significant, the intervention group reported higher total physical activity ($M = 2.93$, $SD = 0.54$) than the control group ($M = 2.66$, $SD = 0.83$), [$F = 1.09$ (1), $p = .16$, eta squared = $.08$, power = $.16$].

Steps per day. Individual-information centered approach for handling physical activity missing data from pedometers (i.e., step counts) was used to calculate a mean of steps per day for the missing data. Individual-information centered approach has been shown to be more effective than the group-information-centered method for handling missing data from pedometers to minimize the loss of information and power.¹⁷ No data and steps less than 1000 were deleted and considered as missing data.¹⁸ After calculating each individual's average step count for the missing day, average number of steps per day was calculated for weekdays and weekend at baseline and post-test because physical activity is considered different during the weekdays versus weekend days. The reliability coefficient for the weekdays and weekend steps per day at baseline were $.83$ and $.69$, respectively. The ANCOVA revealed that the FOO+ group reported lower number of steps per day on the weekdays ($M = 5,465.28$, $SD = 2,931.23$) than the control group ($M = 6,166.28$, $SD = 1,745.78$), [$F = 0.10$ (1), $p = .38$, eta squared = $.01$, power = $.06$], but it was not statistically significant. However, the participants in the FOO+ group significantly took more steps per day on the weekend ($M = 9,538.67$, $SD = 5,378.30$) than the control group ($M = 6,097.80$, $SD = 1,614.45$) at post-test, [$F = 3.75$ (1), $p = .04$, eta squared = $.22$, power = $.43$]. Table 2 illustrates the anthropometric, body esteem, intuitive eating, nutritional habits, and physical activity characteristics at post-test.

LIMITATIONS/FUTURE DIRECTIONS

Conducting this pilot intervention was a first step toward integrating obesity and eating disorder prevention strategies within one program. Future studies should focus on recruiting a more robust sample so that power requirements are met and more stringent analyses can be conducted. Additionally attrition within the control group should be avoided by providing

Table 2. Anthropometric, Nutritional Habits, Body Esteem, Intuitive Eating, and Physical Activity Characteristics at Post-test

	FOO+	Control	F or χ^2 value
Anthropometric			
BMI-for-Age [n, (%)]			4.44
Obese	1 (16.7)	0 (0.0)	
Overweight	1 (16.7)	5 (50.0)	
Healthy weight	3 (50.0)	5 (50.0)	
Underweight	1 (16.7)	0 (0.0)	
Waist Circumference, cm	81.67 (8.45)	79.43 (8.64)	0.98
Body-Esteem [Mean (SD)]			
Appearance	3.05 (0.83)	2.81 (0.49)	8.83**
Weight	2.94 (0.85)	2.54 (0.86)	0.45
Attributions	1.78 (0.74)	1.88 (0.54)	1.00
Intuitive Eating [Mean (SD)]			
Unconditional permission to eat	3.96 (0.78)	3.43 (0.60)	0.02
Eating for physical reasons	3.93 (0.85)	3.22 (1.01)	2.11
Reliance on internal hunger cues	4.08 (0.74)	3.65 (0.56)	0.59
Total composite score	3.98 (0.69)	3.45 (0.61)	0.63
Nutritional Habits			
Eat vegetables [n, (% yes)]	2 (33.3)	7 (77.8)	-
Eat fruits	4 (66.7)	9 (90.0)	-
Physical Activity [Mean (SD)]			
PAQ-A summary score	2.93 (0.54)	2.66 (0.83)	1.09
Steps Per Day (pedometer)			
Weekdays	5465.28 (2931.23)	6166.28 (1745.78)	0.10
Weekend	9538.67 (5378.30)	6097.80 (1614.45)	3.75*

Note. * $p \leq .05$. ** $p \leq .01$. M = mean, SD = standard deviation

additional incentives at post-test. All but one pedometer was eventually retrieved, but pedometer data had limited storage capability. Units returned later than a week later did not allow for daily step count analyses. Therefore, it is recommended that future researchers opt to use accelerometers so that data can be tracked and downloaded at any time.

On the intervention side, researchers observed that although many parents were present since they provided transportation, they did not receive education as part of the program. Future interventions should consider providing a parent education component so that there will be reinforcement of lessons within the home environment. Additionally it is suggested that the age range be limited to 11-14 years of age to address developmental differences observed during the implementation of this study. A school-based implementation of the FOO+ program may allow for increased retention of participants. Evaluation measures including the intuitive eating scale and a modified dietary intake questionnaire were piloted and yielded sufficient alphas for use with 11-16 year old females.

CONCLUSIONS

The participants in the intervention group had significantly

more positive body image regarding their appearance and they increased their physical activity on the weekend compared to the control group at post-test. Although not statistically significant, the participants in the intervention group had higher intuitive eating scores than the control group, indicating that the girls did not place conditions on when, how much, and what foods they could eat. They ate for physical reasons rather than emotional reasons, and they responded better to internal physiological hunger cues. These results suggest that the intervention had positive effects on the girls' body esteem, physical activity, and eating. Thus, we conclude that it is worthwhile for health educators to integrate obesity and eating disorder prevention efforts within one health promotion program to enhance the physical and psychological well-being of female adolescents. Although further study is needed to test the efficacy of integrative programs using a larger sample size, this study represents a first attempt to promote nutrition, physical activity, body image and intuitive eating within one intervention for adolescent females.

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Cancer Survival in Utah: Female Breast, Prostate, Colorectal, Lung and Bronchus, and Melanoma of the Skin, 1997-2006

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ABSTRACT

INTRODUCTION

We examine cancer survival with special emphasis on breast (female only), prostate, colorectal, lung and bronchus, and melanoma of the skin.

METHODS

Utah cancer-specific survival was compared to U.S. rates using data from the National Cancer Institute's SEER Program (SEER 12). We focused on non-Hispanic white adults, diagnosed with a single, invasive, primary cancer from 1/1/1997-12/31/2006. We conducted multivariate Cox PH to assess differences between Utah and SEER 12, controlling for other factors that are strong determinants of survival.

RESULTS

Utah men and women had an increased risk of dying from female breast (HR=1.15; 95% CI 1.08-1.23), prostate (HR=1.13; 95% CI 1.05-1.22), or colorectal (HR=1.07; 95% CI 1.07-1.19) cancers compared to SEER 12. There were no significant differences between Utah and SEER 12 for lung and bronchus cancer and melanoma.

CONCLUSION

Population-based cancer surveillance data shows that Utahns may be experiencing poorer survival from breast, prostate, and colorectal cancers.

Cancer continues to be the second leading cause of death in the United States as well as in Utah, accounting for as many as 23% and 18.6% of all deaths from 2005-2007, respectively (CDC/NCHS, 2011). There is little doubt, however, that advances in early detection and treatment have led to increases in cancer survival. According to recent data published by the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) Program, the average 5-year relative survival from invasive cancer increased significantly from 50.1% in 1975-1977 to 67.8% in 1999-2005 (Horner, et al., 2009). Survival from cancer varies by a number of factors including, but not limited to, (a) the anatomical site, subsite, and histology of the cancer; (b) the presence of cancer biomarkers; (c) age at diagnosis; (d) gender; (e) race/ethnicity; (f) stage, grade, and tumor size at diagnosis; and, (g) geographic region (Clegg, et al., 2002; Horner, et al., 2009; Maning, et al., 2007; Ries, et al., 2007). In this article, we examine cancer survival in Utah with special emphasis on 5 common cancers affecting most Utahns: breast (female only), prostate, colorectal, lung and bronchus, and melanoma (Stroup, Harrell, & Dibble, 2008).

METHODS

STUDY POPULATIONS

Our analysis is based on data from the National Cancer Institute's SEER Program. The SEER Program was established in 1973 and currently collects cancer incidence and survival data from 17 geographic areas (Surveillance Research Program, 2011a). U.S. comparisons to Utah were based on data from the 12 SEER (SEER 12) registries with data available for the entire time period under analysis (1997-2006), representing approximately 13% of the U.S. population (Surveillance Research Program, 2011b). These include: Alaska, Connecticut, Iowa, New Mexico, Hawaii; metropolitan areas of Detroit, Atlanta, San Francisco, San Jose, Los Angeles, and Seattle; and, ten counties in rural Georgia. Utah data were provided by the Utah Cancer Registry (UCR), which is a population-based cancer registry and a member of the SEER Program since its inception in 1973.

We focus on non-Hispanic white adults (aged 20 years and older), diagnosed with an invasive, primary cancer of the breast (female only), prostate, colon and rectum, lung and bronchus, or melanoma of the skin from January 1, 1997 through December 31, 2006 with active follow-up through December 31, 2007. Cancer site and morphology were coded using SEER Site Recode definitions based on the International Classification of Diseases for Oncology, Third Edition (ICD-O-3) (Fritz, et al., 2000). Men and women diagnosed with more than one pri-

mary cancer, diagnosed at autopsy or reported solely via death certificates, or missing survival time were excluded. Although Hispanics are the second largest population group in the state (U.S. Census Bureau, 2010), we excluded Hispanics along with other ethnic minority groups because they each comprised less than 5% of the cancer population (Surveillance, Epidemiology, and End Results Program, 2010). These low numbers are likely to translate into inadequate power to detect significant patterns in survival. The final sample, therefore, was restricted to non-Hispanic whites, who account for just over 85% of Utah's population (U.S. Census Bureau, 2010) and 96% of the cancer population (Surveillance, Epidemiology, and End Results Program, 2010). We limited our study to adults as female breast, prostate, colorectal, lung and bronchus, and melanoma of the skin are extremely rare in children and young adults less than 20 years of age (Altekruse, et al., 2010).

STATISTICAL ANALYSIS

Data for this study were derived from limited-use files made available for research by SEER through SEER*Stat v6.6.2 software (Surveillance Research Program, 2010). SEER*Stat was used to generate descriptive statistics and estimate cause-specific survival rates. Cause-specific survival was calculated using the actuarial method and reflects the net survival measure representing cancer survival in the absence of other causes of death. According to Howlader, et al. (2010), cause-specific survival is recommended when the life tables of the reference population (e.g., U.S. life tables) are not representative of the other-cause (non-cancer) mortality of the cancer patient cohort under study (e.g., Utah population). This indeed seems to be the case for Utah as preliminary analyses suggests that Utah may have higher expected survival than the U.S. population (unpublished communication).

The SEER cause-specific death classification variable was used in the analysis. Briefly, this variable considers the site of the original cancer diagnosis and comorbidities in order to capture deaths which were related to the specific cancer but were not coded as a death due to the specific cancer site. This method is elaborated on in Howlader, et al. 2010. In order to avoid the ambiguity in cause of death for patients diagnosed with more than one cancer, we limited our analysis to patients diagnosed with one and only one primary cancer, which represents 91% and 90% of all Utah and SEER 12 cancers, respectively. Cox Proportional Hazards modeling was then used to assess differences between Utah and SEER 12 while controlling for other factors that are strong determinants of survival including sex (if applicable), age and stage at diagnosis, urban/rural county designation, and receipt of first-course treatment (surgery and/

or radiation). Analyses for female breast cancer survival also controlled for estrogen and progesterone receptor status (ER-PR). Individuals who died from other causes, were alive at the end of follow-up, or lost to follow-up were censored. Significant differences in cause-specific survival between Utah and SEER 12 were assessed using Pearson's chi-squared test statistic at the $p < 0.05$ level.

RESULTS

The case counts and distributions of age and stage of diagnosis, vital status, and urban/rural counties by region (Utah vs. SEER 12) are described in Tables 1 (female breast and prostate), 2 (colorectal and lung and bronchus), and 3 (melanoma). As expected, the large population in SEER 12 resulted in greater sensitivity in the statistical tests which showed even small differences in the distributions as significant. In fact, the absolute values are quite similar with only a few notable exceptions. Female breast cancer patients in Utah are more likely to be diagnosed with regional stage disease than their SEER counterparts (Utah 34%, SEER 12 29%) who are more likely to be diagnosed at earlier (localized) stages (Utah 59%, SEER 12 64%). Colorectal cancer patients in Utah are more likely to be diagnosed under the age of 65 (Utah 41%, SEER 12 33%) and with localized disease (Utah 47%, SEER 12 40%). Gender and urban/rural differences were more pronounced among lung and bronchus cases with a larger percentage of Utah cases being male (Utah 60%, SEER 12 53%) and living in rural counties (Utah 18%,

SEER 12 13%). A larger percentage of melanoma cases in Utah occurred in the younger population aged 20-44 (Utah 32%, SEER 12 26%).

Utah and SEER 12 5-year cancer-specific survival rates by site and stage with 95% confidence intervals are shown in Figures 1-5. Results show that Utah women have significantly lower 5-year breast cancer survival rates as compared to SEER 12 (Utah 86%, SEER 12 88.8%), which is largely due to poorer survival among women with unstaged disease (Utah 28.5%, SEER 12 56.6%). Like female breast cancer patients, the 5-year prostate cancer survival rates for Utah men with unstaged

Table 1. Age, Stage, Vital Status, and Urban/Rural County Distributions Female Breast and Prostate Cancers: Utah and SEER 12 1997-2006

Cancer Type/Characteristic	Utah		US SEER 12	
	N	%	N	%
Breast (Female)	8,254		148,538	
Age***				
20-44 years	1,058	13%	17,320	12%
45-54 years	1,812	22%	33,535	23%
55-64 years	1,944	24%	34,556	23%
65-74 years	1,746	21%	30,262	20%
75-84 years	1,242	15%	24,742	17%
85+ years	452	5%	8,123	5%
Stage***				
Localized	4,884	59%	94,637	64%
Regional	2,778	34%	43,534	29%
Distant	486	6%	7,932	5%
Unstaged/Unknown	106	1%	2,435	2%
Vital Status***				
Alive	6,338	77%	117,435	79%
Deceased	1,916	23%	31,103	21%
Urban/Rural County*				
Urban	7,258	88%	132,404	89%
Rural	996	12%	16,116	11%
Unknown	0	0%	18	0%
Prostate	12,150		155,927	
Age***				
20-44 years	61	1%	734	0%
45-54 years	892	7%	13,176	8%
55-64 years	3,300	27%	44,359	28%
65-74 years	4,755	39%	57,322	37%
75-84 years	2,642	22%	33,837	22%
85+ years	500	4%	6,499	4%
Stage***				
Localized/Regional	11,698	96%	144,653	93%
Distant	359	3%	6,468	4%
Unstaged/Unknown	93	1%	4,806	3%
Vital Status**				
Alive	9,771	80%	123,428	79%
Deceased	2,379	20%	32,499	21%
Urban/Rural County***				
Urban	10,410	86%	137,167	88%
Rural	1,740	14%	18,738	12%
Unknown	0	0%	22	0%

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 2. Age, Stage, Vital Status, and Urban/Rural County Distributions Colorectal and Lung and Bronchus Cancers: Utah and SEER 12 1997-2006

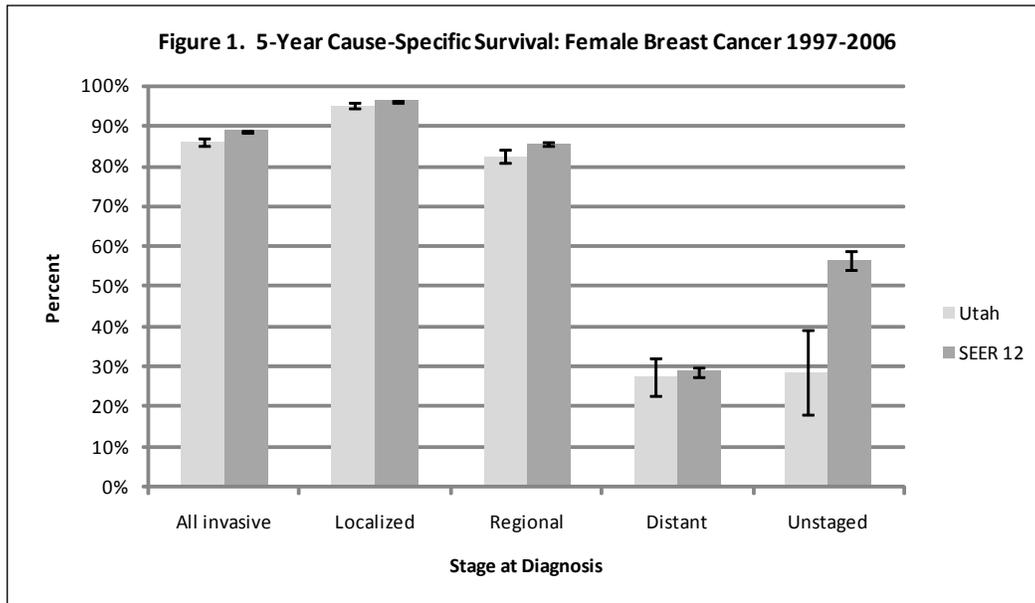
Cancer Type/Characteristic	Utah		US SEER 12	
	N	%	N	%
Colorectal	5,060		96,924	
Sex*				
Male	2,643	52%	48,719	50%
Female	2,417	48%	48,205	50%
Age***				
20-44 years	288	6%	4,185	4%
45-54 years	717	14%	10,713	11%
55-64 years	1,053	21%	17,582	18%
65-74 years	1,261	25%	24,886	26%
75-84 years	1,249	25%	27,261	28%
85+ years	492	10%	12,297	13%
Stage***				
Localized	2,402	47%	38,986	40%
Regional	1,655	33%	35,612	37%
Distant	866	17%	18,175	19%
Unstaged/Unknown	137	3%	4,151	4%
Vital Status*				
Alive	2,726	54%	50,044	52%
Deceased	2,334	46%	46,880	48%
Urban/Rural County				
Urban	4,314	85%	83,293	86%
Rural	746	15%	13,622	14%
Unknown	0	0%	9	0%
Lung & Bronchus	3,768		119,479	
Sex***				
Male	2,243	60%	63,154	53%
Female	1,525	40%	56,325	47%
Age***				
20-44 years	116	3%	2,498	2%
45-54 years	377	10%	10,800	9%
55-64 years	834	22%	26,163	22%
65-74 years	1,292	34%	38,841	33%
75-84 years	926	25%	33,031	28%
85+ years	223	6%	8,146	7%
Stage***				
Localized	546	14%	20,096	17%
Regional	866	23%	29,782	25%
Distant	2,057	55%	62,057	52%
Unstaged/Unknown	299	8%	7,544	6%
Vital Status*				
Alive	480	13%	17,523	15%
Deceased	3,288	87%	101,956	85%
Urban/Rural County***				
Urban	3,107	82%	103,670	87%
Rural	661	18%	15,801	13%
Unknown	0	0%	8	0%

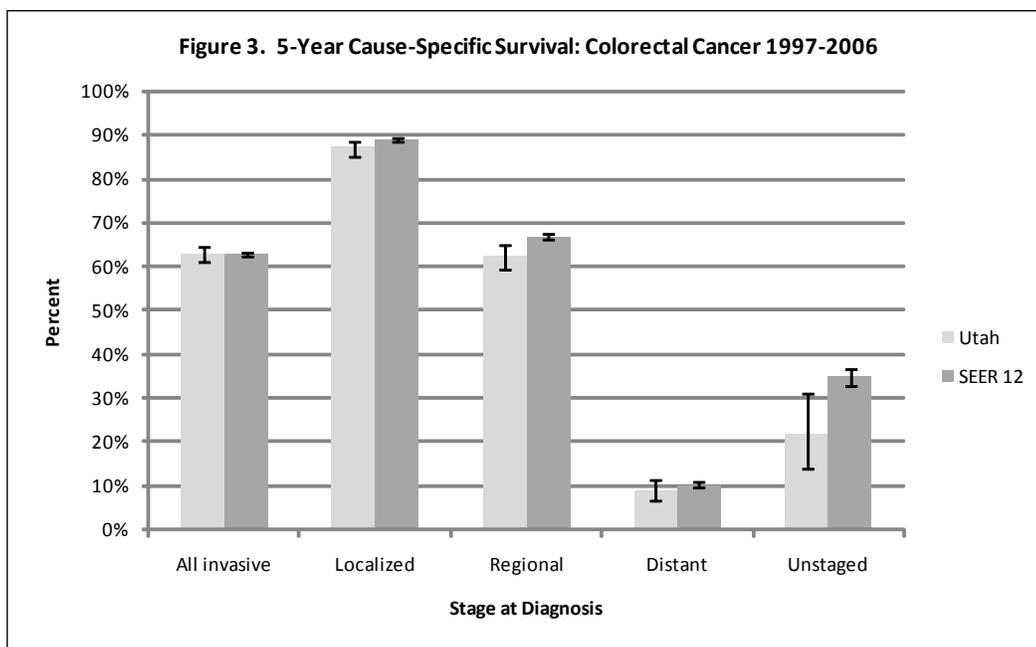
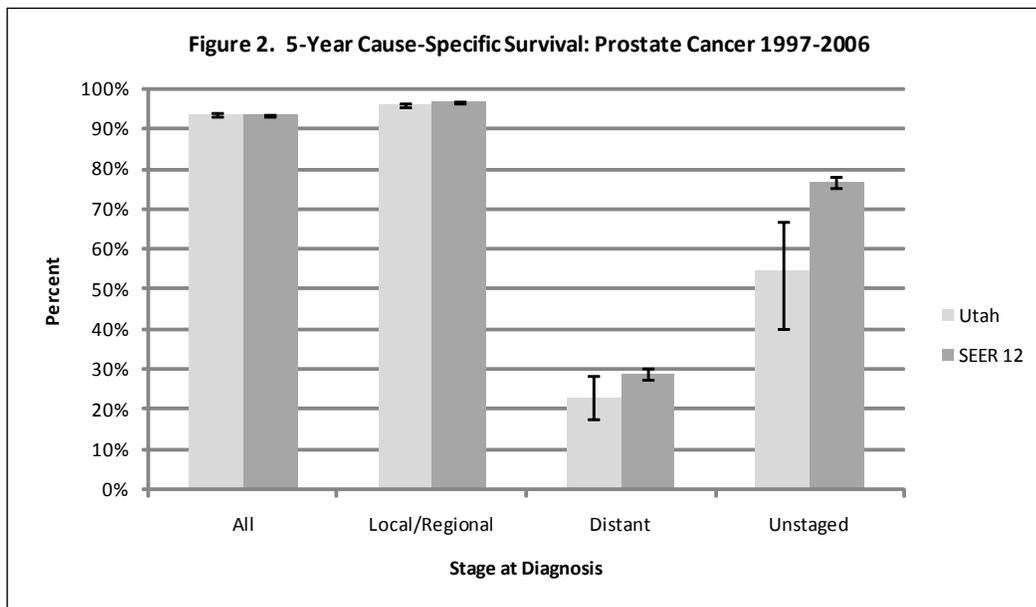
*** p < 0.001; ** p < 0.01; * p < 0.05

Table 3. Age, Stage, Vital Status, and Urban/Rural County Distributions Melanoma of the Skin: Utah and SEER 12 1997-2006

Cancer Type/Characteristic	Utah		US SEER 12	
	N	%	N	%
Melanoma	3,434		46,051	
Sex				
Male	1,892	55%	25,660	56%
Female	1,542	45%	20,391	44%
Age***				
20-44 years	1,100	32%	11,811	26%
45-54 years	680	20%	10,073	22%
55-64 years	614	18%	9,145	20%
65-74 years	513	15%	7,519	16%
75-84 years	406	12%	5,635	12%
85+ years	121	4%	1,868	4%
Stage***				
Localized	2,808	82%	38,415	83%
Regional	426	12%	4,926	11%
Distant	148	4%	1,490	3%
Unstaged/Unknown	52	2%	1,220	3%
Vital Status				
Alive	2,816	82%	38,018	83%
Deceased	618	18%	8,033	17%
Urban/Rural County*				
Urban	3,030	88%	41,325	90%
Rural	404	12%	4,718	10%
Unknown	0	0%	8	0%

*** p < 0.001; ** p < 0.01; * p < 0.05





disease was also notably lower compared to their SEER counterparts (Utah 54.8%, SEER 12 76.9%). Although Utahns with regional and unstaged colorectal cancer had significantly lower 5-year survival rates compared to SEER 12, when rates were stratified by sex the differences were no longer significant (results not shown). Survival differences were not significant for lung and bronchus cancer after controlling for stage at diagnosis. However, unlike colorectal cancer patterns, we found that differences in survival from lung and bronchus cancer persisted even after sex-stratification with Utah men and women experiencing poorer survival than their SEER 12 counterparts

63% for colorectal, 86% for female breast, 88% for melanoma, and 94% for prostate cancer. After controlling for several prognostic factors including stage at diagnosis, we found that there were no significant differences between Utah and SEER 12 in lung and bronchus cancer and melanoma survival. However, Utahns were 13%-15% more likely to die from female breast, prostate, and colorectal cancers than their SEER counterparts. There are a few caveats to our findings, however. First, these findings are restricted to adult (age 20+ years) non-Hispanic whites and comparisons to SEER 12 are limited to less than

(Utah men 11%, SEER men 13.4%, Utah women 15%, SEER women 18%) (results not shown). There were no significant differences in 5-year melanoma cancer survival between Utah and SEER 12. Cox PH models yielded similar results after controlling for age and stage at diagnosis, treatment, sex (except for breast and prostate), urban/rural status, and estrogen/progesterone receptor (ER/PR) status for breast only. We found that after controlling for factors known to influence survival, Utah men and women had a 13%-15% higher risk of dying from breast, prostate, and colorectal cancers in 5-years compared to their SEER 12 counterparts.

DISCUSSION

This study focused on 5 common cancers diagnosed in Utah, including female breast, prostate, colorectal, lung and bronchus, and melanoma cancers. The overall 5-year cancer-specific survival rates among adult, non-Hispanic Utahns diagnosed from 1997-2006 were 13% for lung and bronchus,

11% of the U.S. population (Surveillance Research Program, 2011b). The selection bias attributed to the limited coverage of SEER 12 affects our ability to generalize our findings to the broader U.S. population. Our restriction to adult, non-Hispanic whites also limits our ability to make generalizations to Hispanics, non-whites, and children under the age of 20. Second, we were unable to control for other factors that have been previously found to affect survival including other treatment factors such as receipt of chemotherapy, hormone therapy, immunotherapy, or prognostic biomarkers (Kelley, 2011; Kruger, 2007; Shashidhar-murthy, 2011; Dahlman, 2011). We were unable to control for these factors as they were either not available for both Utah and SEER 12 populations or were not collected for the entire time period under investigation. Unfortunately, we were unable to assess the impact of failing to control for these factors, although we suspect that the misclassification of treatment is non-differential by region; and, therefore, the estimates could be under- or over-estimated. Considering

the relatively small regional differences between Utah and SEER 12 (13%-15%), it is plausible that the Utah-SEER 12 differences could decrease after controlling for these additional prognostic factors.

Traditional cause-specific survival analyses often run the risk of underestimating true survival patterns as it heavily relies on cause of death information from death certificates which may or may not document cancer as a contributing cause of death. Our study approached this potential misclassification problem in two ways. First, we limited our analysis to individuals with a single primary cancer, increasing the likelihood that any cancer-specific cause of death would be attributed to the same cancer the individual was initially diagnosed with (Lund, et al., 2010). We also used cause of death definitions developed by SEER (Howlander, et al., 2010), which account for causes of death that are likely to be misclassified using traditional methods. Therefore, we chose to define

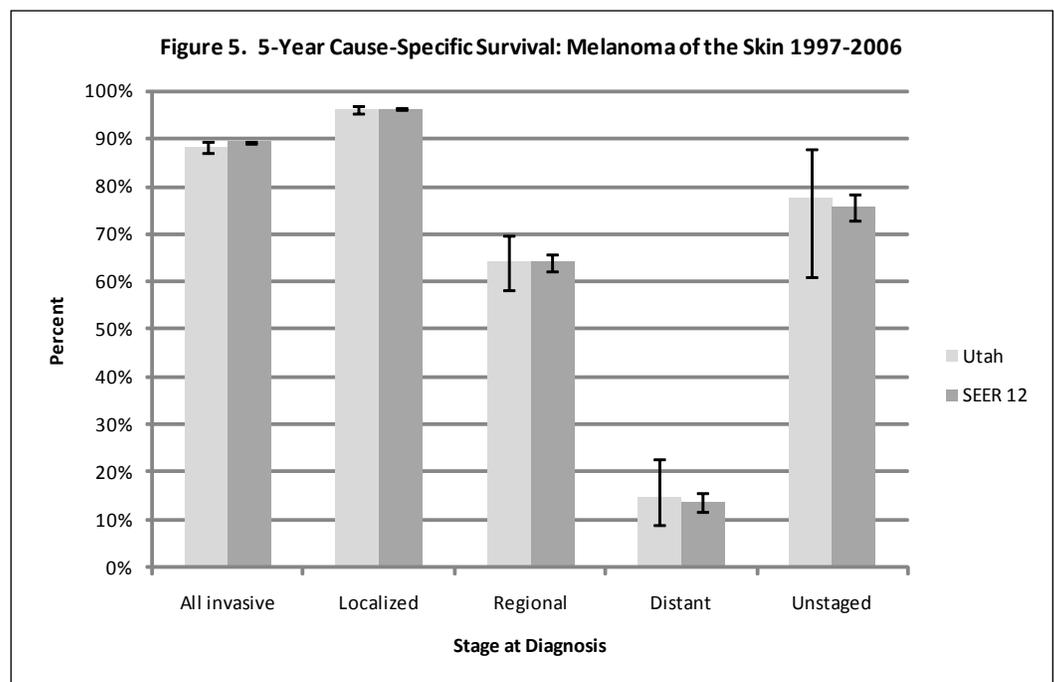
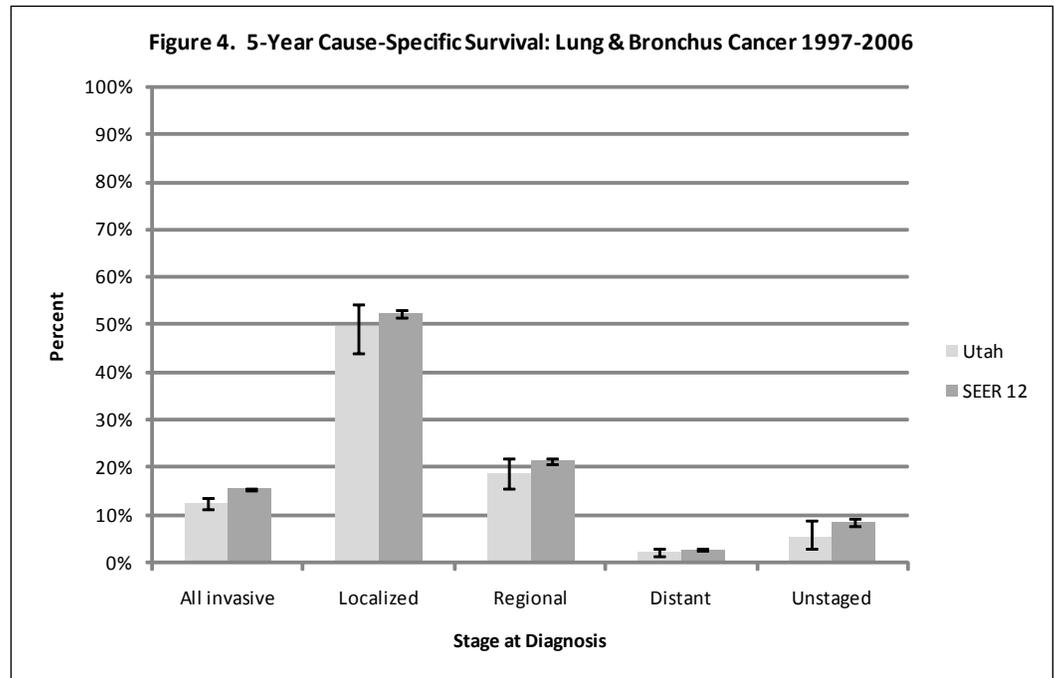


Table 4. Cox PH Results by Cancer Site: Utah Compared to SEER 12 1997-2006†

Cancer Type	Hazard Ratio	Pr < ChiSq	95% Confidence Interval	
			Lower HR	Upper HR
Breast (Female)	1.15	< 0.0001	1.08	1.23
Prostate	1.13	0.0012	1.05	1.22
Lung and Bronchus	1.03	0.1542	1.00	1.07
Colorectal	1.13	< 0.0001	1.07	1.19
Melanoma of the Skin	1.03	0.6449	0.92	1.15

† All models controlled for age and stage at diagnosis, urban/rural county designation, treatment, sex (except breast and prostate), and ER/PR status (breast only).

cancer-specific cause of death as deaths that are attributed to the same cancer site, a cancer death from within the general organ system, a cancer death from all other malignant cancers, or a death from AIDS with cancer. By utilizing these approaches, we believe that the cause-specific survival estimates and relative risks as compared to SEER 12 are more reliable.

Although not the focus of this study, the multivariate results from our Cox PH models followed expected patterns (results not shown). We found that individuals diagnosed with later stage disease, older age at diagnosis, reside in predominantly rural counties, or did not receive surgery or radiation as part of first-course treatment were at a significantly higher risk of death compared to individuals diagnosed at earlier stages, younger ages, reside in urban counties, or received surgery or radiation treatment. For colorectal, lung, and melanoma cancers, gender was also a significant factor with men experiencing higher risks of death compared to women. For female breast cancers, we found support for a recent national survival study which showed that ER+/PR+ women had significantly higher survival rates than women with other ER/PR statuses (Ries & Eisner, 2007). In this study, we found that ER-/PR- women had more than double the risk of dying from breast cancer than ER+/PR+ women.

Future research may include a more detailed examination of the race/ethnic and geographic patterns in the state of Utah as well as the incorporation of other treatment and prognostic indicators, which may attenuate the Utah-SEER 12 differences in 5-year survival for female breast, prostate, and colorectal cancers.

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Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 17 Regs Research Data + Hurricane Katrina Impacted Louisiana Cases, Nov 2009 Sub (1973-2007 varying) - Linked To County Attributes - Total U.S., 1969-2007 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2010, based on the November 2009 submission.

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Perspectives

2011

Utah's Health: An Annual Review

Awareness of Radon-Associated Health Risks in Utah

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ABSTRACT

BACKGROUND

Radon is the leading cause of lung cancer after tobacco exposure. Excess levels of radon when identified can be mitigated. The majority of states have a radon policy and the EPA recommends radon testing of all houses every 2 years.

METHODS

An anonymous survey was performed among Utahans to assess general awareness of radon and its associated health risks.

RESULTS

Of the 497 individual surveyed, 58% stated that they had heard of radon and 12.5% stated that their homes had been tested for radon. Of these, only 20% of respondents were able to correctly answer 4 basic questions regarding radon suggesting that the reported frequency of awareness may be overestimated. Radon testing did not differ according to age or gender, but renters (4.8%) were less likely to state that their living space had been tested compared to home owners (23.5%).

CONCLUSIONS

Overall, these data suggest a knowledge deficit related to the risks of radon in Utah. Residential testing is infrequent and these deficits may be greater for renters.

Lung cancer is the leading cause of cancer mortality in the United States (1) and radon is the most common non-tobacco related cause of lung cancer (2). While lung cancer deaths from cigarettes far exceed those from radon, risk estimates derived from epidemiologic studies of underground miners extrapolated to the USA population attribute 18,600 lung cancer deaths per year from radon (3). Case control studies of residential radon exposure support the association between radon and lung cancer (4,5). Accordingly, 39 states have policies that address radon as a public health hazard directly (6).

Radon is a natural, colorless, odorless radioactive gas that is emitted from the earth and collects in closed spaces such as houses and public buildings. It is most concentrated as it egresses from the earth and then dilutes into the atmosphere. Consequently, its concentrations are greatest in basements and well insulated, air-tight structures. Inhaled radon exposes the lungs to ionizing radiation. Prolonged exposure to high levels is associated with excessive incidence of lung cancer as its only known consequence (2-5).

The Environmental Protection Agency (EPA) ranks counties in the northeast of Utah in the highest category of radon exposure nationwide, while the rest of Utah is rated as intermediate exposure (7). Public records kept by the Utah Department of Health of radon levels from individual residences highlight the variations from house to house and suggest that counties other than those in the northeast may have the highest radon levels (8). Since radon can be detected only by radon testing, the EPA recommends testing every 2 years, but adherence to this guideline requires knowledge of the issue. Since Utah lacks a radon policy, the following survey was constructed to estimate the awareness and frequency of radon testing in the state of Utah and to aid awareness of those who participated.

METHODS

Members of the Huntsman Cancer Institute and the Utah Department of Environmental Quality (Division of Radiation) solicited students to perform a convenience survey regarding radon awareness and testing in the state of Utah. A convenience survey was chosen rather than a systematic sampling of the state to provide pilot data and to limit costs. In an attempt to provide an upper end estimate of radon awareness, the survey sites were chosen to enrich literacy and education. The survey was performed at the Salt Lake City Public Library and the University of Utah Eccles Football Stadium on 11/7/09, when a large fraction of alumnae were present.

Subjects were approached and asked to participate in an anonymous radon awareness survey. Individuals not willing to answer the full questionnaire were asked if they had heard of radon and whether their domicile had ever been tested. Their answers were recorded. The full version consisted of seven questions plus age and gender. Five questions queried radon knowledge, one asked whether their home had been tested for radon and the last asked whether they owned or rented. At the conclusion of the questionnaire, the subjects were given descriptive radon brochures outlining the answers to the questions and the web address (radon.utah.gov) at the department of Health where they could obtain further radon information

and a radon test kit.

The questions collected by the survey are summarized below. The data was evaluated for a global measure of radon knowledge, frequency of radon testing, age, gender and rental/ownership status. The radon-related questions plus demographic data were analyzed by descriptive statistics and regression with ANOVA.

RESULTS

The survey was performed on 11/7/09 under the direction of 23 volunteer survey assistants divided between the SLC Public Library and the University of Utah. There were 497 questionnaires administered and evaluated including 232 (47%) full surveys and 265 (53%) limited surveys. Of the total surveys, 58% of respondents stated that they had heard of radon and only 12.5% stated that their homes had been tested for radon.

There were 232 respondents who agreed to participate in the full survey. Their answers with 95% confidence intervals are listed below each question or statement.

Have you heard of radon (yes, no)?

100% (95%CI +/- 0.85)

Radon is a naturally occurring radioactive gas (true, false).

57.8% (95%CI +/- 6.4) correct

Radon levels can only be determined by a radon test (true, false).

73.7% (95%CI +/- 5.7) correct

The major health effect of radon is lung cancer (true, false).

38.3% (95%CI +/- 6.3) correct

Can high levels of radon be fixed (yes, no)?

82.8% (95%CI +/- 4.9) correct

Has your home been tested (yes, no)?

18.5% (95%CI +/- 5.0)

Do you own or rent living quarters?

Rent 26.7% (95%CI +/- 5.7)

Age (<45, 46-64, 65+)?

< 45 years 57.8% (95%CI +/- 6.4)

Gender (male or female)?

Male 66.8% (95%CI +/-6.1)

In this subset of responders who completed the full survey, virtually all subjects stated that they were aware of radon and 18.5% stated to have tested their house at some time for the presence of radon. Despite this universal stated awareness of radon, only 20% of respondents were able to answer the 4 basic descriptive radon questions correctly. Many individuals

confused radon tests with carbon monoxide monitors or smoke detectors. Hence, an awareness of the word “radon” did not imply knowledge of radon and raised the probability that the reported 18.5% radon testing rate may be an overestimate.

This subgroup of responders who completed all questions can be characterized as younger, male and more likely to own their home. Their age was less than 45 years in 58% (<45=58%, 46-64=30%, 65+=12%), gender was male in 67% (female=33%), 73% owned their own homes and 27% rented. When analyzed by multivariate regression, the frequency of testing for radon was not different according to age or gender, but renters (4.8%) stated that their living space had been tested less frequently than home owners (23.5%).

Of the group who answered the limited survey only, 22% claimed radon awareness compared to the 100% reported for the full survey. Renters were 43% of the limited survey population. Of this group, only 8.6% claim to have tested. Owners tested 13.2% and renters tested 3.8%.

DISCUSSION

Radon is the leading cause of non-tobacco related lung cancer. The EPA recommends testing for radon every 2 years. To comply with this recommendation, sufficient awareness of radon risk and the means to test are required. Of those answering the full survey composed of library patrons and university alumnae, only 20 % were able to answer 4 descriptive radon questions correctly and only 12% recalled ever testing for radon. This lack of awareness and testing were uniform across age and gender. Additionally, we believe these rates to be overestimates relative to the state of Utah since those sampled were queried from the Salt Lake City Library and a University of Utah function. These findings represent a deficit in knowledge of radon and testing rates that do not meet those recommended by the EPA.

Radon-induced lung cancer is a preventable cause of cancer, but only if awareness and motivation exist sufficiently in the population to test for it. The majority of states legislate some

form of radon policy. Most states merely provide a home buyer with a disclosure stating that radon is a health hazard that it can be measured and fixed. Other states require radon testing before ownership changes hands. Radon legislation in Utah in any form would likely improve radon awareness and testing. Alternately, an awareness campaign could be considered.

Renters appear to be a particularly vulnerable subgroup in terms of radon testing. Renters who completed either the full or limited survey believed their homes were tested in less than 5% of cases. Anecdotally, no renter queried stated that they had tested their homes themselves and stated that they believed that it was part of the rental process. Hence, we believe this rate also overestimates radon testing for renters. In other states, radon legislation exists to test public building, but rental properties have not been addressed.

Utah is a unique state in many ways that related radon exposure and lung cancer. Although the frequency of smoking (10) and risk of lung cancer are lower in Utah compared to all other states, lung cancer remains the leading cause of cancer mortality in Utah. Additionally, it is common practice to locate bedrooms in basements due to the dryness of climate and cooler temperatures in the summer. Since much of home time is spent sleeping and radon concentrations are greatest in basements, Utah radon exposure may be greater than other states with equal radon risk.

In summary, radon associated lung cancer is preventable and all major medical societies support testing. This survey identifies a radon knowledge deficit, which prevents testing, especially at the frequency recommended by EPA guidelines. Also, the survey has identified a renting subgroup of Utahans may be at greater risk from radon because their homes may have never been tested. An evaluation should be undertaken to test radon in apartments and public buildings. An awareness campaign or focused legislation would benefit the entire state.

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Community Readiness to Prevent Intimate Partner Violence: A University Needs Assessment to Health Education Practice

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ABSTRACT

KEYWORDS

intimate partner violence, Utah, university, needs assessment, evaluation, program development

BACKGROUND

Intimate partner violence (IPV) has been documented as an issue within Utah high school students and Utah university campuses. As the consequences for IPV impact the psychological and physical health of those who are victimized, pose significant health costs to the national community, and affects the well-being of the Utah community, prevention efforts should be sought and implemented.

METHOD

This study utilizes the Community Readiness Model (CRM) to conduct a needs assessment of IPV within a Utah university community. Structured interviews with key informant members of the university were conducted to assess the university according to the CRM dimensions.

RESULTS

Results indicated that evidence of initiatives existed in the form of policies to address IPV in all forms (i.e., psychological, physical, sexual, and threat of violence) and that educational outreach and poster presentation campaigns reflected sexual violence topics. However, interviews indicated that Utah university students did not have great knowledge related to IPV and that, although university leadership were supportive of IPV efforts, resources related to funding and capacity were significant barriers in the development and sustainability of long-term programs.

CONCLUSION

The results of the interviews demonstrated consistency with the CRM's goal for the assessed community stage of Preparation, which suggests improving IPV program efforts through evaluation and leadership support. It is recommended that Utah State resources are sought and provided to improve the Utah campus's program development and evaluation efforts in the area of IPV.

Defined as psychological, emotional, sexual, or physical violence, or threat of violence, including stalking and harassment, that is inflicted upon by a current or former partner or spouse (CDC, 2008), intimate partner violence (IPV) remains a public health concern. Public health costs were estimated to be equivalent to 8.3 billion per year in 2003 dollars, where \$4.1 billion dollars were related to medical and mental health care, and \$0.9 billion dollars related to economic productivity losses (NCIPC, 2003). Furthermore, IPV has been documented at a significant prevalence, with one study of eighteen states across the U.S. reporting that 26.4% of women and 15.9% of men experienced physical violence and/or sexual violence from intimate partners (Breiding, Black, & Ryan, 2008), while another U.S. study across forty-eight states found that most couples reported having engaged in bidirectional IPV, in which both partners engage in violence toward each other, and that differences in ethnicity emerged among Black, White, and Latino populations (Caetano, Ramisketty-Mikler, & Field, 2005).

Along with a high national prevalence and significant costs to the public, IPV poses health consequences to victims. For example, evidence has shown that women who are victimized by IPV have suffered long-term neurological injuries, gastrointestinal and reproductive health problems, other physical health problems (Leserman & Drossman, 2007; Shane & Ellsberg, 2002), and adverse effects on mental health, such as predicting behavioral disorders, psychiatric disorders, substance use disorders, and suicidal ideation (Afifi, MacMillan, Cox, Asmundson, Stein, & Sareen, 2009) and poor quality of life (Beeble, Bybee, & Sullivan, 2008). Males who are victimized by IPV are also negatively impacted in terms of psychological health, as studies have shown that IPV for males result in greater prediction of co-morbid psychiatric disorders and behavioral disorders (Afifi et al, 2009), while a university sample of male students victimized physical, psychological, and sexual IPV reported symptoms of depression, somatization, anxiety, and hostility (Próspero, 2007).

THE LOCAL COMMUNITY OF UTAH

For physical IPV victimization (i.e., “hit, slapped, or physically hurt on purpose by a boyfriend or girlfriend on purpose”), Utah female high school students reported a prevalence of 7.07%, 8.63%, 11.47%, and 11.37% among ninth, tenth, eleventh, and twelfth grade students respectively, in both 2005 and 2007 (Department of Health [DOH], n.d.). However, these statistics did not account for the percentage of dating violence in the form of psychological violence or threats of violence that have

been consistently documented in IPV relationships. Although “forced sexual intercourse” was measured in the same 2005 and 2007 cohort of students, it is unclear whether the response indicated the presence of other forms of sexual assault or if the responses included dating partners specifically; however, findings indicated that the prevalence of “forced sexual intercourse” were reported at 6.33%, 9.73%, 12.21%, and 15.58% for ninth, tenth, eleventh, and twelfth grade students, respectively. Of importance to note, is that participant response rates of Utah high school students decreased significantly after the initiation of the parental consent process for Utah school surveys between 1997 and 1999 [DOH, n.d.], suggesting that Utah high school students were less likely to report their experience with IPV when confronted with the requirement to request their parent’s permission to participate in the Youth Risk Behavior Survey. These statistics show that IPV among Utah female high school students are comparable to the U.S. prevalence of 6-13% (Morbidity and Mortality Weekly Report [MMMR], 2006).

Utah statistics of sexual violence in adults reached 29.3% of reported victimization from current or former intimate partners, 26.8% from friends, and 18.5% of acquaintances or co-workers (Utah Health Status Update, 2008); incidence rates of emotional and physical violence victimization represented 10% of adult Utah women (Utah Department of Health’s Violence and Injury Prevention Program [VIPP], 2008); and in 2005, there were 65 adult IPV-related suicides and homicides (VIPP, 2006). These statistics suggest that IPV is prevalent within the State of Utah and supports a recent study (Barco, Reel, Próspero, & Kumpfer, 2010) that shows that victimization is prevalent with a Utah university sample, which consisted of 91.9% Utah State residents.

COLLEGE COMMUNITIES

Research has evidenced that IPV is still prevalent within small communities, such as university campuses. An online sampling study (Fass, Benson, & Leggett, 2008) of IPV (i.e., psychological, sexual, and physical) prevalence and awareness of self-reported IPV perpetration or victimization showed that 35.2% experienced physical violence during their university career, higher than the average estimates of 20-30%. Although women had a higher rate of perpetration than men (38.1-33.8%), men tended to perpetrate violence at a higher frequency than women (19.0-8.1%). Prevalence rates indicated that 22.6% of students reported awareness of being physically victimized while in college and 29.4% reported awareness of their own perpetration of physical violence toward their partner.

Non-internet samples using university students found high prevalence of IPV victimization, (i.e., 82% psychological vio-

lence, 49% physical violence and 46% sexual violence), yet only 16% of IPV victims sought mental health services (Próspero, Vohra-Gupta, 2008, p. 382); the study indicated that embarrassment, cost of services, and mental health stigma were reasons for why IPV victims did not seek mental health care. These studies on IPV in university samples support the greater body of literature that indicate that IPV prevalence remains high within university communities and that barriers exist that prevent victims from seeking assistance.

In a study of a Coordinated Community Response program surrounding a college community, 15 respondent-service providers supported the view that “college-aged women were at higher risk for victimization” (Holtfreter & Boyd, 2006, p. 149). This is perhaps more reflective of sexual violence that Fisher, Cullen and Turner (2000) found to be the most common form of violence for college women. Yet, even where studies consistently demonstrate that women are at higher risk for IPV sexual victimization within college communities, other studies have shown that women who self-report perpetrating IPV against their male partners, 11% of female-perpetrated IPV were unidirectional, 28% bidirectional, and 5.5% of females were unidirectional-victimised (Orcutt, Garcia, & Pickett, 2005). These research findings suggest that sexual, physical, and psychological forms of IPV yield gender differences based on perpetration or victimization for college communities, and that college primary and secondary respondent-service providers (e.g., Residence Assistants, Counselors, Campus Police, etc.) to IPV should consider these differences.

Holtfreter et al. (2006) found that college service providers reported that alcohol and “underage drinking in dorms and Greek housing” increased students risk for IPV victimization (p. 149). This is consistent with a study by Fossos, Neighbors, Kaysen, and Hove (2007) who found that university students “who reported lower alcohol aggression expectancies, alcohol-related problems were positively associated with IPV perpetration”; however, the findings were not significant among those who reported higher alcohol aggression expectancies in relation to alcohol-related problems and IPV perpetration (p. 710). In addition, the findings of this study (Fossos et al., 2007) found gender differences, such that, “for men but not for women, subjective evaluations of alcohols effects on aggression are associated with a stronger and positive relationship between alcohol-related problems and IPV perpetration” (p.711). This suggests that although alcohol related problems are associated with IPV perpetration among university students, it is associated with increased IPV perpetration only when students do not recognize the potential for aggression to increase with the use of alcohol, and that men’s “favorable” beliefs about the consequences of

alcohol on aggression was a strong predictor of alcohol-related problems and IPV perpetration.

PURPOSE OF THE CURRENT STUDY

The purpose of this study is to assess barriers and strengths (i.e., needs assessment analysis) for program development and evaluation of an IPV prevention intervention by applying the Community Readiness Model (CRM) (Plested, Jumper, Edwards, & Oetting, 1998; Plested, Edwards, & Jumper-Thurman, 2006) to explore various dynamics related to IPV efforts within a local university community of Utah. The CRM has been used in previous research on community IPV assessment (e.g., Brackley et al., 2003) and holds promise for addressing IPV, providing a qualitative measurable approach using structured interviews with key informant community members to understand community feelings and attitudes toward the issue of IPV, knowledge of signs and symptoms, identifying resources and capacity issues, and discussing weaknesses and strengths of existing community interventions.

The CRM was developed by researchers at the Tri-Ethnic Center for Prevention Research at the Colorado State University for the purposes of determining systematic levels within the model of “readiness” to determine the strengths and barriers of a community in addressing IPV. Evaluating the community’s readiness is beneficial as it assists them in initiating their own development of strategies for progressive movement to improving efforts (Plested, Edwards, & Jumper-Thurman, 2006).

METHODS

Key informants from organizations and groups within the local Utah university, such as student groups and student centers, were invited to participate in the study. This selection procedure was based upon the CRM’s instructions to select 4-6 key informants who are connected to the topic of IPV and to represent different segments of the community.

Five (of the six maximum possible) key informant interviews were conducted with 3 male and 2 female respondents. Interviewees represented the University Counseling Center (UCC), Women’s Resource Center (WRC), Office of the Dean of Students, Housing Education Program (HEP), and University Police Department (UPD).

After obtaining informed consent, respondents participated in a 30-60 minute structured Community Readiness Model (CRM) interview with one of the authors. Each interview consisted of approximately 36 questions based upon the CRM’s six dimensions of community readiness (Plested, Edwards, & Jumper-Thurman, 2006), including *Community Climate*, *Community Knowledge About the Issue*, *Resources Related to the*

Table 1. Six Dimensions of the Community Readiness Model in which Interview Questions are based

	Community Stages
Community Efforts	What efforts, programs, and policies exist to address IPV
Community Knowledge of the Efforts	What the community knows about programs, policies, efforts and if they are accessible to all community populations
Community Leadership	The support and awareness of the issue by the formal leadership in the community
Community Climate	The attitudes/feelings in the community about the issue
Community knowledge about the issue	The awareness or knowledge of people in the community specific to IPV
Resources related to the issue	The current support for the issue and how active the community is in obtaining or using local resources to address the issue

Table 2. Anchored Rating Scale for Scoring CRM Dimension Leadership

Anchored Scale	Rating Statement
1	Leadership has no recognition of the issue.
2	Leadership believes that this is not an issue in their community.
3	Leader(s) recognize(s) the need to do something regarding the issue.
4	Leader(s) is/are trying to get something started.
5	Leaders are part of a committee or group that addresses this issue.
6	Leaders are active and supportive of the implementation of efforts.
7	Leaders are supportive of continuing basic efforts and are considering resources available for self-sufficiency.
8	Leaders are supportive of expanding/improving efforts through active participation the expansion/improvement.
9	Leaders are continually reviewing evaluation results of the efforts and are modifying support accordingly.

Issue, Community Efforts, Community Knowledge of Efforts, and Community Leadership (see Table 1).

The researcher asked each participant all CRM questions that were required to score the interviews for each CRM dimension, consisting of 20 total questions. Examples of the CRM questions under each dimension were: “Please describe the efforts that are available in your community to address IPV” (*Community Efforts*); “What does the community know about these efforts or activities?” (*Community Knowledge of Efforts*); “How are these leaders involved in efforts regarding IPV? Please explain” (*Leadership*); “What are the primary obstacles to efforts addressing IPV in your community?” (*Community Climate*); “How knowledgeable are community members about this issue? Please explain.” (*Knowledge About This Issue*); and “To whom would an individual affected by this issue turn to first for help in your community? Why?” (*Resources for Prevention Efforts [time, money, people, space, etc.]*). Sixteen additional questions

were offered by the CRM as supplemental, for the purpose of gaining a deeper understanding of dimension readiness; some of these supplement questions were omitted due to redundancy or irrelevance to understanding IPV efforts, for example, “Describe the university community.”

ANALYSIS

Each interview (UCC, WRC, Office of the Dean of Students, HEP, and UPD) was thoroughly reviewed to initially identify any important themes consistent with the CRM dimensions. Next, the researcher reviewed anchored scores for each individual CRM dimension (e.g., *Existing Community Efforts*). Following a thorough review of each interview and CRM dimensions, the researcher determined which level best reflected the community’s current state in terms of each CRM dimension for individual interviews. For example, one key informant received a rating of “6.9” under the dimension of *Leadership* based on the researcher’s interpretation that the interview indicated the progression from scales 1 (“Leadership has no recognition of the issue”) through 6 (“Leaders are active and supportive of the implementation efforts”), but have not yet reached scales 7 (“Leaders are supportive of continuing basic efforts and are considering resources available for self-sufficiency”) through 9 (“Leaders are continually reviewing evaluation results of the efforts and are modifying support accordingly”) (see Table 2). The researcher recorded each interview’s anchor rating for each CRM dimension, in addition to a written description of the *Rationale for Rating* of each dimension. For example, in the same previous key informant’s interview that received a “6.9” rating for *Leadership*, the rationale provided for that dimension was “Based on this interview, there was evidence of a great number of ‘leaders’ specific to IPV and those who are supportive of the program implementation efforts. However, the debate and lack of consensus on the model/methods to use in addressing IPV on campus has led to a ‘hindrance to the work they are all trying to do.’ Additionally, it does not seem that the leadership efforts have spanned across campus to include non-student groups.”

Table 3. Example of Individual Score for One Key Informant from the Anchored Scale of the CRM Dimension Leadership

Rating	Rationale for Rating
6.9	Based on this interview, there is evidence of a great number of “leaders” specific to IPV and those who are supportive of program implementation efforts. However, the debate and lack of consensus on the model/methods to use in addressing IPV on campus has led to “a hindrance to the work they are all trying to do.” Additionally, it does not seem that leadership efforts have spanned across campus to include non-student groups.

(see Table 3).

The researcher recorded the anchored ratings of each CRM dimension for each individual key informant under the Community Readiness Assessment Scoring Sheet (see Table 4), then calculated the total score of the Utah university community by adding the individual scores (UCC, WRC, Office of Dean of Students, HEP, and UPD) together for each dimension and taking the average of the Total Calculated Stage Scores (see Table 5) to obtain an overall Community Readiness score for the Utah university community. .

RESULTS

Overall, key informants from various university communities revealed similar themes for each dimension (see Table 6), agreeing on existing efforts, needs related to capacity and resources, community knowledge and recognition of signs and symptoms of IPV, and local data. Each interview provided evidence that, with regards to the first dimension, *Community Efforts*, the university community considered intimate partner violence a “high priority,” evidenced by existing university policies and procedures to work with the issue on campus. Furthermore, existing efforts were reported by several interviewees; however, these tended to focus on addressing sexual violence against women, although one sub-community mentioned a past collaboration presentation with international students, dating norms, and dating violence.

Programs and activities included educational outreach programs, such as “Take Back the Night” and theatre presentations, poster campaigns on sexual violence in the housing residence program, outside partnerships with the Utah Coalition Against Sexual Assault (UCASA) and the Rape Recovery Center (RRC) on sexual violence trainings and presentations, and one or two student peer groups. However, most of these programs did not

Table 4. Individual Scores of Each Key Informant

Interviews	#1	#2	#3	#4	#5
Dimension A (<i>Community Efforts</i>)	7.0	7.0	6.0	5.9	6.0
Dimension B (<i>Community Knowledge of Efforts</i>)	5.9	6.5	3.5	4.5	3.9
Dimension C (<i>Leadership</i>)	6.0	6.9	2.9	6.0	6.0
Dimension D (<i>Community Climate</i>)	6.0	7.0	3.1	5.0	7.0
Dimension E (<i>Community Knowledge About the Issue</i>)	4.5	5.5	4.0	3.2	3.2
Dimension F (<i>Resources Related to the Issue</i>)	3.2	6.0	4.0	4.5	4.5

Table 4. Average Overall Community Readiness Score by Total Dimension Scores

Dimension	Total Dimension Score	÷ # of Interviews	= Stage Score
Community Efforts	31.9	5	6.38
Community Knowledge of Efforts	24.3	5	4.86
Leadership	27.8	5	5.56
Community Climate	28.1	5	5.62
Community Knowledge About the Issue	20.4	5	4.08
Resources Related to the Issue	22.2	5	4.44
Total Stage Scores			30.94
Average Overall Community Readiness Score			5.16

evidence general long-term sustainability, nor did they evidence addressing IPV directly or addressing all forms of IPV other than sexual violence.

On the *Community Knowledge of Efforts* dimension, interviewees indicated that campus prevention efforts for IPV are evident, especially for Greek organizations and incoming student-athletes. New students coming to the housing residence on university premises are exposed to poster campaigns on sexual violence, and there are programs that occur through the housing residence education component, but specific descriptions of programs on IPV were not provided; however, the housing residence program noted they have a trained staff who works directly with the Women’s Resource Center on trainings and connecting the housing residence education component to program initiatives.

Interviews indicated that the university community as a whole, and specifically that “leadership” (i.e., *Community Leadership* dimension), is generally very supportive of IPV intervention efforts. Most university organizations felt that they

Dimension of Assessment	Rating	Rationale for Rating
Community Efforts	Preparation	Evidence of policies and leader-knowledge of policies on IPV; Existing programs and activities for several years, more specifically towards sexual violence; Activities are often collaborated with university sub-community partners and local city/State partners to include trainings and education outreach.
Community Knowledge of Efforts	Preparation	Educational outreach initiatives are targeted mainly to student groups, such as Greek organizations, and new incoming student athletes had previously been targeted (past effort). Poster campaigns have been implemented in housing residence, which target approximately 50% of the student population. Overall, programs have typically remained within these sub-community pockets, and outreach may be difficult beyond students represented here.
Community Leadership	Preparation	Overall, university "leaders" have been supportive in any program related to addressing IPV. Most organizations report not having issues with locating funding when necessary; however, reports have noted that the Women's Resource Center, one of the main "frontlines" for addressing the issue of IPV, has a need for increased funding and capacity.
Community Climate	Preparation	Relevant organization "leaders" show "concern" and "responsibility" in addressing IPV through policies, trainings, and program initiatives. However, non-leadership, such as the overall community members (e.g. students not involved in these organizations), don't reflect an interest in addressing IPV as an issue.
Community Knowledge of IPV	Preparation	"Overall, the campus does not have great knowledge of IPV." Those students who have received educational outreach initiatives have been rated as "somewhat knowledgeable to knowledgeable," and those who have some awareness of the issue may not know how to address it.
Resources Related to IPV	Preparation	For most university organizations, resources for IPV have not been regarded as a barrier to promoting/implementing programs. Many respondents reported capacity for implementing programs was a barrier, and one organization noted that funding was a significant barrier for program development. There was no indication of expansion of programs or developing self-sustainable programs that would consider funding as a potential barrier.

CRM Stage	Program Goal
No Awareness	Raise awareness of the issue.
Resistance	Raise awareness that the problem or issue exists in this community.
Vague Awareness	Raise awareness that the community can do something.
Preplanning	Raise awareness with concrete ideas to combat condition.
Preparation*	Gather existing information with which to plan strategies.*
Initiation	Provide community-specific information.
Stabilization	Stabilize efforts and programs.
Confirmation/Expansion	Expand and enhance services.
High Level of Community Ownership	Maintain momentum and continue growth.

could obtain the necessary resources with regards to funding, space, and incentives necessary to promote activities. However, these have typically been small funds to support short-term programs, and there was no evidence of interventions that are implemented on a continuous cycle and evaluated for results. Furthermore, two interviews indicated specific issues with funding to increase capacity of the Women's Resource Center, which has been identified as a major barrier for program implementation and recruiting student interest. The Women's Resource Center was identified as the "frontline" and primary center to which students who encounter IPV, sexual violence, and "violence against women" are referred..

The attitudes and feelings related to the issue of IPV, rated by the *Community Climate* dimension, reflected that relevant community organizations took "responsibility" for IPV by evidence of their emphasis and knowledge of policies and trainings for victim advocacy. However, outside of the relevant community organizations and sub-community pockets that do show support for efforts, community members (e.g., students) don't reflect an overall interest in addressing IPV as an issue. Interview respondents on *Community Knowledge* about IPV indicate that overall, students possess "surface-level knowledge" of IPV, may not think "it's a problem," and may not know how to address it. The small proportion (350 out of 30,000 students) that constitute the student groups who are targeted for IPV educational outreach initiatives would be rated as "somewhat knowledgeable to knowledgeable," but that "overall, the campus does not have great knowledge of IPV."

For most university organizations, "resources related to the issue" of IPV have not been regarded as an issue that prevents them from providing services. Some organizations have regularly advocated for funds for providing educational outreach to student groups, between \$1,000-2,000 on average of 1-2 times per year. It was agreed upon by two respondents that the Women's Resource Center, one of the main centers which provides services of this type, reports that funding is a significant barrier to promoting programs related to IPV and sexual violence. In addition, many organizations who suggested that funding was sufficient, have not sought funding for more self-sustainable programs. More than three respondents indicated a need for greater capacity and personnel to implement programs on IPV.

The overall *Community Readiness Score* revealed that, according to the Community Readiness Model, community efforts and climate surrounding the issue of IPV are in *Preparation* stage. Thus, according to the model, the steps for improving IPV efforts include "gather existing information with which to plan strategies" (see Table 7). Specifically, the model suggests that conducting surveys on relevant IPV information across campus,

sponsor community events to promote efforts, conduct focus groups to develop strategies from a base level, utilize "key leaders and influential people to speak to groups and participate in local radio and television shows," and evaluate efforts.

DISCUSSION

This study utilized qualitative interviews using the Community Readiness Model (CRM) of Prevention as a framework to understand barriers, strengths, and needs for program development and evaluation of intimate partner violence resources within a Utah university. Findings indicated that IPV has been addressed through educational outreach programs with small university groups, such as Greek organizations and incoming university athletes and a poster campaign effort through the student housing program. These programs have targeted sexual violence but have not addressed other forms of IPV, such as stalking, harassment, psychological, and physical forms of violence; although one organization reported having collaborated on dating norms and dating violence for international students. As some programs are implemented within subgroups of the university's community, it is unclear if programs are reaching students beyond its present efforts and if these students are in need of such programs. Based on these findings, it is recommended that the Utah university conduct a more comprehensive evaluation of its IPV programs, including the use of quantitative surveys and interviews/focus groups, to assess if IPV is addressed in multiple forms, determine the target population of these programs, and determine their effectiveness. Evaluations should be considered using students and leadership with this issue.

Secondly, the CRM analysis show that programs and community leaders have responded to IPV with a focus on female victims and male perpetrators approach. Although the literature indicates that women are victimized by IPV and men have been perpetrators, it has been found that women also perpetrate similar forms of IPV against their male partners, that men and women use violence in intimate relationships at various degrees of severity, and that men are victimized and also adversely affected by IPV. As the findings of this study show that IPV programs tend to focus more on sexual violence, the approach to emphasizing the victimization of women may be validated by the literature that suggest that women are disproportionately victimized by this type of IPV. With regards to the issue of gender, informants of this study have reported the need for male program implementers and presenters on IPV and for the need of a men's resource center to the male student population. In this aspect, surveys can be distributed to these resource centers and groups to explore the potential for male victimiza-

tion within all forms of IPV. As funding was identified as a significant barrier to improving the Women's Resource Center's IPV program development and evaluation, Utah State funders should support development of IPV program outreach and evaluation through the Women's Resource Center and for the development of a Men's Resource Center.

Addressing IPV within a Utah campus community tended to reflect a treatment approach rather than prevention. This supports the view by one respondent who described the overall community efforts to IPV as a "mop-up approach" and suggests that many community members identify IPV when students address their concern for safety and health. Literature shows that students tend not to seek services when experiencing IPV within their own relationships due to financial cost, stigma, or embarrassment. Other literature indicates that other university student samples have shown a failure to recognize the signs and symptoms of IPV in their own relationships. Given these findings, future studies are needed to investigate how the Utah university community, including students and leadership, identify IPV, should be included in the recommended evaluation efforts (e.g., surveys, focus groups) suggested previously.

Finally, capacity has been identified as a barrier. Although capacity was broadly defined by two key informants, capacity was also referred to as "more time," "people and resources," "money," and "funding." Three of the five key informants identified funding as the primary obstacle for capacity; one key informant referred to the WRC as "definitely...not having funding", while another key informant stated that there was "no compensation for time and efforts of students" to develop and maintain an interest to implement peer-to-peer educational programs., These findings indicate that funding can lead to long-term sustainability of IPV programs, as the results of the study identified that the tended to be temporal and student-driven. One university

organization has tended to collaborate with students to implement educational outreach programs that are generally short-term. More resources to increase capacity are needed in this area and can only be accomplished through determining need (i.e., using evaluation efforts) and providing funding to increase staff support and resources. Promising areas of past and present program implementation include informant-outreach to local city and State community organizations, such as the Utah Coalition Against Sexual Assault (UCASA) and the Rape Recovery Center (RRC) to promote addressing sexual violence and IPV. Leadership and funding support is need for continued capacity and sustainability in these important efforts.

CONCLUSION

Overall, the Utah university community is very supportive of initiatives related to intimate partner violence prevention and treatment for the student population. Based on this initial assessment, further evaluation efforts are needed to identify how the university community, including organizational leaders, define and identify IPV, as well as evaluation of program goals, processes, and effectiveness of the educational outreach efforts on IPV. This finding supports the Community Readiness Model's goal for the community stage of *Preparation*, to "gather existing information for which to build strategies." The CRM is limited, however, by failing to recognize the strengths of the community in promoting programs and supporting student activities related to IPV, such as the university's overall efforts in addressing IPV. These strengths have been highly evident in this community through their commitment to the health and well-being of the student population, and their successes in implementing various types and levels of efforts and activities to increase awareness and education about intimate partner violence.

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Working with Individuals with Intellectual Disabilities in Healthcare Settings: Body Image and Eating Disorder Concerns

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KEYWORDS

eating disorders, disordered eating,
body image, intellectual disabilities

ABSTRACT

Individuals with intellectual disabilities are often overlooked for identification and treatment of eating disorders and body image disturbances. In fact, many eating disorder treatment facilities will admit clients with physical disabilities while screening out individuals who have lower IQ scores.¹ According to stigma theory individuals with disabilities possess “discrediting attributes” that prevent them from meeting culturally constructed appearance norms and therefore, may face judgment about one’s body.² Individuals with disabilities report being unable to achieve the societal ideal of masculinity or femininity. As a result they may face a decreased sense of self worth, poor body image, and in some cases may be vulnerable to developing eating disorders. The purpose of this perspective is to bring attention to the unique needs of individuals with intellectual disabilities who struggle with body image and eating disorders for Utah healthcare professionals. The intersection of health/mental health issues and individuals with intellectual disabilities is especially critical given the heightened vulnerability that emerges for those who are affected and healthcare professionals providing treatment. Clinical implications and suggestions for treatment and prevention interventions will be discussed.

In the United States over 10 million individuals suffer from eating disorders including anorexia nervosa, bulimia nervosa, and binge eating disorder. At the time of this article, the current eating disorders rates in Utah are unknown. Eating disorders represent the highest mortality rate of any psychiatric disorder, are the third most common cause of death among adolescent females, and cause numerous medical consequences.^{3,4} Individuals with binge eating disorder who become overweight or obese face additional health complications such as increased risk for heart disease, Type II diabetes, and asthma.^{5,6} Body image (i.e., body dissatisfaction) serves as a major predictor of one's tendency to develop a clinical eating disorder or disordered eating behaviors (e.g., restricting food intake, purging methods, binge episodes). Although body image has been studied extensively within the general population, individuals with disabilities have been largely ignored and understudied.⁷

Currently there is no reliable data that exists on the prevalence of intellectual disabilities in Utah. The nationally projected prevalence rate of individuals with an intellectual disability is 1.8%⁸ and approximately 50,122 people in Utah are estimated to have an intellectual or developmental disability.⁹ Out of the 50,122 estimated people with an intellectual disability, approximately 4,400 are receiving services from Utah Division of Services for People with Disabilities (DSPD) and 1,985 individuals are on a wait list to receive services.¹⁰ Therefore, the purpose of this paper to create awareness among health professionals about body image and disordered eating concerns among individuals with intellectual disabilities. Additionally, this perspective will discuss clinical implications for working with persons who have intellectual disabilities.

Body image and physical self perceptions of people with intellectual disabilities need to be explored further to understand whether individuals with intellectual disabilities exhibit similar rates of body dissatisfaction, body image disturbances, and disordered eating as the general population. Whether individuals with intellectual disabilities endorse a similar body ideal and preference to that portrayed in the media is currently being explored by the authors and assessment tools need to be tested for efficacy with this population. Current body image and eating disorder scales should be modified when needed; however, people with mild and moderate intellectual disabilities should be able to use most current measures with support (i.e., reading or clarifying the questions).^{11,12} Future research exploring eating disorders, obesity, and body image should include abnormal eating behaviors. For example, individuals with genetic disorders (e.g., Turner's syndrome) may demonstrate disordered eating behaviors related to their medical condition. Therefore, a mental disorder diagnosis (i.e., clinical eating disorder) would

not be appropriate in this case.

INTELLECTUAL DISABILITIES

Individuals with intellectual disabilities represent a largely marginalized population within the disabilities community and have been excluded from most scientific studies.¹² Intellectual disabilities (ID) are defined by three identifying criteria: (1) below average intellectual functioning (IQ < 70 or IQ-equivalent), (2) deficits in adaptive daily functioning (for example: may need assistance with hygiene, budgeting of finances, transportation to/from appointments, etc.), and (3) the disability is present before 18 years of age.¹³

Poindexter and Loschen (2007) outlined the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria for anorexia and bulimia nervosa and adapted it for people with severe to profound intellectual disabilities.¹⁴ Part of the criteria for anorexia nervosa involves the refusal of gaining weight and maintaining age appropriate body weight. For example, a person with a severe or profound intellectual disability may exhibit his or her fear of gaining weight by avoiding food and restricting at meals. Approximately 6% - 42% of adults with intellectual disabilities in a hospital setting met the criteria for a clinical eating disorder including anorexia nervosa, bulimia nervosa and eating disorder not otherwise specified (EDNOS) (e.g., binge eating disorder).¹⁵ Another 19% in a community setting had a diagnosable eating disorder.¹⁵ However, these rare studies included individuals diagnosed with pica, severe or profound intellectual disabilities, autism, and other developmental diagnoses or genetic syndromes that tend to be more behavioral in nature. Individuals who fit several of these diagnoses or syndromes will exhibit "eating disorder-like characteristics," however, the similar presentation of the psychopathology within individuals with intellectual disabilities and eating disorders makes it challenging to distinguish an intellectual disability from an eating disorder.¹⁶ Additionally, while the intellectual disability and eating disorder may co-exist, it is important to differentiate a person who is appropriate for a dual diagnosis from one with only an intellectual disability.

Binge eating disorder is present for a subgroup of the obese population. A study conducted on the intellectually disabled population found that people with intellectual disabilities have twice as many health problems as the non-intellectual disabled population who partake in the same everyday practices.¹⁷ Obesity and sedentary lifestyles are linked to many health problems such as cardiovascular disease, diabetes, hypertension, and various cancers.¹⁸ According to van Schrojenstein Lantman-de Valk et al. (2000) individuals with intellectual disabilities are three times more obese than the general population.¹⁷ Another

study found that the prevalence of obesity among males with an intellectual disability is between 11.7% - 26.5% as compared to 3.9% - 23.1% in the male non-intellectual disabled population.¹⁹ Among females with an intellectual disability the prevalence ranges from 23.1% - 58.5% while the prevalence of obesity among the females of the non-intellectual disabled population ranges from 3.6% - 28%.¹⁹

Although there is a paucity of studies about eating disorders and autism spectrum disorders (ASD), it has been suggested that there is a genetic link between autism and anorexia.²⁰ An individual on the autism spectrum disorder would present with impaired social interaction skills (i.e., eye-to-eye contact), communication skills (i.e., verbal or non-verbal), and having repetitive and stereotyped patterns of behavior or interests (e.g., flapping of hands or fingers). ASD can be mistaken for meeting the clinical criteria of disordered eating due to unique food behaviors. However, it is important to distinguish between food selectivity (i.e., being narrow in food choices) versus food refusal with the desired goal of losing weight. Food selectivity is common across individuals with ASD due to difficulties with food textures and sensory concerns rather than calories.²¹ This would be a significant factor for healthcare professionals working with an individual with an eating disorder because the selectivity of food is typical for an individual with ASD. Interestingly, 18% - 23% of adolescent girls with anorexia nervosa exhibited symptoms of Asperger's Syndrome.²² This overlap between the disorders complicates healthcare options as individuals with intellectual disabilities may not respond to traditional eating disorder interventions (i.e., residential eating disorder treatment which is set up for individuals without an intellectual disability).

According to the federal definition individuals with traumatic brain injury (TBI) may meet the criteria for individuals with intellectual disabilities, if the onset is before 18 years old¹³ or before 22 years old.²³ However, an individual that experienced a TBI after 18 or 22 years of age (depending on definition) would not be identified as intellectually disabled per the federal and clinical definitions. Additionally, given their limited functionality and need for support in completing daily tasks, individuals with TBI may have a clinical presentation similar to those with an intellectual disability. Health educators and clinicians have mistakenly treated an individual with a TBI as an individual with intellectual disabilities. This impacts the treatment approach a healthcare professional would provide because the individual with a TBI would have experienced life differently than someone with an intellectual disability (i.e., memories and life maturity) and possibly changed their life coping mechanisms. Individuals who have been able-bodied prior to experiencing

TBI report strong dissonance and their body image is influenced by the degree of lack of sensory input, muscle atrophy, and the feelings associated with wearing a prosthesis.²⁴ Individuals who had a stroke and individuals with TBI exhibited clear dissatisfaction for body parts affected by brain injury (e.g., scars).^{25,26} Females with brain injuries were more likely to report body dissatisfaction than a female comparison group, 47% scored above the cut-off score for body dissatisfaction on the Eating Disorder Inventory and 7.7% scored above the cut-off score for Drive for Thinness which indicates a risk toward the development of eating disorders and body image disturbances for women with TBI and stroke.²⁶

CLINICAL IMPLICATIONS

For healthcare professionals it is advised to treat the client as an individual rather than generalizing an approach based on disability or group membership. Current research (e.g., Potgieter & Khan, 2005)²⁷ shows that individuals with disabilities both celebrated and experienced shame surrounding their bodies. It is suggested that clinicians explore the client's meaning and perceptions of his or her body. The healthcare professional should avoid making assumptions about a client's preferred size or degree of body dissatisfaction based upon whether a client appears visibly overweight or underweight.

In order to diagnose individuals who have intellectual disabilities with an eating disorder or another DSM-IV TR diagnoses, the healthcare professional needs to gather additional information and input from multiple sources. Family, staff, co-workers, employers, and observers can provide information about the individual's perception of self.¹⁴ Furthermore, the healthcare professional should clarify whether the eating disorder behavior is related to an intellectual disability, genetic syndrome or another medical issue to avoid providing inappropriate and ineffective treatment and should be well-versed about different disabilities in order to conceptualize the appropriate treatment approach. For assessment purposes clinical interviews are usually the most informative, however, several sessions may be required to develop an accurate clinical picture. Therefore, the healthcare professional should develop rapport with the client and with permission gather any available collateral information (i.e., previous psychiatric evaluation, psychological testing, psychosocial histories, healthcare records or information from support systems).

Healthcare for an individual with an intellectual disability involves the same treatment approaches the healthcare professional would use with any client with disordered eating and body image disturbances. However, the delivery of these approaches will need to be modified for the client to benefit fully

from treatment. For example, the healthcare professional may need to adjust his or her rate of speech, vocabulary, and expectation for therapeutic change. Rapport building and establishing trust is essential for the therapeutic relationship. Developing this relationship may require more sessions than someone without intellectual disabilities due to high staff turnover rate, inconsistent support systems and abuse history that may impact the relationship development. Furthermore, the treatment progress may be slower and timeline may be extended. The treatment goals should be measurable; however, the goals may need to be more specific or “smaller” key goals achieved as part of the larger therapeutic plan. In order to have an accurate clinical picture, the healthcare professional will need to check in with the client and his or her support systems (e.g., family, staff), gather progress reports, track behaviors and possibly work on creating an individual behavior support plans. Using a behavioral approach, individual behavior support plans target specific behaviors, such as eating behaviors and how the family or staff are providing a structure of support for healthy meals. The most important piece is to join the client in the present and to remember that an individual with a disability is a person with his/her own thoughts and feelings.

RECOMMENDATIONS FOR HEALTH EDUCATORS

It is important for healthcare professionals to tailor approaches to promote positive body image, physical activity, and healthy nutrition to the environment and needs of individuals with disabilities.²⁸ Food choices are often determined by availability of food in house and by the decisions of house managers or family members rather than client's food preferences or biological

cues of hunger and fullness. Therefore, it is important for healthcare professionals to train staff about preparing nutritious meals, appropriate portion sizes, and providing healthy snacks to residents. Structured programs should be provided to encourage physical activity to increase energy expenditure and prevent unhealthy weight gain. Clients with food issues can be referred to a dietitian who understands and has been trained to work with the disabilities population. Dietitians will provide meal plans to clients, their families and staff, whereas staff and family members can serve as role models for healthy eating, being active, and promoting a positive body image.²⁹ Negative body talk should be actively discouraged by support staff, family members, and healthcare professionals. However, positive and negative feelings related to body should be processed with a trained healthcare professional.

CONCLUSION

Obesity and eating disorder literature has focused on the general population without regard for diverse groups such as individuals with intellectual disabilities. Although eating disorder treatment centers are flexible about modifying programs so that individuals with physical disabilities can enter treatment, current eating disorder treatment options are inadequate to treat disordered eating issues and body image disturbances for individuals with intellectual disabilities. More research is needed to explore body image concerns as well as thoughts, feelings, and behaviors around food. This paper is a starting point for discussion among healthcare professionals who are interested in working with individuals with intellectual disabilities.

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2011 Legislative Review

2011

Utah's Health: An Annual Review

The 2011 General Legislative Session saw the benefits of a recovering economy and positive fiscal management which allowed the Utah Legislature to balance the FY 2012 budget as well as address growth in education and Medicaid. This was also able to be accomplished without generating tax increases or drawing on rainy day funds. The Subcommittee for Social Services received an increase in state funds of 11.5% or \$75 million for FY 2012 compared to FY 2011. The Subcommittee also saw a 20.3% or \$996 million reduction in total funds largely caused by reduction in appropriations for the Unemployment Compensation Trust Fund and the elimination of new federal stimulus money for unemployment benefit extensions.

The following are notable budget items from the current year's activities:

- The Tobacco Settlement Restricted Account saw a \$2.4 million backfill of estimated tobacco revenue shortages moving forward to FY 2012.
- Medicaid saw a caseload/utilization increase of \$31,169,900 of which \$19,455,100 is ongoing General Fund offset by a one-time reduction of \$10,500,00 moving forward to FY 2012.
- Medicaid received a \$30,000,000 computer system upgrade to replace their 1970's style Medicaid Management Information System.
- Changes in Medicaid reimbursement of \$11,875,500 of which \$6,873,700 is ongoing General Fund reduction by changing outpatient hospital rates and updating the State's maximum price for pharmacy reimbursement.
- Disability provider rates received additional funds of \$10,000,600 (2,900,00 of State funds) to maintain current disability provider rate and provide for additional services.

In addition to these budget issues, the 2011 General Legislative Session focused on immigration, passing comprehensive reforms with the passage of guest worker, migrant worker and immigration enforcement bills. The hope is that Utah's example of compromise may encourage other states to do the same. Important budget areas like K-12 public education, disabled services, public safety and transportation were also able to avoid budget cuts.

Also of interest in the 2011 General Legislative Session was the passing of HB 477, which would have redefined what kinds of records can be made public and restricted access to electronic communications both to and from public officials. After a large public outcry a special session of the Legislature repealed the bill in both the House and the Senate. Another controversial bill was HB 328, which would have required state agencies back to a five-day work week. The bill was passed by both the House and the Senate, then later vetoed by Governor Gary Herbert, saying that there would be costs involved in the switch which the Legislature did not appropriate funds for. Lawmakers reversed the governor's veto in a veto override session and Herbert issued a blanket order that forced all state agencies back to a five-day work week effective September, 2011.

PASSED BILLS

HOUSE BILL 13 SECOND SUBSTITUTE

Immunizations for Teen Mothers

Sponsor: M. Seelig

Cosponsors: R. Chavez-Houck, S. Duckworth, R. Edwards, D. Ipson, D. Litvack, C. Moss, J. Peterson, M. Poulson, P. Ray, E. Vickers

This bill amends the Health Code to allow a minor who is the parent of a child, or who is pregnant, to consent to immunizations. The purpose of this bill is to give teen mothers who have been abandoned by their parents the power to authorize their own immunizations. In addition parents or guardians that do not consent for the immunizations cannot be responsible for fees associated with the immunization. Also included in this bill is replacing the term "crippled children" with the term "children with disabilities."

HOUSE BILL 14

Catastrophic Mental Health Coverage – Sunset Act

Sponsor: J. Dunnigan

This bill modifies the Insurance Code and the Legislative Oversight and Sunset Act to address catastrophic mental health coverage by removing the catastrophic mental health coverage provision from the Act.

HOUSE BILL 15

Controlled Substance Database – Licensing Amendments

Sponsor: B. Daw

This bill amends licensing provisions in the Controlled Substance Database Act. This bill provides that any individual who is not a veterinarian and obtains a new license to prescribe a controlled substance, must, within 30 days after the day they obtain the license register with the division to use the Controlled Substance Database. This bill also reinstates authority of the Division of Occupational and Professional Licensing to take administrative action for a violation of the Controlled Substance Database Act.

HOUSE BILL 16 THIRD SUBSTITUTE

Pharmacy Benefits Manager Act

Sponsor: E. Vickers

This bill enacts the Pharmacy Benefits Manager Act. This bill provides that when the Utah State Retire-

ment Board issues a request for proposals for a pharmacy benefits manager that the pharmacy benefits manager must submit to the board an invoice for all pharmacy services paid on at least a monthly basis.

HOUSE BILL 18 SECOND SUBSTITUTE

Health Reform – Cost Containment

Sponsor: B. Daw

This bill amends the Utah State Retirement and Insurance Benefit Act. This bill requires that state employees be offered a consumer directed (high deductible) health plan. All state employees will be required to attend training regarding health benefit plans offered to employees, and any state employee hired after July 1, 2011 that does not choose to enroll in a different health benefit plan will automatically be enrolled in a high deductible health plan.

HOUSE BILL 19 SUBSTITUTE

Insurance Law Related Amendments

Sponsor: J. Dunnigan

This bill modifies the Insurance Code and other provisions related to the regulation of insurance and insurance products. (I Need Help Getting This Explained)

HOUSE BILL 57

Joint Professional School of Veterinary

Sponsor: J. Mathis

This bill provides for the establishment of a veterinary education program offered by Utah State University in partnership with Washington State University.

HOUSE BILL 64

Human Blood Procurement and Use

Sponsor: S. Handy

This Bill recodifies, repeals, and amends provisions of the Utah Code relating to the procurement and use of human blood. This bill deletes obsolete provisions regarding donation of blood by a person that is 18 years old, enacts the Human Blood Act, clarifies that the procurement and use of a blood product is a service and not a sale, and allows a minor who is at least 16 years old to donate blood if they have parental consent.

HOUSE BILL 66 SUBSTITUTE

Health Professional Authority – Death Certificates

Sponsor: B. Last

This bill amends the Vital Statistics Act. This bill amends definitions in the Vital Statistics Act to allow nurse practitioners to sign death certificates if employed by a health care facility.

HOUSE BILL 77 SECOND SUBSTITUTE

Medical Assistance Accountability

Sponsor: D. Clark

This bill amends provisions of the Utah Health Code relating to management and oversight of the state's Medicaid and medical assistance programs. This bill provides that the inspector general of Medicaid services or the director of the Office of Internal Audit and Program Integrity will designate and oversee the officer in certain administrative appeal proceedings and also describes other administrative Medicaid appeal requirements. This bill also places the Utah Office of Internal Audit and Program Integrity directly under the executive director of the Department of Health and provides the Program Integrity office with full access to the records of the Division of Health Care Financing.

HOUSE BILL 84 FOURTH SUBSTITUTE

Office of Inspector General of Medicaid Services

Sponsor: D. Clark

This bill creates within the Governor's Office of Planning and Budget, the Office of Inspector General of Medicaid Services. In addition to creating the position, this bill details the duties and powers of the office along with the responsibilities to work directly with the Medicaid Fraud Control Unit of the attorney general's office. The bill provides specifics regarding number of claims to be submitted for fraud review as well as processes on how to handle claims that are found to be fraudulent. The bill also grants the office to full access of records of the department when investigating or auditing the use of Medicaid funds.

HOUSE BILL 128 SECOND SUBSTITUTE

Health Reform Amendments

Sponsor: J. Dunnigan

This bill amends provisions related to state health system reform in the Health Code, the Insurance Code, and the Governor's program. This bill requires the Health Data Authority to publish comparative data about physician and clinic quality by October 1, 2011. This bill also clarifies the duties between the three agencies and grants them power to enforce duties of their offices. The bill also establishes state authority to regulate certain practices of health insurers and requires group health benefit plans to have reasonable plan premium rates and to comply with standards established by the Insurance Department.

HOUSE BILL 171 SECOND SUBSTITUTE

Abortion Clinic Licensing

Sponsor: C. Wimmer

This bill amends provisions of the Health Care Facility Licensing and Inspection Act in relation to abortion clinics. This bill requires annual licensing for abortion clinics and grants

rulemaking authority to the Department of Health in relation to licensing of clinics. Abortion clinics must meet and maintain health and safety standards and be subject to regular inspections of which the clinics will be responsible for paying the costs related to this bill. This bill also requires the Division of Occupational and Professional Licensing to provide the department with the name and address of each physician that reports that they perform elective abortions in Utah other than in a hospital.

HOUSE BILL 201

Tobacco Licensing Amendments

Sponsor: P. Ray

This bill amends provisions of the Utah Health Code and the Cigarette and Tobacco Tax and Licensing Act relating to tobacco licensing. This bill amends that the revocation of a license to sell tobacco is in effect for one year after the day on which the time for filing an appeal for revocation ends, or the day on which the decision to uphold the revocation becomes final. Also provides that manufacturers and distributors of tobacco products are subject to the licensing requirements of the Cigarette and Tobacco Tax and Licensing Act.

HOUSE BILL 204 SUBSTITUTE

Protection of Athletes with Head Injuries

Sponsor: P. Ray

This bill enacts the Protection of Athletes With Head Injuries Act within the Utah Health Code. This bill requires amateur sports organizations to adopt and enforce a concussion and head injury policy and obtain the parent's or legal guardians signature on the policy before allowing a child to participate in a sporting event. Also describes the requirements of the policy including removal of a child from a sporting event when the child is suspected of sustaining a concussion and prohibits the child from returning to the sport until they receive medical clearance from a qualified health care provider

HOUSE BILL 211

Community Service Medicaid Pilot Program

Sponsor: R. Menlove

This bill amends the Health Code and creates a pilot program in the state's medical assistance program. This bill requires the state Medicaid program to develop a community service pilot program and present the proposal to the Legislature's Health and Human Services Interim Committee and requires Medicaid to submit a waiver to the Centers for Medicare and Medicaid services by January 1, 2012 to implement the community service pilot program.

HOUSE BILL 212 SECOND SUBSTITUTE

Charges be Health Providers for Medical Records

Sponsor: F. Gibson

This bill modifies provisions of the Judicial Code relating to patient access to medical records. This bill establishes a time limit for a health care provider to provide medical records to a patient or patient representative, and also establishes charges that a health care provider may charge when copying a patient's medical records.

HOUSE BILL 215

Fatality Review Act Amendments

Sponsor: M. Newbold

This bill requires that the Division of Child and Family Services allow public disclosure of the findings or information relating to a case of child abuse or neglect that results in either a fatality or near child fatality.

HOUSE BILL 217

Appointment of Director of the Division of Health Care Financing

Sponsor: D. Clark

This bill amends the Medical Assistance Act to provide that the director of the Division of Health Care Financing shall be appointed by the governor, after consultation with the executive director of the Department of Health, with the advice and consent of the Senate.

HOUSE BILL 238

Radiology Technologist and Radiology Practical Technician Licensing Act

Sponsor: D. Ipson

This bill amends the Occupations and Professions Code related to Radiology Technologist and Radiology Practical Technician Licensing Act. This bill defines indirect supervision, defines the practice of radiologist assistant, amends the membership of the Radiologic Technologist Licensing Board and establishes a requirement for a license for a radiologist assistant along with continuing education requirements.

HOUSE BILL 240

Social Services – Employment First Priority

Sponsor: R. Menlove

This bill establishes an employment first priority policy for persons with a disability within the Employment Support Act, State Office of Rehabilitation Act, and the Utah Human Services Code. This bill requires the Department of Workforce Services, the Utah State Office of Rehabilitation, and the Division of Services for People with Disabilities to give priority to providing services that assist the person in obtaining and retaining gainful employment.

HOUSE BILL 256 SUBSTITUTE

Children's Health Insurance and Medicaid Administrative Simplification

Sponsor: J. Dunnigan

This bill modifies provisions relating to Medicaid and other children's health insurance programs. This bill requires the Department of Health to apply for grants to fund a simplified enrollment and renewal process for Medicaid, Utah Premium Partnership, and Primary Care Network and allows the Department of Health to enter into agreements with financial institutions to develop and operate a data system to identify an applicant or enrollee's assets. This bill also requires the Division of Health Care Financing to bid out Medicaid dental benefits.

HOUSE BILL 336

Medical Professional Licensing During a Declared Emergency

Sponsor: E. Vickers

This bill modifies the Division of Occupational and Professional Licensing Act and the Pharmacy Practice Act by enacting language regarding health department protocols. This bill authorizes the Department of Health to establish a protocol for the distribution of medicine in a national, state, or local emergency to a local health department, a pharmacy, a prescribing practitioner, a licensed health care facility, a federally qualified community health clinic, a patient's contact, or emergency service personnel.

HOUSE BILL 353

Abortion Freedom of Conscience

Sponsor: C. Wimmer

This bill amends the portion of the Utah Criminal Code relating to abortion by replacing Utah's freedom of conscience law with a new and expanded freedom of conscience law. This bill provides that a health care provider and or a health care facility may refuse to perform an abortion on religious and moral grounds and not be subject to civil liability or any other adverse action as a result of refusing services.

HOUSE BILL 354 SECOND SUBSTITUTE

Insurance Amendments Relating to Abortion

Sponsor: C. Wimmer

This bill amends provisions of the Insurance Code by limiting the type of abortion coverage that may be offered in a health benefit plan, on the state health insurance exchange, or on a federally mandated health insurance exchange. This bill further defines "permitted abortion coverage" and limits the type of abortion coverage that may be offered in a health benefit plan.

HOUSE BILL 404

State Health Insurance Amendments

Sponsor: D. Ipson

This bill enacts un-codified language that requires a study by the Legislature's Retirement and Independent Entities Interim Committee of changes in the way the state provides health insurance to its employees, retirees, and their families. This bill requires the Committee to coordinate its study with the Health System Reform Task Force of the operations of the Health Insurance Exchange.

HOUSE BILL 405 SUBSTITUTE

Charges for Medical Records

Sponsor: F. Gibson

This bill modifies provisions of the Judicial Code relating to charges for medical records. This bill requires a person authorized to provide medical records (other than a health care provider) to do so within 30 days after the request and establishes charges that a person authorized to provide medical records (other than a health care provider) may charge when copying medical records.

HOUSE BILL 450

Hospital Provider Tax Amendments

Sponsor: D. Clark

This bill amends the Hospital Provider Assessment Act to amend provisions related to the repeal of the assessment. This bill will repeal the assessment either from the effective date of any action by Congress that would disqualify the assessment, the effective date of any decision by the Legislature or any court, officer, department, or agency of the state, or the federal government, whichever would come first.

HOUSE BILL 454

State Hospital Revisions

Sponsor: B. Last

This bill amends provisions of the Substance Abuse and Mental Health Act relating to the allocation of adult beds at the state hospital to local mental health authorities. This bill requires the Division of Substance Abuse and Mental Health to establish criteria for a formula to separately allocate adult beds at the state hospital to local mental health authorities. This bill will take effect on May 10, 2011 and After July 1, 2011, the number of beds shall be reviewed and adjusted as necessary.

HOUSE BILL 481 SUBSTITUTE

Transportation of Mental Illness Patients

Sponsor: P. Ray

This bill modifies code provisions relating to cities and counties to allow county sheriffs and local law enforcement agencies to charge a fee for the transportation of mentally ill patients. This bill authorizes sheriffs and municipal law enforcement agencies to charge up to \$2.50 a mile fee for transporting a patient

to or from a hospital or mental health facility in going only up to 100 miles. This bill also provides that if the law enforcement agency requires additional assistance in delivering a patient to the facility, they may charge the actual and necessary cost of the assistance.

HOUSE BILL 482 SUBSTITUTE

Long-Term Care Facility – Medicaid Certification for Bed Capacity Amendments

Sponsor: E. Hutchings

This bill amends provisions of the Medical Assistance Act regarding Medicaid certification of nursing care facility programs. This bill allows the Division of Healthcare Financing within the Department of Health to renew Medicaid certification of a nursing care facility not currently certified.

HOUSE CONCURRENT RESOLUTION 5

Patient and Safety Centered Prescription Labels Concurrent Resolution

Sponsor: M. Poulson

This concurrent resolution of the Legislature and the Governor urges prescribers, dispensers, manufacturers of drugs, health insurers, and government agencies generally to take specific steps to improve patient and safety centered prescription labels. This resolution urges the Utah Pharmacy Board and the Utah Pharmacists association to develop a prescription label format that is patient and safety centered. This resolution also urges federal, state, and local agencies to work to reduce prescription drug abuse and develop campaigns to educate the public regarding the dangers of prescription drug abuse.

HOUSE CONCURRENT RESOLUTION 9

Lupus Awareness Month Concurrent Resolution

Sponsor: T. Cosgrove

Cosponsors: P. Arent, D. Brown, R. Chavez-Houck, D. Clark, B. Daw, J. Fisher, F. Gibson, L. Hemingway, B. King, R. Menlove, M. Newbold, J. Nielson, M. Poulson, P. Ray, D. Sanpei, C. Watkins, L. Wiley

This concurrent resolution of the Legislature and the Governor designates May 2011 as Lupus Awareness Month in the state of Utah. This resolution urges citizens to educate themselves on the symptoms and impact of lupus and to support the Utah Chapter of the Lupus Foundation of America in supporting research, education, and community service.

HOUSE JOINT RESOLUTION 35

Utah Mitochondrial Disease Awareness Week Joint Resolution

Sponsor: K. Sumsion

This joint resolution of the Legislature designates September 5 through September 11, 2011, as Mitochondrial Disease Awareness

Week. This resolution urges the citizens of Utah to observe the week with appropriate activities and programs.

HOUSE JOINT RESOLUTION 38

Joint Resolution to Amend Rule of Evidence

Sponsor: J. Dunnigan

This joint resolution amends Utah Rule of Evidence, Rule 409 regarding expressions of apology by health care professionals and employees. The purpose of amending the rule is to encourage expressions of apology, empathy, and condolence and disclosure of facts related to unanticipated outcomes in the provision of health care, and is not admissible to prove liability for the injury.

HOUSE JOINT RESOLUTION 46

Joint Resolution on State Health Insurance

Sponsor: B. Dee

This resolution directs the Public Employees' Benefit and Insurance Program regarding the medical coverage premiums share between employer and employee and other cost issues related to medical and dental plans. This resolution directs PEHP and the Department of Human Resource Management to change the employer premium share for HMO medical coverage to 90/10 employer/employee. This resolution also directs PEHP to decrease premiums for employees and adjust costs and draw down reserves as necessary to fund the program before July 2012.

SENATE BILL 48

Alzheimer's State Plan Task Force

Sponsor: K. Morgan

This bill establishes an Alzheimer's State Plan Task Force within the Division of Aging and Adult Services in the Department of Human Services. This bill provides staff support for the task force and designates that members of the task force are not entitled to compensation but may receive per diem and travel expenses. This bill also requires the task force to complete its duties and submit a findings report to the Health and Human Services Interim Committee on or before its November 2011 meeting.

SENATE BILL 61 SECOND SUBSTITUTE

Education for Prescribing Controlled Substances

Sponsor: P. Jones

This bill amends provisions of the Utah Controlled Substances Act. This bill requires a prescriber applying for a new or renewed controlled substance license to attend four hours of training during each licensing period and requires the Division of Occupations and Professional Licensing to establish educational content for the training sessions.

SENATE BILL 67 SUBSTITUTE

Annual Eye Examination For Children In Grades Kindergarten Through Three

Sponsor: L. Rubles

This bill extends the public school vision screening from age seven to eight and requires a process for the school that performs the screening to notify a parent or guardian if the child fails the screening and needs follow up care. This bill also provides limited immunity to volunteer vision screeners trained by the State Office of Education

SENATE BILL 128

Regulatory Amendments

Sponsor: C. Bramble

This bill amends the Pharmacy Practice Act. This bill exempts registered nurses and physician assistants from licensure to dispense cosmetic or injectable weight loss drugs to a patient and also exempts optometrists from licensure to dispense a cosmetic drug to a patient.

SENATE BILL 129 THIRD SUBSTITUTE

Licensing of Physician-Educators

Sponsor: S. Urquhart

This bill modifies the Utah Medical Practice Act in relations to licensing of physician-educators. This bill provides for a temporary license for foreign-educated physicians to serve as faculty at a Utah medical school and establishes requirements for a physician who has held a temporary license for five years to apply for a permanent license and authorizes the division to revoke licenses based on misrepresentation or unlawful/unprofessional conduct.

SENATE BILL 134

Transparency in Health Care Provider Advertising

Sponsor: J. Stevenson

This bill amends health care provider licensing laws to require certain information about the health care provider in any professional advertising. This bill defines advertisement and makes it unprofessional conduct to violate the advertisement requirements.

SENATE BILL 149

Qualifications for the Executive Director of the Department of Health

Sponsor: D. Liljenquist

This bill amends the qualification necessary for the executive director of the Department of Health. This bill requires that the executive director must be a physician who is a graduate of a legally constituted medical school, and has completed a master's degree of public health and has at least three years of professional experience in senior level administration or com-

mensurate experience

SENATE BILL 180 SECOND SUBSTITUTE

Medicaid Reform

Sponsor: D. Liljenquist

This bill amends the Medical Assistance Act and the Budgetary Procedures Act. This bill requires the Department of Health to develop a proposal to modify the Medicaid program that maximizes replacement of the fee-for-service delivery model with one or more risk-based delivery models.

SENATE BILL 186

Utah Medical Practice Act Amendments

Sponsor: J. Adams

This bill amends the Utah Medical Practice Act and the Utah Osteopathic Medical Practice Act by clarifying policies and procedures. This bill prohibits an individual from using the title "doctor," "M.D." or "D.O." in a misleading manner and also clarifies licensing requirements and disciplinary procedures.

SENATE BILL 294 SECOND SUBSTITUTE

Patient Access Reform

Sponsor: J. Adams

This bill amends provisions related to access to health care providers in the Health Maintenance Organization and Preferred Provider Organization Chapters of the Insurance Code. This bill provides that an HMO and PPO must reimburse an insured for services not under contract as long as those services are otherwise covered. This bill also established the reimbursement rate for non-contracted providers, and allows the HMO or PPO to impose copayments and deductibles for non-contracted providers.

SENATE CONCURRENT RESOLUTION 1

Crisis Intervention Team Program Concurrent Resolution

Sponsor: P. Jones

This concurrent resolution of the Legislature and the Governor recognizes the positive approach and best practices of the Crisis Intervention Team Program and encourages development of active crisis intervention team programs statewide. This bill recognizes this program as the model of best practice for law enforcement for people with mental illnesses, and encourages law enforcement agencies and community mental health centers to work together with other community programs to develop and maintain active crisis intervention team programs.

SENATE CONCURRENT RESOLUTION 12

Wear Red Month Concurrent Resolution

K. Mayne

This concurrent resolution of the Legislature and the Governor designates February as Wear Red Month in recognition of the

fight against heart disease among women. This bill urges all citizens to wear the color red and increase awareness about heart disease to empower women to reduce their risk of cardiovascular disease.

SENATE CONCURRENT RESOLUTION 14

Concurrent Resolution Honoring Providers of Health Care Services to Military Personnel and Their Dependents

Sponsor: J. Adams

This concurrent resolution of the Legislature and the Governor expresses gratitude to the hospitals, clinics, facilities, and individual providers of health care to Utah's military personnel, their families, and those retired from military service. This resolution recognizes these health care providers for being part of the fight for freedom as they serve the needs of this population.

SENATE JOINT RESOLUTION 3

Adult Immunization Awareness Day Joint Resolution

Sponsor: K. Mayne

This joint resolution of the Legislature designates October as Adult Immunization Awareness Month and urges adults to be current in their immunizations. This resolution urges Utah's adults to be immunized to protect their own health as well as their children's and designates October as the month to increase awareness regarding adults and maintaining current immunizations.

SENATE JOINT RESOLUTION 7

Fibromyalgia Awareness Day Joint Resolution

Sponsor: P. Knudsen

This joint resolution of the Legislature designates May 12, 2011, as Fibromyalgia Awareness Day. This resolution recognizes the needs of those stricken with fibromyalgia and urges citizens to support the search for a cure.

UNPASSED BILLS

HOUSE BILL 11

Inmate Health Insurance Amendments

Sponsor: P. Ray

This bill would have modified the Institutions Code and other code provisions regarding health care for inmates by modifying provisions concerning coverage by a person's private health and dental policies while the person is an inmate or while the person is in the custody of the Department of Corrections or a county jail, and also addresses coordination of benefits and exemptions. This bill would have required a person who has medical or dental insurance upon entering custody to use that coverage as primary, and requires that insurance companies must honor

services while the patient is in custody.

HOUSE BILL 89 SUBSTITUTE

Protection of Children Riding in Motor Vehicles

Sponsor: P. Arent

Cosponsors: J. Briscoe, D. Brown, M. Brown, R. Chavez-Houck, J. Draxler, R. Edwards, B. King, K. McIff, R. Menlove, C. Moss, L. Perry, D. Pitcher, M. Poulson, K. Powell, P. Ray, E. Vickers

This bill would have modified the Motor Vehicles Code by enacting a restriction on smoking in a motor vehicle when a child is present. The bill would have prohibited a person from smoking in a vehicle when a child of 15 years of age or younger is a passenger in the vehicle. The punishment would have been a \$45.00 fine. Police officers would have not be able to issue a citation until July 1, 2012.

HOUSE BILL 165

State Reimbursement for Required Medical Services Act

Sponsor: C. Herrod

This bill would have modified the Utah Health Code to provide for state reimbursement of required medical services provided to an individual not lawfully present in the United States and to seek repayment of the money from the federal government. This bill would have enacted the State Reimbursement for Required Medical Services Act which includes establishing what can be reimbursed, an application process for obtaining reimbursement, outlining violations of the chapter, provides for enforcement and requires the creation of a plan to assert or litigate an obligation by the federal government to repay money reimbursed by the state.

HOUSE BILL 210 SUBSTITUTE

Animal Cruelty Amendments

Sponsor: C. Oda

This bill would have amended provisions of the Utah Criminal Code relating to animal cruelty and animal torture. This bill would have added an element of the crime of animal cruelty that the conduct of the actor towards the animal was not reasonable and necessary to protect the actor or another person from injury, death, or property damage or loss.

HOUSE BILL 229 SUBSTITUTE

Mental Health Professional Practice Act

Sponsor: K. Grover

This bill would have modified provisions of the Mental Health Professional Practice Act. This bill would have eliminated face to face supervision requirements and allows that no more than 50% of supervision of mental health therapists to be conducted remotely. Also defined that an associate marriage and family therapist is a mental health therapist and clarifies that licensed

certified social workers, licensed associate professional counselors, licensed associate marriage and family therapists, and licensed substance abuse counselors may work as an independent contractor or volunteer under the supervision of a licensed mental health therapist

HOUSE BILL 233 SUBSTITUTE

Insurance Coverage for Amino Acid-based Formula

Sponsor: C. Moss

This bill would have amended the Insurance Code to allow an option to provide coverage for the use of an amino acid-based elemental formula, regardless of the delivery method of the formula, for the diagnosis or treatment of an eosinophilic gastrointestinal disorder. This bill would have allowed for a physician to issue a written order stating that the formula is medically necessary.

HOUSE BILL 234

Assertive Community Mental Health Treatment Pilot Program

Sponsor: C. Moss

This bill would have established a pilot program within the Substance Abuse and Mental Health Act for the provision of assertive community treatment services to people with a severe mental disorder, who are not receiving or are transitioning out of other mental health services, and to their families. This bill would have also established who would be eligible to receive services, establish criteria to determine the order of priority for receiving services, and that services could have been withdrawn at any time.

HOUSE BILL 244 SUBSTITUTE

Online Mental Health Therapy

Sponsor: K. Grover

This bill would have amended the Mental Health Professional Practice Act to allow mental health therapists to conduct therapy remotely to individuals inside and outside the state. This bill would also have required a mental health therapist to obtain informal consent from a patient before engaging in online therapy and allows the Division of Occupational and Professional Licensing to make rules regarding implementation of online therapy.

HOUSE BILL 289

Psychologist Licensing Amendments

Sponsor: M. Newbold

This bill would have amended the Psychologist Licensing Act to permit a psychologist who has specialized training and who is in a collaborative model with a primary care practitioner to prescribe psychotropic medications. This bill would have required a licensed psychologist to obtain a certification to obtain limited

prescribing authority and establishes requirements certification and continuing education requirements.

HOUSE BILL 311

Recovery of Uncompensated Emergency Room Care

Sponsor: J. Dougall

No information was made available for this bill.

HOUSE BILL 321

Pharmacy Practice Act Amendments

Sponsor: D. Clark

This bill would have amended the Pharmacy Practice Act. This bill would have clarified the process as to when a therapeutic substitution may be substituted for a therapeutic prescription drug. This bill required the purchaser and the prescribing practitioner to authorize the substitution and requires out-of-state mail pharmacies to comply with the process established and make technical changes.

HOUSE BILL 355 SUBSTITUTE

Healthcare-associated Infections

Sponsor: J. Draxler

This bill would have amended the Utah Health Code, Title 26, by requiring an ambulatory surgical facility, a general acute hospital, and a specialty hospital to provide data on healthcare-associated infections and requiring the Department of Health to release a quarterly report on healthcare-associated infections. This bill also would have established a protocol for the creation of the quarterly report and states that the report cannot be used as evidence in any court proceeding.

HOUSE BILL 357

Long-term Care Amendments

Sponsor: P. Ray

This bill would have amended the Medical Assistance Act by directing the Department of Health to apply for an amendment to the New Choices Waiver. This bill would have dictated that as of July 1, 2011 an individual being evaluated for Medicaid benefits will not be forced to move from the individual's place of residence in order to be evaluated for Medicaid.

HOUSE BILL 360

Housing Alternatives for Nursing Home Eligible Parolees

Sponsor: E. Hutchings

This bill would have amended provisions of the Medicaid Assistance Act relating to a Medicaid certification request for additional beds. This bill would have authorized the director of the Division of Healthcare Financing to issue Medicaid certification for additional beds to meet the needs of nursing home eligible parolees.

HOUSE BILL 381

Prescription Drug Amendments

Sponsor: P. Ray

This bill would have amended provisions related to drug utilization requirements for the state Medicaid program. This bill would have prohibited the state Medicaid program from requiring step therapy for a drug prescribed for the treatment of pain, and permits a requirement for the use of a generic equivalent for pain medications.

HOUSE BILL 382

Statewide Health Insurance Risk Adjuster Mechanism Amendments

Sponsor: C. Wimmer

No information was made available for this bill

HOUSE BILL 397

Controlled Substance Database Modifications

Sponsor: S. Eliason

This bill would have modified provisions of the Controlled Substance Database and requires the Department of Health to use information in the database to determine whether Medicaid billing and prescribing are done correctly. This bill would have authorized certain individuals to access the controlled substance database for program integrity and requires the Department of Health to conduct audits to ensure Medicaid billing is done correctly and that prescriptions are appropriate for frequency and dosage.

HOUSE BILL 448

Trust Fund Amendments

Sponsor: B. Last

No information was made available for this bill.

HOUSE BILL 449

Medicaid Payment Amendments

Sponsor: B. Last

No information was made available for this bill.

HOUSE BILL 467

Clean Air Act Amendments

Sponsor: R. Edwards

No information was made available for this bill.

HOUSE BILL 483

Prescription Act Amendments

Sponsor: D. Clark

No Information was made available for this bill.

HOUSE BILL 498

Inmate Health Issues Amendments

Sponsor: P. Ray

This bill would have modified the State Institutions Code

regarding medical care expenses of inmates in the custody of the Department of Corrections. This bill would have provided that the department would pay an annual flat rate of \$2.5 million from appropriated funds to the University of Utah Medical Center as the health care facility to provide medical service for offenders in custody when care is provided outside the prison facility.

HOUSE JOINT RESOLUTION 3 SUBSTITUTE

Joint Resolution Promoting Healthy and Energy Efficient Schools

Sponsor: M. Wheatley

This joint resolution of the Legislature would have encouraged the Utah State Board of Education and Utah's school districts to promote more healthy and energy efficient schools in the state. This resolution would have encouraged the Board of Education to design and construct more health and energy efficient schools and encouraged school districts to seek certification of energy efficient schools under the Leadership in Energy and Environmental Design rating system (LEED) for new or retrofit construction.

HOUSE JOINT RESOLUTION 40

Joint Resolution on Lupus Awareness Month

Sponsor: T. Cosgrove

No information was made available for this joint resolution.

SENATE BILL 41

Health Amendments for Legal Immigrant Children

Sponsor: L. Robles

This bill would have amended the Medical Assistance Act and the Utah Children's Health Insurance Act to provide Medicaid coverage and health insurance coverage to a legal immigrant child, regardless of the length of time that the child has been in the United States. This bill would have removed the five-year residency requirement for coverage under Medicaid or the Utah Children's Health Insurance Program and directed the Department of Health to amend the state Medicaid plan and the Utah Children's Health Insurance Program.

SENATE BILL 54

Physician Supervision of Cosmetic Medical Procedures

Sponsor: P. Knudson

This bill would have established a requirement for supervision by a physician during a cosmetic medical procedure. This bill would have included cosmetic medical procedure in the definition of the practice of medicine in the physician and osteopathic licensing acts.

SENATE BILL 91

Medical Practice Self Referral

Sponsor: D. Buttaris

This bill would have amended the Health Code and the Division of Occupational and Professional Licensing code to require a disclosure and reporting by a health care provider when the health care provider refers a patient for imaging services and the provider has a financial interest in the imaging services. This bill also would have required the state Health Data Committee to track and report trends regarding provider referral patterns for imaging services.

SENATE BILL 103

Utah False Claims Acts Amendments

Sponsor: B. McAdams

This bill would have recoded and amended the Utah False Claims Act. This bill would have permitted a person to file a civil action against a defendant, in the name of the state, for violation of the Utah False Claims Act. This bill would also have granted the attorney general the right to intervene in an action filed by a person in the name of the state and provides whistleblower protection to an individual who files a civil action in the name of the state.

SENATE BILL 137 THIRD SUBSTITUTE

Medicaid Amendments

Sponsor: A. Christensen

This bill would have amended the Medicaid drug program. This bill would have removed restrictions on the preferred drug list program, requiring the department to authorize non-preferred immunosuppressant and psychotropic drugs when a patient becomes stabilized. This bill would have required a report from the Department of Health regarding cost savings from the use of a preferred drug list and authorizes ongoing appropriations from the savings to go to mental health and dental health provisions.

SENATE BILL 192

Interagency Coordinating Advisory Committee on Health Disparities and Economic Self-Sufficiency

Sponsor: L. Robles

No information was made available for this bill.

SENATE BILL 194

Public Employees Health Program Amendments

D. Liljenquist

No information was made available for this bill.

SENATE BILL 202

Pharmaceutical Competitive Pricing

Sponsor: C. Bramble

This bill would have amended the Medical Assistance Act to establish a competitive bidding process for drug product equiva-

lents. This bill would have established criteria for the competitive bidding process and would have required the Division of Health Care Financing to rebid the program at least once every five years.

SENATE BILL 207

Utah Health Cooperative and Health System Commission

Sponsor: B. McAdams

No information was made available for this bill.

SENATE BILL 253

State Hospital Amendments

Sponsor: J. Adams

This bill would have amended provisions of the Utah Human Services Code by requiring the Division of Substance Abuse and Mental Health to issue a request for proposals for a private entity to operate the state hospital. This bill would have required that before August 1, 2011, the division would issue a request for proposals for a private entity to administer the state hospital under the direction and control of the division. This bill also described requirements that a private entity would have had to meet in order to contract with the state to administer the state hospital.

SENATE BILL 268

Internal Service Fund – Medicaid

Sponsor: D. Liljenquist

No information was made available for this bill

SENATE BILL 311

Anesthesiologist Assistant

Sponsor: D Liljenquist

This bill would have created a new licensing chapter in the Division of Occupational and Professional licensing for Anesthesiologist Assistants that would have put them under the supervision of the Physician Assistant Licensing Board and established requirements and qualifications for licensure.

Utah Health Data Review

2011

Utah's Health: An Annual Review

2011 Utah Health Data Review

91 | Population Indicators

Birth and Death – Utah, Regional, and National Trends
 Chronic Homelessness
 Cost of Urban Living
 Education
 Population by Race and Ethnicity
 Unemployment Rate

100 | General Health Indicators

Air Quality
 All Cause Mortality
 Emergency Department Visits
 Health Insurance Coverage
 Life Expectancy
 Poverty
 Self-Reported/Perceived Health Status

110 | Behavioral Influences on Health

Alcohol Use – Utah and United States
 Homicide
 Motor Vehicle Crash Deaths and Seat Belt Utilization
 Suicide
 Tobacco Use – Utah and United States
 Violent Crime

114 | Women and Children's Health

Newborn Screening
 Overweight Children and Adolescents
 Vaginal Birth and Cesarean Section

123 | Infectious Diseases and STD's

HIV/AIDS
 Chlamydia
 E.Coli
 Gonorrhea
 Hepatitis
 Herpes (and Trichomonas)
 Human Papillomavirus
 Immunizations
 Mumps, Polio, and Rubella
 Pneumonia and Influenza and H1N1
 Syphilis
 Tuberculosis

139 | Chronic Diseases

Breast Cancer
 Colorectal Cancer
 Lung Cancer
 Prostate Cancer
 Skin Cancer
 Cerebrovascular Diseases
 Coronary Heart Disease
 Diabetes Mellitus

153 | Local Health Departments

Bear River Health Department
 Central Utah Health Department
 Davis County Health Department
 Salt Lake County Health Department
 Southeastern Utah Health Department
 Southwestern Utah Health Department
 Summit County Health Department
 Tooele County Health Department
 Tri-County Health Department
 Utah County Health Department
 Wasatch City/County Health Department
 Weber-Morgan Health Department

Birth and Death Rates

Compiled by Ryan M. VanderWerff

HEART DISEASE AND CANCER ARE THE LEADING CAUSES OF DEATH IN UTAH AND THE UNITED STATES.

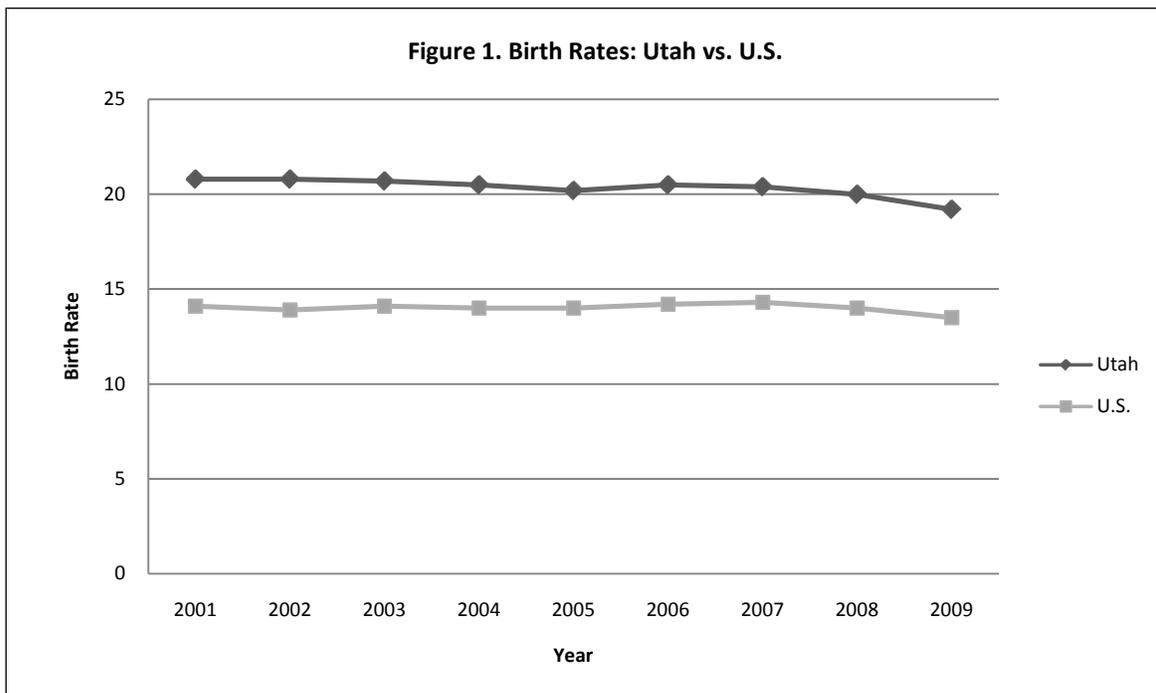
Birth and death rates indicate the growth or decline of a population. They are one of the primary indicators of the health of a nation because they reflect the life span of the individuals. These rates are tracked by each state's health department and are reported to the CDC. The crude birth rate is calculated by the total births in a given period divided by the mid period population. The quotient is published as the number of births per one thousand people.¹ The General Fertility Rate (GFR) is parallel to the birth rate calculation only the number of child bearing women (Age 15-45) are included in the denominator rather than the entire population.² The death rate is the total deaths in a population in a given year. The death rates comparison between populations is not indicative of which population is healthier due to the variation of the concentration of the elderly population.³

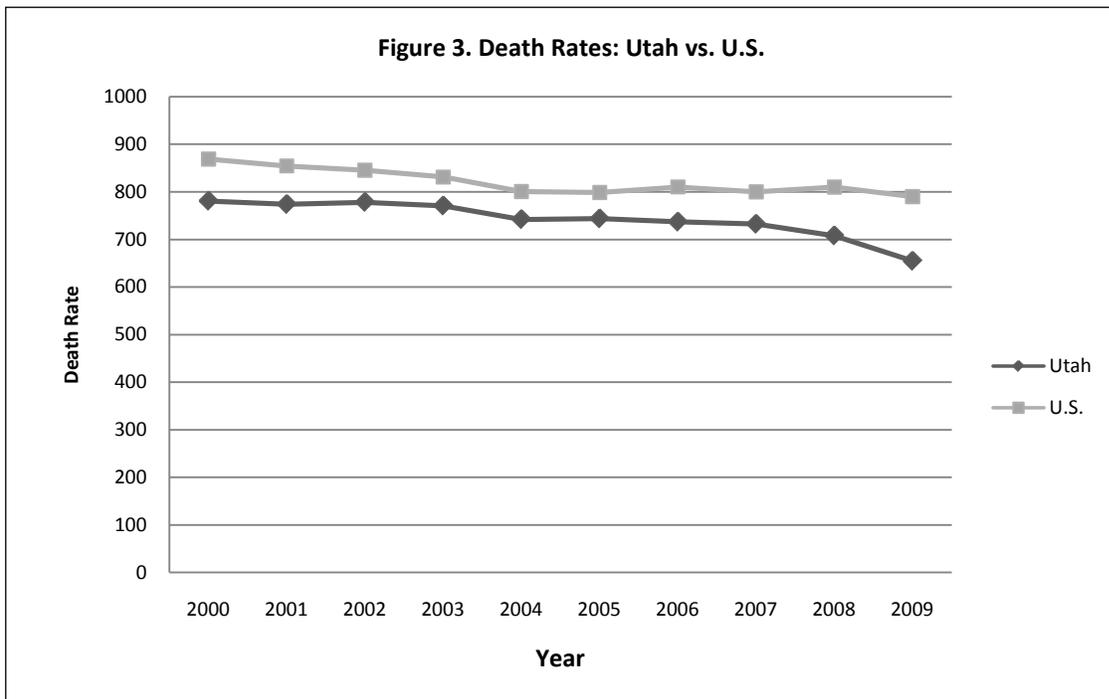
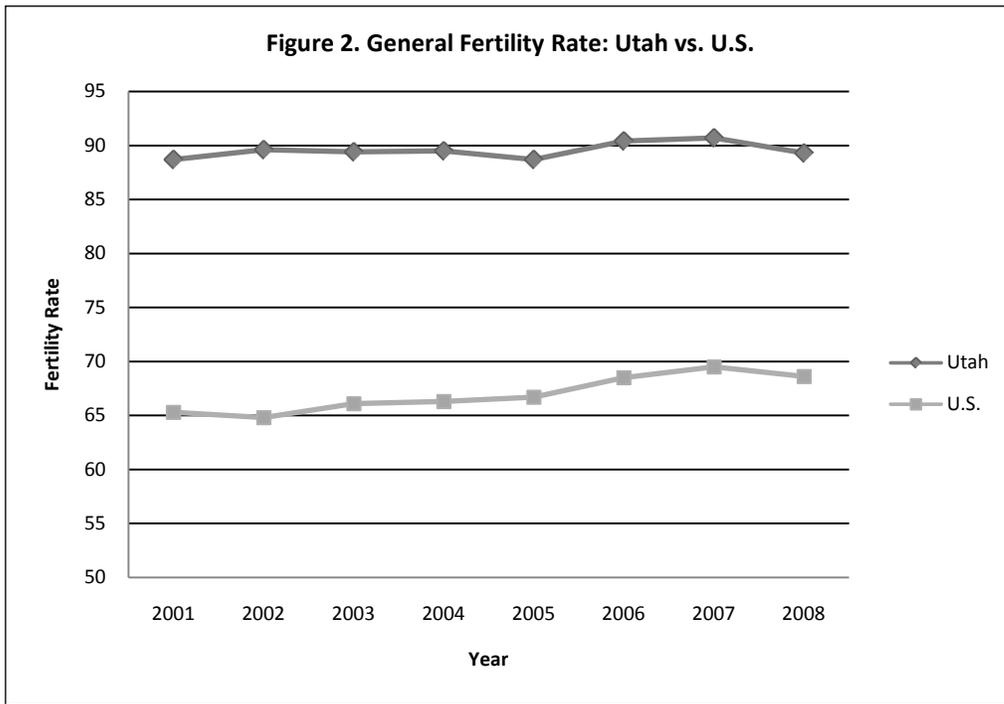
Figure 1 shows the birth rates of Utah and the U.S. from 2001 through 2009. Utah's birth rate supersedes that of the U.S. by almost 25%.¹ Figure 2 shows the Utah GFR rate compared to the

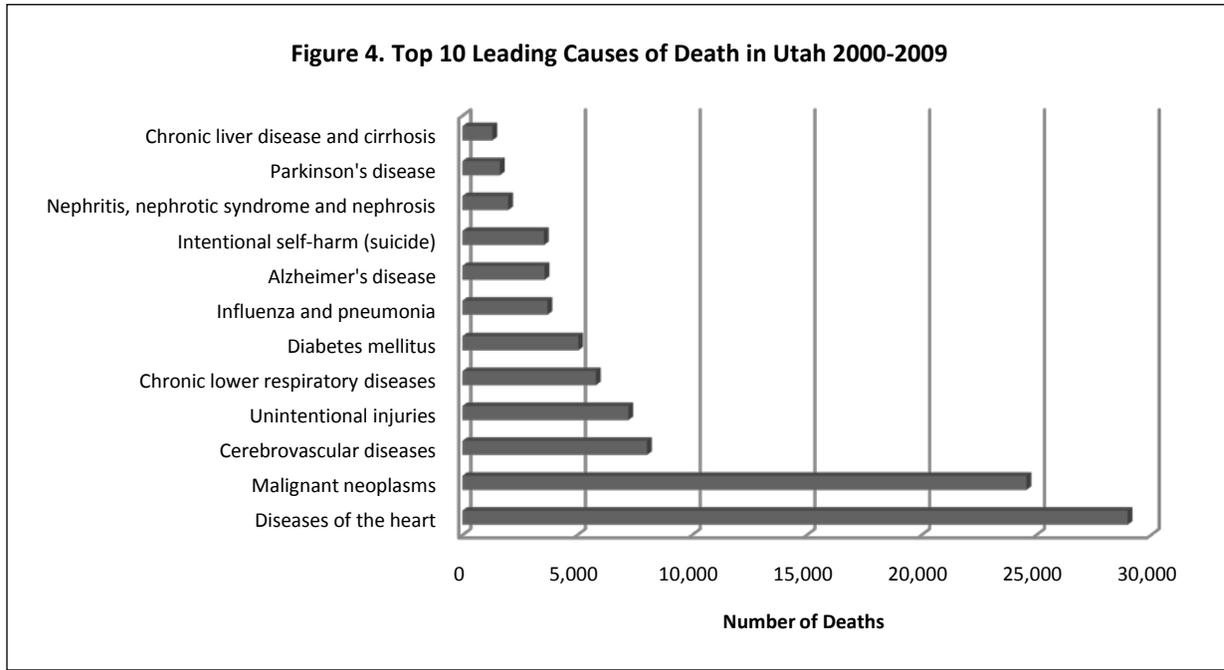
U.S. GFR. The GFR for Utah is also nearly 25% higher than that of the U.S.²

Another important birth rate component is low birth weight. Infants born with a low weight are subject to a greater risk for mortality. Infants that survive a low weight birth are often put in intensive care and are more subject to chronic illnesses. A low birth rate is defined as lower than 2500 grams, or about 5 pounds, 8 ounces.⁴ The U.S. has a low birth weight rate of 8.20% (as of 2007) compared to Utah's rate of 7.00% (as of 2009). Utah's teenage birth rate, which can be a factor in low birth weight, also remains significantly lower than the national average, but is not one of the lowest 10 states in the country.⁵

Figure 3 shows the Utah death rates from all causes compared to that of the U.S. Utah death rates have been well below the national average since the 1990's. Figure 4 lists the 10 leading causes of death in Utah from 2000-2009. Heart diseases and cancer are the primary causes of death in Utah.³







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Chronic Homelessness

Compiled by Zane Partridge

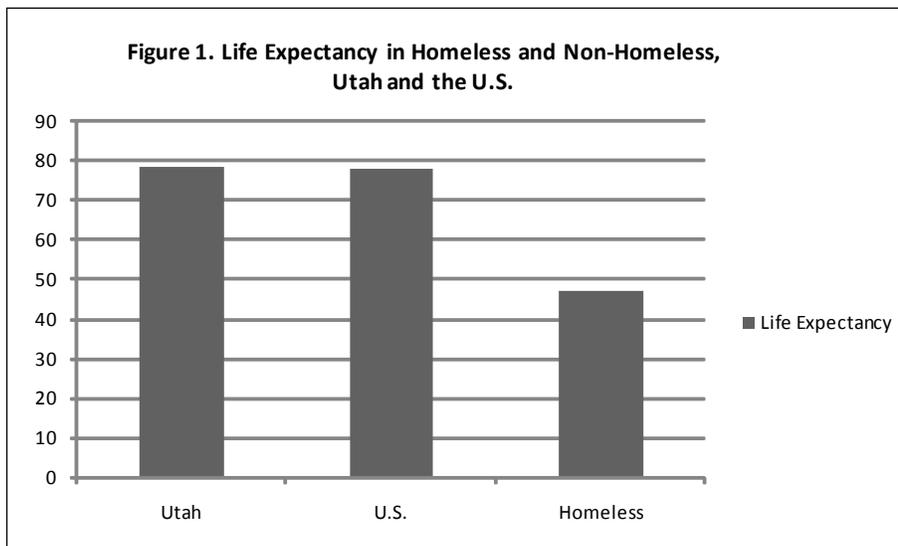
UTAH HAS SEEN A 25% INCREASE IN HOMELESSNESS.

Homelessness is a condition termed for individuals who are without permanent residence for a period of time. During this time these individuals may find refuge in homeless shelters, streets, or other non-permanent housing. Chronic homelessness is a category for those who experience homelessness for a period longer than one year or have had been without residence four times in a three year time frame.¹ Reasons for chronic homeless may include mental or physical disability and drug or alcohol addiction. Other factors that contribute to this condition includes: loss of job, loss of family, bankruptcy, and under-education.²

Health and housing are interdependent on one another. Fourth Street Clinic, a Salt Lake City homeless medical center, sees 6,000 homeless patients per year. Fourth Street reports that the most common incidents of death for this population are preventable and treatable diseases such as heart disease, diabetes, cancer, and viral or bacterial infections³. Because the lack of care, homeless population's life expectancy is drastically decreased from the national average, see figure 1.³

Utah has seen a 25% increase of homeless individuals from 2005 to 2009³. Currently there are 15,642 homeless individuals living in Utah, where 80% do not have medical insurance. Fourth Street reports an estimate of six million dollars lost in 2009 due to healthcare costs for homeless individuals without medical insurance⁴. The average cost for an extended ER visit to area hospitals is approximately \$3,000 to \$6,000. The most extreme cases of homeless healthcare have been projected to be 300,000 dollars of unpaid healthcare for one individual in 2010.⁴

Fourth Street Clinic, The Road Home, Valley Mental, Health, and other facilities who serve the homeless community coordinate strategic planning to help specific individuals off the streets into permanent housing. Fourth Street Clinic has also coordinated efforts with surrounding healthcare facilities, EMS, local governmental agencies, and police to help prevent lost money due to services by redirecting all non-urgent care to all homeless medical centers⁴.



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Cost of Urban Living

Compiled by JB Flinders, MPH, MBA

UTAH'S COST OF LIVING INDEX FOR HEALTH CARE IS WELL BELOW THE NATIONAL AVERAGE

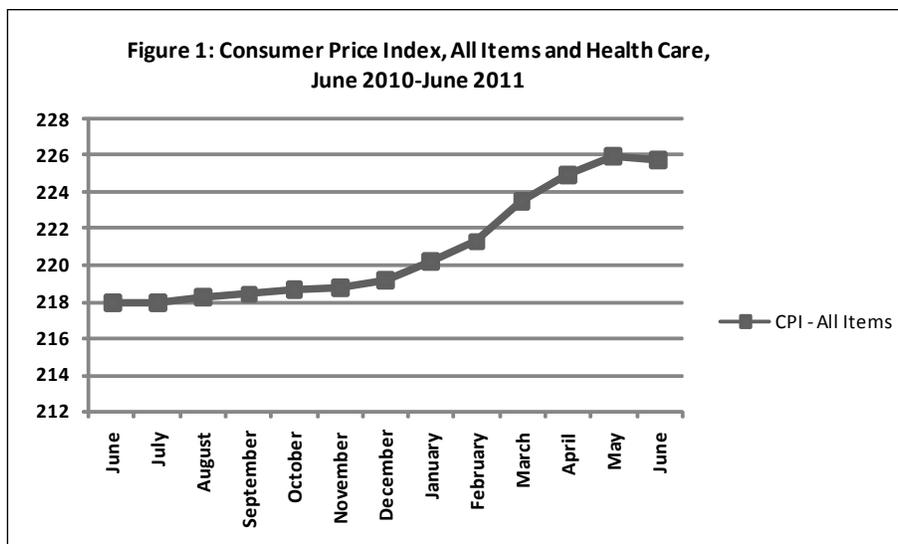
The Consumer Price Index (CPI) estimates the nationwide rate of inflation, both monthly and annually, for a standard selection of goods and services purchased by households. Calculating the percentage change between two time periods provides an estimate of the rate of inflation or deflation and can be used to adjust wages or rents, or to measure whether revenues or incomes are keeping pace with other price increases.¹ The CPI is based on prices of food, clothing, shelter, and fuels, transportation fares, charges for doctors' and dentists' services, drugs, and other goods and services that people buy for day-to-day living.² Prices, including taxes associated with purchase and use, for these goods are collected from 87 urban areas, 4,000 housing units, and 26,000 retail and/or service organizations. These price changes for certain items are averaged together and weighted, representing their importance in the spending of the appropriate population groups.² Medical care is one of the eight major groups in the CPI, and has two classifications, medical care commodities (MCC) and medical care services (MCS). MCS, is the larger of the two, and comprises three expenditure categories: professional services, hospital and related services, and health insurance. The other classification, MCC, includes medications, and medical equipment and supplies.³

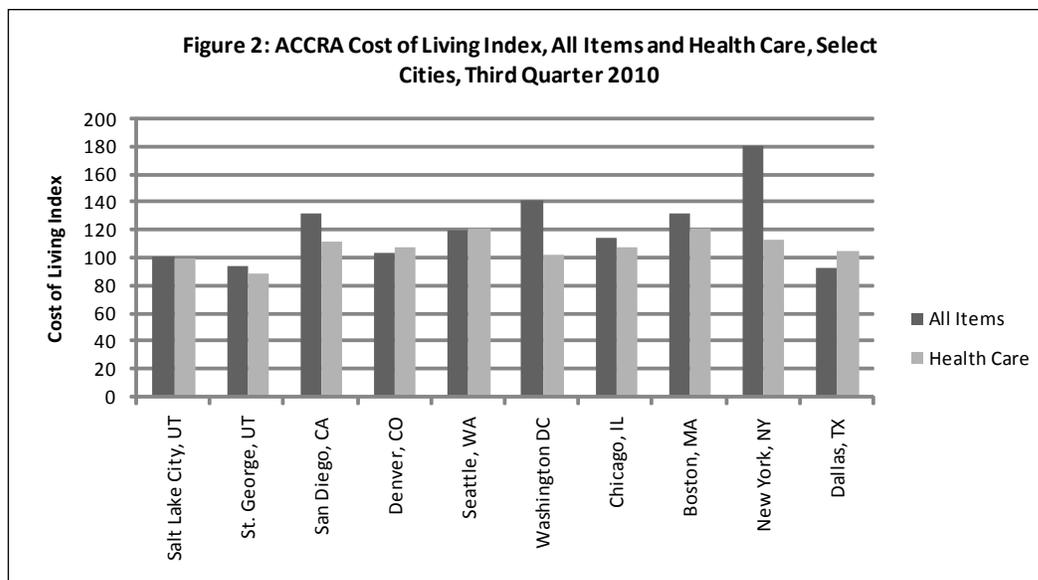
Figure 1 shows the change in the CPI for all items and health care items nationally. The CPI for all items peaked at a high of 225.964 in May of 2011, up from 218.178 in May of 2010. The CPI for all items has gradually increased in 210.228 in December 2008 to 225.722 in June of 2011, showing an inflation rate

of 7.3%.⁴ The CPI for medical care services and commodities has increased 2.9% to 399.522 between June 2010 and June 2011. Specifically, the CPI has increased 5.0% for outpatient hospital services (to 235.759), and 6.7% for inpatient hospital services (to 544.915) between June 2010 and June 2011.⁴

The American Chamber of Commerce Research Association (ACCRA) Cost of Living Index compares cost of living differences among urban areas based on the price of consumer goods and services in six major categories: grocery items, health care, housing, transportation, utilities, and miscellaneous goods and services. The share of consumer spending devoted to the category determines that category's importance in the Index.⁵ Figure 2 illustrates a comparison of the Cost of Living Index (COLI) for major cities as of third quarter 2010.⁶ A score of 100 on the COLI index represents the national average for the United States. The Salt Lake metropolitan area has remained near the national average with a slight decrease from 101.7 in third quarter 2009 to 101.2 in third quarter 2010. Other metropolitan areas in Utah have remained below the national average, including St. George, Cedar City, and Logan.⁶

The Salt Lake metropolitan area COLI increased in health care as well, from 94.5 in third quarter 2009 to 100.4 in third quarter 2010, showing an increase in average prices for health care in this area. The health care CPI in the Logan metropolitan area decreased from 102.3 to 101.0 while the St. George metropolitan area increased from 88.0 to 88.7 over that same period.⁷





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Education

Compiled by JB Flinders, MPH, MBA

IN 2008, 90.3% OF UTAHANS OVER THE AGE OF 25 HAD GRADUATED FROM HIGH SCHOOL.

The value of education, both for economic and individual health, has never been more apparent. Individuals with schooling greater than a high school diploma can expect to live nearly 82 years versus 75 years without. From 1990 to 2000, those with greater education increased life expectancy by 1.6 years while those with less education has no increase or, in the case of females, actually had a decline in life expectancy. This is likely due to lower income, crime, poor housing conditions, or decrease access to health care.¹ Economists have found that an additional year of schooling, on average, raises an individual's earning power between 8 and 15 percent, and a full four years of college boost earnings nearly 65 percent.² Specifically, workers with an advanced degree earned 2.6 times more on average than

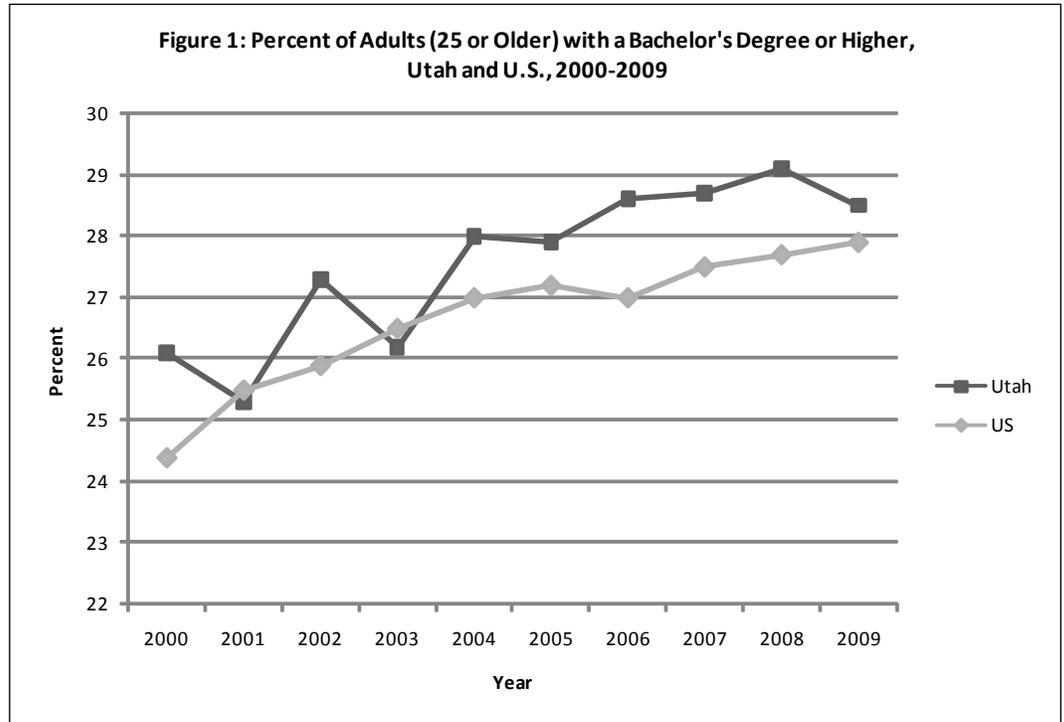
workers with a high school diploma.³ Education levels also correlate with higher social support networks, improved cognitive and critical thinking skills, greater senses of control, increased ability to use more complex technologies (with may assist in healthier behaviors), and other activities that reduce morbidity (reduced alcohol and tobacco usage, increased exercise, etc.).⁴

In 2009, the pupil to teacher ratio in Utah elementary and secondary schools was 23.7 to 1 with per student expenditures of \$6,579.⁵ However, although Utah students tested at the national average on standardized tests, States with similar poverty levels, parent education levels, and ethnic profiles scored significantly higher than Utah on many National Assessment of Educational Progress (NAEP) tests. In fact, Utah was the lowest

achieving state in its demographic peer group in 2006-2007, which many say is a consequence of spending significantly less per student on education.⁶

In 2009, 90.4% of Utahns over the age of 25 had graduated from high school (or greater) and 28.5% had a bachelor's degree (or greater). Figure 1 shows these levels are higher than the national averages of 85.3% and 27.9% respectively.⁷ However, 10.3% of the nation had a graduate or professional degree, compared to only 9.1% of Utahns.^{8,9} However, while Utah consistently surpasses

the national average in bachelor's degrees, Utah's ranking fell from fifth to 16th in the nation from 1940-2000, and slid to 18th in 2008. From 2000-2008 bachelor's degrees in Utah increased from 30.0% to 32.1% in males and 22.3% to 26.1% in females. Although more Utahns are graduating from higher education, Utah women are below the national level while Utah men surpassing the national average.¹⁰



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Population by Race and Ethnicity

Compiled By Kyle Burningham

MINORITIES CONTRIBUTED 35% OF THE STATE'S POPULATION GROWTH IN THE 1990S.

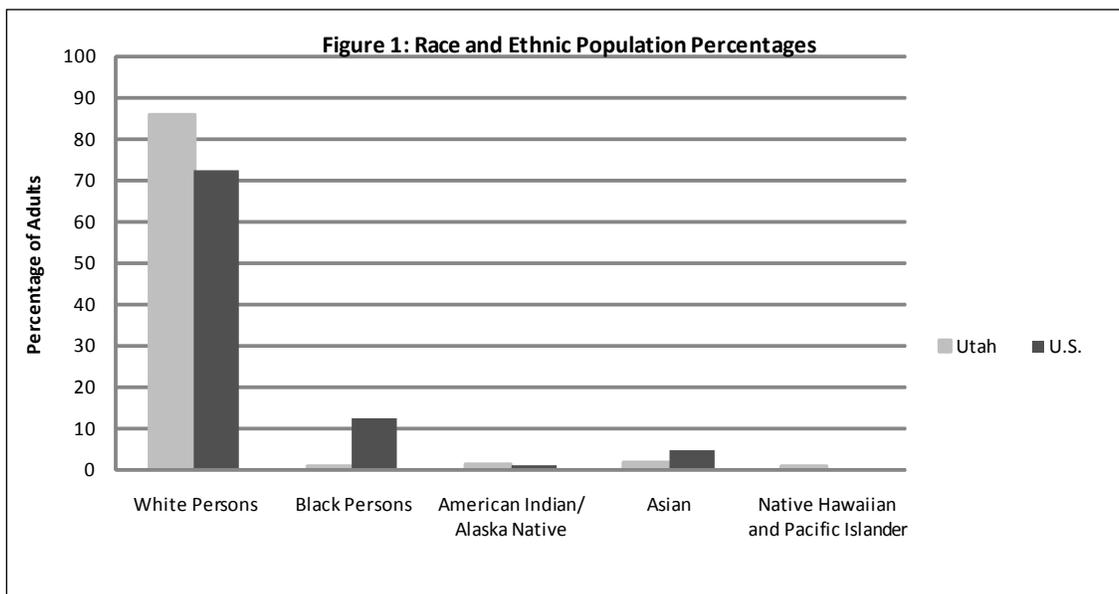
Race categories, as used by the Census Bureau, are socio-political constructs that reflect self-identification by people according to the race or races with which they most closely identify. They include both racial and national-origin groups (such as the classifications used in this report). Hispanic and Latino is another designation used by the Census Bureau which is independent of any race.¹

In 2010, a study of the distribution of race within the state of Utah (as measured by the U.S. Census Bureau's Population Estimates Program) found that Utah's population is racially composed of approximately 86% white persons. The next highest group is persons of Hispanic or Latino origin at 13% with black persons, American Indians and Alaska Native persons, and Asian persons at only 1-2% of the population. In addition, nearly 2% of Utah's population considered themselves part of two or more races. Utah is considerably less diverse than the national average. In the USA, the population is 72.4% white persons, 12.6% black persons, 0.9% American Indian or Alaska Native persons, 4.8% Asian persons, and 0.2% Native Hawaiian and Other Pacific Islander persons.²

Utah's population is increasing and diversifying at a rapid rate. Data shows that Hispanics make up the

second largest population in Utah. Minorities contributed 35% of the state's population growth in the 1990s and is expected to continue growing.³ In the same decade, Salt Lake City became known as an emerging national community with a 174% growth in the city's foreign-born population. Summit County recorded the largest growth with respect to the Latino/Hispanic population within Utah during the 1990s with a Latino/Hispanic growth rate of 638%.⁴

This growth in diversity within the state of Utah is creating a demand to better understand population characteristics to help improve social programs like education and health care as well as to address population disparities that arise with increased diversity. For policy makers to better address these issues, understanding the distinctions and characteristics with the Utah population will be vital to create policies and methods that address Utah's social problems. Utah's continued growth, similar to that seen in the 1990's, will necessitate a greater understanding of racial and ethnic population characteristics at both a state and national level.



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Unemployment Rate

Compiled By JB Flinders, MPH, MBA

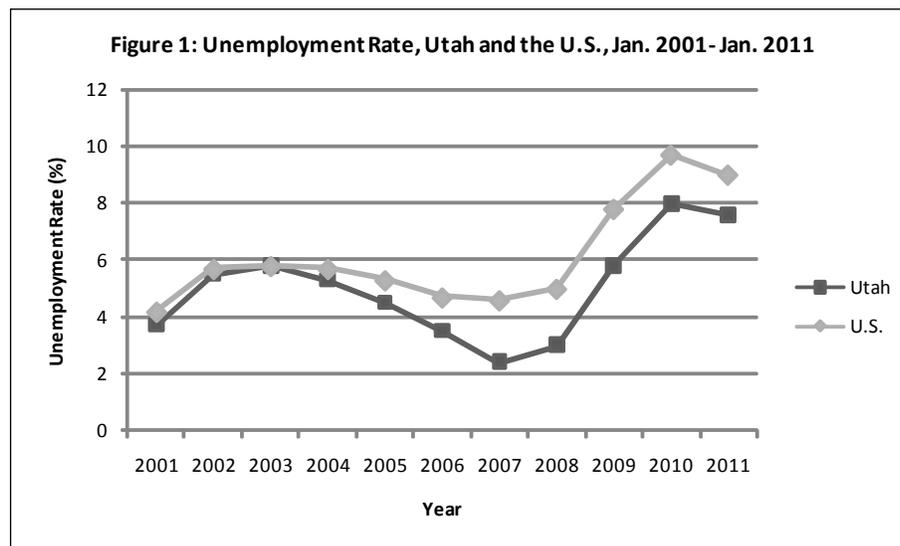
UTAH'S UNEMPLOYMENT RATE OF 7.4% IS LOWER THAN THE NATIONAL UNEMPLOYMENT RATE.

The unemployment rate is an important metric for the condition of the labor market and economy. Persons are classified as unemployed if they do not have a job, have actively looked for work in the prior month, and are currently available for employment. Unemployment also includes individuals who were not working but waiting to be rehired at a job from which they had been temporarily laid off. In July 2011, the national unemployment was 9.1%, a decrease from the 2010 annual average of 9.6%.^{1,2} As of June 2011, the lowest State unemployment rate was South Dakota at 4.8%, while the highest unemployment rate was in Nevada at 12.4%.³

In June 2011, Utah's unemployment rate was 7.4%. Over the last ten years, as shown in Figure 1, Utah's lowest unemployment rate was 2.4% during first quarter 2007, with a high of 8.0% during first quarter 2010.⁴ From 2002 to 2007, Utah's

unemployment rate continually decreased; a decrease linked to population increases, as total employment in Utah increased 19.1% concurrent with a 17.1% growth in population.⁵ Utah's unemployment rate began increasing at the end of 2007, coinciding with the increase in the national unemployment rate due to the U.S. recession.⁶

The unemployment rate is not without its flaws, including lack of data surrounding key issues associated with recessions. These issues include not accounting for workers who are considered under-employed, such as those working part-time involuntarily, and discouraged workers, who are available to but are not currently working, or those who exit the labor market altogether because they feel no jobs are available. However, even though these flaws exist, the unemployment rate is considered by many to the most objective measure of labor underutilization.⁷



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Air Quality

Compiled by JB Flinders, MPH, MBA

Air quality consistently ranks as one of Utah residents' major concerns.¹ The variability of its topography, rapidly growing population, and increased industrial base provide a multitude of problems for the State's air quality. Despite these factors, Utah's concentrations of criteria air pollutants either remained the same or followed a decreasing trend in 2010, with the exception of particulates from natural wind storms.²

The major air quality issue in Utah is caused by inversions, which occur when a dense layer of cold air is trapped under a layer of warmer air. This acts like a "lid", trapping pollutants within the cold air near the valley floor. Topographically, the Wasatch Front valleys and the surrounding mountains hold the air in the valleys which, over time, cause a stronger and stronger level of concentrated pollutants within it.³

Table 1 shows the six major air pollutants that cause damage to individual, environmental, and/or property health. They include ozone (O₃), particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO₂), lead (Pb), and sulfur dioxide (SO₂). The United States Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for each of these pollutants, which are monitored in Utah by the Department of Environmental Quality.⁴ The two pollutants of most concern currently are ozone and particulate matters, known as PM_{2.5}, as exposure to these two pollutants are much more dangerous than previously understood.²

Ozone is formed when volatile organic compounds (VOCs) and nitrogen oxides (NO_x) mix with sunlight and heat. Also known as smog, it is mainly a problem when temperatures are high and daylight hours are long, but it may also create issues in winter months as well. Particulate matter refers to the tiny particles found in the atmosphere which are less than one tenth of a micrometer (about one-tenth the size of a human hair) up to 50 micrometers in diameter. Those finer particles, known as PM_{2.5}—or those up to 2.5 micrometers in diameter—are a more serious health problem.¹ Along the Wasatch Front, 60 percent of particulate matter and 70 percent of carbon monoxide emissions come from vehicles. Industrial sources account for 70 percent of sulfur dioxide emissions, with vehicles accounting for the remaining 30 percent.³

Table 1 also shows the long-term health effects of these types of air pollution which can include lung cancer, heart disease, chronic respiratory disease, and damage to the brain, nerves, and other internal organs.² It also affects the lungs of growing children and can aggravate medical conditions in the elderly.

While research into these effects is ongoing, it is estimated that healthcare costs, productivity losses in the workplace, and the impact on human welfare costs the U.S. billions of dollars each year.³

A number of regulatory changes in recent years have affected Utah's air quality standards. In 2006, the EPA revoked the annual standard for PM₁₀, but retained the 24-hour standard, which is set at 15 µg/m³. For PM_{2.5} the EPA lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³. These 24-hour standards are met when the probability of exceeding the standard is no greater than once per year for a 3-year averaging period. In 2008, the EPA lowered the ozone standard from 0.084 parts per million (ppm) to 0.075 ppm, based on a 3-year average of the annual 4th highest daily 8-hour average concentration. Revisions to the SO₂ and NO₂ standards also occurred in 2010.²

The State of Utah continues to implement programs to help meet EPA standards and improve the health of Utah's citizens. The State is implementing specialized computer systems to gather data on particulate matter and create atmospheric models of Utah for the EPA. The Division of Air Quality, in conjunction with local health departments and local governments, continues to provide air quality assessments, speak at public meetings, and implement health assessments in communities and neighborhoods throughout the state. Studies on Fugitive Dust, PM_{2.5}, and Ozone continue across the State. The Utah's Clean School Bus Retrofit Project, Clean Diesel Trucking Initiative, Clean Diesel for Agriculture Project, and Utah Asthma Task Force are also programs addresses air quality issues in Utah. Finally, grant and loan programs continue to provide financial support to business and government to operate vehicles on clean fuel or to purchase new clean fuel vehicles.²

Table 1: EPA Designated Pollutants

Name	Sources	Health Effects
Carbon Monoxide (CO)	Burning of gasoline, wood, natural gas, coal, oil, etc.	Reduces the ability of blood to transport oxygen to body cells and tissues. Hazardous to people who have heart or circulatory problems and/or damaged lungs or breathing passages.
Lead (Pb)	Paint (cars, houses), smelters (metal refineries), manufacture of lead storage batteries	Damages nervous systems and causes digestive system damage. Children are at special risk. May also cause cancer in animals.
Nitrogen Dioxide (NO ₂)	Burning of gasoline, natural gas, coal, oil, and other fuels. Cars are also an important source of NO ₂ .	Causes lung damage and other illnesses of the respiratory system.
Ozone (O ₃)	Chemical reaction of pollutants, VOC's and NO _x	Causes breathing problems, reduced lung function, asthma, irritated eyes, and reduced resistance to colds and other infections. May also speed up aging of lung tissues.
Particulate Matter (PM ₁₀ , PM _{2.5})	Burning of gasoline, natural gas, coal, oil, and other fuels; industrial plants; agricultural plowing or burning of fields; unpaved roads; mining; construction activities. Also formed from the reaction of VOC's, NO _x , Sox, and other pollutants in the air.	Causes nose and throat irritation, lung damage, bronchitis, and early death.
Sulfur Dioxide	Burning of coal and oil (including diesel and gasoline), industrial processes.	Causes breathing problems and may cause permanent damage to lungs.

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All-Cause Mortality

Compiled by Zane Partridge

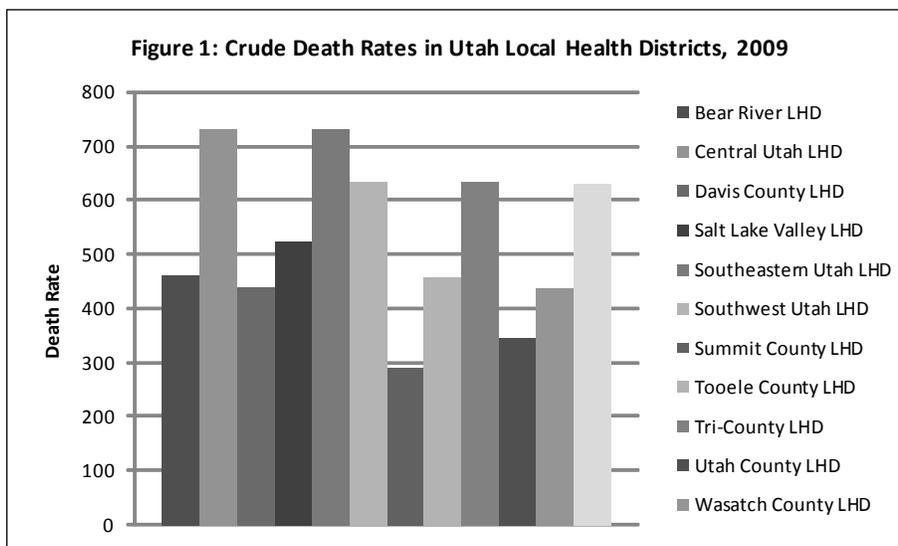
THE DEATH RATE IN UTAH IS 17% LOWER THAN THE NATIONAL AVERAGE.

All known and unknown causes of death, including homicide, suicide, disease, and unintentional injuries, comprise all-cause mortality. This mortality number is compared to the entire population as a whole, and is usually expressed in units of deaths per 1000 or 100,000 individuals per year. The numbers of all-cause mortality may also reflect a population's life expectancy. As all-cause mortality decreases, a population's life expectancy increases.¹

Funeral directors in Utah are mandated to file death certificates after obtaining demographic information from a close family member of the decedent and the cause of death, which is certified by the decedent's physician or the physician who was present at the time of death. Death certificate data is extensively reviewed for completeness and consistency after which they are keyed into software locally by the Utah Department of the Office of Vital Records and Statistics (OVRs), then shipped to the National Center for Health Statistics where they are machine coded to federal standards and returned to OVRs for updating.¹

OVRs also maintains records of specific characteristics such as cause of death, age of deceased, and other incident-related factors.²

In 2009, 14,010 Utah residents died. The crude death rate for the State of Utah was 500.34 deaths per 100,000 individuals. Within the state, Summit County Local Health District had the lowest crude death rate at 289.24 deaths per 100,000 people, while Southeastern County Local Health District had the highest at 731.81 deaths per 100,000, shown in figure 1.³ The Utah age-adjusted death rate has decreased since 1997 and is now 17% lower than the overall death rate for the U.S. This low death rate is credited to a number of different factors, including an extremely low rate of tobacco and alcohol use (and other healthy lifestyles), low rates of poverty, and better access to quality health care.² However, heart disease, cancer, stroke, and other leading causes of death are similar for Utah and the U.S. overall, adjusted for sex, race, and ethnicity.¹



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Emergency Department Visits

Compiled by JB Flinders, MPH, MBA

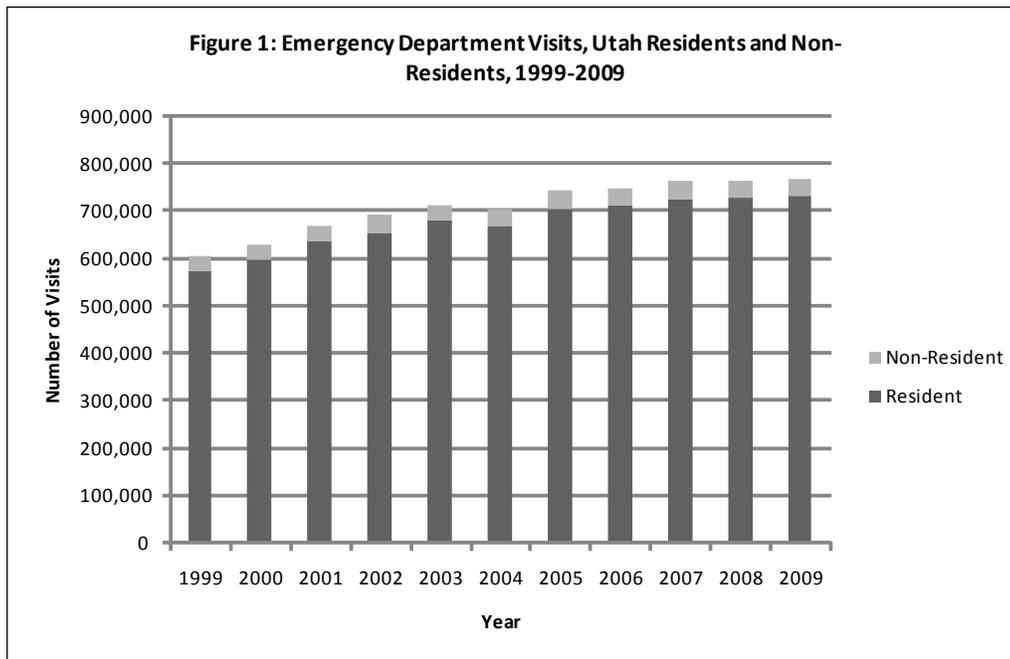
THERE WERE 733,522 EMERGENCY DEPARTMENT VISITS IN UTAH IN 2009.

Emergency Departments treat people for a vast amount of medical issues and conditions. With increasing regulations surrounding insurance coverage, this may explain the continuing growth in visits to Emergency Departments. Statistics on Emergency Departments include both residents and nonresidents of Utah, along with all patients who received treatment and were discharged as well as all inpatient admissions via Emergency Departments.¹

In the U.S. in 2008, there were 123.8 million visits to Emergency Departments, or 41.4 visits per 100 people. 42.4% of these visits were injury-related, and 18% of patients were seen in 15 minutes or less.² Figure 1 shows Emergency Department visits

in Utah during the last decade. In 2009, there were 733,522 Emergency Department visits for Utah residents, an increase of 18.7% from the 599,660 visits in 1999.¹ Overall costs for 2009 Emergency Department visits in Utah were \$1,033,765,520.³

The World Health Organization and the U.S. National Center for Health Statistics have an international system used to classify causes of death on death certificates as well as diagnoses, injury causes, and medical procedures for emergency department visits. In Utah, The Emergency Department Encounter Database gathers data on medical codes, patient characteristics, services received, and charges billed for each emergency department encounter.¹



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Health Insurance Coverage

Compiled by Priti D. Shah

IN 2009 THE PERCENTAGE OF UNINSURED IN UTAH WAS 11.2%, NEARLY THE SAME AS THE NATIONAL RATE.

Both the Utah Department of Health's Utah Healthcare Access Survey (UHAS) and the Census Bureau's Current Population Survey (CPS) include information on physical and mental health status, health insurance coverage, and access to care. Beginning in 2009, these data are being collected on the Behavioral Risk Factor Surveillance System (BRFSS) and cannot be combined with data from the other two surveys. These new data are believed to be the most valid available.¹

Figure 1 shows the percentage of persons who lacked health insurance coverage in Utah (UHAS, CPS, and BRFSS) and the U.S. (CPS) from 1988-2009. An estimated 314,300 Utahans (11.2%) were without health insurance in 2009, which is an increase of 0.5% from last year. Over the past ten years, the percentage of persons in Utah and in the U.S. who lacked health coverage has increased, and the percentage in Utah has increased at a faster rate and is now approximately the same as the U.S. rate. Based on 2009 figures, Utah ranks as the 24th among the other states.¹

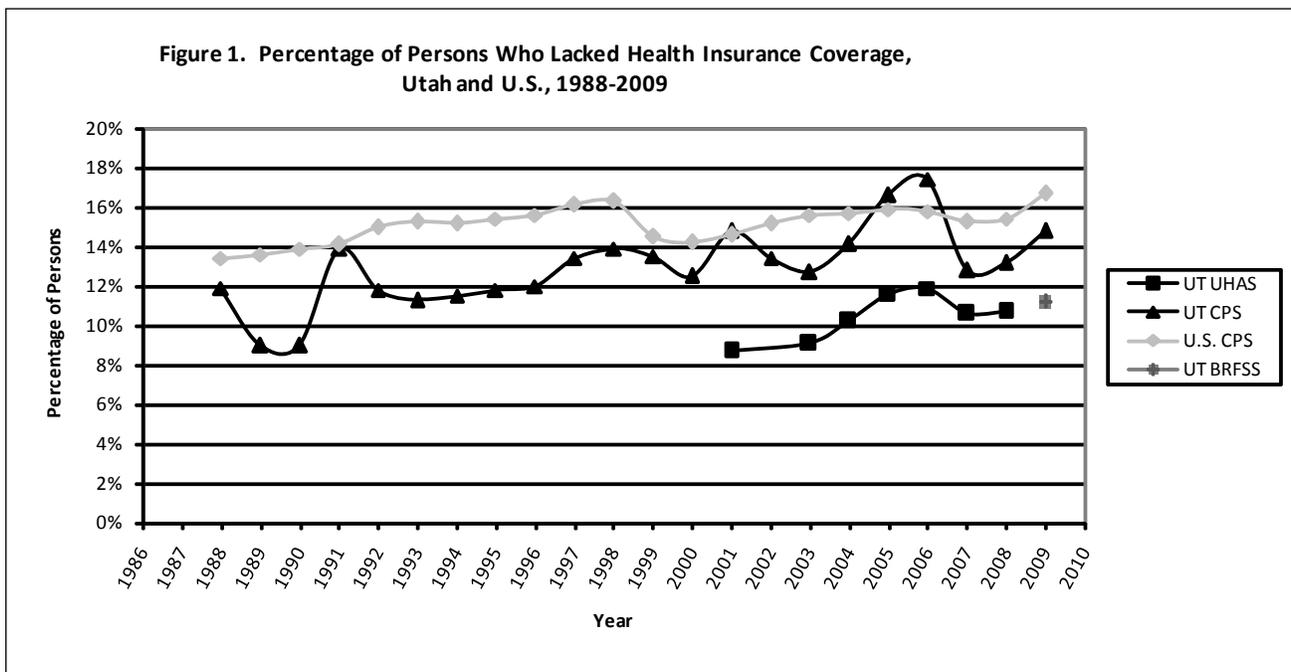
Figure 2 shows the distribution of the uninsured individuals in Utah according to gender and age in 2009.¹ Males aged 19-26 were most likely to be uninsured, at 27.5%. Furthermore, the percentage of uninsured children in 2009 was 8.1% down from 8.4% (UHAS).¹ Values for these categories have been suppressed because sample sizes were too small to produce reliable esti-

mates: Male, under 1 year, 1 to 5 years, and 65+ years; Female, under 1 year and 65+ years.¹

There is a correlation between poverty and lack of insurance. Approximately 75.6% of the total uninsured population are people who live below 200% of the federal poverty level.¹ 21.2% of adults of age 18-25 in 2009 were most likely to be uninsured, and those with household incomes less than \$10,000 had the highest rate, 57.5%, of being uninsured compared to those with higher incomes.¹

To improve conditions, the Utah Department of Health administers programs to improve access to care, such as Medicaid, Children's Health Insurance Program (CHIP), the Primary Care Network, and Utah's Premium Partnership for Health Insurance. The Utah Department of Health also works to provide primary care grants to rural areas and clinics for children with disabilities. Local health departments provide preventive services such as immunizations and screenings at low or no cost to eligible persons.¹ The Healthy People 2020 initiative to increase the proportion of objectives that are tracked at the national level.^{1,2}

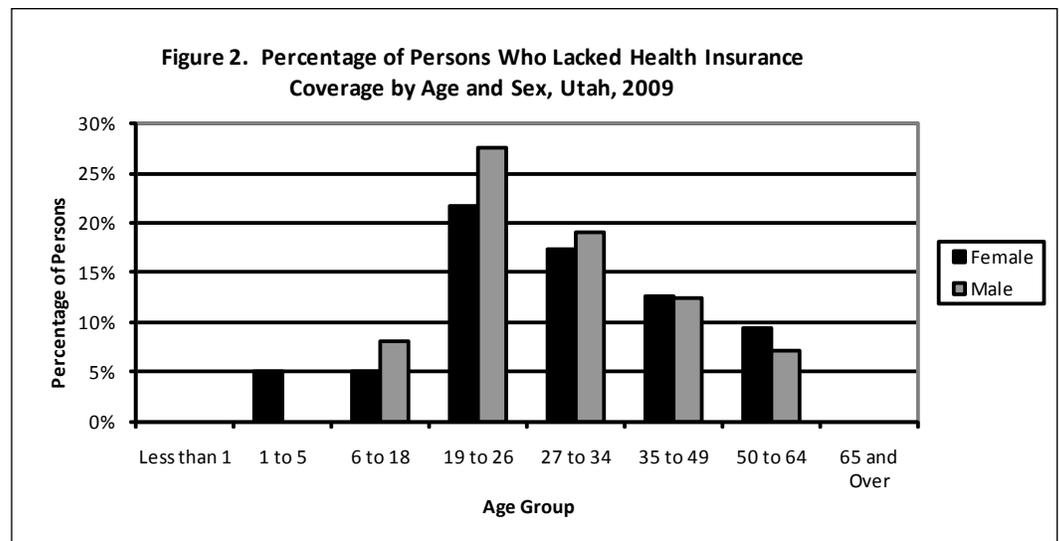
Health Maintenance Organizations (HMOs) attempt to balance patient needs with the need to hold down medical costs. In Utah, 10% of the population is enrolled in Medicare compared to 15% in the U.S. as of July 1, 2009. 40,500 small businesses in



Utah could be helped by a tax credit to provide coverage; small businesses pay about 18% more than large businesses for the same coverage.⁴ Last year, about 22,400 Medicare beneficiaries hit the donut hole, or gap in Medicare Part D drug coverage, and received no extra help to cover prescription drug costs. Beneficiaries who hit the gap this year will get a one-time \$250 rebate, and the law seeks to close the donut hole by 2020.⁵ For persons that are uninsured and are not covered by other health insurance, the Primary Care Network provides primary preventive health coverage, but the federal government requires that more parents than people without children be enrolled.⁵ Utah's Premium Partnership for Health Insurance (UPP) helps people pay their health insurance premiums through their employer's health insurance plan or COBRA coverage up to \$150 per adult and up to \$120 per child per month if they qualify.⁶ The UHAS's Utah's Health Care Safety Net provides health care and related services to the uninsured, Medicare, Medicaid, underinsured, and other vulnerable patients who experience geographical, cultural, language, economic or other barriers to care.⁷ For private insurance, Utah health insurers are required to provide individual coverage to residents of Utah that are not eligible for health insurance via other programs.⁸

About 6.7% of Utah children aged 0-18 years did

not have health insurance in 2009, which has decreased from 8.4% in the previous year.⁹ Eligibility for Medicaid and CHIP is largely based on income as a percentage of federal poverty level. Children can be insured with Medicaid or CHIP if they are not insured by private or employer-provided plans. Children are eligible for Medicaid if they are 0-5 years old and live in homes with incomes at or below 133% of poverty; children 6-18 years must live at or below 133% of poverty and pass an asset test. To be eligible for CHIP, all children aged 0-18 years must live in homes below 200% of the poverty level and cannot be eligible for Medicaid or have any other type of insurance, whereas children can still qualify for Medicaid even with other insurance. The 2009 BRFSS estimates that approximately 76% of insured children were income eligible for health care services through CHIP or Medicaid programs.¹⁰ However, children born outside the U.S. who have not lived in the U.S. for five years are not eligible for Medicaid or CHIP, regardless of income.¹



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Life Expectancy

Compiled by JB Flinders, MPH, MBA

LIFE EXPECTANCY AT BIRTH IN UTAH REMAINS EQUAL TO OR ABOVE U.S. AVERAGE.

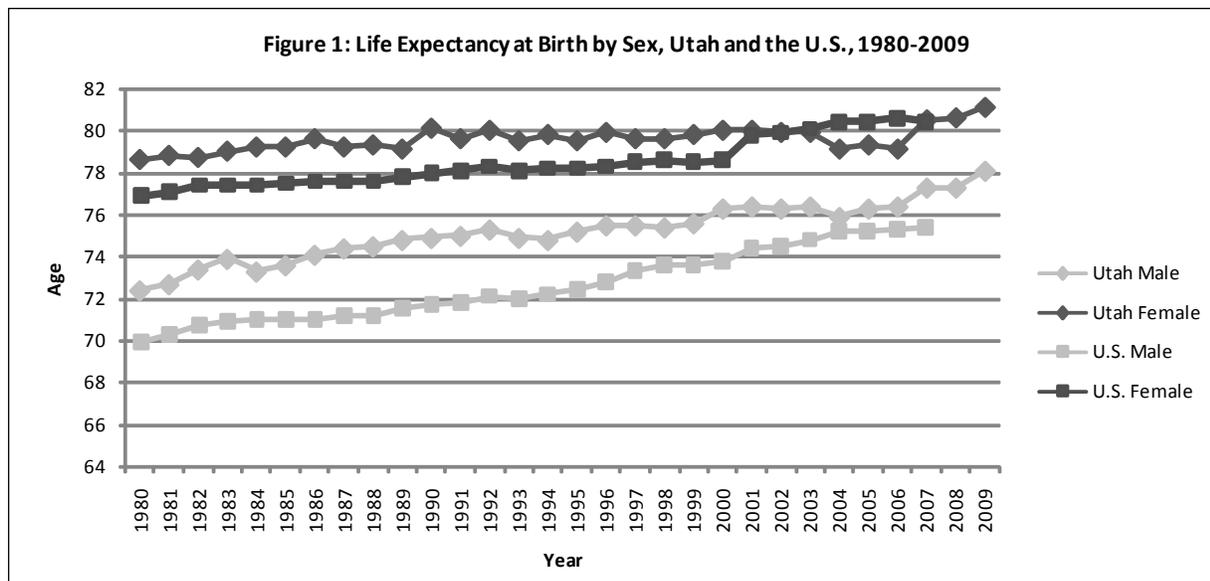
Life expectancy is a statistical measurement of the expected average life span for individuals born into an identifiable population. It also gauges the overall health of a community. The life expectancy at birth statistic measures health status across all ages and indicates cyclical trends in mortality. Predicting life expectancy allows for the planning of services and support for the changing population, especially the elderly. As the life expectancy of a population increases, the number of chronic illness cases often increases as well, as they are more common in older age groups.¹

In the U.S., life expectancy at birth reached 78.2 years in 2009, and increase from 78.0 years in 2008. Life expectancy at birth increased .2 years for males, to 75.7 years, and .1 years for females, to 80.6 years.² Life expectancy rates were highest in Hawaii (80.8 years) and Minnesota (78.8). Utah ranked 3rd in the U.S. in life expectancy, tied with Connecticut (78.7 years).³ As shown in Figure 1, life expectancy at birth of Utah citizens has been equal to, or higher, than the average U.S. citizen between the years of 1980 to 2008. By gender, women had a

higher life expectancy than men from 1980 to 2008, but the life expectancy of men is currently increasing at a faster rate than that of women.¹

By ethnicity, in the U.S., life expectancy for the White population increased by .2 years while life expectancy for the Black population remained unchanged in 2009.² In Utah in 2009, Asian/Pacific Islanders had the highest life expectancy at 83.8 years, followed by White, at 78 years, Black, at 77.8 years, and American Indian/ Alaskan Native at 77.1 years.

The recent record high life expectancy rates can be attributed to a variety of factors. One factor was 36,336 fewer deaths in 2009, a 1.5% decrease from 2008. Another factor was the decline in age-adjusted death rates 10 of the 15 leading causes of death including heart disease, 3.7%, cancer, 1.1%, chronic lower respiratory diseases, 4.1%, stroke, 4.2%, accidents/unintentional injuries, 4.1%, Alzheimer's disease, 4.1%, diabetes, 4.1%, influenza and pneumonia, 4.7%, septicemia, 1.8%, and homicide, 6.8%.²



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Poverty

Compiled by JB Flinders, MPH, MBA

UTAH'S POVERTY RATE HAS INCREASED TO 14.3% IN 2009.

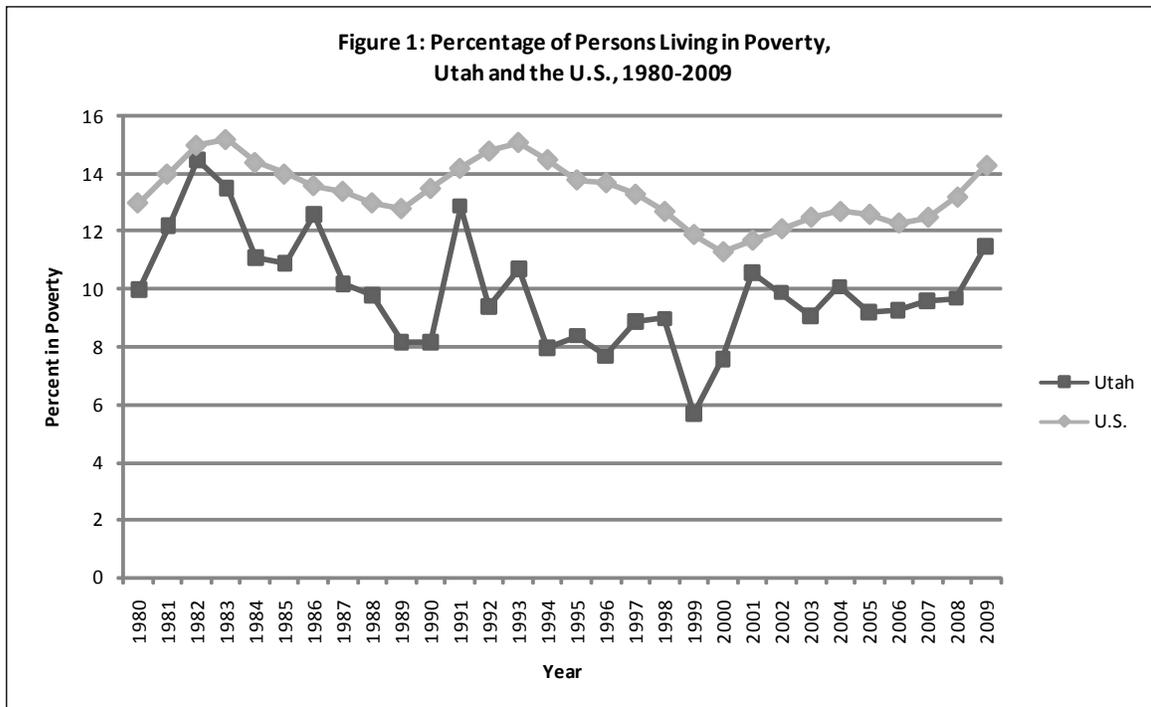
The federal poverty level is defined by two different metrics, the poverty thresholds and the poverty guidelines. Poverty thresholds are used mainly for statistical uses including preparing estimates and figures. Poverty guidelines are simplified versions of poverty thresholds administrative uses such as determining eligibility for programs. All official poverty population figures are calculated using poverty thresholds.¹ The Census Bureau uses income thresholds which vary by family size and composition, including number of people per household, ages of the household, and income of each individual within the household, to determine poverty. If a family income is less than the computed family threshold, then all of those family members are considered in poverty. Poverty thresholds are not geographically-specific, but do account for inflation using the Consumer Price Index (CPI-U).²

The poverty threshold for a household of four is \$21,954, while the poverty guidelines for a household of four was \$22,050, with \$3,740 added for each additional family member.¹ The U.S. poverty rate in 2009 was 14.3%, up from 13.2% in 2008, marking the second annual increase since 2004. This was the highest poverty rate since 1994, but 8.1% lower than 1959 when poverty levels were first recorded. For the third year in a

row, the number of people in poverty increased, from 39.8 million in 2008 to 43.6 million in 2009, and is currently the largest number in the history of recorded poverty levels. Between 2008 and 2009, poverty levels increased for children under age 18, from 19 to 20.7%, increased in individuals aged 18-64, from 11.7 to 12.9%, but decreased for individuals over age 65, from 9.7 to 8.9%.⁴

As shown in Figure 1, Utah's 2009 poverty rate was 11.5%, lower than the national rate of 14.3%.⁵ 316,217 Utahns lived in poverty, an increase of 58,568 from 2008. Utah's poverty rate also dropped from 9th to 14th in the nation between 2008 and 2009. Mississippi had the highest poverty rate in the nation at 21.9%, and New Hampshire the lowest at 8.5%. Utah's child poverty rate grew from 10.5 to 12.2% in 2009. San Juan County had the highest poverty rate of any County in the State at 28.1%. Morgan County had the lowest County poverty rate at 4%. Morgan County was also one of the ten lowest county poverty rates in the nation.³

Poverty is associated with greater health risks, less access to quality food or shelter, exposure to environmental or occupational risks, shorter life expectancy, higher disease severity, decreased access to medical care, and increased mental health



issues.⁶ Utah has a number of programs to assist those living in poverty. These include food-related programs, such as emergency food, food stamps, child nutrition, and WIC; cash-assistance programs, including child care subsidies and reimbursement, unemployment insurance, general assistance, and the Utah

Family Employment Program; housing, including housing assistance, housing funds, rental assistance, and the home energy assistance target program; and education and employment programs, like job counseling, referral, ESL, and other training programs.⁷

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Self-Reported Health Status

Compiled by JB Flinders, MPH, MBA

IN 2009, 14.4% OF UTAH ADULTS REPORTED HAVING SEVEN OR MORE DAYS IN THE PAST 30 DAYS WHEN THEIR PHYSICAL HEALTH WAS NOT GOOD.

Health status is defined as the impact of disease on self-reported patient function or, more specifically, the range of disease manifestation in a given patient including symptoms, functional limitation, and quality of life, in which quality of life is the difference between actual and desired function.¹

In 2009, an estimated 14.4% of Utah adults reported having seven or more days in the past 30 days when their physical health was not good. This rate has remained fairly constant since 1993, with a low of 12.4% in 2002 and a high of 15.9% in 1997. From 1993-2008, Utah and the U.S. have had similar percentages of adults who reported seven or more days when their physical health was not good in the past 30 days. These rates in 2009 were 15% in Utah and 15.2% in the U.S. Self-reported health status rates are age adjusted as Utah has a younger population compared to the rest of the U.S., and younger adults are generally less likely to experience poor physical health.²

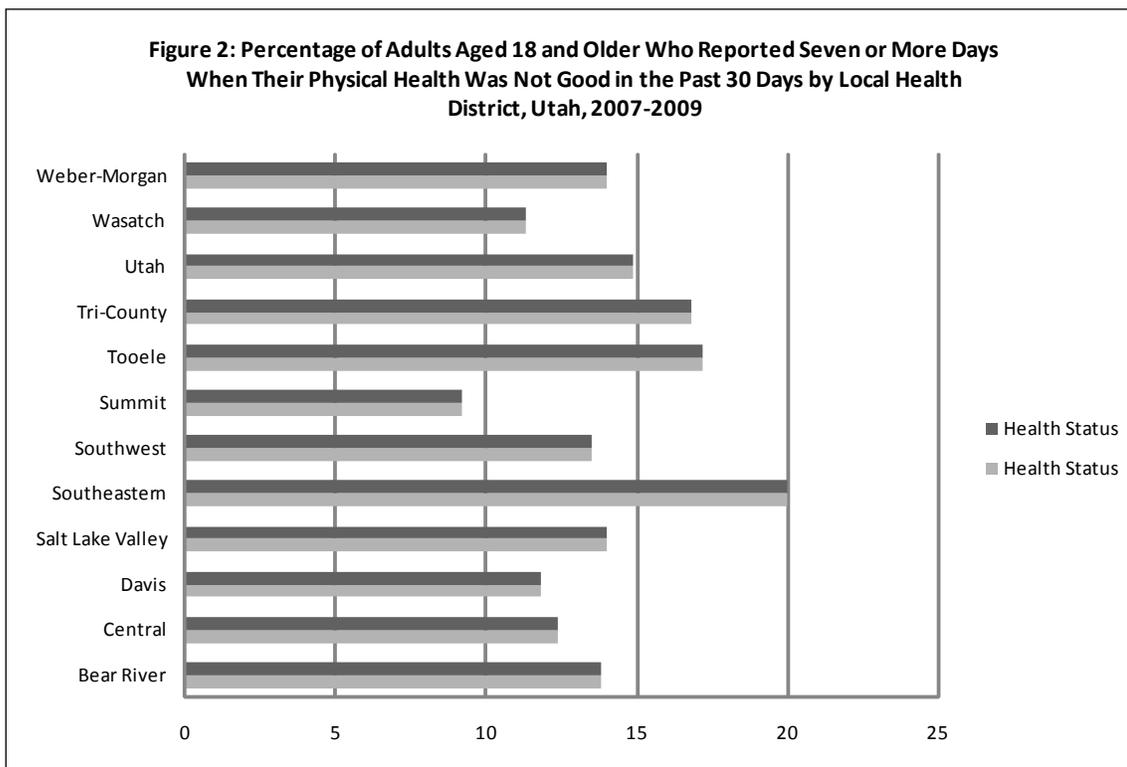
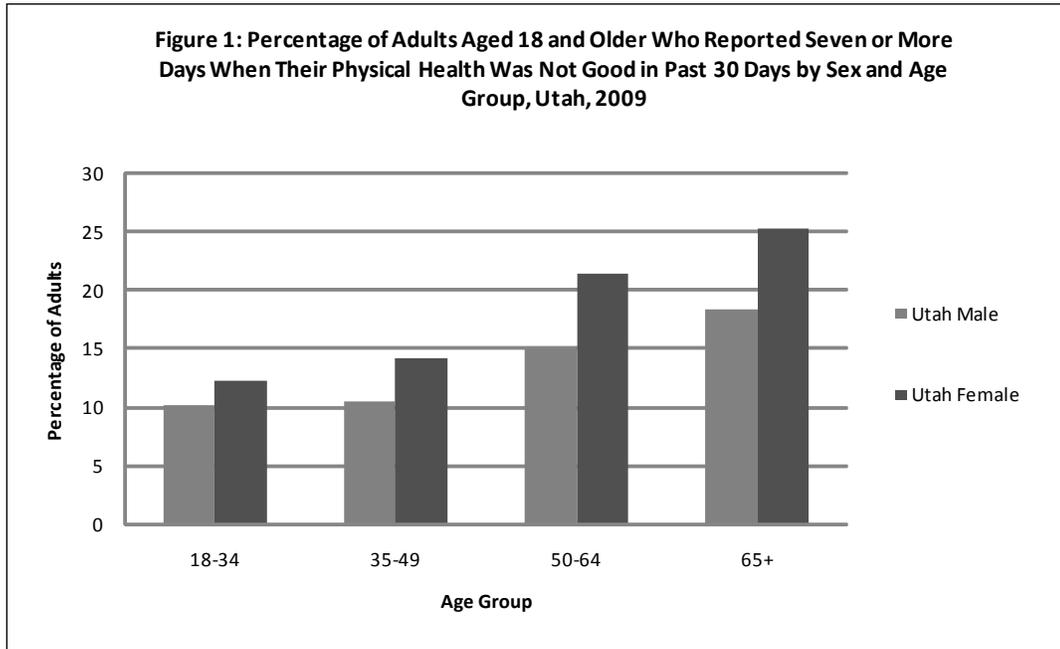
Figure 1 shows the variation between age and sex in self-reported health status. In general, women in Utah reported higher rates of seven or more days in the past 30 days when their physical health was not good. This disparity is highest in the 65+ age group, with 25.4% of women reporting their physical health not being good compared to 18.4% of men. Figure

2 shows an estimate of self-reported health status by Health District, where reporting of having seven or more days in the past 30 days not being good is highest in Southeastern, Tooele, and Tri-County region.²

Other disparities in self-reported health status include education level, income level, and obesity. In 2009, 26.2% of those with less than a high school education reported having seven or more days in the past 30 days when their physical health was not good, compared to 11.5% of those who had graduated from college. In terms of income level, 26% of those whose income was less than \$25,000 annually reported having seven or more days in the past 30 days when their physical health was not good, compared to 17.3% of those whose income was \$25-49,999 annually, 10.3% of those whose income was \$50-74,999 annually, and 9.8% of those whose income was greater than \$75,000 annually. In terms of obesity, 12.2% of those considered to be of normal weight reported having seven or more days in the past 30 days when their physical health was not good compared to 14% of those considered overweight and 19.2% of those considered obese.²

Self-reported health status data indicates a need to reduce morbidity and improve disease self-management from Utah's

chronic disease prevention and control programs. The continuing goal from this data would be to decrease the percentage of adults who experience poor physical health days.²



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Alcohol Use—Utah and the United States

Compiled by Zane Partridge

BINGE DRINKING IN UTAH HAS INCREASED 0.6% BUT STILL HAS MET HEALTHY PEOPLE 2010 GOAL.

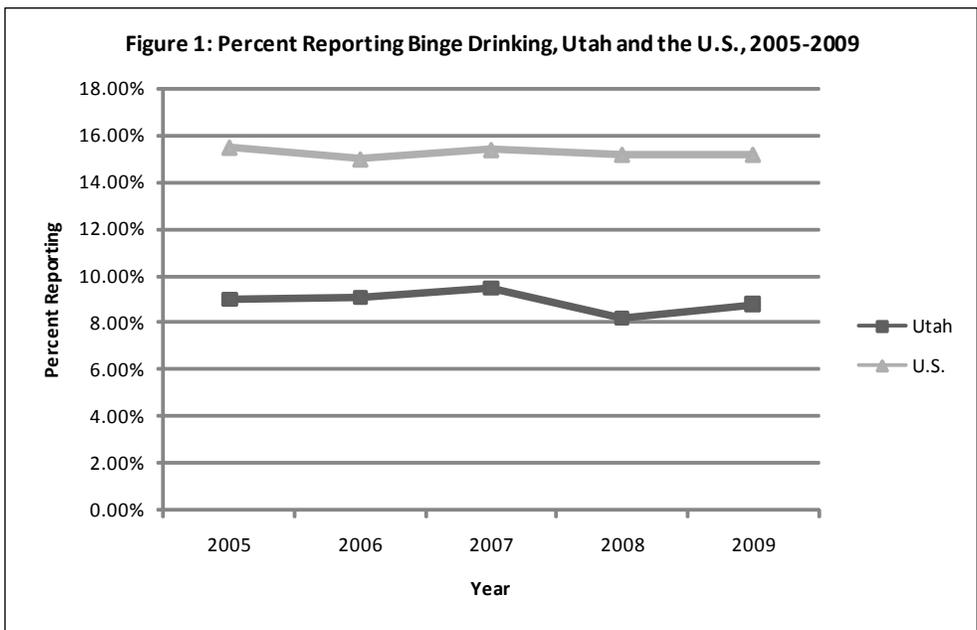
Ethanol, or ethyl alcohol, is found in the three categories of alcohol: beer, wine, and spirits. The liver metabolizes ethanol at a relatively slow pace, and the remaining alcohol circulates through the body and acts as a depressant for the central nervous system; with an effect that varies depending on a variety of factors.¹

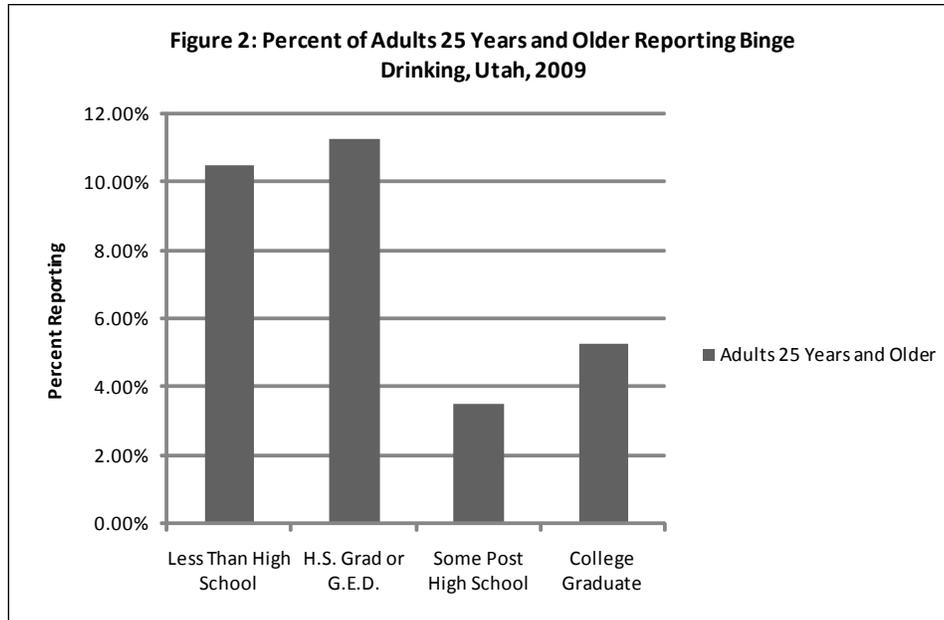
Alcoholism is defined as an addictive disorder. Reasons may vary why a person will consume alcohol, but alcoholism is considered as a treatable disease for individuals who have dependence for alcohol and may not be able to stop drinking on their own.² Men are more prone to become dependent on alcohol, while physicians see more physical complications in women, such as liver disease. Depression and mental disorders, age, family history of abuse, social and culture factors contribute to abuse. Complications due to alcohol or alcohol abuse include cirrhosis, heart disease, dependence, and fetal alcohol syndrome, if a mother consumes alcohol during gestation. Interestingly, moderate alcohol intake may slow bone loss in postmenopausal women, reduce heart disease due to plaque, and lower the risk of stroke. Nearly 18 million Americans abuse

alcohol, and more than 100,000 Americans die yearly from alcohol-related causes.²

Binge drinking is an indicator of alcohol abuse. Binge drinking is defined as consuming five or more drinks at one time for men and four or more drinks for women. As shown in Figure 1, in 2009, 8.8% of adults in Utah reported binge drinking compared to 15.2% nationally. Between 2008 and 2009 binge drinking has increased by 0.6% in Utah; however, it has achieved the Healthy People 2010 goal.³ The highest numbers of binge drinkers in Utah are Hispanic and white males ages 18-34. Figure 2 shows binge drinking occurs less in educated adult males 25 years and older binge drink less than non-educated adults.⁴

A government program named Healthy People provides science-based, 10-year national objectives for improving the health of all Americans. For 3 decades, Healthy People has established benchmarks and monitored progress over time in order to: Encourage collaborations across sectors, guide individuals toward making informed health decisions, and measure the impact of prevention activities. Healthy People 2010 has made a goal for the nation to lower binge drinking to 13.4%.⁵





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Homicide

Compiled by Anthony Tran

UTAH'S HOMICIDE RATE IS LOWER THAN THE NATIONAL AVERAGE FOR BOTH MALES AND FEMALES.

Homicide is the death of a person caused by the deliberate force of another person. Examples of homicide include voluntary manslaughter, involuntary manslaughter, intoxicated manslaughter, dangerous driving causing death to another person, reckless manslaughter, and negligent manslaughter.¹ Homicide is often considered an act of criminal activity and vindictive behavior, but it can also result from acts of self-defense, such as protecting oneself, family, or attack by another country.²

From 2004-2009, Utah's age adjusted homicide rate was 2.0 per 100,000 persons. Figure 1 shows homicide rates in both Utah and U.S.³ Homicide rates for males in the U.S. are consistently higher than that of rates for females in the U.S., and higher than both male and female rates in the State of Utah. Although Utah's rates are consistently lower than the national average, homicide is still the third leading cause of death for Utahans ages 1-4 and 15-24 years old. Figure 2 shows that both male and female rates are similar in each age group, with the exception of the teenage and early adulthood years in males. The target number for U.S. homicide rates is 2.8 per 100,000 population and the State of Utah target is 2.0 per 100,000 population. According to the Utah Department of Health, Utah's 2008 rate was 1.7 per 100,000 population.⁴

The Utah Department of Health Violence and Injury Prevention Program (UDOH-VIPP) is funded by the U.S. Center of Disease Control and Prevention, and implements the Utah Violent

Death Reporting System (UTVDRS). The UTVDRS is a data collection and monitoring system that provides information to decision makers about the trends, characteristics, and magnitude of violent deaths such as homicide. Data are collected from the Office of the Medical Examiner, Vital Records, and law enforcement agencies. UTVDRS is in its fifth year of operation and continues to help identify risk factors, understand circumstances, and better characterize perpetrators of violent death.⁵

Figure 1: Homicide Rates by Sex and Year, Utah and U.S., 2003-2009

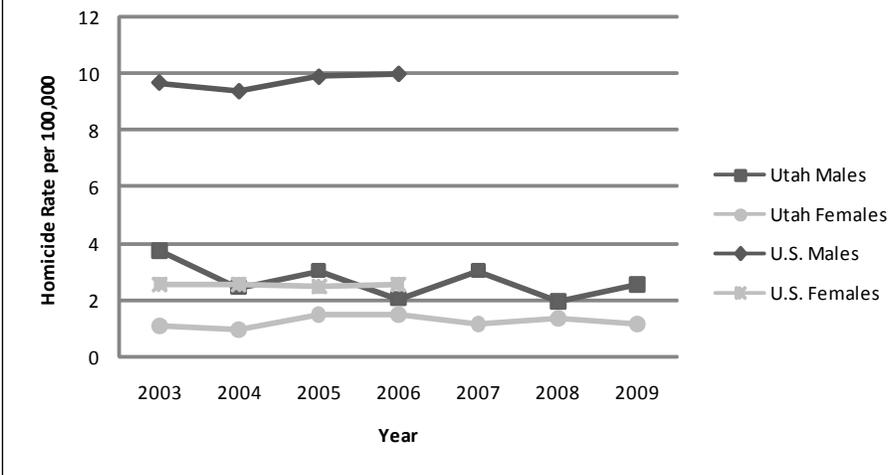
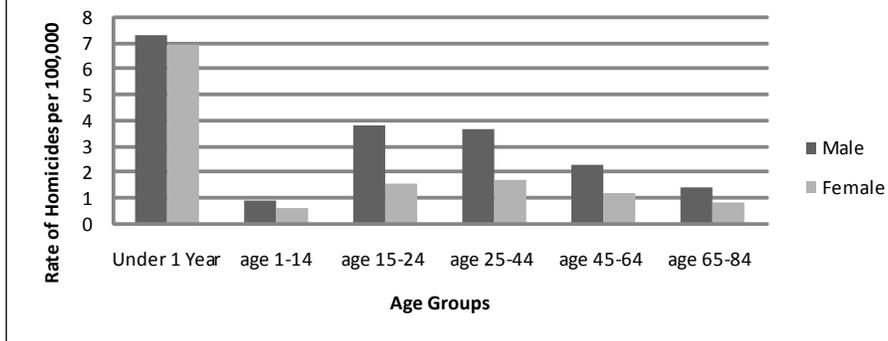


Figure 2: Homicide Rates by Sex & Age Group, Utah, 2004-2009



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Motor Vehicle Crash Deaths and Seat Belt Utilization

Compiled by JB Flinders, MPH, MBA

SEAT BELT USAGE OF 89% IN 2010 IS THE HIGHEST UTAH SEAT BELT USAGE RATE IN RECORDED HISTORY.

Motor vehicle crashes (MVC) are one of the leading causes of injury, hospitalization, and death in Utah.¹ In Utah in 2009, MVC's accounted for 227 deaths making them the second leading cause of injury death.² As shown in Figure 1, Utah's rates of MVC's have declined since 2004 and remained lower than national rates in 2007, at 10.4 per 100,000 population in Utah versus 13.9 per 100,000 population nationally. In 2009, Utah's rate of MVC's decreased to 8.7 per 100,000 population. Utah also had a lower rate of MVC deaths per miles driven (1.06 fatalities per million vehicle miles traveled) than the U.S. (1.26 fatalities per million vehicle miles traveled) in 2008.²

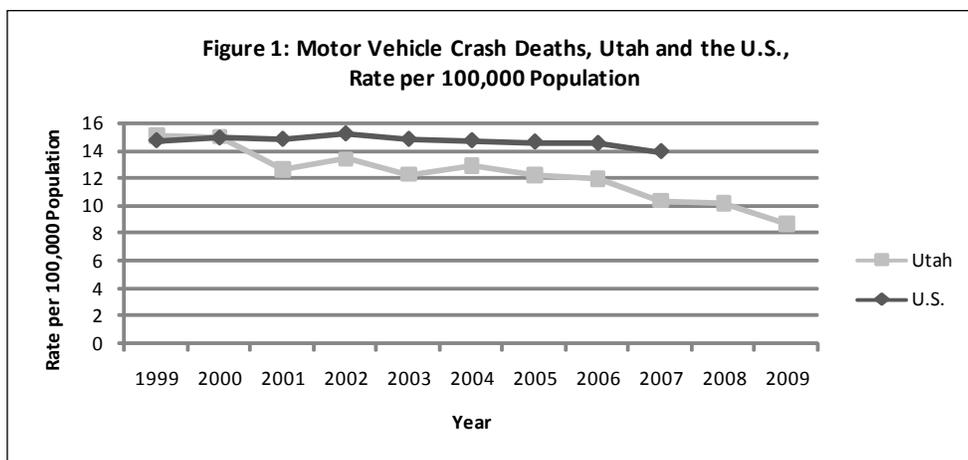
When analyzed by demographics, MVC death rates from 2007-2009 were nearly twice as high for males (12.5 per 100,000 population) as females (6.3 per 100,000 population) in Utah. Males aged 20-24 had the highest rates of death from MVC (12.5 per 100,000 population) followed by males aged 65 and above (19.6 per 100,000 population). In females, individuals aged 65 and above had the highest rates of MVC deaths (10.5 per 100,000 population).³ Geographically, from 2007-2009, Utah residents in rural areas tend to have higher MVC death rates than urban area residents. For example, the TriCounty (26.8 per 100,000 population), and Southeastern (26.1 per

100,000 population) health districts had the highest MVC death rates, while Davis County (7.4 per 100,000 population) and Salt Lake Valley (7.7 per 100,000 population) health districts had the lowest rates.³

According to the National Highway Traffic Safety Administration (NHTSA), seat belt use could reduce deaths and serious injuries from MVC's almost 50% with proper and consistent use of safety belts and, with 90% seat belt usage nationwide, result in overall cost savings of \$5.5 billion.¹ Those involved in MVC's who wore seat belts were nearly 30 times more likely to survive a crash than those who did not wear a seat belt, and those who survived had a greater than 84% chance of escaping without injury and a 15.8% chance of surviving with injuries (compared to 53.8% and 43.8% of non-seat belt wearing survivors).¹ The Utah Department of Public Safety conducts annual safety belt observational surveys to determine seat belt usage in Utah. In 2010 seat belt usage in Utah was 89.0%, the highest recorded seat belt usage to date.³

Utah's Safety Belt Use Law mandates seat belt use for individuals up to 19 years of age, and also allows an officer to stop a vehicle if an unrestrained occupant is observed. For a person age 19 or older, the failure to wear a seat belt can only be cited

when the person has been stopped for another offense, such as speeding. This law applies to all seats in the vehicle that are equipped with seat belts.⁴ Other motor vehicle safety laws include HB290 which prohibits texting and emailing while driving. Law enforcement agencies and transportation agencies assist with reducing MVC's through designing and constructing safer roadways and enforcing traffic laws.³



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Suicide

Compiled by Anthony Tran

SUICIDE IS THE 11TH LEADING CAUSE OF DEATH IN THE UNITED STATES.

Suicide is defined as the intentional destructive act of taking one's own life. In 2007, more than 34,000 people committed suicide in the United States, equivalent to 94 suicides per day and one suicide every 15 minutes.¹ Suicide is the 11th leading cause of death in the United States. Suicidal behavior is complex and often researched considering its diverse causes and backgrounds to the individuals involved. Risk factors vary with age, gender, and ethnic group and are known to occur in the combination and change in severity and abundance over time. The most common risk factors for suicide include depression and other mental disorders, but other risk factors can include stress, substance abuse, physical and/or sexual abuse, prior suicide attempts, keeping firearms in the home, and exposure to the suicidal behavior of others. The most common methods of suicide are firearms, suffocation, and poisoning among adults, and firearms in youth populations.² Ninety percent (90%) of those who do commit suicide suffer from drug or alcohol dependency or major depressive disorder. In 2004, 41% of the over 106,000 drug-related suicide attempts admitted to emergency rooms were diagnosed with a psychiatric condition in persons aged 18 years or older. The major clinical diagnosis was depression.¹

Suicide accounted for 1.4% of the total deaths in the United States in 2007.³ Although women and teens report more suicide attempts, white men take their own lives at nearly four times the rate of females and represent a total of 78.8% of all U.S. suicides.¹ Figure 1 shows that the national rate of suicide deaths in males was 18.4 deaths per 100,000 and 4.7 deaths per 100,000 for females.⁴ In 2009, rates in Utah increased by more than 2

per 100,000 for both genders, with 26.4 deaths per 100,000 for males and 7.8 deaths per 100,000 for females.

Of Utah high school students who completed the Youth Risk Behavior Survey in 2009 more females (17.4%) seriously considered suicide than did males (10.5%).⁵ The percent of suicides related to depression or other mental disorders in offenders 18-21 were in the range of 80%-90%.¹ Figure 2 shows the trends in suicide-related behaviors from 2001, 2003, 2005, 2007, and 2009. The national Youth Risk Behavior Survey (YRBS) monitors priority health risk behaviors that contribute to the leading causes of death, disability, and social problems among youth and adults in the United States. The national YRBS is conducted every two years during the spring semester and provides data representative of 9th through 12th grade students in public and private schools throughout the United States.

The Department of Health and Human Services has created Healthy People 2020 which establishes the major risks to health and wellness, changes public health priorities, and provides information about emerging issues related to health preparedness and prevention.³ The Healthy People Objective for Utah is to reduce suicide deaths among adolescent males age 15-19 years to 10 per 100,000 by 2020.³ In order to educate Utah residents about the prevalence, trends, and characteristics of violent deaths, such as suicide, and improve state violence prevention policies and programs, the Utah Violent Death Reporting System, UTVDRS, has been implemented to collect and monitor data for dissemination to Utah's decision making bodies.¹

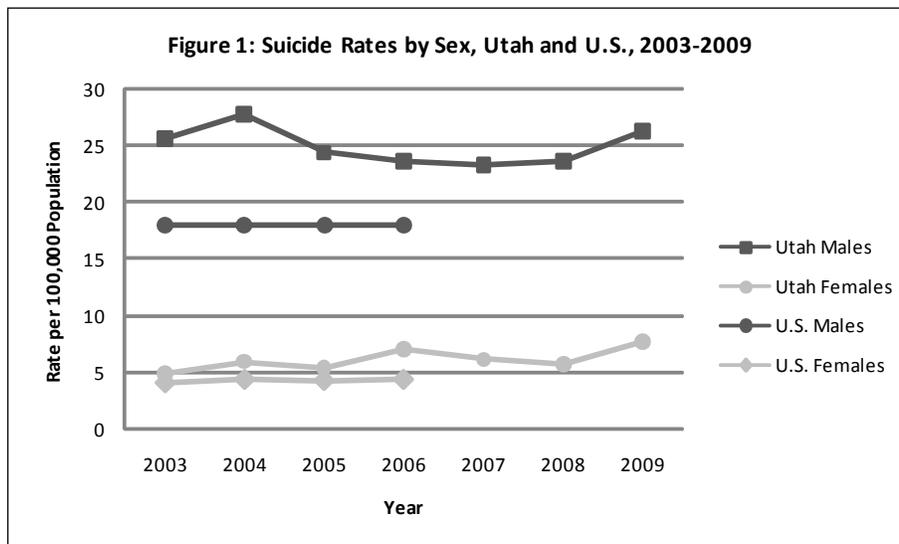
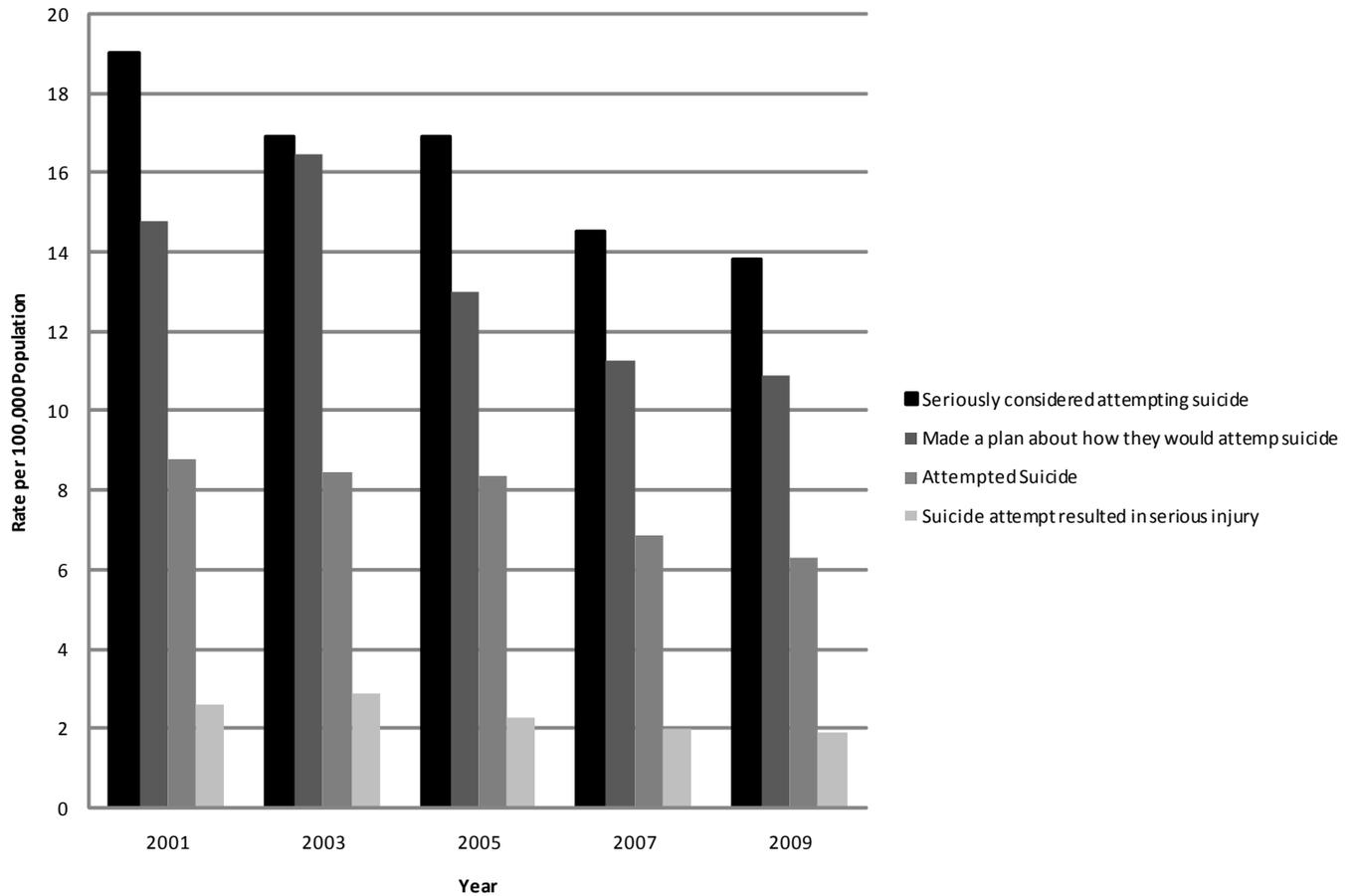


Figure 2: Utah Trends in Suicide-Related Behaviors, 2001, 2003, 2005, 2007, 2009



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Tobacco Use: Utah and the U.S.

Compiled by JB Flinders, MPH, MBA

IN 2008, UTAH REACHED AN ALL-TIME LOW FOR PERCENTAGE OF ADULT SMOKERS AT 9.1%.

Tobacco use is the most preventable cause of disease, disability, and death in the United States. Each year nearly 443,000 people die prematurely from smoking or exposure to second-hand smoke, while another 8.6 million develop a serious illness

caused by smoking.¹ Tobacco smoke contains at least 250 harmful chemicals, 69 of which are known to cause cancer, including arsenic, benzene, cadmium, 1,3-Butadiene, and Polonium-210. Smoking is the leading cause of cancer and cancer death,

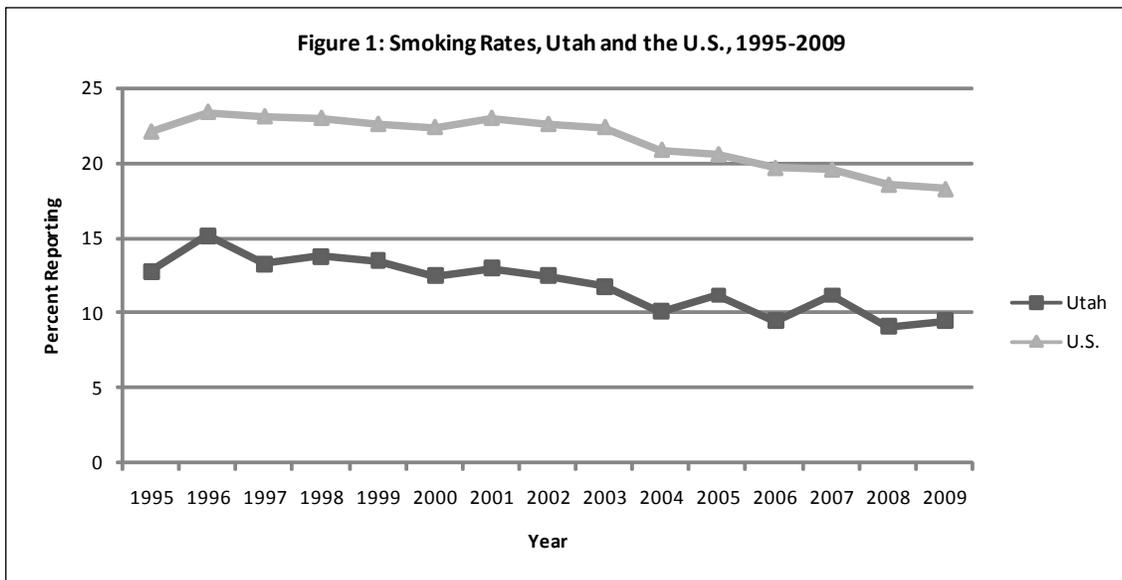
including lung, larynx, mouth, esophageal, kidney, bladder, stomach, and pancreatic cancer. Smoking also causes stroke, heart disease, chronic obstructive pulmonary disease, asthma, cataracts, low birth weight, sudden infant death syndrome, and increases the risk for pneumonia, lung infections, and erectile dysfunction.² Despite these risks, approximately 46 million U.S. adults smoke cigarettes.¹

Although cigarette smoking is the largest contributor to tobacco related death and disease, 3.5% of Americans 18 and older also report using smokeless tobacco in the form of chewing tobacco or snuff. These forms of smokeless tobacco contain 28 cancer causing agents.³ The use of smokeless tobacco produces severe consequences, including gum disease, tooth decay, pregnancy problems, reduced sperm count, and lung, larynx, esophageal, and oral cancers.^{2,4}

Exposure to secondhand smoke can also cause death or serious diseases, including heart disease and lung cancer in non-smoking adults and sudden infant death syndrome, acute respiratory infections, and severe asthma attacks in children. This exposure also causes an estimated 3,000 deaths to nonsmoking Americans from lung cancer, 46,000 deaths from heart disease, and almost 300,000 lower respiratory infections in children 18 months or younger.¹

In 2009, the United States reached an all-time low for percentage of adult smokers at 18.3%. Utah's rate reached its lowest point in 2008 at 9.1%, but rose slightly to 9.5% in 2009. As shown in Figure 1, Utah's smoking rate has consistently been around 10% lower than the national average. Utah also has lower cigarette smoking rates in high school aged children, with 8.5% reporting smoking in Utah compared to 19.5% reporting smoking nationwide. However, Utah's rate has gradually increased since 2003 while the national rate has decreased since 2005.⁶

State and National programs have been established to help eliminate tobacco use. More popular campaigns, like the Truth, provide facts and information about the dangers of smoking so individuals can make educated health decisions.⁷ The Utah Department of Health uses a wide variety of programs that prevent young adults from initiating tobacco use, to help current tobacco users to quit, and to eliminate the exposure of second-hand smoke to nonsmokers.⁵



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Violent Crimes

Compiled by JB Flinders, MPH, MBA

UTAH'S FORCIBLE RAPE RATE IS SIGNIFICANTLY HIGHER THAN THE NATIONAL RATE.

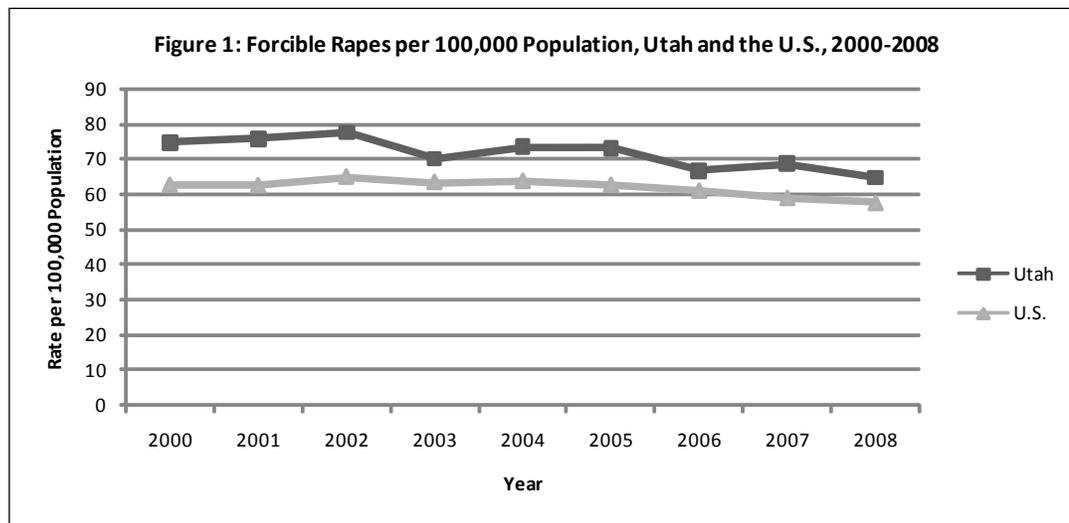
According to the FBI's Uniform Crime Reporting (UCR) Program, violent crime involves four offenses, including non-negligent manslaughter and murder, forcible rape, aggravated assault, and robbery. These violent crimes also involve force or threat of force. In 2009, an estimated 1,318,398 violent crimes occurred, a decrease of 5.3% from 2008, and 7.5% from 2000. Aggravated assaults comprised 61.2% of violent crimes, followed by robbery at 31%, forcible rape at 6.7%, and homicide at 1.2% in 2009. All four offenses decreased from 2008 to 2009, with robberies decreasing 8.0%, homicides decreasing 7.3%, aggravated assaults decreasing 4.2%, and forcible rates decreasing 2.6%.¹

Utah's violent crime rate is well below that of the national average, making Utah a relatively safe location to reside. Utah has a high rate of property-based crime, at 3,275.4 crimes per 100,000 population, compared to its violent crime rate of 212.7 per 100,000 people. Utah's violent crime rate is well below the national average of 429.4 per 100,000 people.² In 2009, Utah's

violent crime rate decreased 1.46% from 2008 levels, with a 0.57% decrease in aggravated assault and 7.47% in robberies. However, Utah had increases of 4.17% in forcible rapes and 5.13% in homicides. Thus, in Utah in 2009, one homicide occurred every 8.9 days, one rape every 9.47 hours, one robbery every 6.67 hours, one aggravated assault every 2.41 hours, and one burglary every 35.57 minutes.³

Although the violent crime rate is lower in Utah than the national average, Utah's forcible rape rate has been considerably higher since 2000. Figure 1 illustrates the rate of forcible rapes in Utah compared to the U.S. average.⁴ Although this rate discrepancy may be attributed to an improvement in reporting, some studies have suggested that Utah could be one of the highest states in estimated percentage of rape victims, with rates as high as 20.6% of the state's female population estimated to be a victim of rape.⁵

Utah employs a relatively low amount of employees in State and Local law enforcement agencies and is 44th in the United States in this category, including 102 sworn officers per 100,000 population. However, Utah is 17th highest in the number of full-time sworn officers with State agencies, with 23 per 100,000 residents, which is higher than the national rate of 20 per 100,000 residents.⁶



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Newborn Screening

Compiled by JB Flinders, MPH, MBA

IN 2009, 99.2% OF ALL UTAH CHILDREN WERE SCREENED FOR 37 GENETIC OR FUNCTIONAL DISORDERS.

The Utah Newborn Screening Program (NSP) began in 1979 with screening tests for Phenylketonuria, Galactosemia, and Congenital Hypothyroidism. By 2009, 33 additional screening tests, including a test for cystic fibrosis, have been added to allow screening for 37 different disorders.¹ In Utah, newborns are screened for metabolic, exocrine, endocrine, and hematologic 37 disorders (Table 1), including amino acid metabolism disorders, fatty acid oxidation disorders, organic acid metabolism disorders, cystic fibrosis, and hearing loss. Each baby born in the State of Utah undergoes a special blood test shortly after birth to detect the presence of these disorders. Early detection of these disorders is vital, as screening allows for identifying the disorder prior to symptom onset, and early entry into comprehensive care programs. Screening also allows for early treatment of disorders with severe clinical symptoms, including sepsis, severe anemia, growth retardation, permanent brain damage, and increased risk of death.²

Utah State law mandates that screening tests collect two specimens, using heel stick blood spots, between 48 hours and five days after birth (or before discharge) and a second screening between 7 and 28 days following birth to confirm the findings.² In Utah, parents or legal guardians may refuse to allow the screening for religious reasons only. If an abnormal result is found, The Utah State Health Department notifies the signing medical practitioner, who then may be required to collect and submit additional specimens in order to make a final diagnosis within 30 days of the abnormal result notification letter.³ Additional tests may also be recommended. On April 12, 2010, the Utah newborn screening program implemented a new procedure for screening newborns considered "sick" or "pre-term".³ The main differences are that the second screening should occur at eight days of age assuming the baby is still in the nursery or ICU, otherwise normal screening rules apply.⁴

In 2004, The Maternal and Child Health Bureau commissioned the American College of Medical Genetics (ACMG) to draft standardized guidelines for state newborn screening programs, define responsibilities for collecting and evaluating the

data, and recommend a uniform panel of conditions to include in screening programs. This panel identified 29 conditions for which screening should be mandated and an additional 25 conditions to consider for screening as they are clinically significant (though they may lack efficacious treatment). ACMG also found that all newborn screening programs they evaluated improved outcomes and almost all reduced overall costs.⁵

As of 2009 99.2% of newborns born in Utah underwent heelstick newborn screening. The state target for 2010 is that 98.5% of newborns undergo screening, and the state is funding newborn screening education to achieve this goal.⁶

Table 1: Disorders for which Utah's Children are Screened.³

Amino Acid Metabolism Disorders:

- I. Phenylketonuria (phenylalanine hydroxylase deficiency and variants);
- II. Tyrosinemia type 1 (fumarylacetoacetate hydrolase deficiency);
- III. Tyrosinemia type 2 (tyrosine amino transferase deficiency);
- IV. Tyrosinemia type 3 (4-OH-phenylpyruvate dioxygenase deficiency);
- V. Maple Syrup Urine Disease (branched chain ketoacid dehydrogenase deficiency);
- VI. Homocystinuria (cystathionine beta synthase deficiency);
- VII. Citrullinemia (arginino succinic acid synthase deficiency);
- VIII. Argininosuccinic aciduria (arginino succinic acid lyase deficiency);
- IX. Argininemia (arginase deficiency);
- X. Hyperprolinemia type 2 (pyrroline-5-carboxylate dehydrogenase deficiency);

Fatty Acid Oxidation Disorders:

- I. Medium Chain Acyl CoA Dehydrogenase Deficiency;
- II. Very Long Chain Acyl CoA Dehydrogenase Deficiency;
- III. Short Chain Acyl CoA Dehydrogenase Deficiency;
- IV. Long Chain 3-OH Acyl CoA Dehydrogenase Deficiency;
- V. Short Chain 3-OH Acyl CoA Dehydrogenase Deficiency;
- VI. Primary carnitine deficiency (OCTN2 carnitine transporter defect);
- VII. Carnitine Palmitoyl Transferase 1 Deficiency;
- VIII. Carnitine Palmitoyl Transferase 2 Deficiency;
- IX. Carnitine Acylcarnitine Translocase Deficiency;
- X. Multiple Acyl CoA Dehydrogenase Deficiency;

Organic Acids Disorders:

- I. Propionic Acidemia (propionyl CoA carboxylase deficiency);
- II. Methylmalonic acidemia (multiple enzymes);
- III. Isovaleric acidemia (isovaleryl CoA dehydrogenase deficiency);
- IV. 2-Methylbutyryl CoA dehydrogenase deficiency;
- V. Isobutyryl CoA dehydrogenase deficiency;
- VI. 2-Methyl-3-OH-butyryl-CoA dehydrogenase deficiency;
- VII. Glutaric acidemia type 1 (glutaryl CoA dehydrogenase deficiency);
- VIII. 3-Methylcrotonyl CoA carboxylase deficiency;
- IX. 3-Ketothiolase deficiency;
- X. 3-Hydroxy-3-methyl glutaryl CoA lyase deficiency;
- XI. Holocarboxylase synthase (multiple carboxylases) deficiency;

Other Disorders:

- I. Biotinidase Deficiency;
- II. Congenital Adrenal Hyperplasia;
- III. Congenital Hypothyroidism;
- IV. Galactosemia;
- V. Hemoglobinopathy and Sickle Cell Disease;
- VI. Cystic Fibrosis;
- VII. Hearing Loss.

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Overweight Children & Adolescents

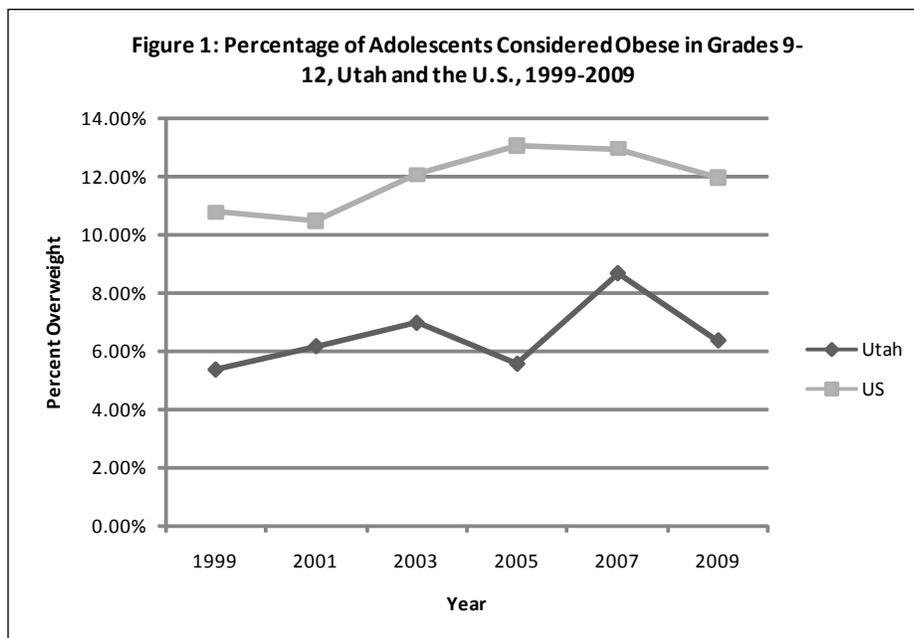
Compiled by Ryan M. VanderWerff

6.1% OF UTAHANS ARE OVERWEIGHT AND 20.4% OF UTAH CHILDREN ARE OVERWEIGHT.

The Centers for Disease Control and Prevention (CDC) use the Body Mass Index (BMI) calculation to determine an adult or child's weight status (e.g. underweight, overweight, or obese).¹ BMI is calculated by dividing one's weight in kilograms by their height in meters squared and is interpreted for adults by using standard height and weight tables. For children and teens, however, the BMI interpretation includes the factors of weight, height, age, and sex; all weighted against a CDC growth chart and is reported in percentiles. There are important factors to always consider when assessing BMI such as physical activity and diet.¹ Adults who are overweight have a BMI in the range of 25 and 29.9 and those who are obese have a BMI score of 30

or greater. Children classified as overweight fall within the 85th and 95th percentile and obese children are those above the 95th percentile.

In the U.S., people currently consume 300 calories more per day than in 1980.² Studies report that high caloric intake, in combination with decreased exercise activity, is the direct cause for the childhood obesity epidemic, and that lifestyle factors are the driver of these causes. More than 35% of U.S. high school students spend 3 hours or more on a school day in front of the television.³ A study at the University of Utah reports that from 2003-2005, on average, adolescents spent more than 6 hours per day dedicated to leisure activities, but 2/3 of this leisure



time was spent on passive activities that promoted no personal growth.⁴ Studies have also found that mothers who limit their children's access to unhealthy foods had a lower BMI than those who did not.⁵

Overall 6.1% of Utahans are over weight. In 2010 20.4% of Utah elementary school students were over weight and 9.7% were obese, with more boys being obese than girls.⁶ 1 in 4 Utah children in grades kindergarten through 8th grade are over-weight or are at risk for becoming overweight. This amounts to filling 124 Utah elementary schools, equivalent to 2,067 classrooms.⁷ Overweight rates in children have nearly tripled in the United States since 1980.⁸ Figure 1 shows the number of obese adolescents (high school age, grades 9-12) in the U.S. versus that of Utah. Utah's rate of obesity in high school aged children is well below that of the U.S., reaching a high of 8.7% in Utah in 2007 and 13.1% in the U.S. in 2005. Current rates in Utah and the U.S. are 6.4% and 12%, respectively.⁹

A survey done of Utah high school students, in an article by Nanny, Bohner, and Friedrichs (2008), found that 82% ate fruits less than 5 times per day, 88% ate vegetables less than three times per day, and 14% drank a can, bottle, or glass of

soda or pop at least one time per day. Of these students, 10% did not participate in at least 60 minutes of physical exercise within 7 days of the survey, 43% did not attend physical education (PE) class in an average week when they were in school, and 78% did not attend PE class daily when they were in school. Policies of Utah schools found in rural and/or impoverished areas are at higher risk for not being conducive to reducing childhood obesity.¹⁰

Several programs have been instituted across the United States such as the VERB program and the Gold Medal School program. The VERB program had some success in making children ages 9-13 more physically active. This program was shut down due to lack of funding.¹¹ In 2001 the Utah Department of Health developed a Gold Medal School program, which uses the Utah office of core curriculum and the CDC's guidelines to implement policies and programs to combat the overweight and obesity problem in Utah children. Utah Elementary schools reported increases in physical activities and more healthy food consumption.¹² Despite these and many other efforts, the problem of childhood obesity persists and researchers concur that this change must take place at home within the family.

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Vaginal Birth and Caesarean Section

Compiled by Priti D. Shah

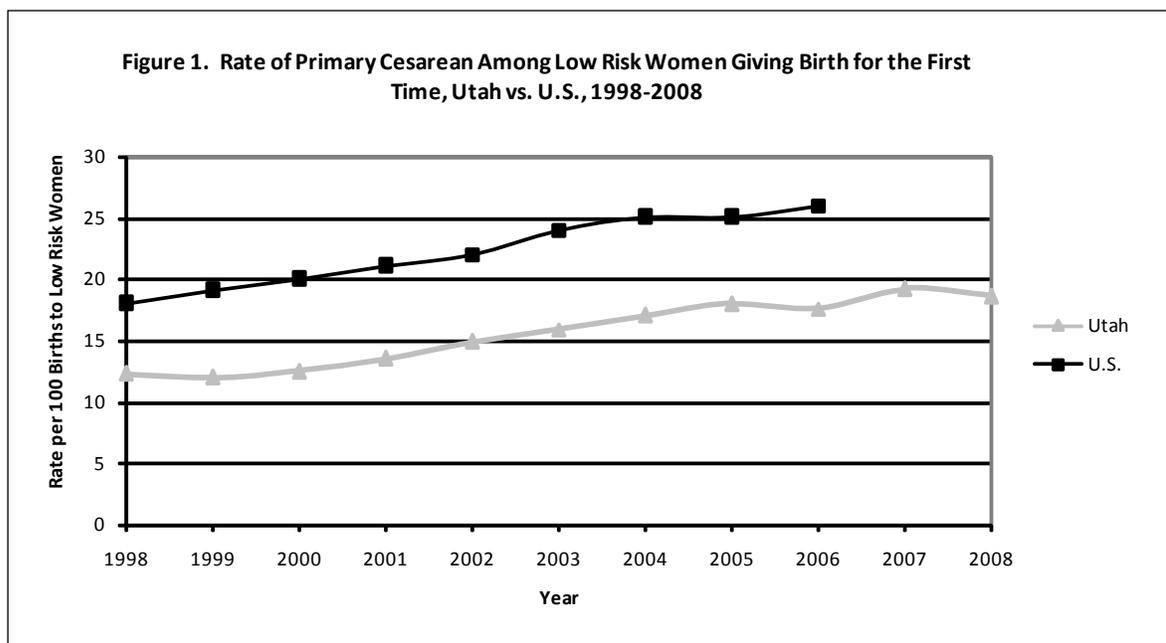
THE 2008 RATE OF CAESAREAN DELIVERIES FOR UTAH WOMEN GIVING BIRTH FOR THE FIRST TIME IS 18.6%.

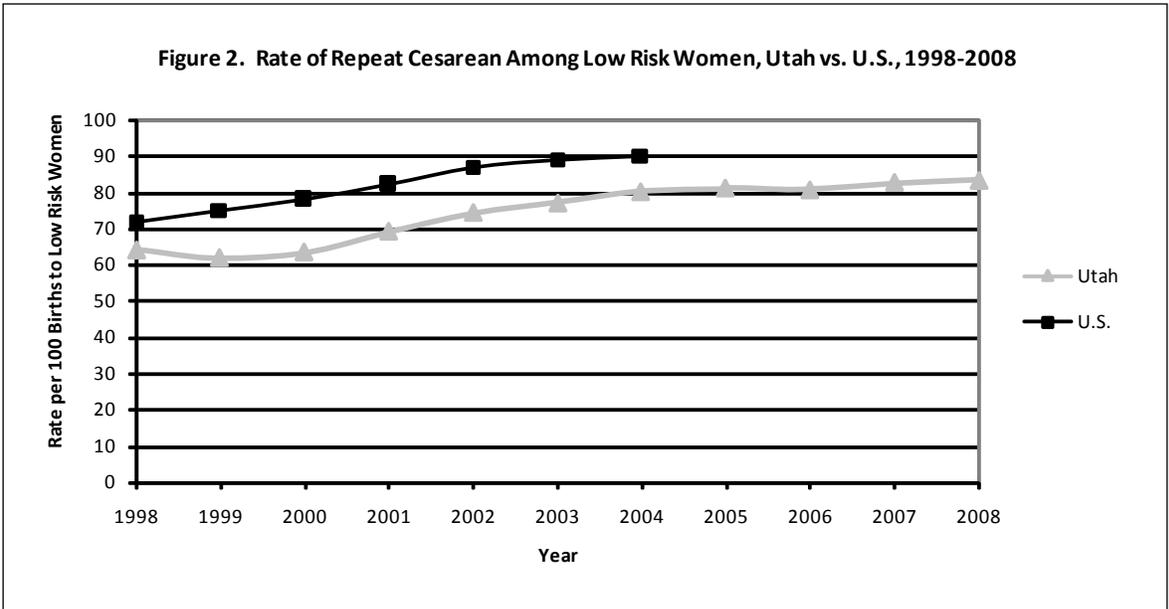
A Caesarean section (C-section) occurs when an infant is delivered by a surgical incision through the abdomen and uterus as opposed to a natural vaginal birth. A C-section is usually performed when a vaginal birth would pose risk to the mother or the child. C-section prevalence in the U.S. increased significantly between 1970 and 1988, from 5% to 25%; likely due to increased pressure on physicians, discouraging them to perform vaginal breech deliveries and midpelvic forceps deliveries. Although the World Health Organization (WHO) recommends natural vaginal births unless there are valid safety concerns, mothers that are considered low risk are choosing to have a C-section, a controversial aspect known as Cesarean delivery on maternal request (CDMR).¹

There is a growing trend to increasingly perform C-sections for all subsequent births. Evidence suggests there is increased risk in the next birth. Post-surgical complications for the mother include postpartum hemorrhage, infection, anesthetic complications, and placenta previa and placenta accrete in subsequent pregnancies. There is an increased risk of complications in cases of maternal obesity.^{1,2} Effects of a C-section on the newborn may include difficulty with initiation of breastfeeding, prematurity, lacerations, and respiratory problems. Post-surgical maternity hospital stays last longer and are more costly compared to vaginal births.¹

From Figure 1, the 2008 rate of primary C-section among low risk women giving birth for the first time was 18.6 per 100 births in Utah, down from 19.2 in 2007. The C-section rate for all women in Utah in 2008 was 22.8 per 100 births.¹ In Figure 2, 83.3% of the total number of low risk deliveries in Utah were repeat C-sections in 2008 compared to 90% in the U.S. in 2006 (most recent data available).¹ A set of health objectives developed by the U.S. Department of Health and Human Services, called Healthy People 2010, set a goal to have a 15% C-sectional birth for women giving birth for the first time by the year 2010; beginning in 2003, Utah rates surpassed the target and continue to increase. Of all U.S. newborns in 2006, 31% were born by Cesarean delivery, an increase of 50% over the last decade, from 20.7% in 1996.¹

The Utah Department of Health is promoting education regarding healthy weight and lifestyle beginning in the teen years and planned pregnancy and preconception to insure the best possible outcomes regardless of the mode of delivery. Women are also advised of the benefits and risks of vaginal birth after C-section (VBAC).¹ Some studies indicate that VBAC is a reasonable and safe choice for a majority of women and a way to decrease the Cesarean delivery rate in the U.S.³





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HIV/AIDS

Compiled by JB Flinders, MPH, MBA

IN 2010, 2,518 PEOPLE IN UTAH WERE LIVING WITH HIV OR AIDS.

Human Immunodeficiency Virus (HIV) is the precursor to Acquired Immune Deficiency Syndrome (AIDS). HIV infects certain cells and tissues of the immune system, specifically white blood cells called CD4 + T cells, rendering them incapable of identifying, targeting, and building immunity to bacterial and viral diseases. Because of this, a person infected with HIV is more susceptible to diseases, infections, and other complications that a normally healthy immune system could resist. AIDS is the final stage of HIV infection, diagnosed when a patient has acquired one or more specific infections, such as tuberculosis or pneumonia, or when there is an extremely low number in CD4 + T cells.¹

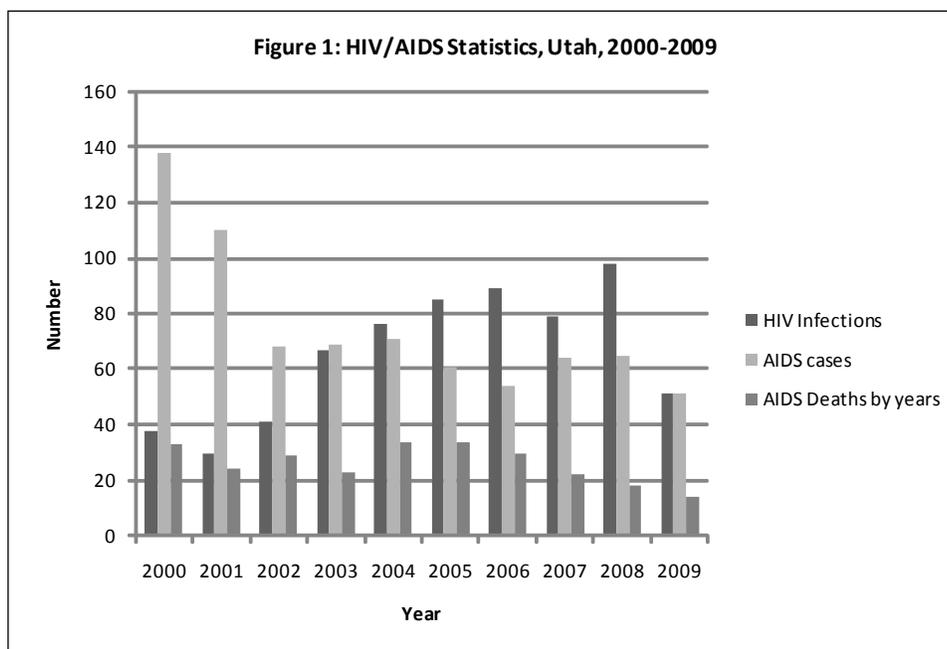
HIV is spread primarily through unprotected sex (vaginal, anal, or oral) with a person who has HIV, or through sharing needles, syringes, or other illicit drug equipment. HIV can be passed to infants during pregnancy, birth, or via breastfeeding.² Historically, HIV infection was also caused by blood transfusions and products until 1985 when blood tests became available to scan for HIV.³

Initial symptoms of HIV may not become evident for years after infection, which increases the need for clinical testing so early treatment can occur. The first stage of HIV infection causes flu-like symptoms, including fever, tiredness, and enlarged lymph nodes. Later stages, after the immune system is

severely weakened, can include rapid weight loss, extreme tiredness, extended periods of diarrhea, sores of the mouth, anus, or genitalia, pneumonia, skin blotches, and memory loss, depression, or other neurological disorders.⁴

In 2009 there were an estimated 48,100 new HIV infections. 61% of these infections occurred in MSM (men having sex with men) population and 27% in the heterosexual population. Since 2006, MSM's have represented 2% of the U.S. population, but have accounted for over 50% of all new HIV infections. There has also been a 21% increase in HIV incidence in 13-29 year olds, including 34% in the 13-29 year old MSM population. In 2009, African American men had the highest rate of new HIV infections, 103.9 per 100,000 individuals, followed by Hispanic/Latino men, 39.9 per 100,000, and African American women, 39.7 per 100,000.⁵ New York (201,871) and California (161,695) have the highest cumulative AIDS diagnoses in the nation.⁶

Table 1 shows HIV/AIDS statistics in Utah from 2000-2009. HIV and AIDS have shown an increasing trend while AIDS deaths have decreased. Both HIV and AIDS cases increased significantly in 2009, from 96 HIV infections and 65 AIDS cases in 2008 to 112 HIV infections and 77 AIDS cases in 2009.⁷ 77% of AIDS cases and 70% of HIV infections occurred in Caucasians, followed by 13% and 16%, respectively, in Hispanic/Latinos.⁸



Organizations across the nation contribute to the effort to spread knowledge of HIV and AIDS prevention. The Centers for Disease Control and Prevention (CDC) provides knowledge of prevention, and conducting trials of pre-exposure prophylaxis for HIV prevention. Pre-exposure prophylaxis is the prevention

procedure of taking an FDA approved HIV drug called tenofovir disoproxil fumarate used alone or in combination with emtricitabine (Truvada) daily as an oral preventative drug. Researchers are conducting other such studies in an effort to decrease the number of HIV cases.⁹

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Chlamydia

Compiled by JB Flinders, MPH, MBA

UTAH RANKED 46TH AMONG 50 STATES IN CHLAMYDIAL INFECTIONS IN 2008.

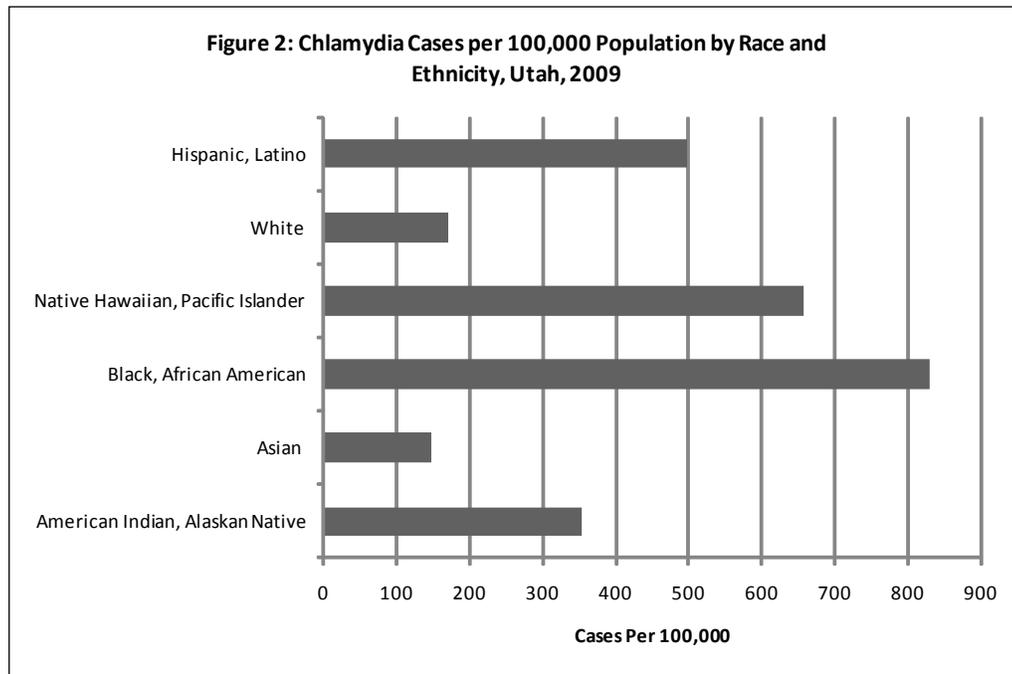
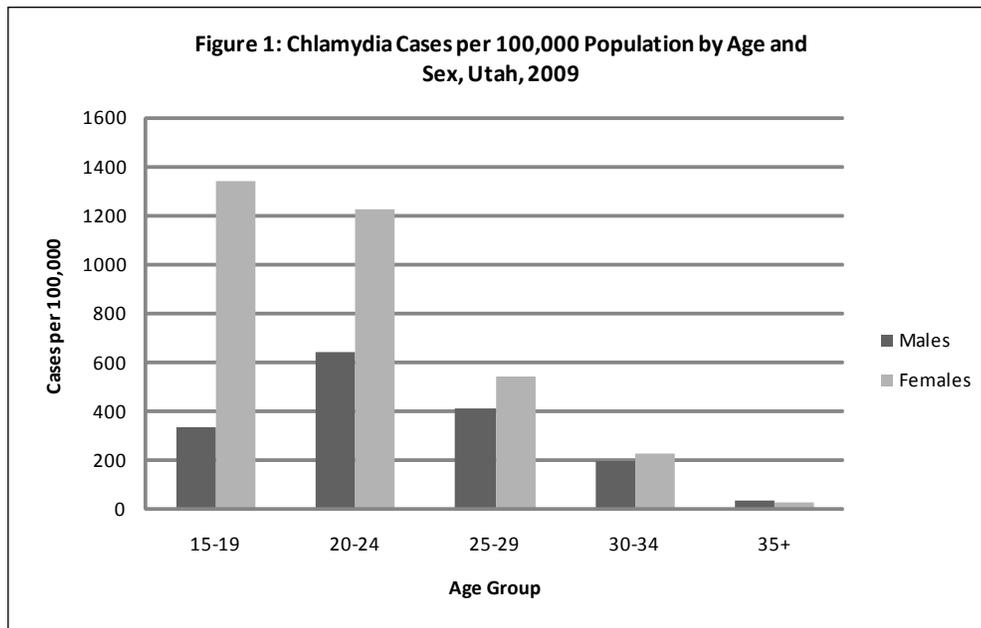
Chlamydia infections, caused by the bacteria *Chlamydia trachomatis*, are the most frequently reported bacterial disease in the U.S. There were 1,244,180 cases of chlamydia reported in 2009, or 409.2 cases per 100,000 population; an increase of 28% from 2008 reporting. Chlamydia infections have increased from 106.2 to 409.2 cases per 100,000 population since 1990, in large part due to increased screening, more sensitive tests, and better case reporting from labs and providers.¹ However, because of the "silent" nature of chlamydia, up to 75% of women and 50% of men are unaware of their symptoms and infection status, thus it is likely that many more individuals have chlamydia than reporting indicates.²

Females with chlamydia are at risk for developing pelvic inflammatory disease (PID) which can cause permanent damage to the uterus, fallopian tubes and other tissues. This occurs in 40% of women with untreated infections. It can also lead to chronic pelvic pain, ectopic pregnancies and, in both men and women, infertility. Contracting a serious sexually transmitted infection such as HIV is also up to five times more likely with untreated chlamydia. Women with chlamydia who become pregnant can pass the infection to their infant during delivery, as chlamydia is the leading cause of early infant pneumonia and

conjunctivitis (pink eye).^{2,3}

Figure 1 shows chlamydia cases in Utah by age and sex. Chlamydia levels decreased from 2008 levels except in 25-34 year old males and 15-24 year old females.⁴ 65% of chlamydia cases reported in 2009 were in females, with adolescent and young adult females 15 to 24 years of age representing 72% of those cases. In 2009, those 15 to 24 years of age represented 16% of Utah's population but accounted for 66% of the reported chlamydia cases (4,028).⁵ Figure 2 shows chlamydia cases by race and ethnicity in Utah. African Americans had the highest rate of chlamydia infections, at 830.2 cases per 100,000 population, followed by Native Hawaiian/Pacific Islanders at 657.1 per 100,000. However, as the number of reported cases for most minority populations in Utah is low, results should be interpreted with caution.⁶

The Utah State Health Department, with funding from the CDC, runs a Comprehensive STD Prevention System (CSPS) grant program which helps prevent STD's through behavioral interventions, medical and laboratory services, outbreak response, surveillance of disease, professional development, and awareness and education campaigns.³



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Escherichia Coli O157:H7 (STEC)

Compiled by JB Flinders, MPH, MBA

E. COLI INFECTIONS IN UTAH PER 100,000 PEOPLE ARE DOWN SIGNIFICANTLY FROM 2006 LEVELS.

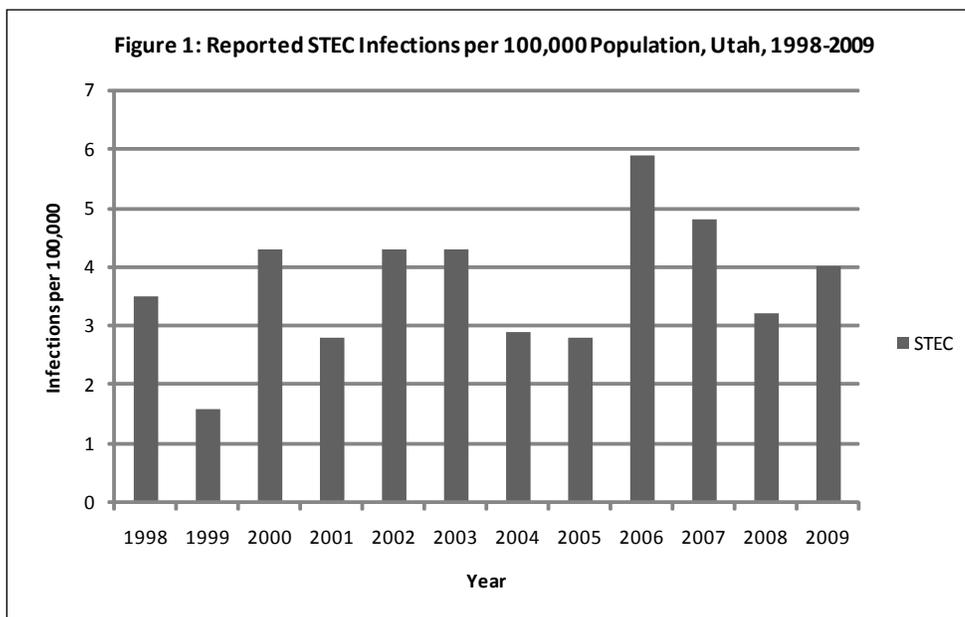
Escherichia coli, or *E. coli*, represents a large and varied bacterial group. Although many strains are harmless, others, like *E. coli* O157, can make members of a population quite ill. *E. coli* O157 causes disease by producing a toxin called Shiga toxin (also known as STEC for Shiga toxin-producing *E. coli* or ETEC for enterohemorrhagic *E. coli*). These bacteria live in the intestines of some healthy cattle, and contamination can occur during the slaughtering process. Consuming inadequately cooked ground beef, unpasteurized milk or juice, or contaminated fruits and vegetables are the major causes of infection, but ingesting or swimming in contaminated water (usually containing sewage), or being in contact with infected animals can also cause infections. Although most infections specifically refer to *E. coli* O157, other bacteria, referred to as non-O157 STEC (or *E. coli* serogroups O26, O111, and O103) can also often cause illness in people in the United States.¹

Symptoms of *E. coli* (STEC) infections include severe stomach cramps, diarrhea, vomiting, and, in some cases, a low-grade fever. STEC's incubation period is usually between 3-4 days after exposure, but can vary from 1-10 days. The symptoms often begin with mild stomach pain or non-bloody diarrhea which worsens over the following days. Most people with an STEC infection get better within 5-7 days. From 5-10% of those with an STEC infection can develop hemolytic uremic syndrome (HUS) around 7 days after infection, which is a dangerous illness that causes the kidneys to stop functioning.¹

In 2009, rather than listing *E. coli*:O157 and *E. coli*:other infec-

tions separately, the Utah Department of Health began reporting all strains of *E. coli* that produce Shiga toxin as STEC infections. As shown in Figure 1, STEC infections were down from 2006 levels of 5.9 infections per 100,000 to 4.0 infections per 100,000 in 2009. It is difficult to relate this to national data as many infected people do not seek medical care or submit a stool specimen for testing.¹ Title 26, Chapter 6, Section 6 of the Utah Code lists individuals and facilities, including but not limited to physicians, hospitals, health care facilities, HMO's, schools, day care centers, and laboratory and other testing sites, that are required to report known or suspected communicable diseases to the Health Department.³

To prevent STEC infections, the CDC recommends washing your hands after using the bathroom, changing diapers, preparing or eating food, and contacting animals or their environments, cooking meats thoroughly and avoiding cross contamination in preparation areas, avoiding unpasteurized foods, and avoiding swallowing water in lakes, ponds, streams, and pools.¹



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Gonorrhea

Compiled by JB Flinders, MPH, MBA

UTAH RANKED 45TH IN THE 50 STATES IN GONORRHEA INFECTIONS IN 2009.¹

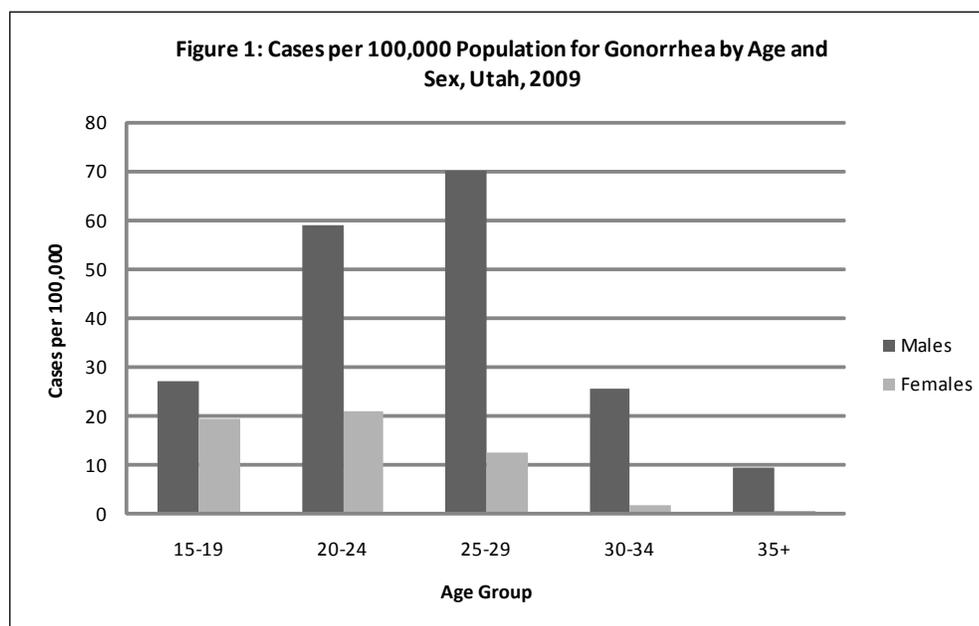
Gonorrhea is the second most commonly reported notifiable disease in the United States.² *Neisseria gonorrhoeae*, the bacteria that causes gonorrhea infections, is especially dangerous as it can easily multiply in warm, moist areas of the reproductive tract in men and women, as well as the eyes, mouth, throat, and anus. The CDC estimates over 700,000 new gonorrhea infections are detected each year, with only half of them reported.³ The State of Utah ranks 45th among the 50 states in gonorrheal infections with 12.5 cases per 100,000 people.¹

Without treatment, gonorrhea can cause serious reproductive health problems in women, including infertility and chronic pelvic inflammatory disease (PID). PID can lead to internal abscesses, damage to the fallopian tubes and uterus, and increase the risk of infertility, ectopic pregnancy, and chronic pelvic pain.⁴ In men, gonorrhea can cause epididymitis and infertility.¹ Gonorrhea may cause serious eye infections, blindness, pneumonia, or death if infection occurs during birth.⁴ Gonorrhea can spread into the joints where it can become systemic and life-threatening, and individuals with untreated gonorrhea are also more likely to contract a serious sexually transmitted infection such as HIV.⁵ Both women and men often show no symptoms even when an infection is present, but even noticeable symptoms can mirror other health problems like bladder or vaginal infections in women or painful or swollen testicles

in men. Gonorrhea that is present in the cervix or urethra can be diagnosed by testing a urine sample or a Gram stain, which microscopically analyzes a sample from the urethra or cervix.¹

Since 2005, the gonorrhea case rate in Utah has decreased by 53%.⁶ In 2009, gonorrhea rates in the state were higher in males, at 19.2 cases per 100,000 population, than females, with 5.0 cases per 100,000 population. Figure 1 shows gonorrhea infection rates by age and sex.⁵ Males aged 20-24 and 25-29 still account for the majority of gonorrhea infections, at 58.8 and 70.2 cases per 100,000 population, respectively. Nationally, in 2009, gonorrhea rates were higher in females, at 105.5 cases per 100,000 population, than males, at 91.9 cases per 100,000 population. Gonorrhea rates were highest among females aged 15 to 19, at 568.8 cases per 100,000 population, and females aged 20 to 24, at 555.3 cases per 100,000 population. The next highest groups were males aged 20 to 24 with 407.5 cases per 100,000 population. Overall, national gonorrhea case rates decreased 10.5% since 2008.²

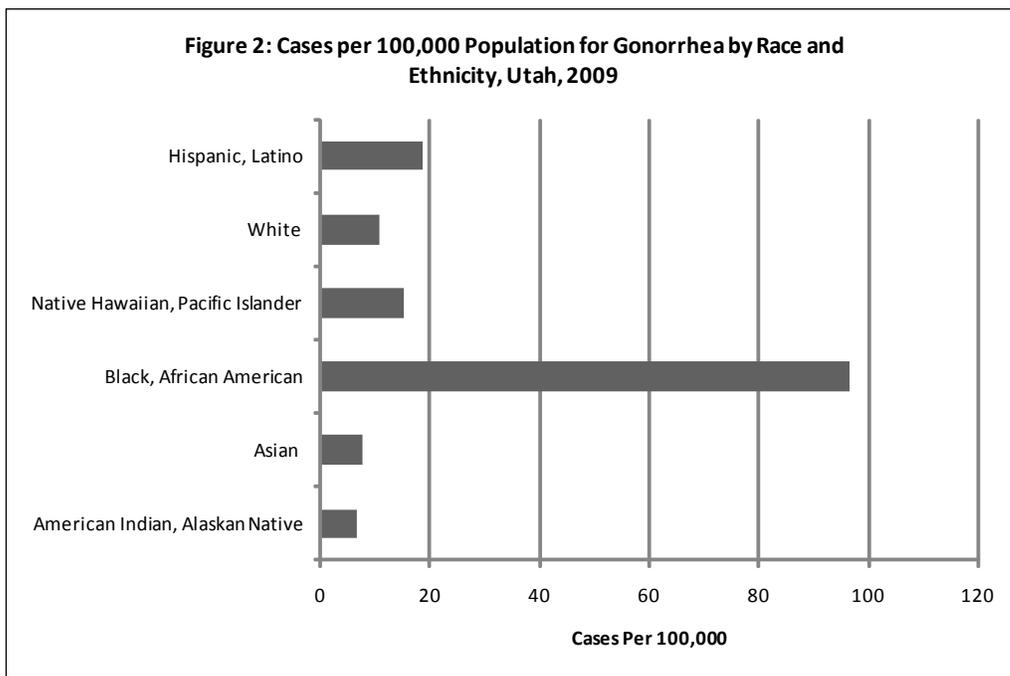
Gonorrhea rates, in terms of race/ethnicity, are higher in Black, African-American and Hispanic, Latino populations, at 96.6 cases and 18.4 cases per 100,000 population, respectively. However, as the number of reported cases for most minority populations in Utah is low, results should be interpreted with caution.⁷ Nationally, from 2005–2009, overall gonorrhea



rates decreased among all racial/ethnic groups. In 2009, black women aged 15–19 years of age had the highest gonorrhea rate of any group, at 2,613.8 cases per 100,000 population, followed by black women and black men aged 20–24 years of age, at 2,548.7 and 2,168.9 per 100,000 population, respectively.²

The Utah State Health Department, with funding from the

CDC, runs a Comprehensive STD Prevention System (CSPS) grant program which helps prevent STD's through behavioral interventions, medical and laboratory services, outbreak response, surveillance of disease, professional development, and awareness and education campaigns, including the Catch the Answer campaign aimed at young adults.⁸



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Hepatitis

Compiled by Kyle Burningham

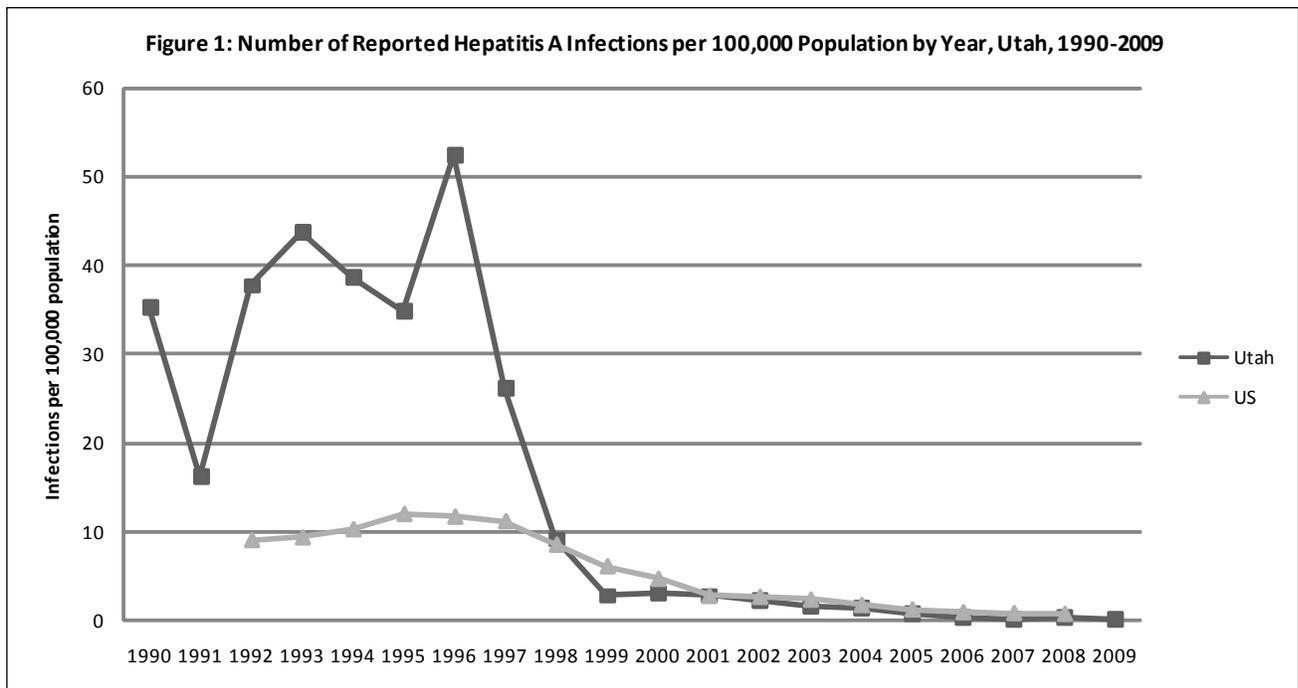
HEPATITIS RATES IN UTAH MIRROR THE NATIONAL AVERAGE.

Hepatitis, characterized by inflammation of the liver, is a gastroenterological disease. Hepatitis is most commonly known by its viral forms A (HAV), B (HBV), and C (HCV). Hepatitis is most often caused by alcohol, certain medicines, various viral and autoimmune diseases, and severe bacterial infections. Symptoms can include joint aches, frequent vomiting, loss of appetite, dark urine, fever, jaundice, and malaise.¹

HAV can be transmitted through personal contact or consumption of contaminated materials. This acute form of hepatitis and can be treated with rest and hydration. HAV will run its course in roughly a month. Prevention includes adherence to strict personal hygiene and avoidance of uncooked foods. HBV can be both acute and chronic. This form can be transmitted through contamination of bodily fluids, such as through sexual contact and contact with contaminated needles, and/or of blood, such as through blood transfusions, illegal drug use, and tattoos. Untreated cases can cause complex immune diseases.

HCV is a predominantly chronic form of hepatitis, and is generally transmitted through blood. Although HCV may be asymptomatic for up to 20 years, symptoms may include cirrhosis. No vaccine is available and most cases result in death, although it can be treated with interferon and antiviral drugs.¹

Utah HAV rates decreased considerably in the 1990's. In 1994 the rate was 38.7 cases per 100,000 population, while in 2000 the rate was 3.2 cases per 100,000 population. From 2007 to 2008 the rate increased for the first time in nearly 10 years from 0.3 to 0.5 cases per 100,000. However, the rate decreased again with 2009 data showing 0.2 cases per 100,000 population. HAV rates in the U.S. decreased from 11.7 per 100,000 population in 1996 to 0.9 per 100,000 population in 2008.^{1,2} Utah and U.S. rates are similar from 1998 to 2008. The HAV vaccine was introduced in 1995 and experts believe this vaccination has dramatically affected rates of the disease in the United States.²



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Herpes Simplex Virus and Trichomoniasis

Compiled by JB Flinders, MPH, MBA

VISITS TO PHYSICIANS OFFICES' FOR HERPES INFECTIONS HAVE DOUBLED SINCE 2001.

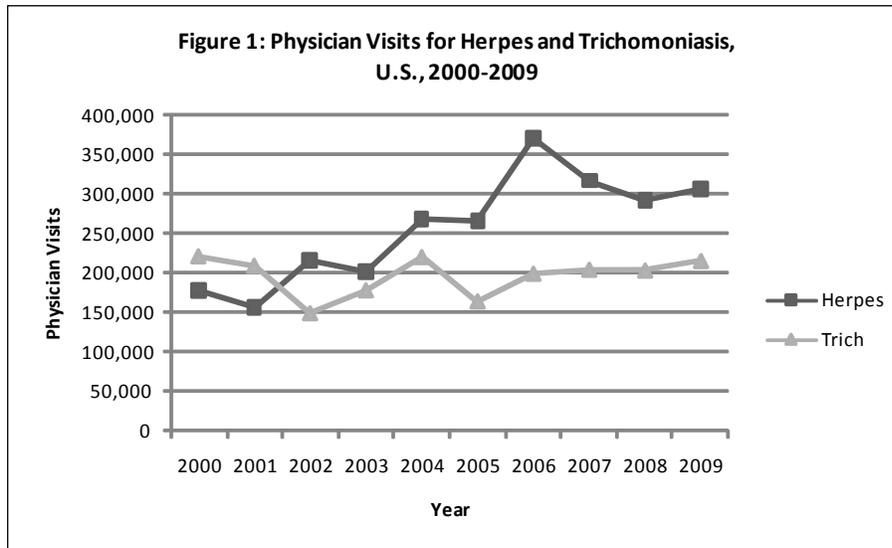
Herpes simplex is a viral infection affecting the mouth or genital area. There are two strains of herpes simplex viruses, herpes simplex virus type 1 (HSV-1), associated with infections of the mouth and face, and herpes simplex virus 2 (HSV-2), which causes genital ulcers or sores.¹ HSV-1 is most often transmitted by saliva and causes herpes labialis, an infection of the lips, mouth, or gums causing small, painful blisters. Initial infection of HSV-1 may cause no symptoms, or milder symptoms which usually go away in 1 to 2 weeks. The virus remains dormant in the nerve tissues around the face where it can reactivate and produce cold sores repeatedly in the same area. HSV-1 is generally considered harmless except in newborns, the immunosuppressed, and when the infection occurs near the eye.²

HSV-2 infections often exhibit either no symptoms, mild symptoms that go unnoticed, or symptoms that individuals do not recognize as a sign of herpes infection. The most common of these symptoms is a cluster of painful, blistering sores on the genital area, and psychological distress from the infection. HSV-2 can also cause fatal infections in newborns if acquired during pregnancy. As with HSV-1, these symptoms may last several weeks and go away but may return in weeks, months, or years.³ Nationally, studies show that one in six people, or 16.2%, aged 14 to 49 have HSV-2 infection. This number has remained stable over the past decade. HSV-2 is more common in women (one in five) than men (one in nine).³ HSV-2 rates are also lower in those with one sex partner, at 4%, than those with 10 partners or more, at 27%. It is estimated that HSV-2 costs the U.S. health care system \$19 billion a year.⁴

Trichomoniasis is caused by the proto-

zoan parasite, *Trichomonas vaginalis*. The parasite is sexually transmitted, and the most common sites of infection are the vagina and urethra. Most men with trichomoniasis do not have signs or symptoms, but can have penile irritation, discharge, or burning after urination or ejaculation. Infection in women can cause a frothy, yellow-green vaginal discharge with a strong odor, genital irritation and itching, and discomfort during intercourse and urination. These symptoms often appear between 5 and 28 days from time of exposure. Trichomoniasis can usually be cured with antibiotics such as metronidazole or tinidazole.

Figure 1 shows the number of physician visits from 2000-2009 due to herpes or trichomoniasis infection. Visits for herpes infections have nearly doubled, from 157,000 in 2001 to 306,000 in 2009. Visits for trichomoniasis have fluctuated from a low of 150,000 visits in 2002 to 222,000 in 2000, with 216,000 visits in 2009.⁶ There is currently no cure for herpes, but certain medications help manage the infection, speeding up the healing of sores, and prevent frequent outbreaks.



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Human Papillomavirus

Compiled By Caroline Harris

AT LEAST 50% OF SEXUALLY ACTIVE MEN AND WOMEN WILL CONTRACT HPV AT SOME POINT IN THEIR LIVES.¹

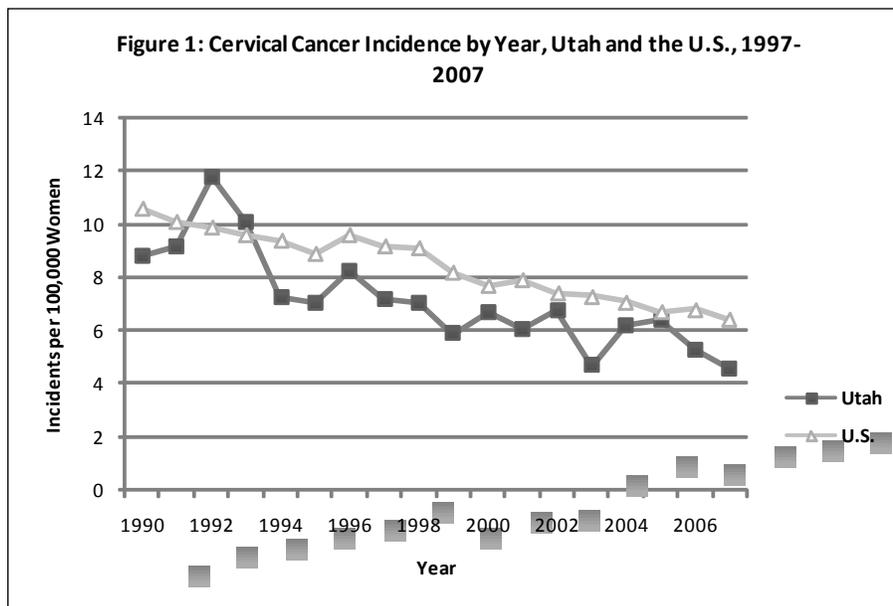
Genital Human Papillomavirus (HPV) is the most common sexually transmitted infection.¹ More than 40 types exist that can infect the genitals of both males and females. Currently nearly 20 million Americans are infected with HPV. In the majority of cases, nearly 90% of the time, the body will naturally eradicate the HPV within two years.¹ However, persistent HPV infections can mutate the normal cells in the infected area into abnormal cells. Such cell abnormalities can lead to several different health outcomes including the development of genital warts, cervical cancer, or other HPV-related cancers including cancer of the vulva, vagina, penis, anus, and head or neck (tongue, tonsils, or throat).²

In most cases HPV does not manifest into symptoms that would alert an individual to an infection. For this reason most infected persons do not often realize that they may in fact be passing HPV to another person. HPV is passed through genital contact, most commonly during vaginal and anal sex.¹ It is also possible for one individual to contract more than one type of HPV. There is no way of identifying which type of HPV will go

on to cause cancer of other health problems.¹

One of the most problematic outcomes of HPV is the development of cervical cancer. Women with cervical cancer do not often display symptoms until the cervical cancer becomes quite advanced.¹ Each year about 12,000 women get cervical cancer in the United States,¹ or 6.4 women per 100,000 in the population. Utah is significantly lower than the national rate. In 2007, 4.61 per 100,000 women in Utah were diagnosed with cervical cancer.³ The cervical cancer incidence in Utah spiked drastically from 1991 to 1992. This was the only year in which Utah's cervical cancer incidence rate was higher than that of the national rate.³ As indicated in Figure 1, since 2005, Utah has seen a steady decrease in the cervical cancer incidence rate, and is expected to continue to decrease. Both the national incidence rate and Utah's incidence rate have continued to go down, most likely due to the advent of several HPV vaccines, including Gardasil and Cervarix.¹

In addition to the vaccine, there are several ways men and women can lower their risk of contracting HPV, and the development of genital warts or cervical cancer. Abstinence from all sexual activity or, for those who are sexually active, condoms are the best ways to lower the risk of an infection.¹ Because of the latency period between the initial contact with HPV and the development of symptoms is often a long period, it is important for women to have regular Pap smears to help catch the development of abnormal cells. At this point in time no general test exists for men or women to find HPV on the genitals or in the mouth or throat; nor is there a treatment for HPV, only for the diseases HPV may cause.¹



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Immunizations

Compiled by JB Flinders, MPH, MBA

IN 2008 UTAH EXCEEDED THE NATIONAL AVERAGE OF THE 4:3:1:3:3:1 IMMUNIZATION RECOMMENDATION.

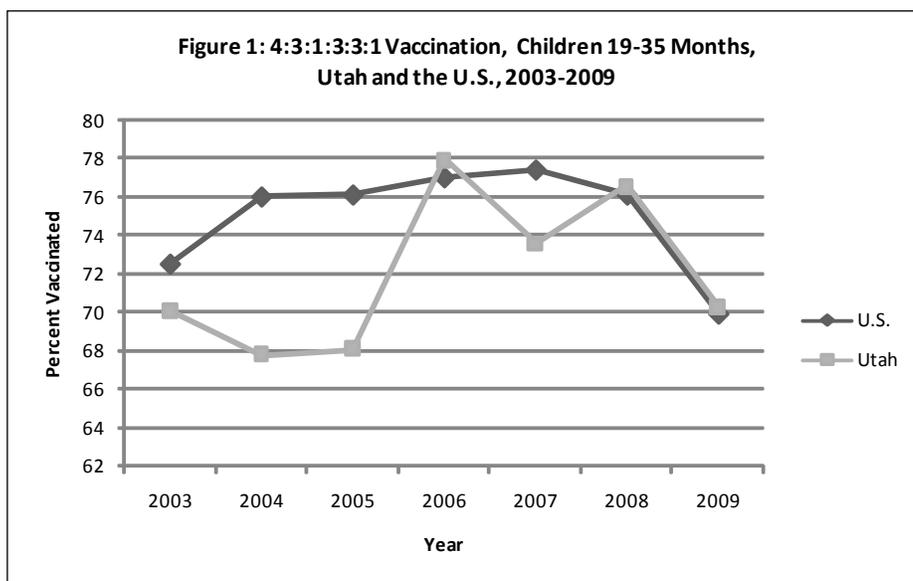
Immunization creates immunity or resistance to an infectious disease, typically through the administration of a vaccine. Vaccines, which are most often weakened forms of the targeted disease, stimulate the body's own immune system to protect against subsequent infection. Immunization is estimated to prevent over 2 million deaths each year. It is known to be cost-effective, and extremely accessible to even the most vulnerable, hard-to-reach populations. Immunizations effectively prevent, or have even eradicated, such deadly diseases as polio, smallpox, and measles.¹

In the U.S., many diseases that vaccines prevent are especially harmful to children. From birth through 18 months, the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP) recommend 3 doses of hepatitis B (HepB), 3 doses of Rotavirus (RV), 4 doses of diphtheria-tetanus-pertussis (DTaP), 3 doses of haemophilus influenza type b (HiB), 4 doses pneumococcal conjugate vaccine (PCV), 3 doses of inactivated polio (IPV), 1 dose of measles-mumps-rubella (MMR), 1 dose of varicella, 2 doses of hepatitis A (HepA), and a yearly influenza shot starting at 6 months. Between 2 and 3 years, 1 dose of HepA, 1 dose of PPSV (pneumococcal), and 1 dose of meningococcal (MCV4) are also recommended.² From years 4-6 years, additional doses of DTaP, IPV, MMR, and varicella are recommended. According to state law for Utah, in order to attend an early childhood program, ACIP regula-

tions for diphtheria-tetanus-pertussis (DTaP), Polio, Measles-Mumps-Rubella (MMR), Haemophilus Influenza Type b (Hib), Hepatitis A, Hepatitis B, Pneumococcal, and Varicella must be met prior to entering school.³

In order to determine immunization coverage, a basic childhood immunization series has been developed, commonly referred to as the 4:3:1:3:3:1 series. This series includes the 4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 HepB, and 1 varicella vaccines. An additional series including PCV, known as the 4:3:1:3:3:1:4, is also tracked.⁴ As seen in Figure 1, 4:3:1:3:3:1 immunizations in Utah have been at or below the national average almost every year since 2003.⁵ Because of this, groups like the Every Child By Two Immunization Coalition have been formed to promote 4:3:1:3:3:1 immunizations and other adolescent immunization goals. The organization aims to achieve 90% vaccination levels for children under two in Utah.⁶

In 1999, the New Vaccine Surveillance Network (NVSN) was formed to research the impact of new vaccines, create vaccine recommendations, including studies on vaccine effectiveness, and better understand vaccination benefits, coverage, and feasibility issues in implementing new vaccine recommendations. In 2009, three more sites were added to the network, which is now the NVSN-Extended Network. Ongoing surveillance ensures new varieties of vaccines and improved methods of immunization.⁷



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Mumps, Polio, and Rubella

Compiled by Anthony Tran

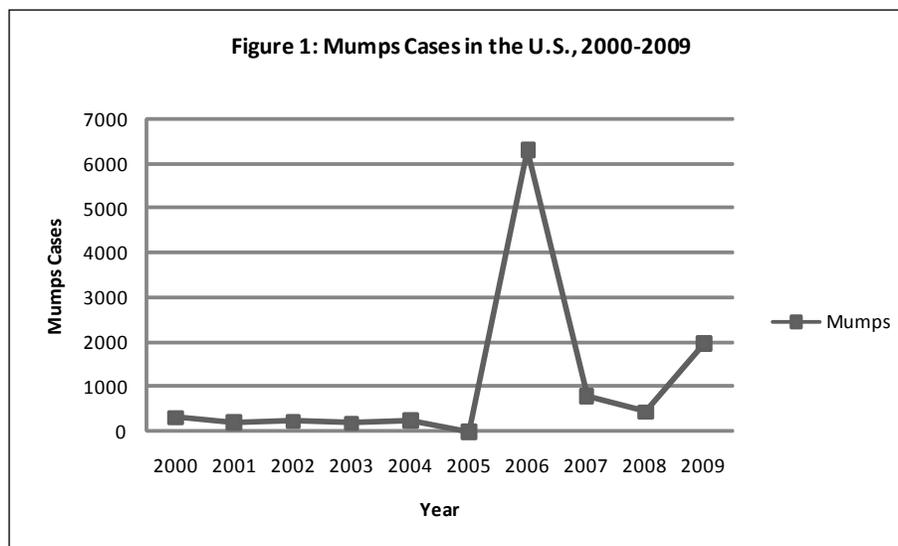
UTAH HAS A SIGNIFICANTLY LOWER MUMPS RATE THAN THE NATIONAL AVERAGE OF 17.1 PER 100,000.³

Mumps is a virus that presents as a painful swelling of the salivary glands. Mumps will usually run its course through the body without treatment other than rest, fluids, and pain management using painkillers. Mumps can also cause fever, headache, testicular swelling (orchitis), and a rash.¹ There have only been 20 cases of Mumps in Utah since 2004.² Mumps is also known as a vaccine-preventable disease, and is prevented by receiving the Mumps vaccination early in childhood, given in two separate doses. Figure 1 shows the prevalence of Mumps from 2000 to 2008 in the United States.³ Mumps cases are significantly lower in Utah than the rest of the United States. For example, in 2009, there were 1,991 reported cases in the U.S. and only 4 cases reported in Utah.³

Polio, also known as Poliomyelitis, is also a viral infection.

The symptoms are often mild and most commonly affect the spinal neurons causing weakness, sudden paralysis, and asymmetric paralysis of the legs. The paralytic symptoms usually begin 1-10 days after the prodromal symptoms and will progress for 2-3 days. However, the muscle weakness and paralysis can be present as far as 12 months after onset, if not permanently.² The incidence rate in both the U.S. and Utah has decreased because of the vaccine introduced in 1955 and, as of 2008; Polio is essentially eliminated in both in the state and nationally. There have been no reported cases of Polio in the state of Utah since 1996 and prior to that the last case occurred in 1959.²

Rubella, also known as German measles, is caused by the rubella virus. The symptoms of Rubella are maculopapular rash, swollen lymph nodes, and a slight fever. Rubella is most



serious in pregnant women as it can cause birth defects in some newborns.⁴ These defects are most often physical abnormalities, and can be referred to as Congenital Rubella Syndrome or CRS. These include a multitude of signs and symptoms such as deafness, blindness, heart defects, behavioral disorders,

mental retardation, growth retardation, bone disease, enlarged liver and spleen, thrombocytopenia, and purple skin lesions. These symptoms may not develop for 2-4 years. The last case of Rubella occurred in 2004 and since 2001 there have only been 2 reported cases.⁵

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Seasonal and H1N1 Influenza

Compiled by JB Flinders, MPH, MBA

48.9% OF ALL INFLUENZA-ASSOCIATED HOSPITALIZATIONS IN UTAH OCCURRED IN CHILDREN UNDER THE AGE OF 4.

Seasonal influenza, or “the flu”, is a contagious viral infection of both the respiratory tract caused by influenza viruses. Influenza primarily affects the nose, throat, and lungs.¹ The viruses are mainly transmitted through respiratory droplets in the acts of coughing and sneezing, but may also be spread when a person touches these droplets on other persons or objects and then touches their own mouth or nose without first washing their hands.² On average, 5% to 20% of the population in the United States contracts influenza per year. Influenza is unpredictable, and can be relatively mild or quite severe. Between 1976 and 2006, deaths associated with influenza ranged between 3,000 and 49,000, with hospitalizations ranging between 120,929 to 430,960 annually.³

Influenza viruses are classified into types A, B, and C. Type A is most often the cause of serious epidemics, and the most severe illnesses and associated hospitalizations. Type B viruses are usually milder than type A viruses, although they may still cause epidemics. Type C is less common and usually causes only mild illnesses. Each type includes numerous strains which can change annually. This prevents resistance, or immunity, to upcoming influenza strains. Every year, prior to the influenza season, vaccines are prepared to combat these rapidly changing viruses, which often include inactivated viruses from A and B strains.⁴

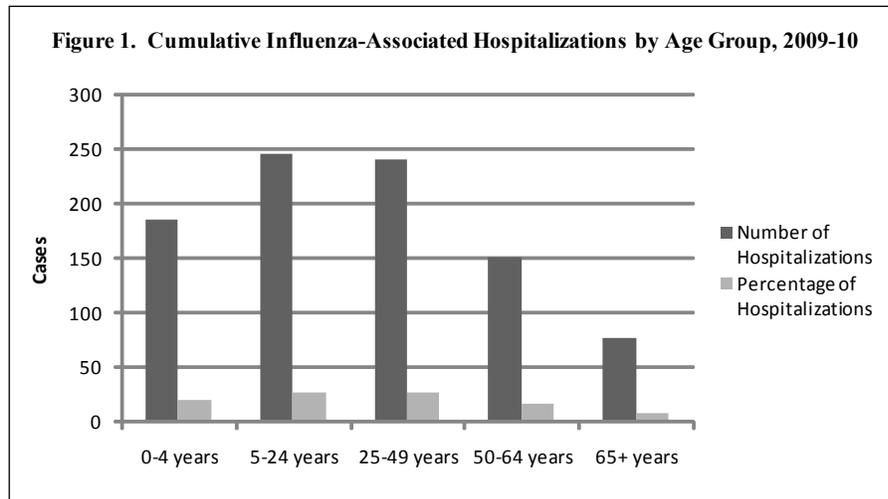
Influenza infection results in fever, chills, cough, sore throat, runny or stuffy nose, body aches and fatigue, headache, and, in some cases, diarrhea and vomiting. Anyone is at risk for developing influenza; however, children under 5 years in age, adults over 65 years in age, pregnant women, people with certain medical conditions such as asthma or chronic metabolic disorders, and people who are morbidly obese are at greater risk from influenza.²

In April of 2009, a new influenza virus was detected in the United States, known as the H1N1 virus. The H1N1 virus, also known as “swine flu”, was the major strain of influenza in 2009. A U.S. Public Health Emergency for 2009 H1N1 Influenza was announced, which later expired in June 2010. According to experts, it is likely that the H1N1 virus will continue for years similar to the regular seasonal influenza virus.⁵

According to data from 2009-2010, and shown in Figure 1, the highest number of Influenza-Associated Hospitalizations (IAH's) in Utah occurred in those 5-24 years of age, at 246, closely followed by those 25-49 years of age, at 242. Although those age groups had the highest number of cases, they were the lowest in the number of cases per 100,000 population. The highest cases per 100,000 population occurred in the 0-4 year age group, which had a case rate of 68.7 per 100,000 population.⁶

2009-2010 data indicated women outnumbered men in IAH's with a reported 491 visits for women and 413 visits for men. Racially, the highest number of IAH's occurred in Caucasians,

with 611 hospitalizations. Caucasians accounted for 67.6% of total IAH's followed by Hispanics with 151 IAH's, accounting for 16.7% of the total IAH's.⁶



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Syphilis

Compiled by Zane Partridge

UTAH REPORTS THE HIGHEST OUTBREAK OF SYPHILIS IN 20 YEARS.

Syphilis is a sexually transmitted disease that is caused by the *Treponema pallidum* bacteria. Not only is this disease transmitted by sexual contact, it can also be transmitted from mother to fetus during gestation or birth, which is termed congenital syphilis.¹

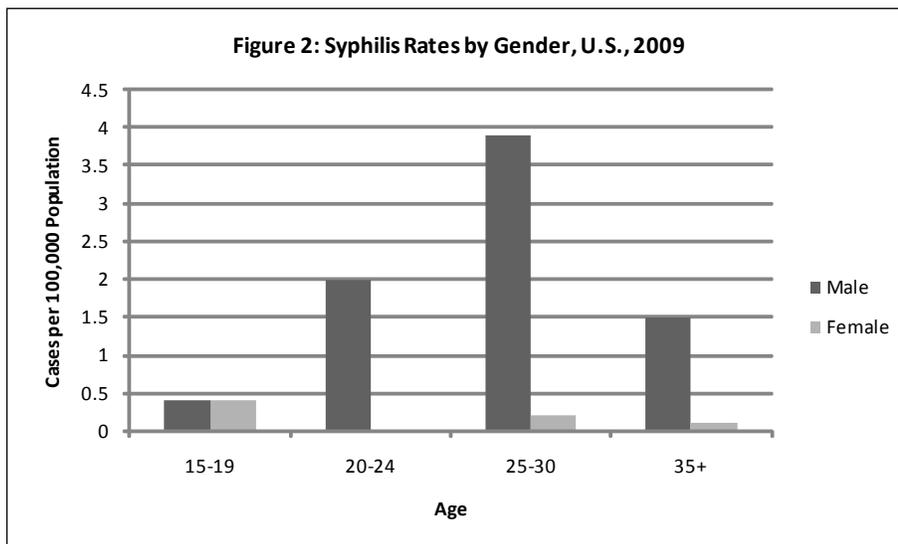
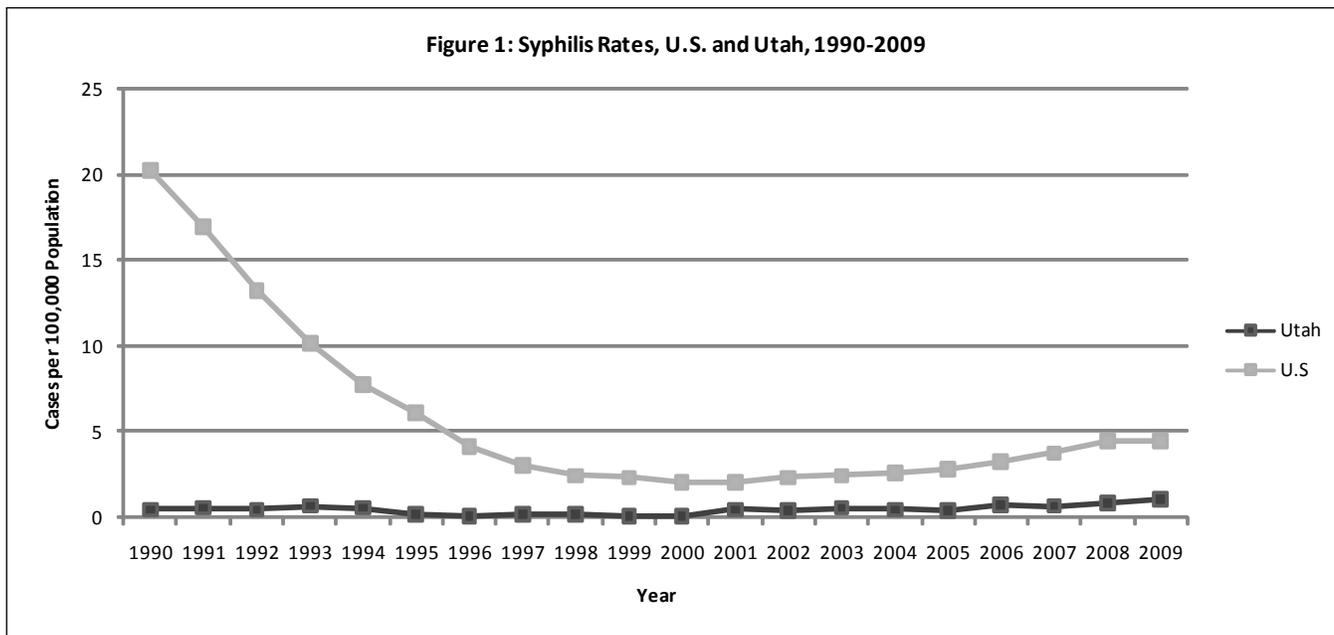
There are four stages of syphilis - primary, secondary, latent, and late. During the primary stage a chancre, a highly infectious and painless open sore, is formed. These chancres are most often found on external genitalia, the vagina, anus, rectum, lips, or mouth. Second stage syphilis includes fever, swollen lymph glands, sore throat, patchy hair loss, headaches, weight loss, muscle aches, and fatigue. These symptoms are usually absent from the latent stage, which can cause the host to believe they

are healed from the infection, even though the infection remains in the body for years. The late stages of syphilis can appear 10-20 years after infection was first acquired. In the late stages of syphilis, damage may occur in the internal organs, including the brain, nerves, eyes, heart, blood vessels, liver, bones, and joints. This damage may be serious enough to cause death.¹ Women who have contracted syphilis have an increased risk of giving birth to a still born. Even if a newborn has developed the disease, and does not show any signs or symptoms, the child is at risk of developmental delays, seizure, or even death if not treated.¹

Treatment for syphilis requires an intramuscular injection of penicillin or an equivalent anti-biotic. If the infection has been

in the host for longer than a year it may require numerous injections for a period of time. Prevention for syphilis consists of abstinence or a monogamous sexual relationship with a partner who has been tested for sexually transmitted infections. Alcohol and illegal drugs also increase the chances of becoming infected due to risky behaviors associated with these substances.²

Figure 1 shows syphilis rates from Utah and the U.S. from 1990 to 2009.³ Although syphilis rates are the highest in the State during that time period, Utah reported 1.1 cases per 100,000 people, which is significantly lower than the national average of 4.4 per 100,000. Figure 2 shows comparisons of the demographics of syphilis, with syphilis being more prevalent in males with 3.9 cases per 100,000 compared to women who average only 0.2 per 100,000 in the 25-30 age group.³



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Tuberculosis

Compiled by Priti D. Shah

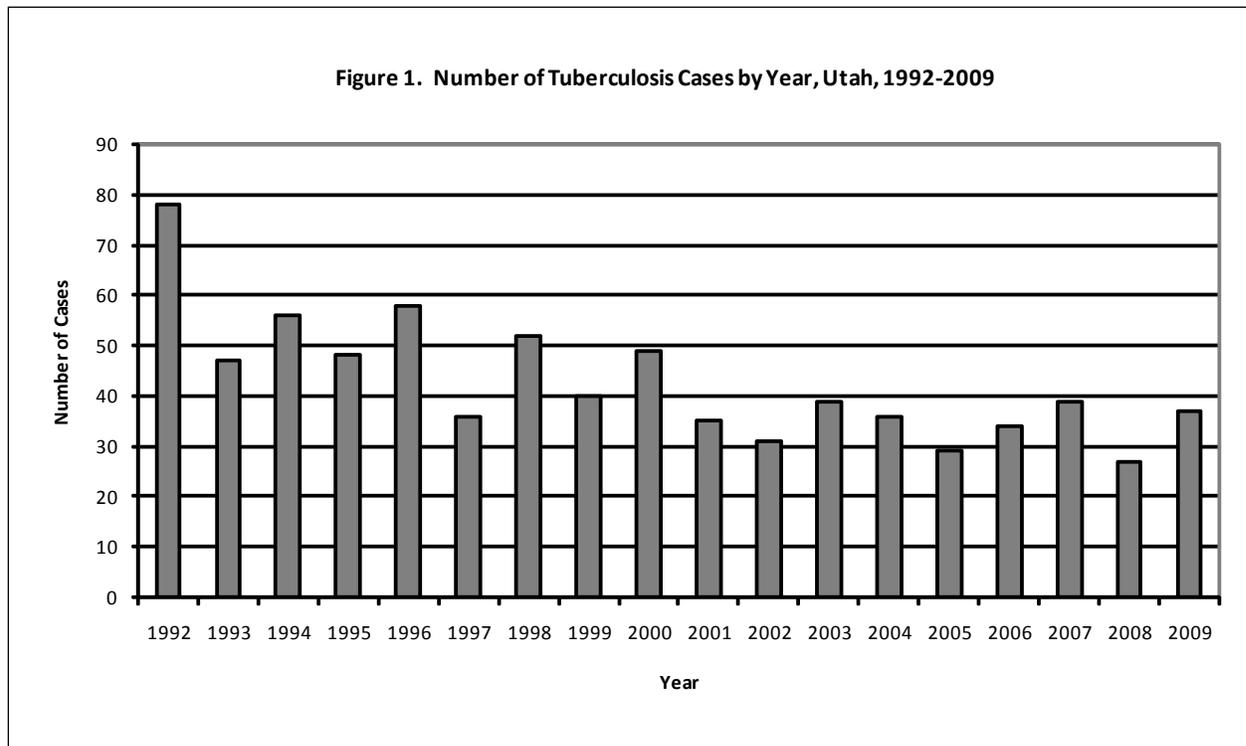
THIRTY-SEVEN CASES OF TUBERCULOSIS WERE REPORTED IN UTAH IN 2009.

Tuberculosis (TB) is an infectious disease caused by the bacteria *Mycobacterium tuberculosis*. The bacteria usually infect the lungs but may attack any part of the body. TB can infect anyone at any age and is contracted by inhaling air that contains TB germs. The general symptoms of TB disease include feeling sick or weak, weight loss, fever, and night sweats. Symptoms of TB of the lungs include coughing, chest pain, and coughing up blood. Other symptoms depend on the part of the body that is affected.¹

People with TB infection, but not TB disease, have the germs that cause TB in their bodies. They are not sick because the germs are inactive or dormant, and they cannot spread the germs to others. However, people with TB disease are sick from germs that are active in their body, have symptoms of TB, and those with the bacteria in the lungs or throat are capable of spreading the disease to others when they expel tiny airborne particles when exhaling.^{1,2} Most people who are exposed to TB

germs develop a positive tuberculin skin test approximately 2-10 weeks after exposure, although 90% of these people will never develop the disease.¹ People who are at high risk of developing TB disease include persons with HIV, chronic illnesses that weaken the immune system such as silicosis, gastrectomy, or body weight below 10% of ideal. In addition, babies and young children, those infected with TB germs within the last two years, those with improper TB treatment in the past, and substance abusers, especially IV-drug users, are also at risk.^{1,2}

Figure 1 shows that thirty-seven cases of TB were reported in Utah in 2009, an increase of ten from last year.² For the five-year period from 2005-2009, Utah had an average of 33 cases per year. The 2009 TB case range in Utah was 1.3 per 100,000 persons as compared to 1.0 per 100,000 persons in 2008. For the five-year period from 2005 to 2009, Utah had an average of 1.2 cases of TB per 100,000 persons. Figure 2 shows that the case rate of TB in Utah has consistently been about 30% lower

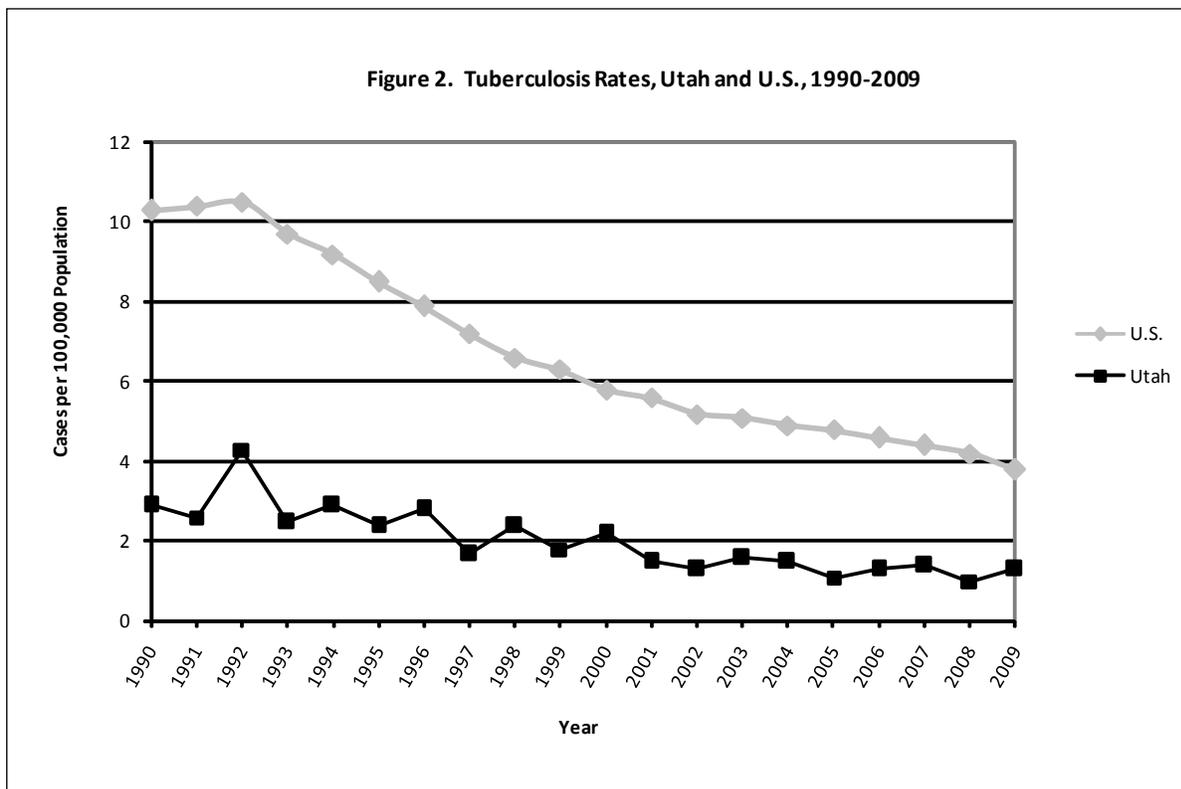


than that found in the U.S. overall.²

It is very important that patients with active TB adhere to their treatment regimen not only for effective therapy, but also to prevent an increase in cases of drug-resistant germs. In 2009, 6 of the 29 persons with TB in Utah on whom drug sensitivity testing was performed had organisms that were resistant to one or more of the anti-tuberculosis medications.² When TB isolates are resistant to the two most effective drugs, isoniazid and rifampin, treatment is more difficult, costly, and can be prolonged up to 24 months. From 2005 to 2009, the percentage of culture isolates with resistance to one or more anti-tuberculosis medications relative to the total number of laboratory culture

confirmed cases ranges from 5% to 27%, with a five-year average of 14%.²

The Tuberculosis Control and Refugee Health Program at the Utah Department of Health is responsible for reducing the incidence of active TB through timely reporting and treatment. The program provides screening and preventive therapy for those with TB infections with the 12 local health districts throughout Utah at the forefront who diagnose and treat latent TB infections and active TB disease, ensure patient compliance, screen high-risk populations, coordinate/refer persons, and provide culturally-appropriate client education.²



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Breast Cancer

Compiled by Kim Judd

UTAH HAS THE THIRD LOWEST MAMMOGRAM SCREENING RATE IN THE NATION OF WOMEN 40 YEARS OF AGE OR OLDER WHO HAVE HAD A MAMMOGRAM WITHIN THE PAST TWO YEARS.

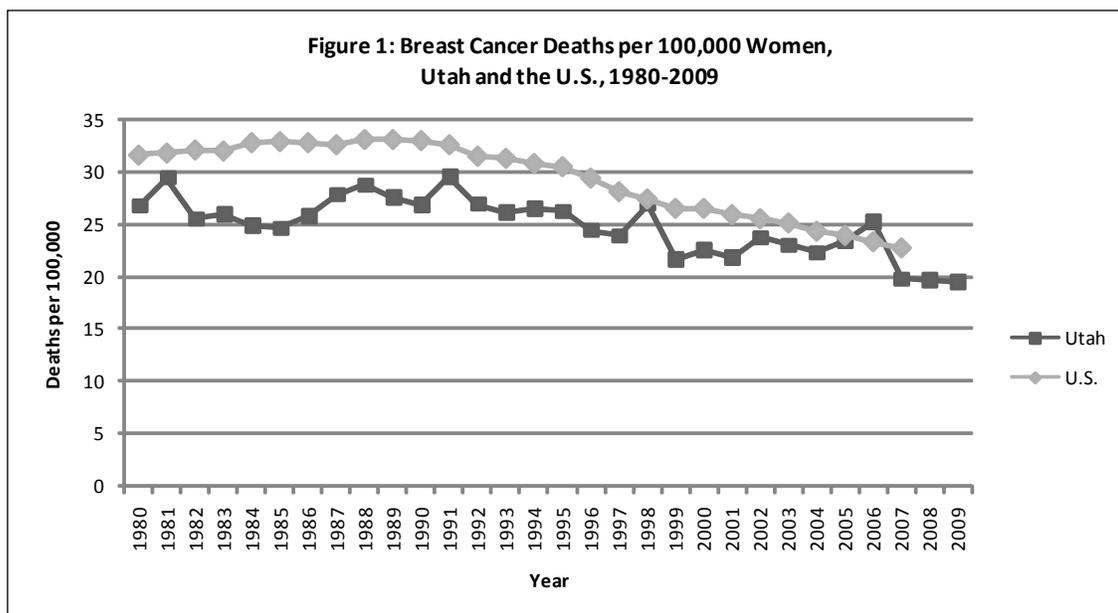
Breast cancer is the most common cancer among women in the United States, excluding skin cancer.¹ It accounts for more than one in four cancers diagnosed in women. Deaths from lung cancer surpass deaths from breast cancer on a national level; however, breast cancer is the leading cause of cancer death among women in Utah.²

National statistics show that the chance of a woman having invasive breast cancer some time during her life is about one in eight (12%). The chance of dying from breast cancer is about one in 35.³ The American Cancer Society projects there will be approximately 230,480 new cases of breast cancer diagnosed in women and approximately 39,520 women will die from breast cancer in 2011.⁴ Utah is the sixth lowest ranked state in the country with a breast cancer incidence rate of 113.1 cases per 100,000 females in the year 2008. In this same year, Utah is the fourth lowest ranked state in the country with a breast cancer mortality rate of 19.8 deaths per 100,000 females in 2007.⁵

After increasing for more than two decades, female breast cancer incidence rates decreased by approximately 2% per year from 1998 to 2007. This decrease was seen in women aged 50 or older, and may be due, in part, to the decline of hormone therapy use after menopause.^{4,6} Overall, breast cancer deaths have decreased on both a national level and a state level from 1980-2009. Utah's age-adjusted breast cancer mortality rate

did not change significantly from 1980 to 1998 (26.8 deaths per 100,000 females and 27.0 deaths per 100,000 females, respectively); however, the mortality rate decreased to 21.8 deaths per 100,000 females in 1999, and in 2009 the rate continued to decrease at 19.6 deaths per 100,000 females. On average, Utah has consistently maintained a lower age-adjusted breast cancer mortality rate than the U.S. However, in 2006, Utah experienced a higher rate than the U.S. average mortality, 25.3 deaths per 100,000 Utah females compared with 23.4 deaths per 100,000 U.S. females, as shown in Figure 1.²

A woman can lower her risk of breast cancer by changing those risk factors that are under her control, such as limiting alcohol use, exercising regularly, not smoking, and staying at a healthy weight. Women who choose to breast-feed for several months may also reduce their breast cancer risk.⁷ Not using post-menopausal hormone therapy can also help decrease one's risk. Other than lifestyle changes, the most important action a woman can take is to follow early detection guidelines. The American Cancer Society currently promotes having a yearly mammogram starting at age 40.⁸ Mammography remains the main screening tool as it is more effective than clinical breast examination and self-examination.⁸ When a mammogram is taken, low dose radiation x-rays are used. They are taken from a few different angles to show the inner structures of the breasts.

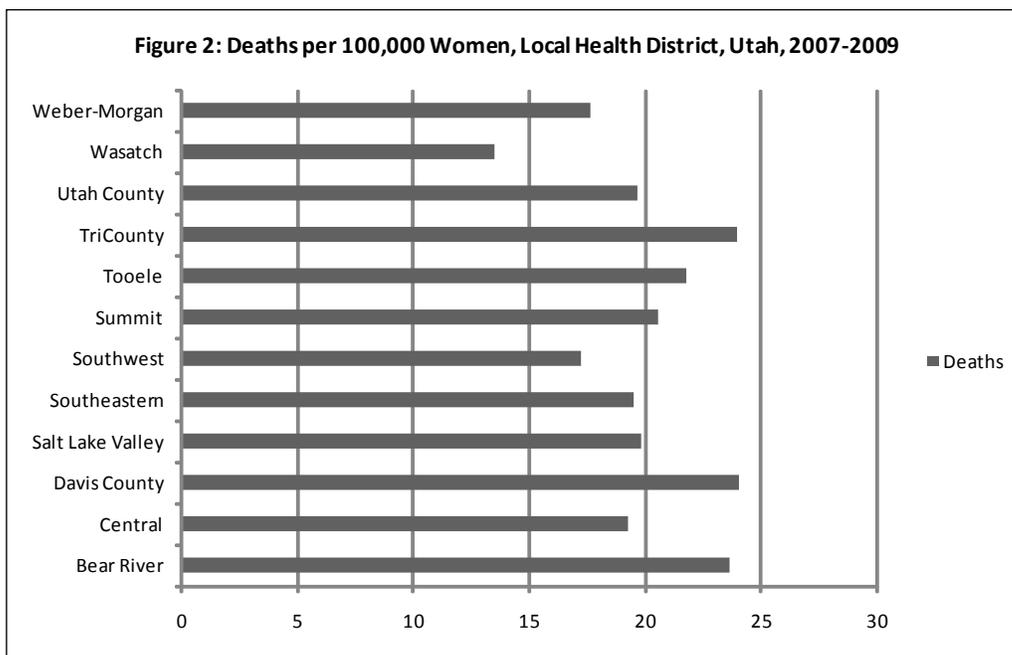


Some tumors will show up on a mammogram two years before they can be felt as lumps in the breast. Although early detection will not prevent breast cancer, it has been shown to save lives and increase treatment choices.⁹

Older women are at a higher risk of developing breast cancer and dying from this disease than younger women.² From 2004-2008, the median age at diagnosis for cancer of the breast was 61 years of age. Approximately 5.60% of women will develop cancer of the breast between their 50th and 70th birthdays. From 2003-2007, the median age at death for cancer of the breast was 68 years of age.¹⁰ Research has shown that older women are not generally aware that they have these increased risks or that mammograms are needed even in the absence of symptoms.¹¹ 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 49.² However, Utah has the third lowest rate in the nation of women ages 40 or older who have had a mammogram within the past two years. In 2008 only 67.8% of women in Utah had received a mammogram as compared to the nationwide average of 76%.¹² The evidence of effectiveness is

sufficiently strong to justify organized and coordinated efforts at early detection by mammography as a public health measure.¹³

In 1990 Congress passed the Breast and Cervical Cancer Mortality Prevention Act to improve access to screening. This guided CDC in creating the National Breast and Cervical Cancer Early Detection Program (NBCCEDP). Currently, the NBCCEDP funds all 50 states. Utah takes part in this national act to increase cancer screening levels among the populations at lower income levels, the uninsured, and the underserved.¹⁴ The Utah Department of Health Utah Cancer Control Program (UCCP) distributes free mammography vouchers to women who receive a clinical breast exam at a UCCP sponsored clinic and meet age and income guidelines. They also provide 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. As of July 1, 2001, the UCCP is able to refer Utah women in need of treatment for breast and cervical cancers for full Medicaid benefits. The women must meet all requirements as outlined in the National Breast and Cervical Cancer Treatment Act.²



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Colorectal Cancer

Compiled by Zane Partridge

UTAH IS THE ONLY STATE IN THE NATION TO MEET HEALTHY PEOPLE OBJECTIVES IN COLORECTAL CANCER DEATH RATES.

Colorectal cancer is a life threatening disease if untreated or if it metastases to other areas of the body. Colorectal cancer, or more commonly referred as colon cancer, affects the large intestine and rectum.¹ The body can form small growths on the inside of the colon wall called polyps. These growths are categorized as benign, pre-malignant, or malignant.¹ Polyps categorized as malignant are termed colorectal adenocarcinomas. If untreated the adenocarcinomas may continue to grow within the colon wall. As the tumor grows the cancer cells will develop outside the colon wall, and if passed into the lymph system, these cells will be transferred to other sites around the body causing more tumors to develop in various locations.¹

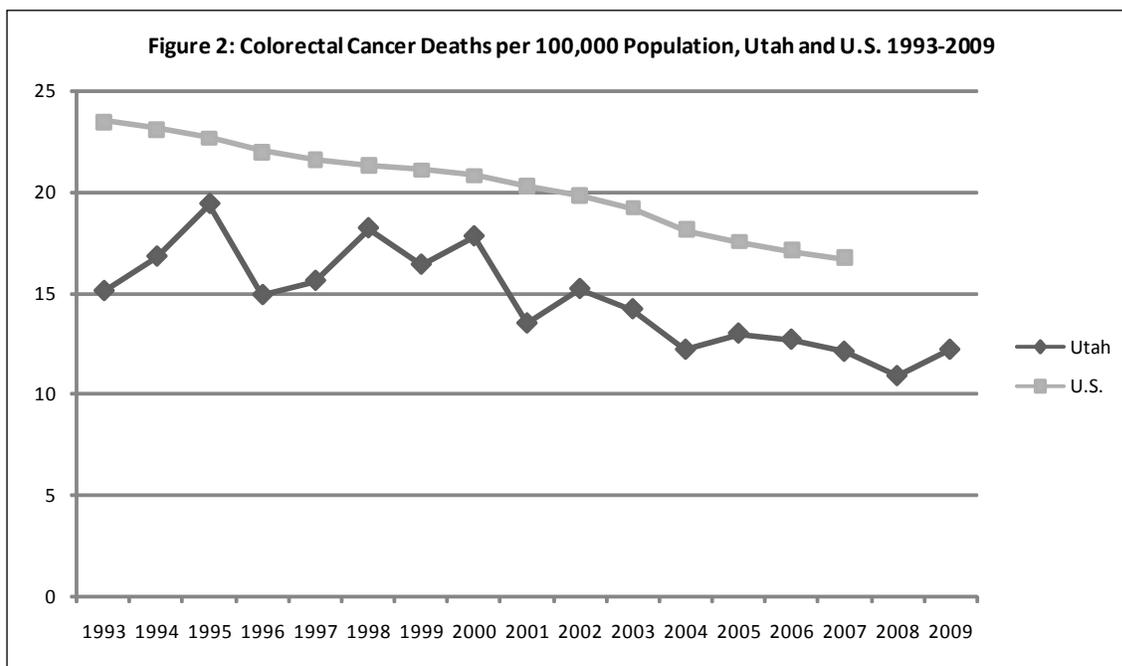
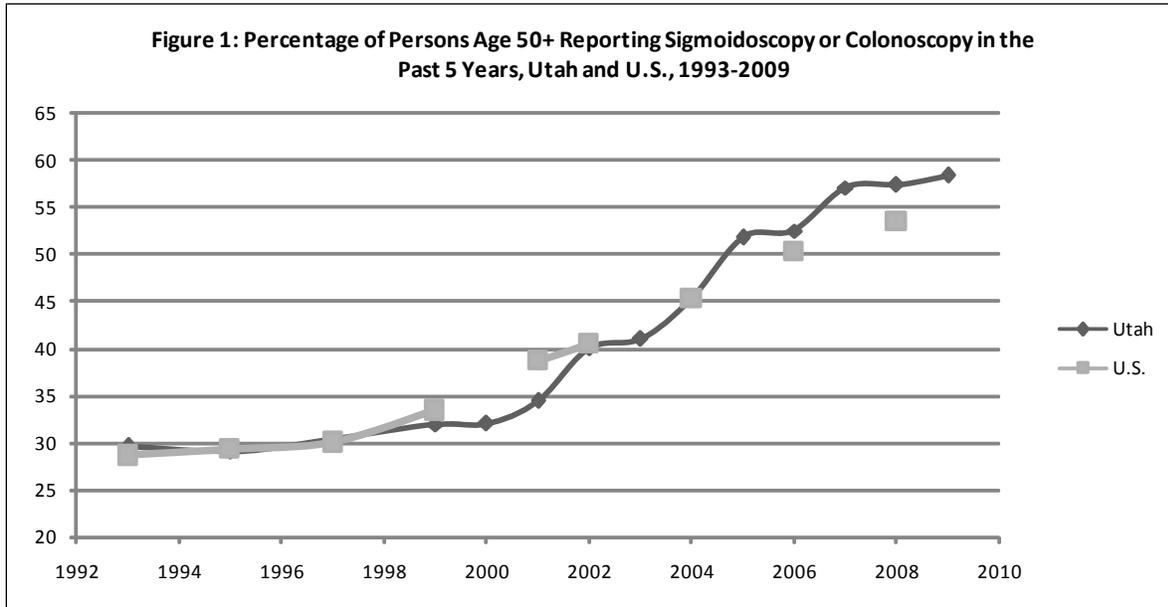
The severity of the symptoms of colorectal cancer may vary depending on the person and how long the tumor has been affecting the body. Some signs and symptoms include: bloody stools, black stools, abdominal pain, vomiting, or a significant change in bowel movements; severe constipation or diarrhea.¹ The National Cancer Institute recommends that the most effective preventative action is to be screened for colorectal cancer at the age of fifty.¹ Individuals that have colon cancer in their family history, consume alcohol, or smoke increase their chances of colorectal cancer and should follow physician instruction on the frequency of screening.¹

The most common way to be screened for colon cancer is

through a colonoscopy or sigmoidoscopy, but other methods can be used including fecal occult blood tests, a virtual colonoscopy, double contrast barium enemas, or digital rectal exams.¹ During a colonoscopy precancerous or cancerous polyps are removed and patients are asked have a follow up screening depending on the type and severity of the polyps in the colon. If colon cancer is caught early there is a 90% chance of survival over five years.¹

Utah ranks as the second lowest state for colon and rectal carcinoma incidence at 35.3 diagnoses per 100,000 people. Arizona was the only state to rank lower at 35.0 diagnoses per 100,000 people. Utah is the only state in the nation to meet the Healthy Peoples objective for a death rate at or under 13.9 deaths per 100,000 people where Utah is ranked as the lowest state in the nation at 12.3 deaths per 100,000 people based on 2008 data.²

Figure 1 shows colorectal screening in Utah and the U.S. for individuals over the age of 50 from 1993-2009.³ Figure 2 shows the number of colorectal cancer deaths in Utah and the U.S. during this same time period. These charts show strong correlations between death rates and screening rates. Utah statistics fluctuate, but deaths of colon cancer have steadily trended in the negative over a 16 year time series as colon cancer screenings have increased.⁴



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Lung Cancer

Compiled by Michelle Everill-Flinders

UTAH HAS THE LOWEST LUNG CANCER INCIDENCE AND MORTALITY OF ANY STATE IN THE UNITED STATES.

Mutations in DNA from lung cells can lead to lung cancer. The mutations cause malfunction in the regulation of cell division, which can cause tumor formation. The cells often become metastatic, losing their ability to anchor to lung tissues and spread cancer cells throughout other organs in the body.¹ The two types of lung cancer are non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). NSCLC accounts for the majority of lung cancer cases, at 85%, while SCLC accounts for the remainder 15%.²

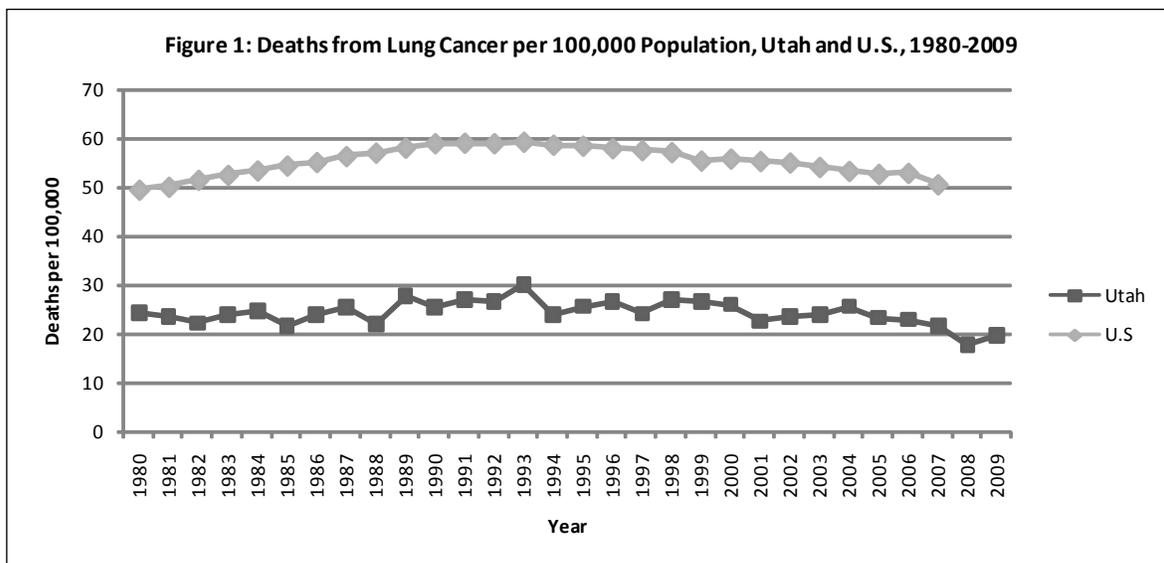
SCLC starts in smaller cells located in the bronchi. Due to rapid division and spread to other organs, surgery is rarely used to treat the cancer. Standard first-line treatment includes the use of chemotherapy.³ NSCLC includes cancer cells located in the middle of the lungs (squamous cell carcinoma), the outer part of the lungs (adenocarcinoma), and any other part of the lung consisting of large cells (undifferentiated carcinoma). Treatment includes surgery, chemotherapy, radiation, and targeted therapy.

Lung cancer leads to death more frequently than any other

type of cancer.² Symptoms of lung cancer include shortness of breath, frequent coughing, voice changes, and coughing up blood.¹ Because these symptoms often do not appear until the disease is advanced, early detection of this cancer is difficult. Cigarette smoking accounts for 87% of lung cancer deaths and other lung cancer risk factors include family history, genetic factors, and diet.⁴

In 2007, the lung cancer mortality rate in Utah was less than half the U.S. rate at 50.7 deaths per 100,000 people in the U.S. and 22.0 deaths per 100,000 people in Utah. Based on 2007 data, Utah ranked lowest in the nation in lung cancer mortality rates with the next lowest state (Hawaii) having 36.0 deaths per 100,000 people which is a difference of over half of the deaths that occurred in Utah.⁵ Figure 1 illustrates the difference in mortality rates in Utah versus the U.S. yearly since 1980.⁴

Utah's statewide Tobacco Prevention and Control Program is seeking to prevent underage use of tobacco, help tobacco users quit, eliminate unwanted exposure to secondhand smoke, and reduce tobacco-related disparities.⁴



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Prostate Cancer

Compiled by Michelle Everill-Flinders

PROSTATE CANCER INCIDENCE AND DEATH RATES IN UTAH ARE HIGHER THAN THE NATIONAL AVERAGE.

Prostate cancer is a cancer of the prostate, a male reproductive organ between the bladder and rectum, which surrounds the urethra. Tumors, also called lesions, form where there is an abundance of cells due to the overproduction of new cells and/or buildup of old damaged cells that do not dispose of naturally. These tumors can be malignant (cancerous) or benign. Prostate cancer cells infiltrate other organs by entering nearby blood or lymph vessels. The circulatory and/or lymphatic systems transport cancerous cells throughout the body, where the diseased cells attach to other tissues or organs; most commonly the bones. Risk factors for prostate cancer include family history, age, genome changes, prostate changes, and race.¹

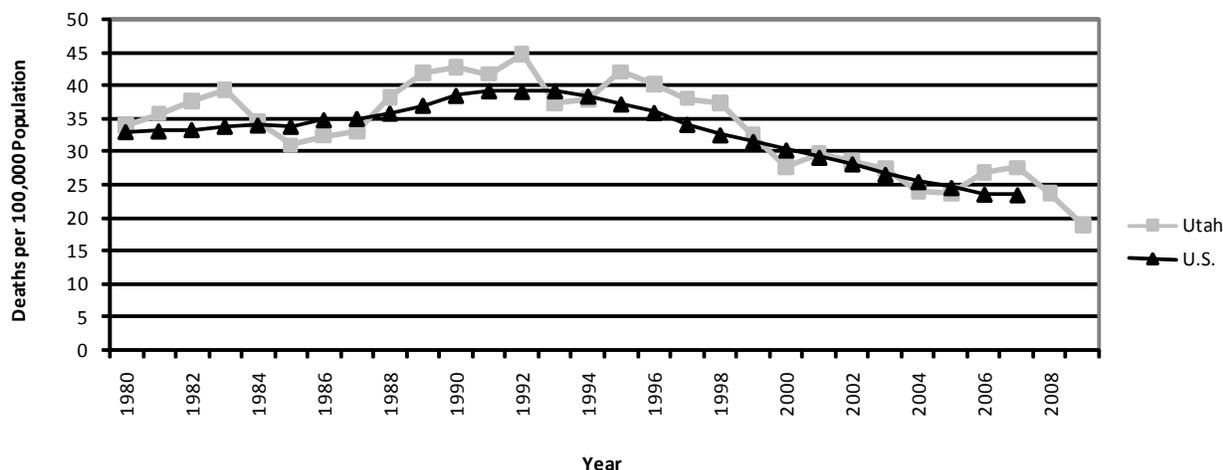
Screening for prostate cancer is recommended for men over 40 years of age. Screening consists of two tests: a Digital Rectal Exam (DRE), also called a “finger wave”, and a blood test that measures the Prostate Specific Antigen (PSA). Most health care providers will suggest being screened annually, or every two to four years if risk is limited.² Based on historical incidence rates, 16% of men born today (or 1 in 6 men) will be diagnosed with prostate cancer at some point during their lifetime.³ Early prostate cancer diagnoses result in a 100% five-year survival rate. Men diagnosed with distant metastasis (the spread of cancer to distant areas away from the prostate) are given a 31% five-year survival rate.⁴ Prostate cancer is currently the second leading

cancer-related cause of death in men.⁵

As treatment options for prostate cancer vary from surgical treatment, radiation, watchful waiting, hormone therapy, and chemotherapy, decision making for men diagnosed with prostate cancer can be very difficult. More research is needed in these areas; however, funding for Prostate Cancer research in the United States is limited due to the controversy regarding a standard treatment after diagnosis.⁴

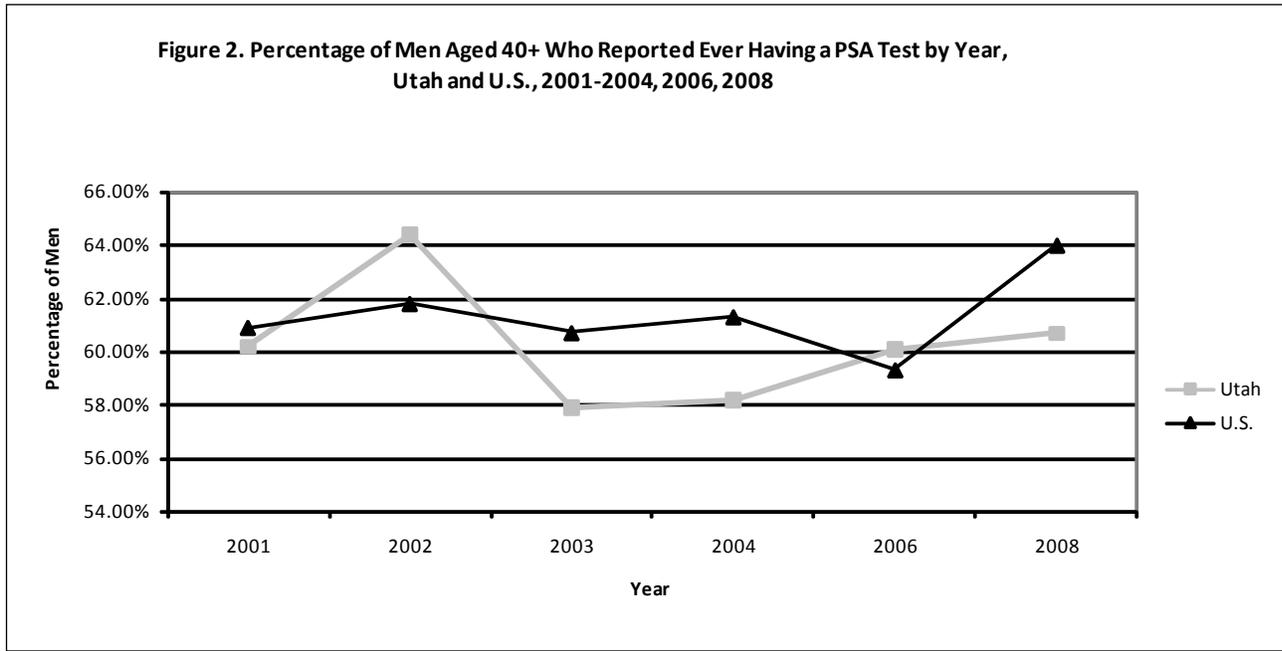
Prostate cancer incidence in Utah is ranked the tenth highest in the nation and sixth highest for deaths caused by prostate cancer based on 2007 data.⁶ Figure 1 illustrates the fluctuation of mortality rates in Utah versus the United States average. Overall, Utah death rates are consistently higher than that of the national average. In 2007, the state prostate cancer death rate was 27.6 deaths per 100,000 men, exceeding the national rate of 23.5 deaths per 100,000 men.⁷ Figure 2 shows that PSA screening rates of men aged 40 or higher in Utah was below the national average by 3.3% as of 2008 data. This data does not account for regular screening values. PSA screening rates do increase with age; 88.2% of men aged 65 and higher have had a PSA test at some point in their lives.⁸ As prostate cancer is a slow forming cancer, and oftentimes does not show physical symptoms until after the cancer has progressed to a higher stage, it is important for men to be screened for this disease reg-

Figure 1. Prostate Cancer Deaths per 100,000 Population Utah versus U.S.



ularly prior to symptoms being present. PSA level increases can often present prior to symptomatic changes. Prostate screening is generally performed by a family care physician, urologist, or oncologist and can be performed during a routine physical

exam. Various organizations within Utah perform free screening at certain times throughout the year. More information regarding free screening can be found through the Utah Cancer Action Network (UCAN).⁹



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Skin Cancer

Compiled by Kim Judd

UTAH HAS CONSISTENTLY BEEN RANKED IN THE TOP 10 STATES FOR HIGHEST MELANOMA INCIDENCE.

Skin cancer is the most common form of cancer in the United States. Utah is the second highest ranked state in the country with Melanoma skin cancer incidence at 28.1 diagnoses per 100,000 people in the year 2008. The United States average is at 18.8 per 100,000 people. Only Oregon has a higher incidence rate of 28.8. Melanoma of the skin death rates in the same year were 3.0 deaths per 100,000; which Utah ranks fourteenth in the nation with a U.S. average of 2.7 deaths per 100,000 people.¹

The two most common types of skin cancer are Basal Cell and Squamous Cell carcinomas. These are highly curable. However, Melanoma, which is the third most common skin cancer, is much more dangerous and uncertain.² Melanoma is more likely than any other type of skin cancer to spread to other parts of the body if not caught early. It is a cancer that begins in the melanocytes and can occur anywhere on the skin. Most Melanoma cells produce melanin and are usually brown or black, but they can be non-pigmented. Melanoma accounts for less than 5% of skin cancer cases, but causes a large majority of skin cancer deaths.³ Utah has consistently been ranked in the top 10 states for highest Melanoma incidence and it is continuously on the rise, as shown in Figure 1.⁴

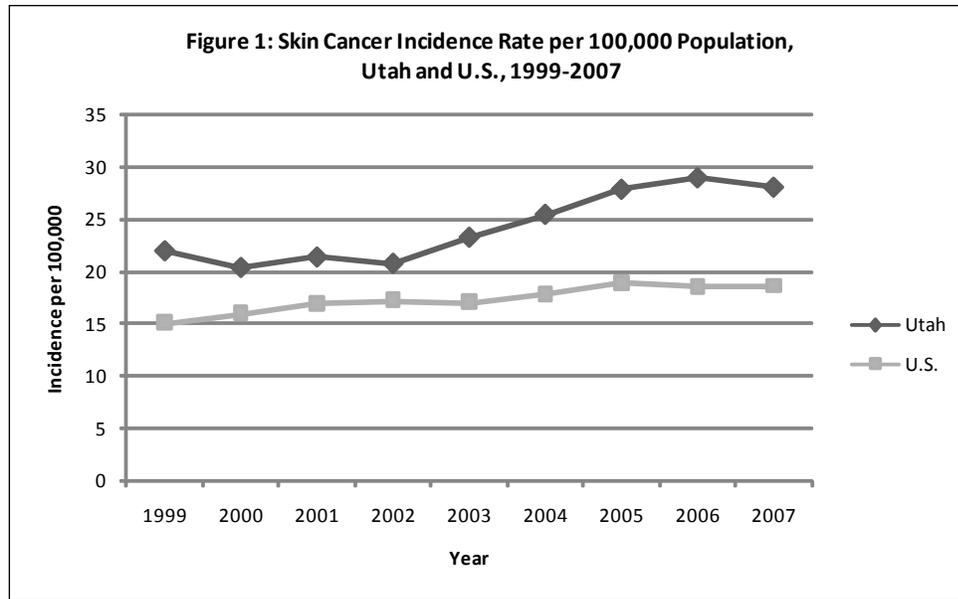
Other risk factors for Melanoma include fair skin, freckling, light hair, family history of Melanoma, personal history of Melanoma, blue or green eyes, certain types of moles (Dysplastic Nevi or Congenital melanocytic nevi), a large number of moles, and a history of sunburns early in life.^{3,5} Utahns are at a higher risk for skin cancer due to the state's high elevation, predominantly fair-complexioned population, and frequent sunny days.⁶

The melanoma rate has been climbing in the U.S. since the 1970s. The American Cancer Society estimates that in Utah, 65 to 90 percent of melanomas are caused by the sun's ultraviolet rays.^{5,6} This is an invisible kind of radiation that comes from the sun, tanning beds, and sunlamps. UV rays can penetrate and change skin cells. There are three types of UV rays: UVA, UVB, and UVC. UVA and UVB reach the earth's surface at different levels and with too much exposure can damage connective tissue and lead to skin cancer.³ The National Weather Service and Environmental Protection Agency developed the UV index to forecast the risk of exposure to UV rays. It indicates the strength

of solar UV radiation at any given time in any area in the U.S. on a scale from 1(low) to 11+ (extremely high).⁷

A rising concern is the number of people who use tanning beds. Use of sunbeds for tanning continues to increase in popularity, especially among young women and teens.⁸ Tanning bed use increases the risk of developing Melanoma of the skin by approximately 75% when use starts before the age of 30. Tanning beds and booths may emit the same type and amount of UV radiation as the summer sun at noon, and sometimes more.⁹ Most tanning beds emit mainly UVA radiation and they can cause deeper skin damage than being outside.¹⁰ Recent recommendations from the International Agency for Research on Cancer, a subsidiary of the World Health Organization, state that measures such as prohibiting minors and discouraging young adults from using indoor tanning facilities are important to protect against additional melanoma risk.¹¹ Each state has their own laws regarding tanning restrictions for minors. Some states have a ban for those 14 years and younger. Utah does not have an age limit for tanning beds. The state statute regarding tanning restrictions for minors requires that those under 18 years of age have parental permission in person. The number of tanning sessions is specified by the parent and it is valid for twelve months; however, it does not require parental accompaniment.¹³

Utah Cancer Action Network (UCAN) and the Utah Department of Health have prepared The Utah Comprehensive Cancer Control Plan for 2006-2011. One of the primary prevention goals in this plan is to reduce the incidence of skin cancer in Utah by increasing the proportion of adults and or children who used sun protection measures.¹² These measures include protective clothing such as a wide brimmed hat, long sleeved shirt, pants and sunglasses. They also include applying sunscreen with an SPF of at least 30 every 2 hours, even when it's cloudy.¹³ It also includes decreasing the number of teens reporting the use of tanning beds and other UV tanning devices by 5%. Strategies used to achieve this will be improving public knowledge and awareness of the danger of ultraviolet light exposure from tanning beds and seeking state legislation requiring all tanning parlors to distribute information regarding the dangers of tanning prior to selling tanning sessions.⁴



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Cerebrovascular Disease (Stroke)

Compiled by JB Flinders, MPH, MBA

STROKE REMAINS THE THIRD LEADING CAUSE OF DEATH IN UTAH.

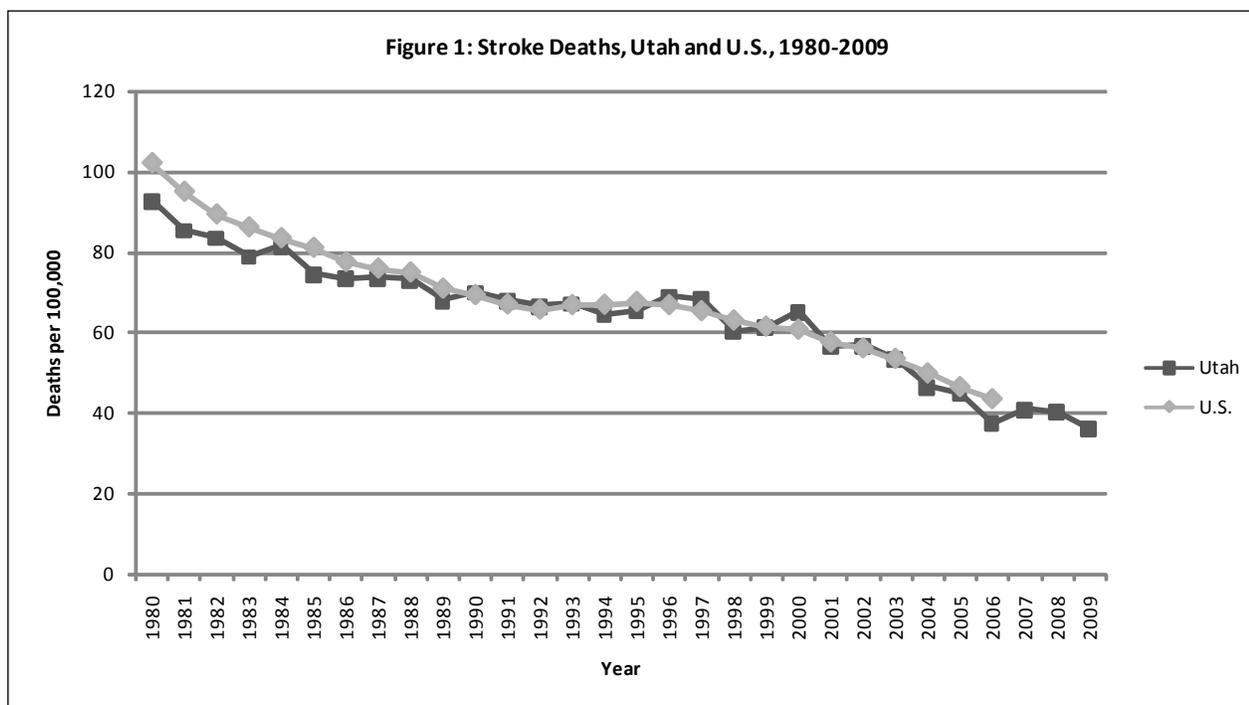
A stroke occurs when a blood vessel carrying oxygen to the brain is either blocked by a clot or ruptures. The rupture of a weakened blood vessel which prevents blood flow to the brain is known as a hemorrhagic stroke, while a clot obstructing blood flow to the brain is known as an ischemic stroke. A transient ischemic attack (TIA) caused by a temporary clot can also occur, and is more commonly known as a “mini stroke”.¹ Warning signs for a stroke include sudden numbness or weakness, especially on one side of the body, sudden confusion, or trouble understanding and speaking, loss of balance or coordination and dizziness, sudden severe headache without cause, and sudden loss of vision.²

Hemorrhagic strokes are the most serious type of stroke and comprise 13 percent of stroke cases. These strokes are caused by either an aneurysm, a ballooning of a weakened blood vessel, or an arteriovenous malformation, a cluster of abnormal blood vessels. Both aneurysms and arteriovenous malformations cause bleeding in the brain.³ Ischemic strokes account for roughly 87 percent of all stroke cases. These strokes are caused by blood vessels that become blocked by fatty deposits, and cause either cerebral thrombosis or cerebral embolisms. A cerebral thrombosis occurs when a clot blocks part of the vessel

within the brain while a cerebral embolism is caused by a blood clot from another portion of the circulatory system, generally in the large arteries of the neck and upper chest. The clot breaks off, and flows into the brain, where it becomes lodged within the narrow vessels.⁴ TIA's occur when blockage caused by a clot occurs for a short duration of time. Normal body functions resolve these clots and no permanent injury to the brain occurs.²

Several risk factors have been associated with increased incidence of stroke. Resistant risk factors include increased age, family history, being male, being African American, and previous history of stroke. Controllable risk factors include high blood pressure, cigarette smoking, diabetes, artery diseases, atrial fibrillation, sickle cell disease, high blood cholesterol, poor diet, physical inactivity and obesity.⁵

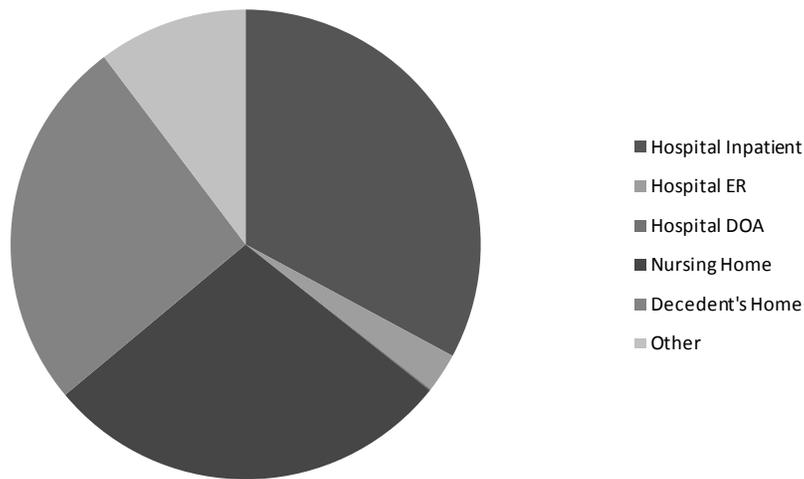
Stroke is the third leading cause of death in the U.S., killing more than 137,000 people per year. A stroke occurs every 40 seconds, and a death from stroke every four minutes. Overall, the U.S. will spend nearly \$74 billion in stroke-related medical costs in 2010.⁶ Stroke is also the third leading cause of death in Utah, following heart disease and cancer, and is a major cause of long-term disability. Figure 1 shows stroke deaths from 1980-2009 in Utah and the U.S. In 2009, Utah's death rate



from stroke was 36 deaths per 100,000, a decrease from 40.3 in 2008. Utah's previous low was 37.5 deaths per 100,000 in 2006, which was lower than the U.S. rate of 43.6 deaths per 100,000.⁷ Although stroke deaths have decreased, stroke deaths that occur prior to transport have remained constant. As figure 2 shows, in Utah between 2003 and 2007, only one of every three deaths from stroke occurred in a hospital setting. The remainder occurred in nursing homes, at 28%, the decedents' home, at 26%, and other settings, at 10%.⁸

In an attempt to continue to decrease the amount of deaths caused by stroke a 9-1-1 campaign has been implemented in the State of Utah to increase public awareness of the signs of stroke and the importance of dialing 911 when stroke occurs. Hospitals and health professionals are also being encouraged to improve emergency response to stroke to ensure better screening of stroke patients and increased access to lifesaving treatment.⁸

Figure 2: Pre-Transport Stroke Deaths by Place of Death, Utah, 2003-2007



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Coronary Heart Disease (CHD)

Compiled by JB Flinders, MPH, MBA

UTAH HAS REMAINED BELOW THE NATIONAL CHD MORTALITY RATE SINCE 1980.

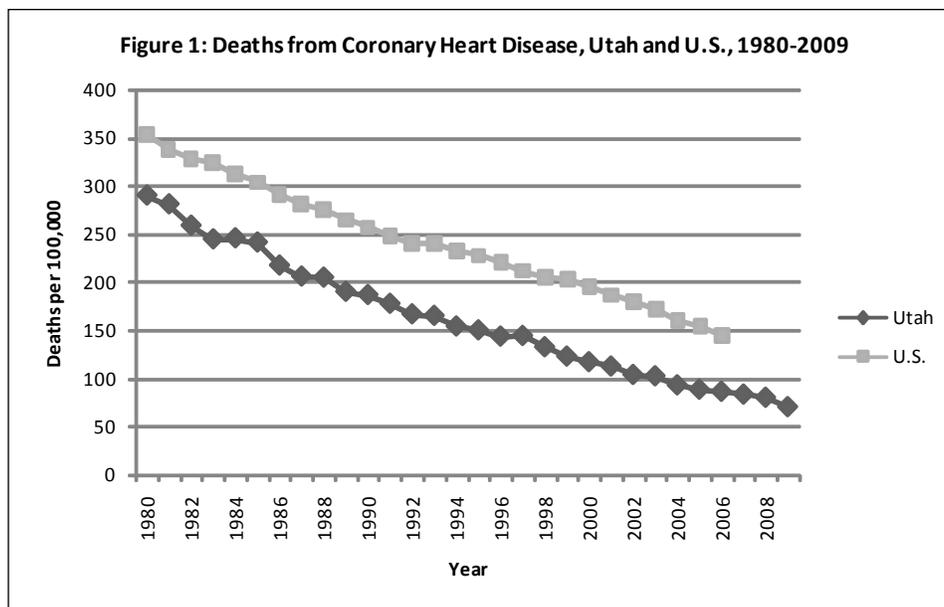
Coronary heart disease (CHD) involves the narrowing of blood vessels that move oxygenated blood to the heart, causing a reduction in blood flow. CHD is also known as Coronary Artery Disease (CAD).¹ This reduction of blood flow is often caused by plaque build-up, comprised of cholesterol deposits and other substances, within the coronary arteries, called atherosclerosis. Atherosclerosis causes an inadequate amount of oxygen to reach the heart's tissues causing heart muscles to weaken which may lead to heart failure, irregular heartbeats, or heart attack.²

Coronary heart disease is the number one cause of death for both men and women in the U.S. Risk factors for CHD include high blood cholesterol, high blood pressure, physical inactivity, obesity, unhealthy diet, diabetes, and smoking. Other factors that may contribute to CHD include sleep apnea, stress, alcohol use, and older age.³ Signs and symptoms of CHD include angina, a sudden pressure or squeezing in the chest, shortness of breath, myocardial infarction (heart attack), arrhythmia, and sudden cardiac death.⁴

Figure 1 shows deaths attributed to CHD in Utah and the United States from 1980 to 2009. Utah's Healthy People 2010 goal was set at 109.4 deaths per 100,000 people. This goal was reached in the year 2003 with only 102.8 deaths per 100,000 people.⁵ Utah has remained below the

national mortality rate since 1980. In 2006 the mortality rate in the U.S. was 144.3 deaths per 100,000 compared to 86.7 deaths per 100,000 in Utah. Utah's mortality rate in 2009 was 70.8 deaths per 100,000, a decrease of 9.7 deaths per 100,000 population since 2008.⁶

The CDC recommends a number of lifestyle factors to prevent CHD. These include eating a healthy diet, including increased fruits and vegetables and limiting sodium and saturated fat; maintaining a healthy weight, exercising at moderate-intensity for at least 30 minutes regularly, avoiding smoking, and limiting alcohol use. They also recommend monitoring cholesterol and blood pressure levels, and managing any other chronic conditions, such as diabetes.⁷ Other preventative measures being taken include patient education and self-management tools.



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Diabetes Mellitus

Compiled by Ryan M. VanderWerff

25.8 MILLION PEOPLE ARE AFFECTED BY DIABETES IN THE UNITED STATES.

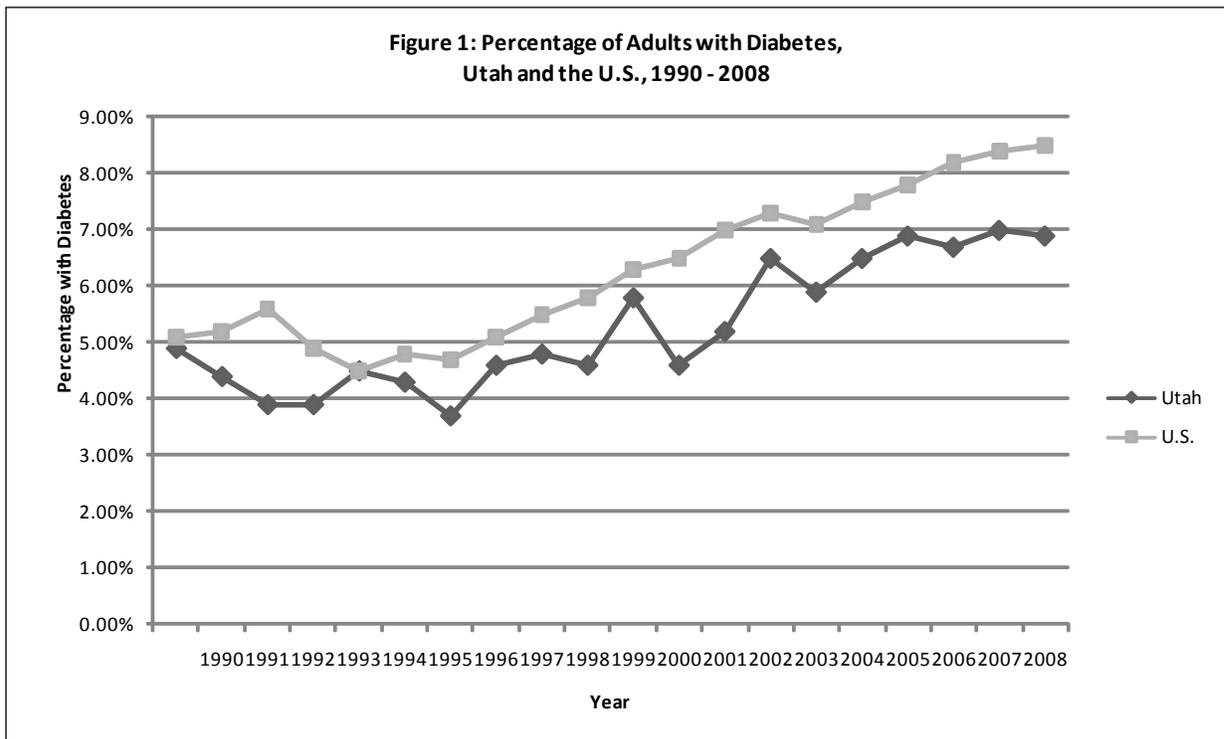
Diabetes is classified into two categories: Type 1 and Type 2. Type 1 Diabetes involves the underproduction of insulin, caused by body's destruction of beta cells that produce the insulin hormone. Type 2 Diabetes occurs when the body properly produces insulin, but insulin receptors become resistant to the insulin. The insulin hormone facilitates the metabolism of glucose. When glucose is present in the blood, insulin attaches to special receptors that allow cells to use it as energy or store it as fat. If it is not metabolized properly, glucose levels build up in the blood stream, which causes a myriad of complications such as stroke, heart disease, and nerve damage.¹

Type 1 Diabetes is less prevalent and more commonly known as juvenile diabetes as the majority of diagnoses occur in young people. Currently 1 in 400 children will be diagnosed with Type 1 Diabetes.¹ Type 2 Diabetes is significantly more prevalent among the population, and is caused generally by poor diet and lack of exercise.² Type 2 generally increases in children over the age of 10, but and is significantly more prevalent in adults.¹ Prediabetes is a condition where blood glucose levels are higher than normal but do not meet the threshold of diabetes. Those

diagnosed with prediabetes are at higher risk of Type 2 Diabetes.² Gestational diabetes occurs during pregnancy. These cases often subside after the pregnancy, but mothers with gestational diabetes are at higher risk for Type 2 Diabetes.³

In 2010 there were 1.9 million new cases of Diabetes diagnosed in the U.S. Of those cases, 24% were 20-44 year olds, 55% were 45-64 years old, and 21% were 65 and older. Diabetes is also more common in Non-Hispanic, Black, and American Indian adults than non-Hispanic white adults, after age adjustment. An estimated 79 million Americans age 20 and older are affected with prediabetes.⁴ Figure 1 shows the percentage of adults with diabetes in Utah and the U.S. In 2009, 6.9% of the Utah population had been diagnosed with Diabetes, after age adjustment, while 8.5% of the U.S. population had been diagnosed with diabetes after age adjustment.⁵ Nearly 45,000 more Utahans have diabetes but have not yet been diagnosed.⁶ By the mid-nineties, the U.S. rate of Diabetes was on a steady increase, while Utah has fluctuated with an overall increase. With the exception of 1994, Utah has remained below the national average.

Among adults in the United States the 58% of diabetic cases



are treated with oral medication, 14% with a combination of oral medication and insulin, 12% with insulin only, and 16% do not take either insulin or oral medication.⁶ If not treated properly by medication or insulin, or controlled by good diet and exercise, diabetes can be deadly. Diabetes is currently the 7th leading cause of death, the leading cause for kidney failure, and the major cause of heart disease and stroke. It is also the leading cause for non-traumatic lower limb amputation.⁶ Genetic and congenital factors also play into one's susceptibility. Early detection, preventative measures, and insulin and/or oral medication provide control of the disease. The overall economic cost for diabetes in 2007 was 174 billion dollars.⁷

Since 1980, the Utah Department of Health Diabetes Prevention and Control Program (DPCP) is a local program funded by the CDC to work with Primary Care Providers, local health specialists and agencies, and the public to make Utahans aware of the risk of diabetes, how to treat it, and how to prevent it. Further, the DPCP works to provide more Utahans with access to education about Diabetes.⁸ Weight control through good dieting and exercise are the main foundations of prevention. The American Diabetes Association is a non-profit organization with a national initiative to prevent and cure diabetes and improve the lives of those affected by diabetes.⁹

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Bear River Health District

Compiled by Kyle Burningham

COUNTY: BOX ELDER, CACHE, RICH

POPULATION (2010): 168,623

AREA: 7,915 SQUARE MILES

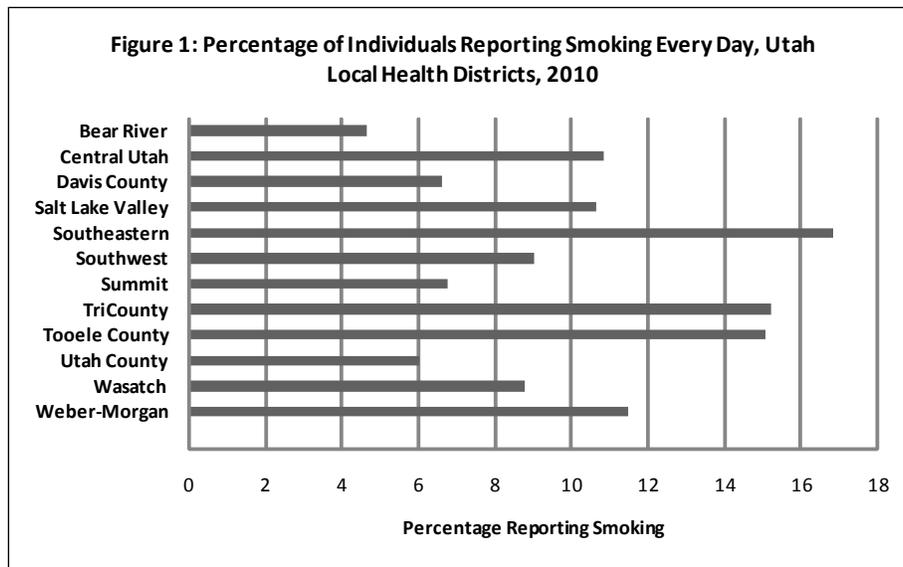
The Bear River Health District (BRHD) covers the three counties of Box Elder, Cache, and Rich. The combined population for these counties is 168,623. The majority of the population resides in Cache County with a population over 120,000 while Rich County has a population of less than 3,000.¹

2010 data for Bear River Health District shows Utah's lowest percentage of individuals who smoke cigarettes every day. The 4.67% is significantly lower than the Utah State average of 9.13%. In 2009, this percentage in BRHD was 8.41%, showing the largest decrease by any health district in Utah, as shown in Figure 1. This decline can be attributed to a strong anti-tobacco campaign initiated by the Bear River Health Department.²

The Bear River Health Department continues promoting cancer awareness for various forms of cancer, including skin

cancer. Promotions include the topics of prevention, screening, and general education. In 2008, 31.37% of the population surveyed used sunscreen; in 2010, this percentage grew to 38.55%. The Utah State average, in 2010, was 36.81%.³

A recent outbreak of Pertussis (whooping cough), a highly contagious and a commonly occurring vaccine-preventable disease in the United States, drew attention in the Bear River Health District. BRHD specifically advised Cache County, after two cases were confirmed in its schools.⁴ Through government grants, immunizations were made available to mothers, fathers, and other people with close contact to infants and individuals whose immune systems had been compromised. The intent of BRHD was to protect the at-risk population by immunizing those in direct contact.⁵



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Central Utah Health District

Compiled by Kyle Burningham

COUNTY: JUAB, MILLARD, PIUTE, SANPETE, SEVIER, WAYNE

POPULATION (2010): 77,731

AREA: 16,897 SQUARE MILES

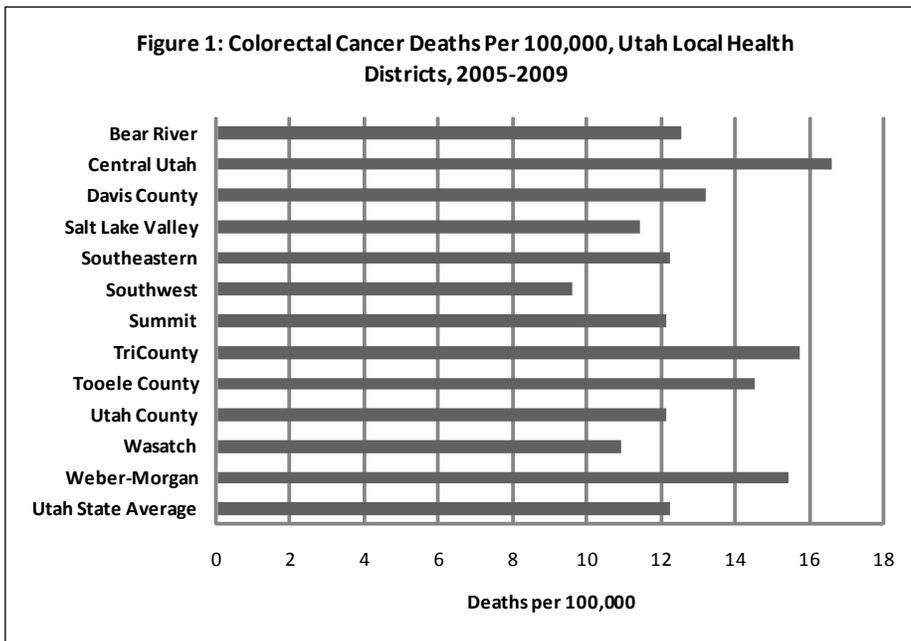
The Central Utah Health District (CUHD) includes the six counties of Juab, Millard, Piute, Sanpete, Sevier, and Wayne, making the CUHD the third largest health district in Utah. The birth rate of the CUHD in 2009 was 16.07 per 1,000 persons, lower than the state of Utah rate of 19.25 per 1,000. The total population in 2010 was 77,731 which is an increase from 75,252 from 2008.¹

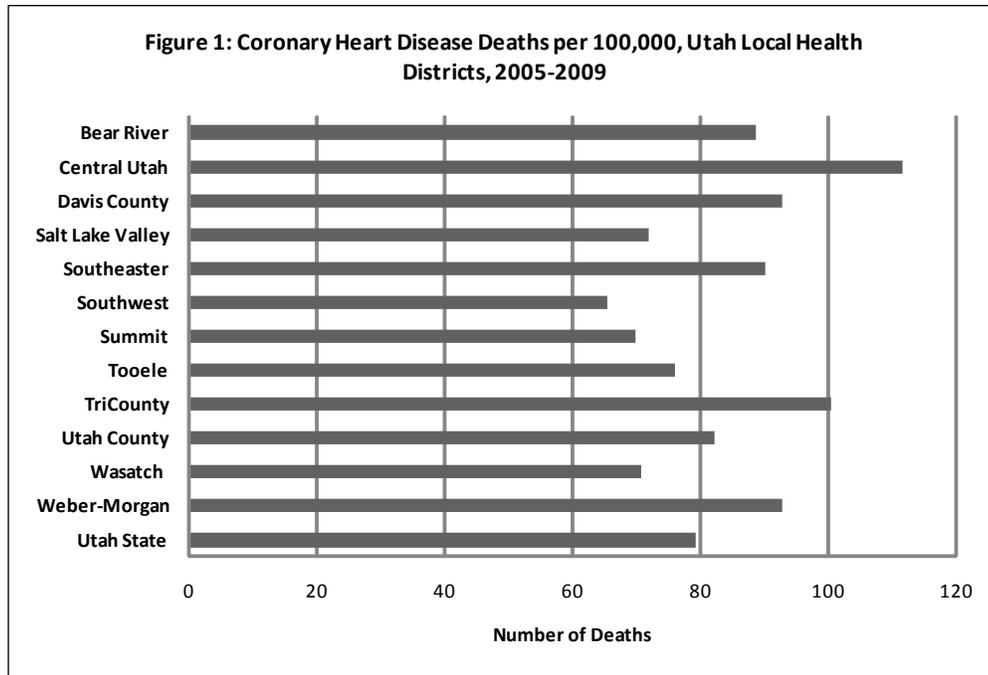
2010 data indicates that the CUHD has the highest amount of Colorectal Cancer deaths at 16.6 deaths per 100,000. The average in Utah is 12.2 deaths per 100,000, shown in Figure 1. Colorectal Cancer is the second leading cause of cancer-related deaths in the U.S. When national cancer-related deaths are estimated separately for males and females, this cancer is the third leading cause of cancer death behind lung and breast cancer for females and behind lung and prostate cancer for males. Deaths

from Colorectal Cancer can be substantially reduced when precancerous polyps are detected early through screenings such as a Colonoscopy and Sigmoidoscopy.²

Residents of CUHD have the lowest percentage of residents being screened for Colorectal Cancer, with 39.3% screening rates in Juab, Millard, and Sanpete County and 47.2% screening rates in Sevier, Piute, and Wayne County. The chance of surviving Colorectal Cancer exceeds 90% when the cancer is diagnosed before it has extended beyond the intestinal wall.³

The CUHD also leads Utah with the highest Coronary Heart Disease deaths. Data indicates 111.9 deaths per 100,000 population in CUHD. The second highest is TriCounty Health District at 100.5 per 100,000 population. The average death per 100,000 for Utah is only 79.4, shown in Figure 2.⁴





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Davis County Health District

Compiled by Kyle Burningham

COUNTY: DAVIS

POPULATION (2010): 312,918

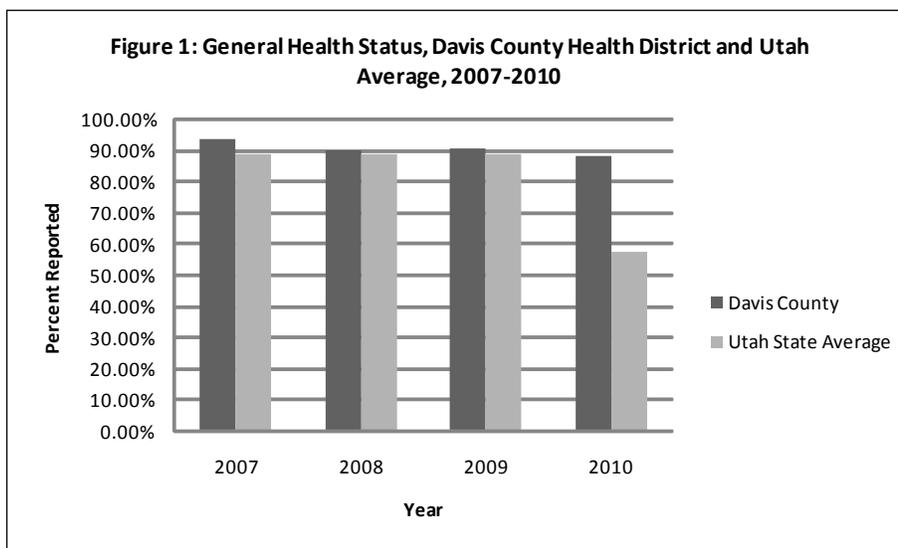
AREA: 634 SQUARE MILES

The Davis County Health District (DCHD) covers Davis County, which is located in Northern Utah. The Davis County Health Department is the oldest local public health department in Utah and was established in 1934. In 2010, the Davis County Government official website estimated the population of Davis County at 312,918, with an annual population increase of 2%. Davis County has the smallest land mass in Utah, but is ranked third in population.¹

Davis County Health District is one of the healthiest districts in the state of Utah. When asked "Would you say that your general health is Excellent, Very Good, Good, Fair or Poor?" DCHD had 88.59% of the reporting population rate their health status as excellent, very good, or good, shown in Figure 1. This percentage was a slight decrease from 91.07% in 2009.²

In 2010, The DCHD continued its efforts to vaccinate the at-risk population against the H1N1 novel influenza virus and other strains of influenza. These efforts, along with prevention and treatment education, helped decrease the hospitalized cases of influenza from 153 in 2009 to 11 in 2010.³

During the spring of 2010, a significant increase of Invasive Streptococcal Infections occurred in Davis County. 12 cases were reported with five of them resulting in death. This outbreak occurred in a younger than expected population and infections were noted as more severe than previous years. The DCHD investigated this odd occurrence and no commonalities were identified. Early detection programs were implemented to recognize future outbreaks.⁴



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Salt Lake Valley Health District

Compiled by Breanna Burningham

COUNTY: SALT LAKE

POPULATION (2010): 1,059,955

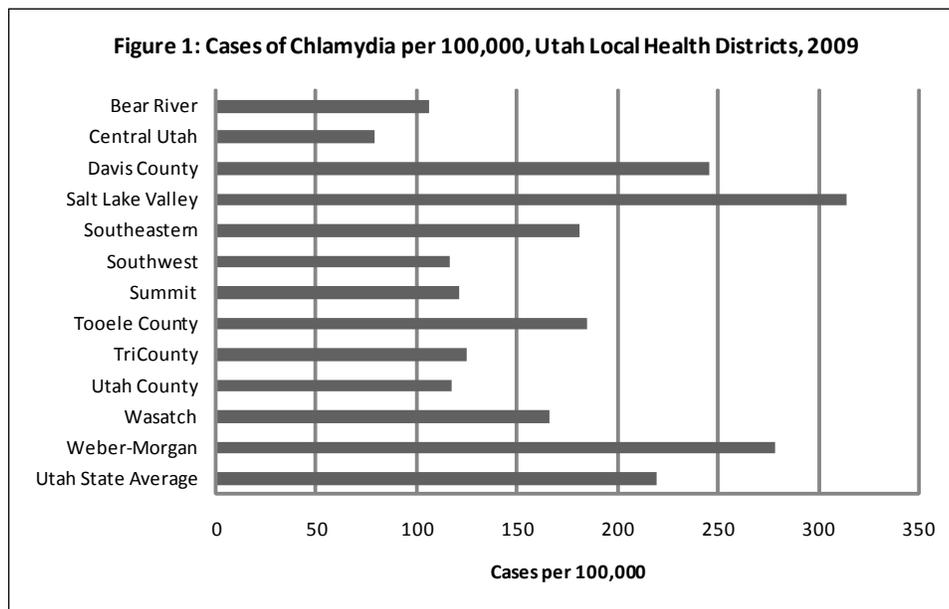
AREA: 808 SQUARE MILES

The Salt Lake Valley Health Department (SLVHD) is located in Northern Utah and includes Salt Lake City, the state capital. Salt Lake County is the most densely populated county in Utah with over 1,300 people per square mile. The 2010 population increased to 1,059,955 from 1,042,125 in 2009.¹

As shown in Figure 1, Salt Lake County has the highest rate of Chlamydia cases in Utah. SLVHD data indicates 313.9 cases of Chlamydia per 100,000 people.² This is almost 100 cases more than the state average. Gonorrhea cases are also comparatively high. Data indicates 23.1 cases per 100,000 population of Gonorrhea in 2009 compared to the state average of 12.1.³ To counter the increasing numbers of Chlamydia, Gonorrhea,

and other sexually transmitted diseases, SLVHD encourages any person who begins sexual activity to meet with an STI/HIV counselor in order to develop a personalized plan on how to remain sexually healthy.

According to data, the last case of Measles reported in Salt Lake County occurred in 1997. However, in 2011 an official outbreak was declared by SLVHD. On May 17, 2011 SLVHD announced that there had been no new confirmed measles cases in Salt Lake County in 28 days, indicating that the county was no longer experiencing the measles outbreak. The outbreak ended with a total of the 9 confirmed cases requiring 3,000 health department staff hours and a tentative final cost of \$130,246.00.⁴



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Southeastern Utah Health District

Compiled by Breanna Burningham

COUNTY: CARBON, EMERY, GRAND, SAN JUAN

POPULATION (2010): 56,693

AREA: 17,574

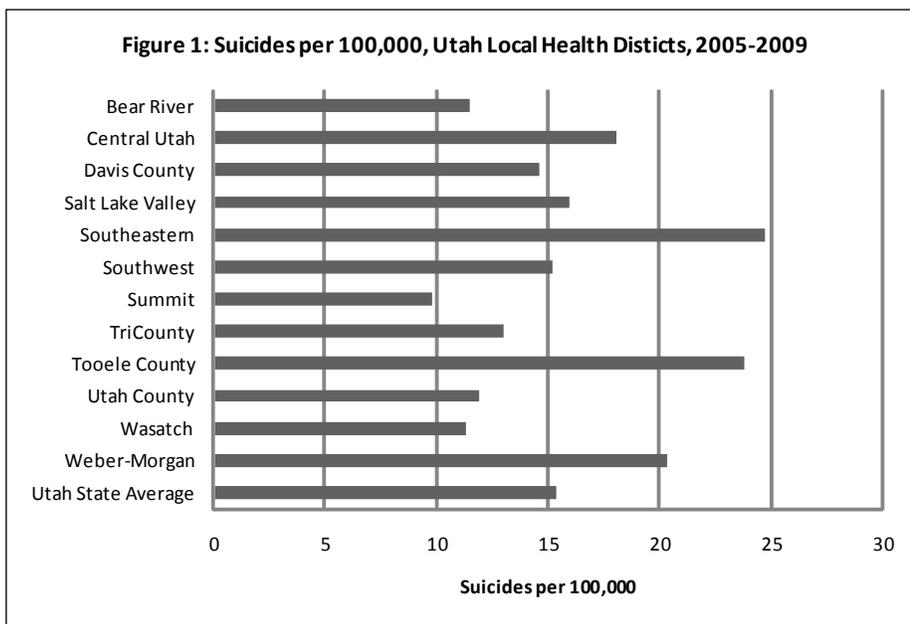
The Southeastern Utah Health District (SUHD) covers the four rural counties of Carbon, Emery, Grand, and San Juan. It is the second largest district in terms of square mileage and has the fourth smallest population of districts in Utah. Southeastern Utah's population rose to 56,693 individuals in 2010 up from 55,752 in 2009 and continues to have one of the lowest growth rates in Utah. SUHD has the lowest Caucasian ethnicity density in Utah at 66.3% and is 31.0% American Indian.

One of the most alarming economic conditions within SUHD is child poverty. Poverty in the early years of a child's life has many harmful effects including developmental delays and infant mortality. In later childhood, teen pregnancy, substance abuse, and educational attainment are influenced by childhood poverty. In San Juan County alone, the childhood poverty rate is above 30%. In 2009, the most recent year for which data is available on a state level, an estimated 12.2% of Utah children live in poverty. Utah, as a whole, has a lower proportion of chil-

dren in poverty than the U.S.¹

Another notable health condition from SUHD is the suicide rate. Utah has an average of 15.3 suicides per 100,000 based on 2005-2009 data. SUHD has 24.7 suicides per 100,000, the highest amount of any health district in Utah. This data does not include the many people who are hospitalized or treated in the emergency room for suicide attempts. According to the 2009 Youth Risk Behavior Survey, during the past 12 months before the survey, 7.2% of Utah high school students attempted suicide one or more times, shown in Figure 1. Suicide is the second leading cause of death for Utahans age 15-34.²

Tracking and treating suicide is very complex due to the intricacies of circumstances. Because suicide is not openly discussed, data is often considered incomplete. A 24-hour national suicide prevention lifeline can be accessed by calling (800) 273-TALK (8255).³



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Southwest Utah Health District

Compiled by Kyle Burningham

COUNTY: BEAVER, GARFIELD, IRON, KANE, WASHINGTON

POPULATION (2010): 214,377

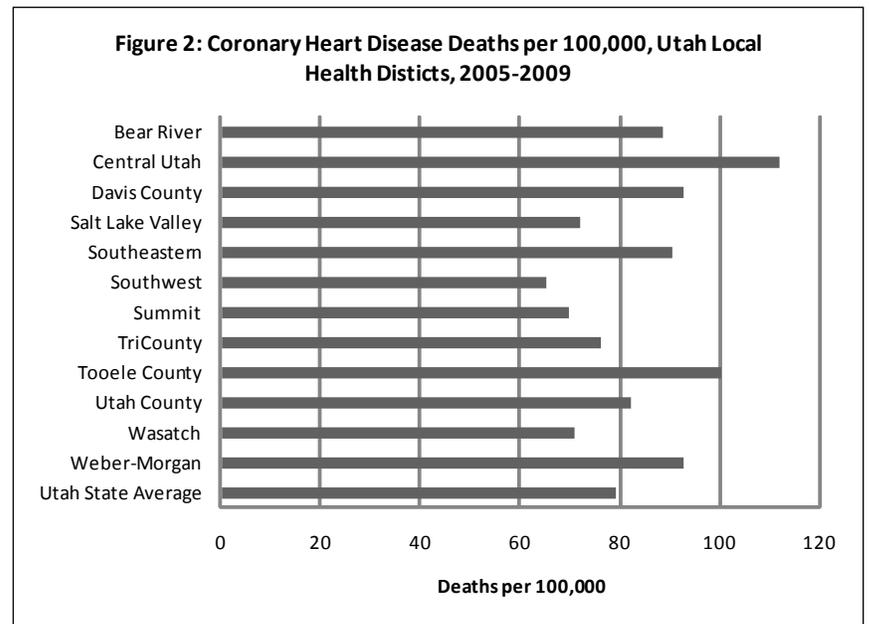
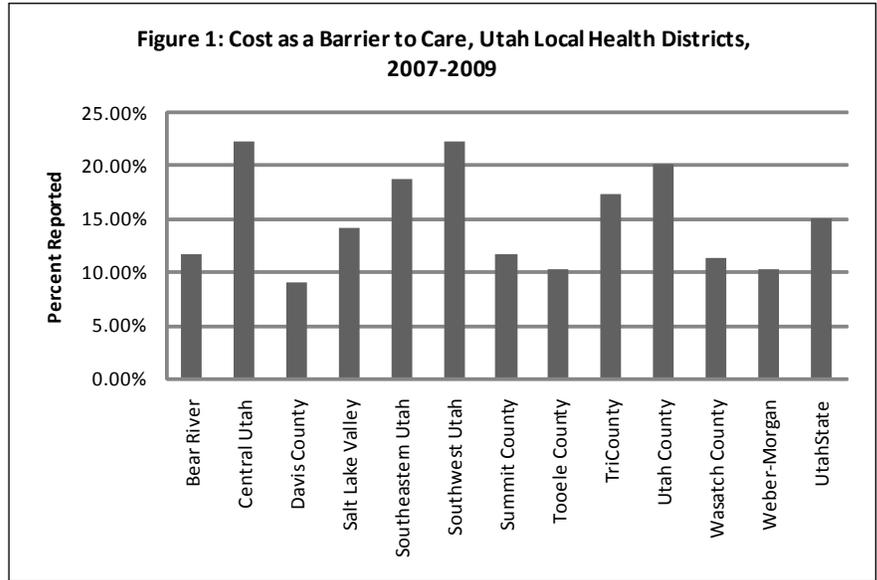
AREA: 17,641 SQUARE MILES

The Southwest Utah Health District (SUHD) is the largest health district by area and the fifth largest by population size. Counties covered in the SUHD are located in the Southwest portion of Utah and include Beaver, Garfield, Iron, Kane, and Washington. The population increased significantly from 200,246 in 2009 to 214,377 in 2010.¹

The SUHD has the highest uninsured rate of individuals age 19-64. 22.4% of this population range is uninsured compared to Utah's average of 15.0%. Access to health care is still a problem for many Utahns. Individuals who cannot obtain needed health care tend to have higher rates of death and disability from chronic disease.²

Cost is the most commonly reported barrier to getting needed health care. 15.2% of adults in the SUHD reported that cost was a barrier to receiving care. This is an alarming amount when compared the percentage of adults reported for Utah at 11.9%, shown in Figure 1. More alarming is that SUHD's percentage is higher than the U.S. rate of 14.3%.³

In data collected for 2005-2009, 65.4 deaths per 100,000 population resulted from Coronary Heart Disease. The SUHD had the lowest rate in Utah by nearly five deaths per 100,000. The Utah rate for Coronary Heart Disease during the same period was 79.4 deaths per 100,000 population, shown in Figure 2.⁴



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Summit County Health District

Compiled by Breanna Burningham

COUNTY: SUMMIT

POPULATION (2010): 41,146

AREA: 1,882 SQUARE MILES

The Summit County Health District (SCHD) is located in Northern Utah. The population in 2010 was 41,146 with the majority of the population between 15 to 44 years old. The Summit County Health Department actively promotes health awareness and physical activity which has led to a relatively healthy population when compared to the rest of Utah.

SCHD's good physical health may be related to their reported high physical activity levels. The percentage of Utah's adults meeting recommended physical activity is 59.98%. In comparison, SCHD's population of adults meeting recommended physical activity is 75.57%, shown in Figure 1. Recommended physical activity is defined as light or moderate physical activity for at least 30 minutes five or more times per week or vigorous

physical activity for at least 20 minutes three or more time per week.¹ Also, when asked about how they felt about their physical health in the past 30 days, SCHD had 91.87% of respondents say "Less than 7 days not good." Utah's state average for this data set was 86.87%.²

Data also indicates that SCHD has the lowest rate of arthritis being diagnosed by doctors in the state of Utah, as shown in Figure 2. In 2009, SCHD's rate was 18.41% compared to Utah's rate of 22.66%. In addition, 35.02% of SCHD respondents indicated that arthritis limited their usual activities. Data shows this number to be considerably lower than the state average of 46.43%.³

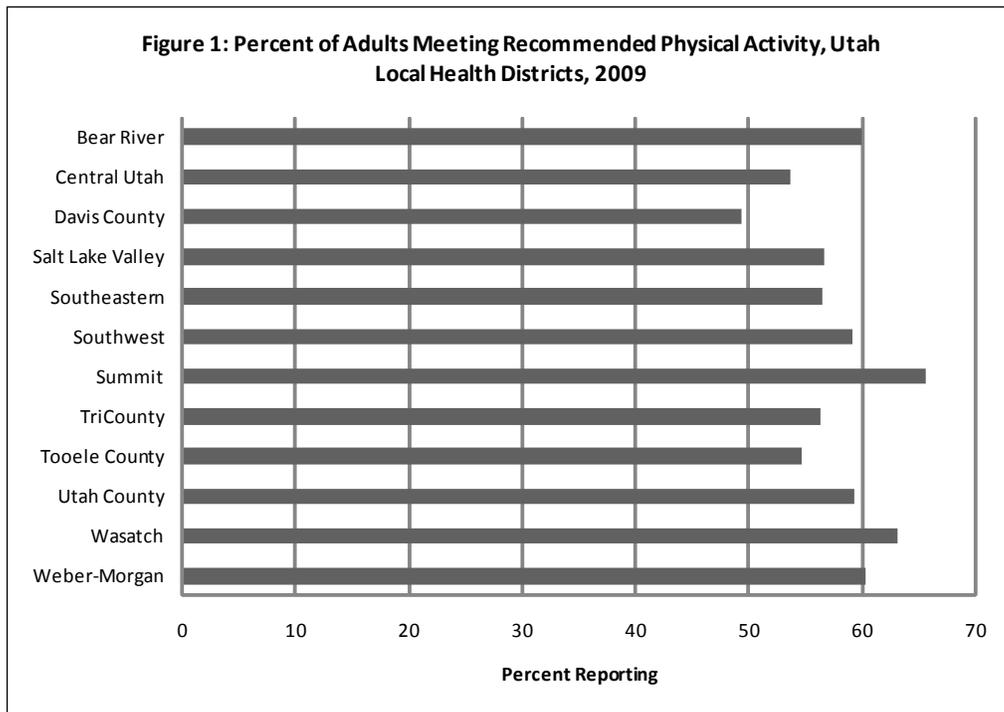
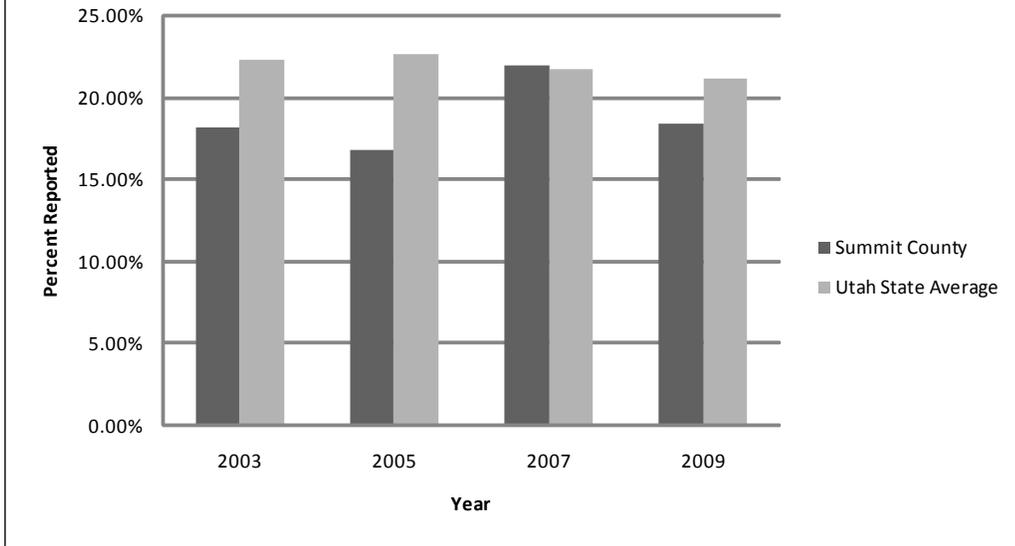


Figure 2: Percent Diagnosed with Arthritis, Summit County Health District and Utah Average, 2003, 2005, 2007, 2009



REFERENCES

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Tooele County Health Department

Compiled by Breanna Burningham

COUNTY: TOOELE COUNTY

POPULATION (2010): 60,129

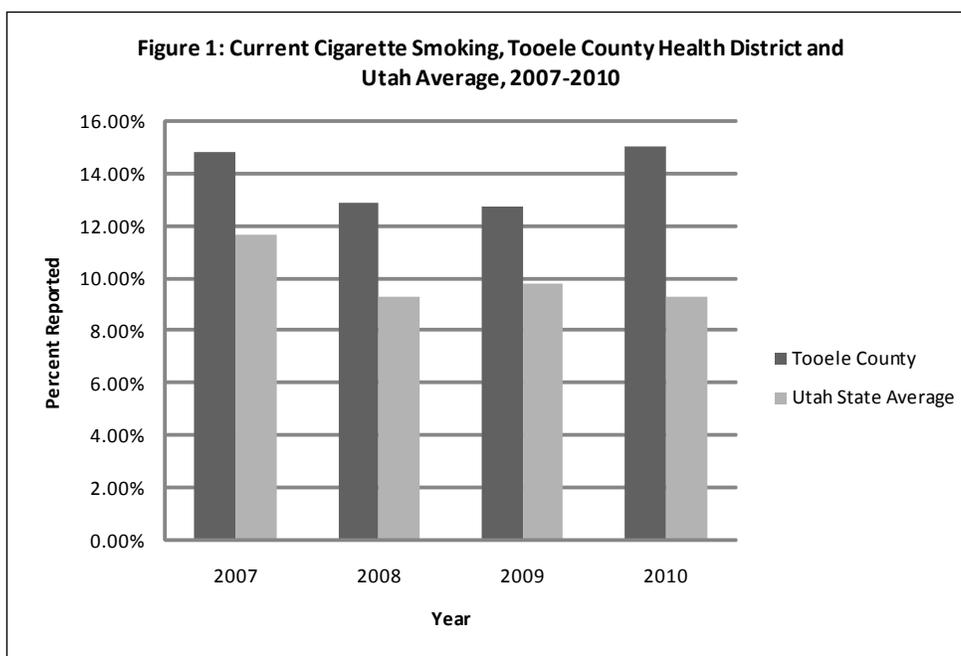
AREA: 6930 SQUARE MILES

Tooele County Health Department (TCHD) serves Tooele County, which is located in Northwest Utah. Tooele County's 2010 population is 60,129 which is an increase from 58,335 in 2009. Tooele County is predominately Caucasian, comprising 93.7% of the population. The 2010 median household income for TCHD is \$61,867 compared to Utah's average of \$56,820.¹

Tobacco use remains the leading preventable cause of death in the United States. TCHD provides an extensive Tobacco Program including health education, cessation (adult and teen), prevention, and retail information. TCHD has been successful in making some of Tooele's Parks smoke free. However, data shows an increase in tobacco use in Tooele County. When asked,

"Do you now smoke cigarettes everyday?" 12.78% responded yes in 2009; while in 2010, 15.04% responded yes. The Utah State average for 2010 is 9.13%, shown in figure 1, which is a slight decrease from 2009.²

TCHD announced funding to provide a sexual abstinence based prevention program. This program is called The Responsibility Education Program. Money will be used to fund programs that educate teens about ways to prevent pregnancy and sexually transmitted diseases, programs to promote healthy relationships, educational and career services, and the promotion of healthy life skills such as goal-setting.³



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3. Tooele County Health Department,

Health Promotion, Available online at, http://www.tooelehealth.org/Community_Services/Health_Education/Health_Educ_Main_Page.html. Accessed 15 May 2011

Tri-County Health District

Compiled by Breanna Burningham

COUNTY: DAGGETT, DUCHESNE, UINTAH

POPULATION (2010): 50,484

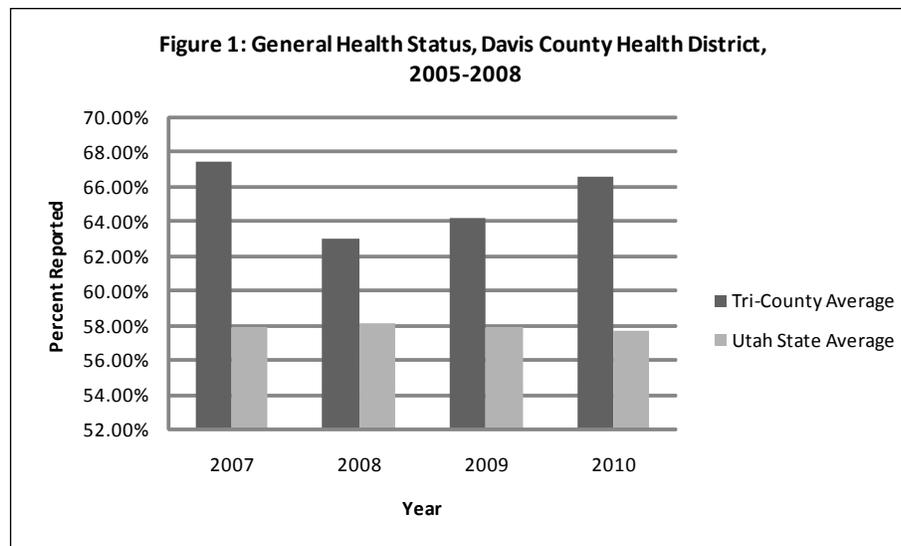
AREA: 8,478 SQUARE MILES

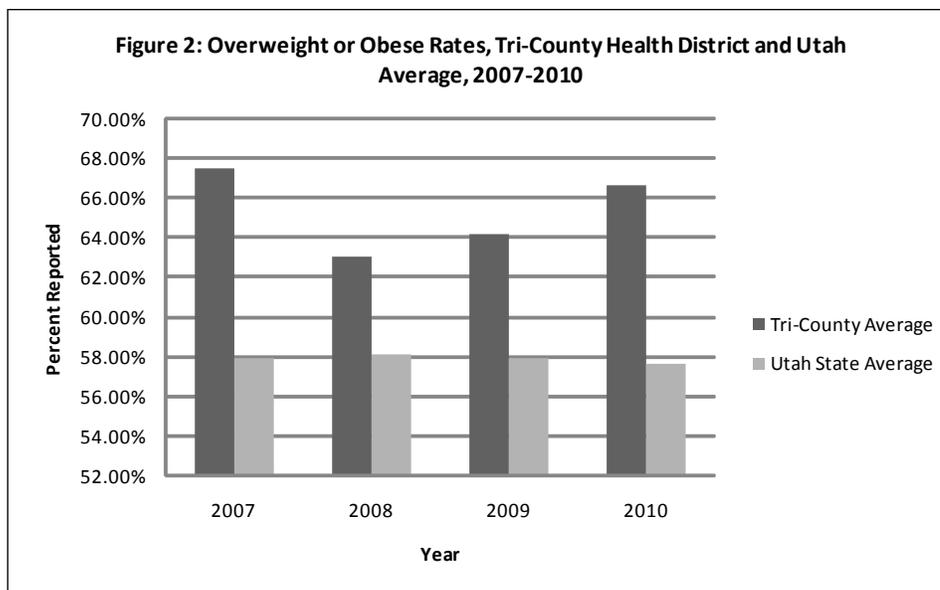
The Tri-County Health District (TCHD) serves Daggett, Duchesne, and Uintah Counties. These counties are located in Northern Utah. The combined population of these counties is estimated at 50,484. The Tri-County Health District continues to show strong population growth with an estimated annual growth rate of nearly 3%.; however, population density per square mile is still below 6.0.¹

Figure 1 shows that the Tri-County Health District continues to show improvement in the number of people diagnosed with Diabetes, with the percentage decreasing in 2007 to 12.49%, 2008 to 10.18%, 2009 to 9.50%, and 2010 to 7.21%.² However,

obesity rates continue to increase and remain higher than the Utah State average of 57.71%. TCHD data shows 66.66% obesity in 2010, up from 64.24% in 2009, shown in Figure 2.³

In 2010, Tri-County Health District updated many programs to more closely meet the needs of its residents. Examples of this include education about car seats and booster seats, informing the public about low cost options and critical child travel safety. TCHD also provided support for Gold Medal Schools Program, which encourages schools to establish policy and environmental supports to give students and staff increased opportunities for physical activity and nutritious food choices.⁴





REFERENCES

1. Economic Development Corporation of Utah, Utah Demographics, Available online at http://www.edcutah.org/documents/section3_demographics.pdf. Accessed on 25 May 2011
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3. Utah Department of Health, Complete Indicator Profile of Utah Over Weight, Obese, Available online at <http://ibis.health.utah.gov/query/result/brfss/BRFSSCrude/OverWtObese.html>. Accessed on 25 May 2011
4. TriCounty Health Department, Available online at <http://www.tricountyhealth.com/index.html>. Accessed on 25 May 2011

Utah County Health District

Compiled by Breanna Burningham

COUNTY: UTAH

POPULATION (2010): 540,541

AREA: 2,141 SQUARE MILES

The Utah County Health District (UCHD) provides services to all of Utah County, including the metropolitan areas of Provo and Orem. The UCHD has consistently experienced significant population growth, from 423,286 residents in 2003, 519,632 residents in 2008, and 540,541 in 2010. The birth rate per 1,000 residents in 2009 was 22.49 which put it clearly above Utah's rate of 19.25.¹ Birth rate is considered a major contributor to the growth occurring in this area.

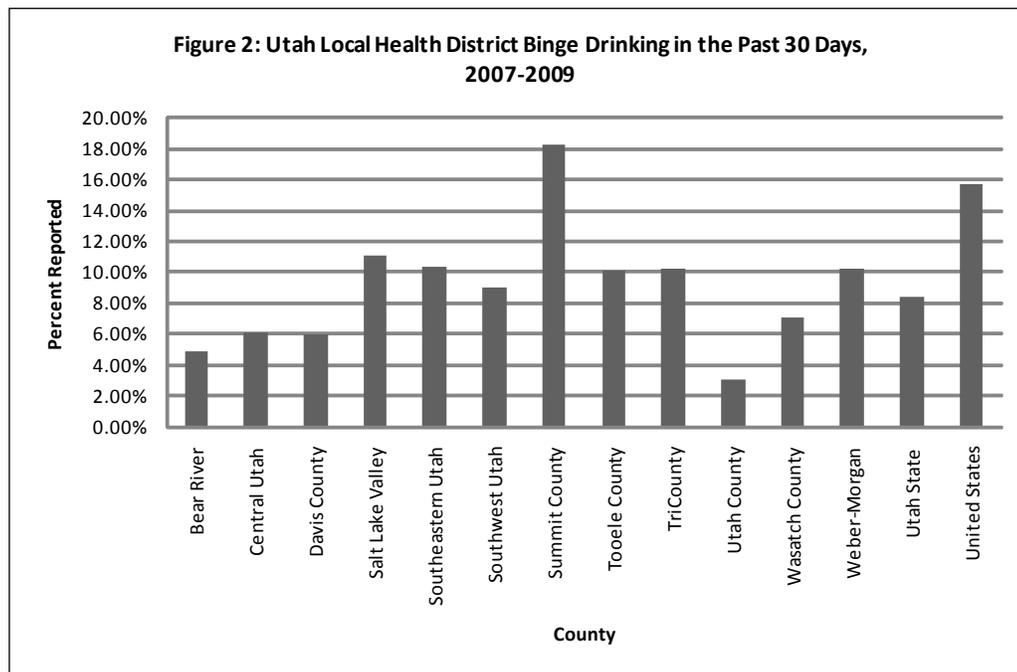
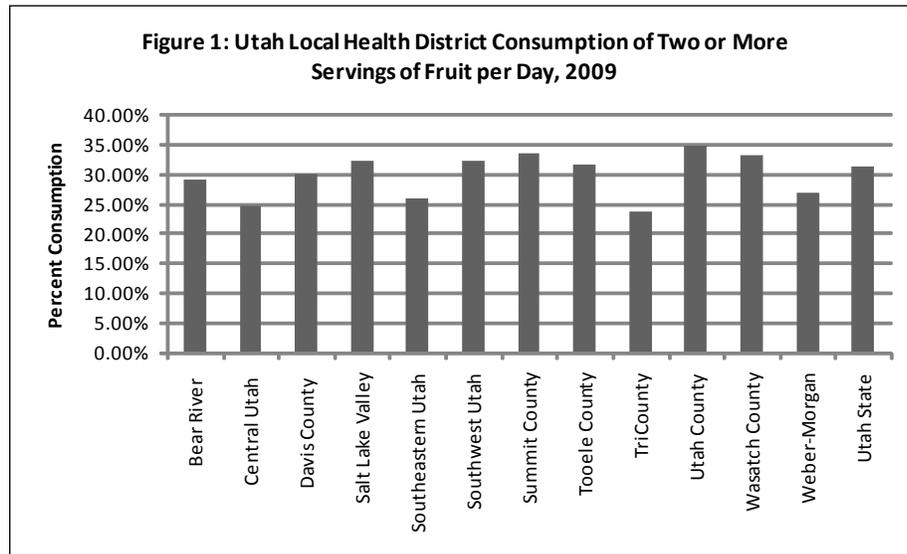
The UCHD remains a relatively healthy area despite the rapidly growing population. Data shows fruit consumption as a major factor for the healthy population. Fruits contain essential vitamins, minerals, fiber, and other compounds that may prevent many chronic diseases. Compared with people who consume a diet with only small amounts of fruit, people who eat

generous amounts of fruit as part of a healthy diet are likely to have reduced risk of stroke, cardiovascular diseases, and certain cancers. The UCHD boasts the highest percentage of adults 18+ who eat two or more servings of fruits per day at 34.8% compared to state average of 31.5%, as shown in Figure 1.²

2007-2009 data indicates 15.7% of U.S. adults participated in binge drinking within the past 30 days. Utah's average is much lower at 8.4%. This significantly lower percentage can be attributed to the UCHD's rate of 3.1% of adults participating in binge drinking. This low percentage is noteworthy considering the UCHD holds one of Utah's largest universities, Brigham Young University. The low percentage can also be correlated with the predominately LDS population, who abstain from alcoholic beverages, as shown in Figure 2.

Utah County Health Department sponsors many prevention services for substance abuse including EASY Program and SHARP Survey. EASY Program (Eliminate Alcohol Sales to Youth) provides training for all clerks and cashiers who sell alcohol for off-premise consumption and is effective in decreasing youth consumption by limiting the availability of alcohol.

SHARP Survey (The Student Health and Risk Prevention) is a voluntary questionnaire given to those in grades 6, 8, 10, and 12 to help identify substance abuse trends among Utah County youth. Prevention services are also available by phone for person under 21 at 801-851-7127 and adults at 801-851-7112.⁴



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- Utah County Health Department, Prevention Services Substance Abuse, Available online at, <http://www.utahcountyonline.org/Dept2/Health/Substance%20Abuse/prevention.asp>. Accessed 31 May 2011

Wasatch County Health District

Compiled by Breanna Burningham

COUNTY: WASATCH

POPULATION (2010): 23,837

AREA: 1,209 SQUARE MILES

The Wasatch County Health Department (WCHD) is located in Northern Utah. It is a moderately sized health district based on square mileage, but it is the smallest health district in Utah based on population. WCHD serves a population of 23,837 in 2010, up from 23,428 in 2009.¹

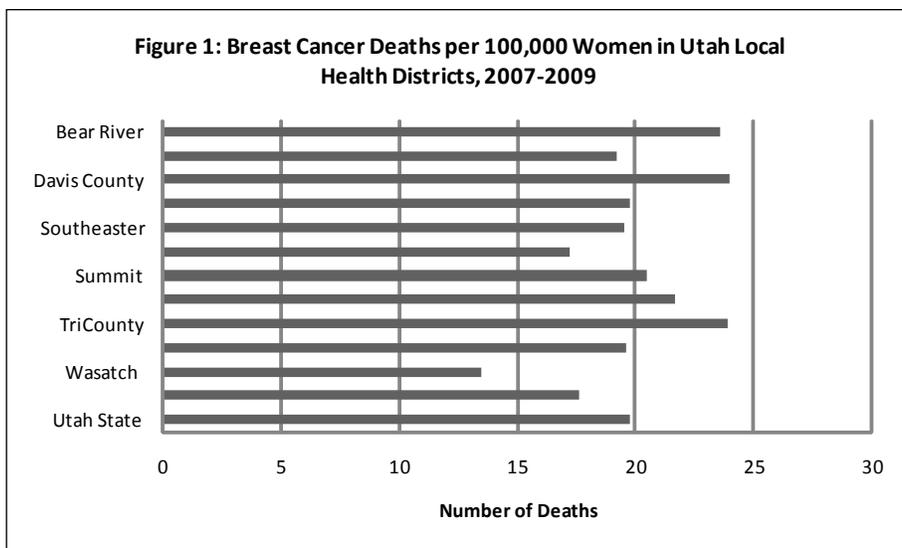
Data indicates that the WCHD has the lowest breast cancer deaths per 100,000 women. Figure 1 shows that 17.6 deaths occur per 100,000 compared to the Utah average of 19.8.² In 2003-2007, Wasatch County had 26.6 breast cancer incidence per 100,000 in women under the age of 50; Utah had 25.1. In women 50 years and older, Wasatch County had 372.4 per 100,000 and Utah had 304.9.³

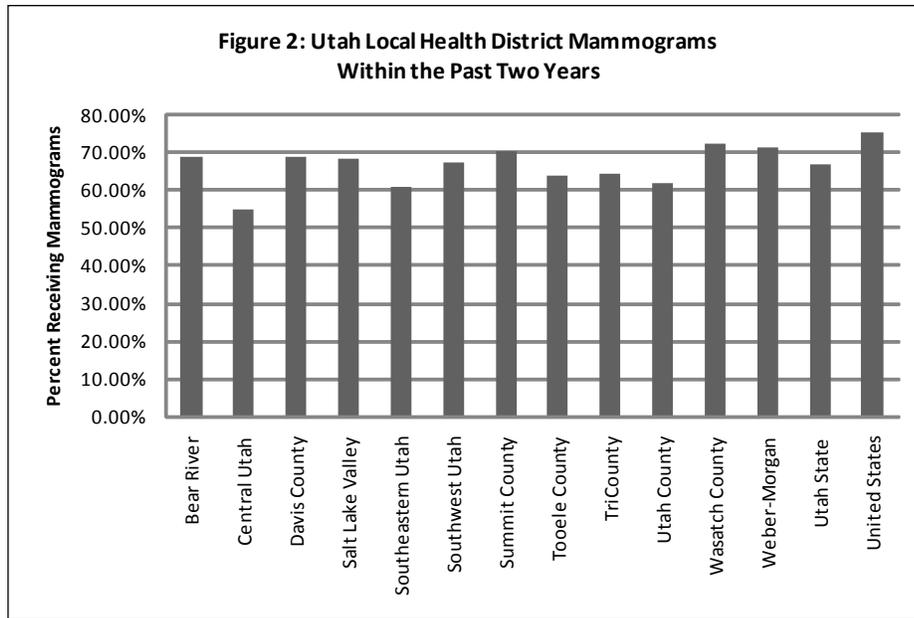
Breast cancer is the most commonly occurring cancer in U.S. women and a leading cause of female cancer deaths in both Utah and the U.S. It is interesting that the WCHD is high in breast cancer incidence, but low in deaths caused by breast cancer. Deaths from breast cancer can be substantially reduced if the tumor is discovered at an early stage. The WCHD leads Utah in the percentage of women age 40+ who have had mam-

mograms within the past two years at 72.5%. This percentage is higher than Utah's number of 67.2%, but lower than the U.S., 75.5%, as shown in Figure 2.⁴

The WCHD puts a great emphasis on early detection and treatment of breast and cervical cancer. The health department offers screening, risk assessment, and education for those who qualify. Mammograms are also provided free of charge if financial and age requirement are met. Clinics are held twice monthly and can be scheduled by calling 435-657-3307.⁵

In an effort to educate the population on the importance of children wearing a helmet when riding a bike, the WCHD has recently implemented a program that allows a ticket to be issued to a child. The ticket is not issued if the child is not wearing a helmet; rather a ticket is given to a child who is caught wearing a helmet and is redeemable for an ice cream. Wearing a helmet can reduce the risk of serious head injury by up to 85%. The WCHD has helmets available from Bell Sports at minimal costs.⁶





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Weber-Morgan Health District

Compiled by Kyle Burningham

COUNTY: WEBER, MORGAN

POPULATION (2010): 241,263

AREA: 1,270 SQUARE MILES

The Weber-Morgan Health Department (WMHD) is located in Northern Utah. It serves those residing in Weber and Morgan County. The 2010 population was 241,263 which was an increase from 237,206 in 2009.¹ Weber and Morgan County are considered rural counties, but a major city, Ogden, is located within its borders.

In 2010, cases of Campylobacter infection were reported among residents in the WMHD. This infection is linked to the consumption of raw milk which is unpasteurized. Symptoms include diarrhea, abdominal pain, fever, headache, nausea, and

vomiting. Although not life threatening, the illness can last up to a week or more and can be serious, especially for young children, the elderly, and pregnant women. Those who choose to consume raw milk are cautioned to purchase the milk only from dairies permitted by law to sell it and to keep the milk refrigerated at or below 40 degrees Fahrenheit.²

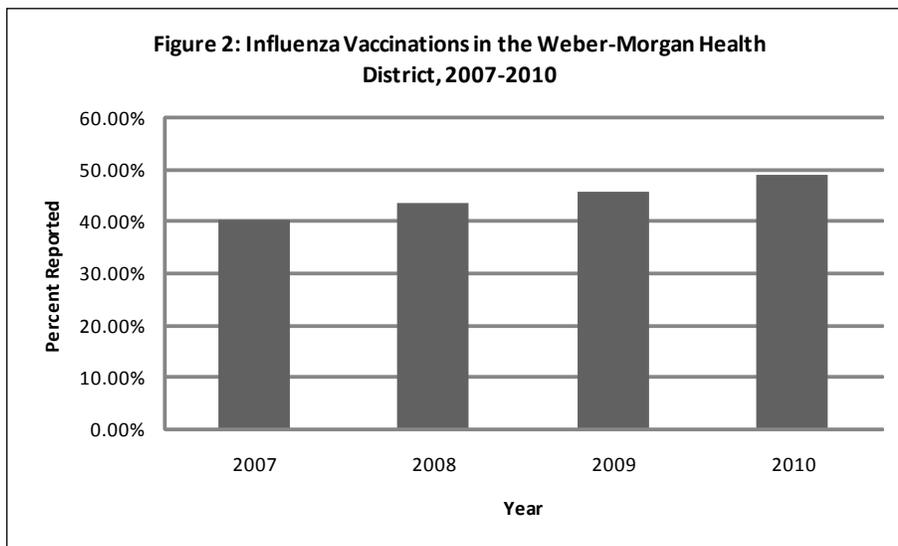
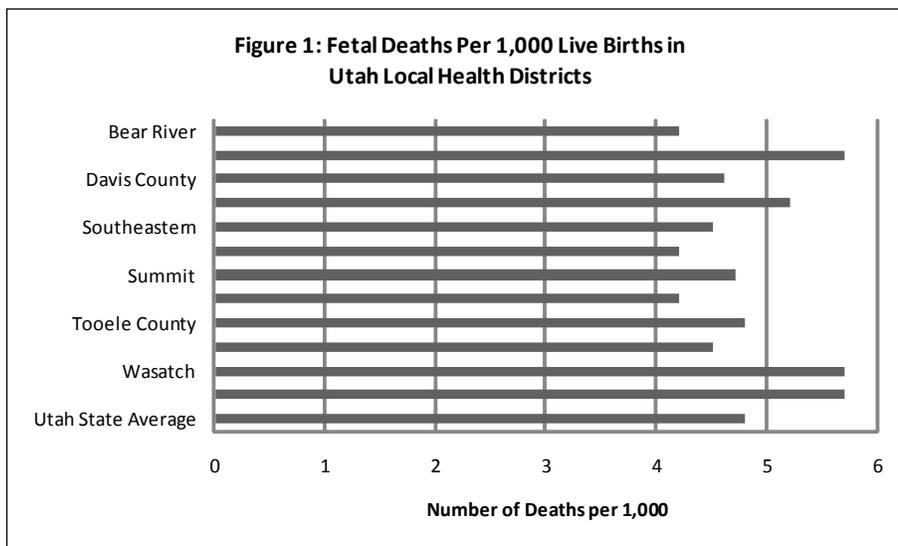
Figure 1 shows the WMHD fetal mortality rate is high at 5.7 deaths per 1,000 live births compared to the overall Utah rate of 4.8. Fetal death refers to the spontaneous intrauterine death of a fetus at any time during pregnancy. They are defined as

20 weeks or greater gestation and are sometimes referred to as stillbirths.³

Immunizations continue to be heavily promoted by the WMHD. Data indicates 49.24% percent of the population was immunized for Influenza within the past 12 months. Influenza immunizations have grown at a stable rate of approximately 3% per year since 2007 (Figure 2).⁴

The WMHD supports the Women, Infants & Children (WIC)

Program. The WIC provides Federal grants for supplemental foods, health care referrals, and nutritional education from low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk. The WMHD can be contacting regarding this program at 801-399-7200 for Ogden and 801-829-4275 for Morgan.⁵



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2. Utah Department of Health, Utah Health News, Available online at, <http://health.utah.gov/uthealthnews/2010/20100516-Outbreak-RawMilk.html>. Accessed 04 June 2011
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5. Weber-Morgan Health Department, Women, Infants & Children Program, Available online at, <http://www.co.weber.ut.us/health/wic.php?d=6>. Accessed 04 June 2011

Health Services Directory

2011

Utah's Health: An Annual Review

HOSPITAL/MEDICAL CENTERS	CONTACT	TELEPHONE	WEBSITE
Adolescent Health – University Health Care – Clinic 6 Madsen Health Center 555 S Foothill Blvd Salt Lake City, Utah	Nicole Mihalopoulos, MD	(801) 587-7574	www.uuhsc.utah.edu/coe/womenshealth/clinical/adolescent.html
Alta View Hospital 9660 South 1300 East Sandy, Utah 84094-3793		(801) 501-2600	www.intermountainhealthcare.org/xp/public/altaview
American Fork Hospital 170 North 1100 East American Fork, Utah 84003-2096		(801) 855-3300	www.intermountainhealthcare.org/xp/public/americanfork/
Bear River Valley Hospital 440 West 600 North Tremonton, Utah 84337-1129		(435) 257-7441	www.intermountainhealthcare.org/xp/public/bearriver/
Breast Cancer Program Huntsman Cancer Institute 2000 Circle of Hope Salt Lake City, Utah 84112	Saundra Buys, MD Ed Nelson, MD	(801) 587-4241	www.hci.utah.edu/group/breastCancer/breastCancerIndex.jsp
Cardiology –Preventative Cardiology Program University Health Care 50 North Medical Drive Salt Lake City, Utah 84132	Karen Segerson, MD	(801) 581-4182 1-866-850-886	healthcare.utah.edu
Cassia Regional Medical Center 1501 Hiland Avenue Burley, Idaho 83318-2648		(208) 678-4444	www.intermountainhealthcare.org/xp/public/cassia
Delta Community Medical Center 126 South White Sage Avenue Delta, Utah 84624-8928	James Beckstrand	(435) 864-5591	www.intermountainhealthcare.org/xp/public/delta/
Dental Clinic at University Hospital 50 North Medical Drive Clinic 7 Salt Lake City, Utah 84132	Craig Olson	(801) 581-2220	www.healthcare.utah.edu
Dixie Regional Medical Center 544 South 400 East St. George, Utah 84770-3799	Terri Kane, CEO	(435) 688-4000	www.intermountainhealthcare.org/xp/public/dixie/
Eye Health-John A. Moran Eye Center John A. Moran Eye Center 65 Medical Drive Salt Lake City, Utah 84132	Randall Olson, MD	Telephone 801.581.2352 Fax 801.581.3357	www.uuhsc.utah.edu/moraneyecenter
Fatigue Consultation Clinic 1002 E South Temple, Suite 408 Salt Lake City, Utah, 84102	Lucinda Bateman, MD	(801) 359-7400	www.fcclinic.com
Fillmore Community Medical Center 674 South Highway 99 Fillmore, Utah 84631	James Beckstrand	(435) 743-5591	www.intermountainhealthcare.org/xp/public/fillmore/
Fourth Street Clinic 404 South 400 West Salt Lake City, Utah	Allan D. Ainsworth, CEO	(801) 364-0134	http://fourthstreetclinic.org

HOSPITAL/MEDICAL CENTERS	CONTACT	TELEPHONE	WEBSITE
Garfield Memorial Hospital 200 North 400 East Panguitch, Utah 84759-0389	Alberto Vasquez	(435) 676-8811	www.intermountainhealthcare.org/xp/public/garfield/
Headache Clinic- University Health Care 729 Arapeen Drive Salt Lake City, Utah 84108	Kathleen Digre, MD	(801) 585-6387	www.healthcare.utah.edu
Heber Valley Medical Center 1485 South Highway 40 Heber City, Utah 84032		(435) 654-2500	www.intermountainhealthcare.org/xp/public/hebervalley/
Hill Air Force Base Family Support Center 7336 D Street Building 150 Hill Air Force Base, Utah 84056	Ed Brisley	(801) 777-4681	www.hill.af.mil/family/
Huntsman Cancer Institute 2000 Circle of Hope Salt Lake City, Utah 84112	Mary C. Beckerle, Executive Director	(877) 585-0303	www.huntsmancancer.org
Intermountain Healthcare Facilities	Merrill Gappmayer, Chairman, Board of Trustees	(801) 442-2000	http://intermountainhealthcare.org/xp/public/facilities/hospitals.xml
LDS Hospital 8th Avenue & C Street Salt Lake City, Utah 84143-0001		(801) 408-1100	www.intermountainhealthcare.org/xp/public/lids/
Logan Regional Hospital 1400 North 500 East Logan, Utah 84341		(435) 716-1000	www.intermountainhealthcare.org/xp/public/logan
McKay-Dee Hospital Center 3939 Harrison Boulevard Ogden, Utah 84409-0370		(801) 387-2800	www.intermountainhealthcare.org/xp/public/mckaydee
Neurology Department – University Health Care 729 Arapeen Drive Salt Lake City, Utah 84108	John Greenlee, MD	(801) 585-6387	www.healthcare.utah.edu
Osteoporosis/Bone Density Program – University Health Care Department of Orthopaedics 590 Wakara Way Salt Lake City, Utah 84108	Amy Powell, MD Timothy Beals, MD Co-Directors	(801) 587-7109 1-866-850-886	healthcare.utah.edu
Orem Community Hospital 331 North 400 West Orem, Utah 84057-1999		(801) 224-4080	www.intermountainhealthcare.org/xp/public/orem/
Psychiatry – University Health Care 50 North Medical Drive Salt Lake City, Utah 84132	Clara Michael, MD	Faculty: 1-866-850-8863	www.healthcare.utah.edu/medicalServices/
Primary Children's Medical Center 100 North Medical Drive Salt Lake City, Utah 84113-1100		(801) 662-1000	www.intermountainhealthcare.org/xp/public/primary/
Sanpete Valley Hospital 1100 South Medical Drive Mt. Pleasant, Utah 84647-2222	Brad Howell	(435) 462-2441	www.intermountainhealthcare.org/xp/public/sanpete

HOSPITAL/MEDICAL CENTERS	CONTACT	TELEPHONE	WEBSITE
Sevier Valley Hospital 1100 North Main Street Richfield, Utah 84701-1843	Gary Beck	(435) 896-8271	www.intermountainhealthcare.org/xp/public/sevier
Stroke Center - University Health Care 175 North Medical Drive Room 3204 Salt Lake City, Utah 84132	Elaine J. Skalabrin, MD	(801) 587-9935	www.healthcare.utah.edu
TOSH – The Orthopedic Specialty Hospital 5848 South 300 East Murray, Utah 84107		(801) 314-4100	www.intermountainhealthcare.org/xp/public/tosh/
University Counseling Center Student Services Building 201 South 1460 East Room 426 Salt Lake City, Utah 84112-9061		Office: (801) 581-6826 Fax: (801) 585-6816	
University Health Care 50 North Medical Drive Salt Lake City, Utah 84132	Lorris Betz, MD, PhD, CEO	(801) 581-2121	www.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
University of Utah; Certified Nurse-Midwives and Nurse Practitioners; Birthcare HealthCare Ellis R. Shipp Clinic 4535 South 5600 West West Valley City, Utah 84120	Leissa Roberts, MS, CNM	(801) 963-7357	www.nurs.utah.edu/practice/practices.htm
Utah Valley Regional Medical Center 1034 North 500 West Provo, Utah 84604-3337		(801) 357-7850	www.intermountainhealthcare.org/xp/public/uvrmmc
Valley Mental Health Crisis Hotline 5965 South 900 East Salt Lake City, Utah 84121	Debra Falvo, Executive Director	(801) 261-1442	www.vmh.com/
Valley Mental Health 5965 S 900 E Suite 420 Salt Lake City, Utah 84121	Debra Falvo, Executive Director	(801) 263-7100	www.vmh.com/
Valley View Medical Center 1303 North Main Cedar City, Utah 84720-3462		(435) 868-5000	www.intermountainhealthcare.org/xp/public/valleyview

HOSPITAL/MEDICAL CENTERS	CONTACT	TELEPHONE	WEBSITE
Women's Health Clinic – UniversityHealth Care Madsen Clinic 555 South Foothill Blvd Salt Lake City, Utah 84112	Jennie VanHorn, MD Medical Director	(801) 585-2111	www.uuhsc.utah.edu/coe/womenshealth/clinical/
GOVERNMENT RESOURCES	CONTACT	TELEPHONE	WEBSITE
211 Info Bank (Health Resource List)		Phone: 2-1-1 or 1-888-826-9790 Fax: (801) 746-2880	www.informationandreferral.org
Adult Protective Services 120 North 200 West Suite 325 Salt Lake City, Utah 84103	Nels Holmgren Executive Director	(800) 371-7897	www.hsdaas.utah.gov/ap_purpose.htm
Aging and Adult Services Utah State Department of Human Services 120 North 200 West, Suite 325 Salt Lake City, Utah 84145	Nels Holmgren Executive Director	(801) 538-3910	www.hsdaas.utah.gov/
Bear River Health Department 655 E. 1300 N. Logan, Utah 84341	Lloyd C. Berentzen, MBA Department Director	(435) 792-6500	www.brhd.org
Centers for Disease Control & Prevention 1600 Clifton Rd. Atlanta, GA 30333	Dr. Julie L Gerberding, Director	(404) 639-3311	http://www.cdc.gov
Central Utah Public Health Department 70 Westview Dr. Richfield, Utah 84701	Robert Resendes Executive Director	(435) 896-5451	www.centralutahhealth.com
Children Justice Centers – Office of the Utah Attorney General Utah State Capitol Complex East Office Bldg, Suite 320 Salt Lake City, Utah 84114	Mark L. Shurtleff Utah Attorney General	(800) 244-4636	www.attygen.state.ut.us/childjuscntoloc.html
Children with Special Health Care Needs Bureau Utah Department of Health 44 North Medical Drive Salt Lake City, Utah 84114	L. Harper Randall Bureau Director	(800) 829-8200	www.health.utah.gov/cshcn/
Children's Health Insurance Program (CHIP) Utah Department of Health P.O. Box 144102 Salt Lake City, Utah 84114	Gaylene Henderson Manager	1-877-KIDS-NOW	www.health.utah.gov/chip/

GOVERNMENT RESOURCES	CONTACT	TELEPHONE	WEBSITE
Clinicas de Buena Salud (See Website for all Community Health Centers) 14 North 100 East Suite 2 Brigham City, Utah 84302	Dexter Pierce Executive Director, CHC Inc	(435) 723-8276	www.immunize-utah.org/public/evchild_chc.htm
Community and Family Health Services Utah Department of Health 288 North 1460 West 2nd Floor Salt Lake City, Utah 84116	George Delavan, MD	(801) 538-6901	health.utah.gov/cfhs/
Community Services Council (CSC) 1025 South 700 West Salt Lake City, Utah 84104	Jim Pugh Executive Director	(801) 978-2452	www.csc-ut.org/
Davis County Health Department Courthouse Annex 50 E. State St. P.O. Box 618 Farmington, Utah 84025	Lewis Garrett, APRN, MPH Director of Health	(801) 451-3340	www.daviscountyutah.gov/health
Division of Water Quality – State Dept of Environmental Quality 288 North 1460 West, 3rd floor Salt Lake City, Utah 84114	Walter L. Baker	(801) 538-6146 *24-hour emergency spill line: (801) 536-4123	www.waterquality.utah.gov/
Health Education Association of Utah P.O. Box 2337 Salt Lake City, Utah 84110	Eric Edwards President	(801) 851-7097	www.heau.org/
Indian Health Services Phoenix Area Indian Health Services Two Renaissance Square 40 North Central Avenue	Don J. Davis, MPH Director	(602) 364-5039	http://www.ih.gov
Medicaid Program Utah Department of Health P.O. Box 144102 Salt Lake City, UT, 84114	Michael Hales Director, Division of Health Care Financing	(800) 662-9651	www.health.utah.gov/medicaid/
Oral Health Program Utah Department of Health 288 North 1460 West Salt Lake City, Utah 84116	Steven J. Steed State Dental Director	(801) 538-9177	health.utah.gov/oralhealth/
Pregnancy Risk Line Utah Department of Health 44 North Medical Drive Salt Lake City, Utah 84114	Julia Robertson Project Director	800-822-BABY (in Salt Lake City: 801-328-BABY)	www.pregnancyriskline.org/
Primary Care, Rural and Ethnic Health Division of Health Systems Improvement UDOH, P.O. Box 142005 Salt Lake City, UT, 84114	Iona Thraen Director	(801) 538-6113	http://www.primarycareutah.org

GOVERNMENT RESOURCES	CONTACT	TELEPHONE	WEBSITE
RxConnect Utah Utah Department of Health 288 North 1460 West Salt Lake City, Utah 84114	Sicilia Richins Program Manager	(866) 221-0265	www.health.utah.gov/rxconnect-utah/
Safe Place (shelter for youth) Salt Lake County Division of Youth Services 177 West Price Avenue (3610 Sth) Salt Lake City, Utah 84115	Lorri Lake Coordinator	(801) 269-7500	www.slcoyouth.org/html/Safe-Place.html
Salt Lake City Housing Authority 1776 South West Temple Salt Lake City, Utah 84115	Rosemary Kappes	(801) 487-2161	www.hasaltlakecity.com/
Salt Lake Valley Health Department (SLVHD) - Salt Lake County Human Services Department 2001 South State Street Suite S-2500 (South Building) Salt Lake City, Utah 84190	Gary Edwards Executive Director	(801) 468-2700	www.slvhealth.org/
Services for People with Disabilities 120 North 200 West, Suite 411 Salt Lake City, Utah 84103	George Kelner Acting Director	(800) 837-6811	www.dspd.utah.gov/index.htm
Southeastern Utah Health Department 28 S. 100 E. Price, Utah 84501	David Cunningham, RN, MSN	(435) 637-3671	http://www.southeastuthealth.org/
South Main Public Health Center (healthcare for low-income individuals) 3195 South Main Street Salt Lake City, Utah 84115	Kristy Cottrell	(801) 483-5451	www.slvhealth.org/fh/html/locfhs.html
Southwest Utah Health Department 620 South 400 East #400 St. George, Utah 84770	Gary L. Edwards, MS, CHES Health Officer	(435) 673-3528	http://www.swuhealth.org/
Summit County Health Department 85 N. 50 E. P.O. Box 128 Coalville, Utah 84017	Steve Jenkins EHS, MPH Director	(435) 336-3222	www.co.summit.ut.us/services/office/health.html
Tooele County Health Department 151 N. Main St Tooele, Utah 84074	Myron Bateman, EHS, MPH Director	(435) 843-2300	www.tooelehealth.org
Tri-County Health Department 147 E. Main St Vernal, Utah 84078	Joseph B. Shaffer MA, MBA, EHS Director of Health	(866) 275-0246	www.tricountyhealth.com/main.html
Utah Association of Local Health Officers and Local Boards of Health Kathy M. Froerer MHEd, Executive Director, 726 North 1890 West Provo, Utah 84601	Rita Hieber Assistant	(801) 377-1264 (801) 374-3076	

GOVERNMENT RESOURCES	CONTACT	TELEPHONE	WEBSITE
Utah Bureau of Childcare Licensing 288 North 1460 West Salt Lake City, Utah 84116	Teresa Whiting Bureau Director		
Utah Cancer Control Program Utah Department of Health 288 North 1460 West Salt Lake City, Utah 84114	Katheryn Rowley Program Director	(800) 717-1811	www.utahcancer.org/index.htm
Utah Commission for Women and Families 140 East 300 South Salt Lake City, Utah 84114	Carol Walker Executive Director	(801) 468-0174	www.governor.state.ut.us/women/
Utah County Health Department 151 S. University Ave. Provo, Utah 84061	Joseph K. Miner, MD, MSPH Executive Director	(801) 851-7000	www.co.utah.ut.us/Dept/Health/index.asp
Utah Department of Health 288 North 1460 West P.O. Box 141010 Salt Lake City, Utah 84114-1010	David Sundwall Executive Director		
Utah Division of Drinking Water Utah State Office Park — Building One 150 North 1950 West Salt Lake City, Utah 84116	Kevin Brown Division Director	(801) 536-4200	http://www.deq.state.ut.us/eqdw
Utah Division Substance Abuse and Mental Health (DSAMH) 120 North 200 West, Room 209 Salt Lake City, Utah 84103	Mark Payne Director		
Utah Domestic Violence Council 205 North 400 West Salt Lake City, Utah 84403		(801) 521-5544	www.udvc.org
Utah Health Data Committee UDOH Office of Health Care Statistics 288 North 1460 West, PO Box 144004 Salt Lake City, Utah 84114-4004	Wu Xu Director	(801) 538-6152	http://www.health.utah.gov/licensing
Utah Health Facility Licensing, Certification and Resident Assessment 288 North 1460 West Salt Lake City, Utah 84116	Allan D. Elkins Bureau Director	(801) 538-6158	http://www.health.utah.gov/hflcra
Utah Heart Disease Stroke Prevention Program UDOH, P.O. Box 142107 Salt Lake City, Utah 84114-2107	Barbara Larsen, MPH, RD Program Director	(801) 538-6142	http://www.hearthighway.org
Utah Hospitals & Health Systems Association 2180 South 1300 East Suite 440 Salt Lake City, Utah 84106	Joseph M. Krella President	(801) 486-9915	http://www.uha-utah.org

GOVERNMENT RESOURCES	CONTACT	TELEPHONE	WEBSITE
Utah Immunization Program 288 North 1460 West, Salt Lake City, Utah 84116	Linda Abel, BSN, MPA Program Manager	(801) 538-9450	http://www.immunize-utah.org
Utah Medical Association 540 East 500 South Salt Lake City, Utah 84102	Dr. Catherine J. Wheeler President	(801) 355-7477	http://www.utahmed.org
Utah Medical Education Council 230 S. 500 E., Suite 550 Salt Lake City, Utah 84102	Gar Elison Executive Director	(801) 526-4554	http://www.utahmec.org
Utah Nurses Association 4505 South Wasatch Blvd. #290 Salt Lake City, Utah 84124	Donna Eliason, MS, RN President		
Utah Psychological Association 2757 E. South Temple #112 Salt Lake City, Utah 84111	Teresa Bruce Executive Director		
Utah Public Health Association P.O. Box 16048 Salt Lake City, Utah 84116	Teresa Garrett President		
Utah State Division of Community and Family Health Services PO Box 142001 Salt Lake City, Utah 84114-2001	George Delavan, MD Director		
Utah State Division of Epidemiology and Laboratory Services UDOH, PO 142104 Salt Lake City, Utah 84114-2104	Theresa Garrett Division Director	(801) 538-6128	www.health.utah.gov/els
Utah State Division of Mental Health and Substance Abuse 120 North 200 West, Room 209 Salt Lake City, Utah 84103	Dr. Michael Crookston Chair	(801) 538-3939	www.hsmh.state.ut.us
Utah State Insurance Department 3110 State Office Building PO Box 146901 Salt Lake City, Utah 84114-6901	D. Kent Michie Commissioner	(801) 538-3800	www.insurance.utah.gov
Utah Tobacco Prevention and Control Program UDOH, PO Box 142106 Salt Lake City, Utah 84114-2106	Heather Borski Program Manager	(801) 538-9998 Toll Free Resource Line: (877) 220-3466	www.tobaccofreeutah.org
Violence and Injury Prevention Utah Department of Health PO Box 142106 Salt Lake City, Utah 84114	Trisha Keller Program Manager	(801) 538-6864	www.health.utah.gov/vipp/
Wasatch City/County Health Department 55 S. 500 E. Heber City, Utah 84032	Phil D. Wright, MS, EHS Health Officer	(435) 654-2700	www.health.utah.gov/ihd/html/wasatch-city-country-healthdep.html
Weber-Morgan Health Department 477 23rd Street Ogden, Utah 84401	Gary House Executive Director	(801) 399-7100	www.co.weber.ut.us/healthdept/index.asp

GOVERNMENT RESOURCES	CONTACT	TELEPHONE	WEBSITE
Women, Infants and Children Program Utah Department of Health 288 North 1460 West Salt Lake City, Utah 84116	Nan Streeter Acting Director	877-WIC-KIDS	health.utah.gov/wic/
Youth Crisis Center, Iron County (Shelter for abused children) 1692 West Harding Ave Cedar City, Utah 84720	Paul Arnold	(435) 586-1704	www.jjs.utah.gov/shelter-care.htm
Youth Crisis Center, Washington County (Shelter for abused children) 251 East 200 North St. George, Utah 84770	Tammy Fullerton	(435) 656-6100	www.jjs.utah.gov/shelter-care.htm
RESEARCH/EDUCATION FACILITIES	CONTACT	TELEPHONE	WEBSITE
IHC Clinical Research Foundation 959 E. 400 S. Salt Lake City, Utah 84102		(801) 272-7498	
MidContinental Regional Medical Library National Network of Medical Libraries 10 North 1900 East Salt Lake City, Utah 84112	Claire Hamasu Associate Director	(800) 338-7657	nnlm.gov/mcr/
National Center of Excellence in Women's Health University of Utah 30 N 1900 East School of Medicine, Rm 2B-111 Salt Lake City, Utah 84132	Kathleen Digre, MD	(801) 585-9971	www.uuhsc.utah.edu/coe/womenshealth/
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/
Utah State Library Division 250 North 1950 West, Suite A Salt Lake City, Utah 84116	Donna Jones Morris	(801) 715-6777	www.library.utah.gov/
Utah State Library for the Blind and Disabled 250 North 1950 West, Suite A Salt Lake City, Utah 84116	Bessie Oakes Program Manager	(800) 662-5540	www.blindlibrary.utah.gov/

Utah's Health: Manuscript Submission Guidelines

Utah's Health is a peer reviewed journal which focuses on issues timely to the health of Utah's population. Utah's Health publishes original research articles and special perspectives that pertain to the health and well-being of the State of Utah. This includes papers related to all aspects of medical practice as well as related fields such as nutrition, dentistry, public health, human genetics, psychology, psychiatry, education, health promotion, sociology, and nursing.

Once a year, a statistical update is published which focuses on important issues indicators of health outcome. Its purpose is to provide readers with current and pertinent information regarding health and health care in Utah. It is also intended to generate interest in, and to facilitate discussion of, health-related topics. Utah's Health: An Annual Review is compiled and edited by the Governor Jim Matheson Center for Healthcare Research, the University of Utah Department of Health Promotion & Education, the University of Utah College of Nursing, the University of Utah School of Medicine School, and a number of other departments across the University and surrounding community.

Articles are contributions by administrators, educators, policy makers, practitioners, researchers, and scholars. Preference is given to articles that report the results of independent research that has not been previously published.

Utah Perspectives are contributions that provide readers with basic information regarding various health care topics and issues that have arisen. These articles present opinions and insights on important topics that are relevant to the state of health in Utah. While many of these articles are solicited, prospective authors are also encouraged to submit unsolicited commentary for review.

Reviews provide a comprehensive overview of the state-of-the-art knowledge in a defined area. They emphasize new questions, conceptions, and future research directions. Reviews are generally limited to eight printed pages including figures, tables and references.

Brief reports of no more than 1500 words pertaining to clinical or laboratory topics are also considered for publication. These submissions should be organized and prepared in the same manner as a full-length manuscript but should cite no more than 12-15 references. They are normally limited to two printed pages.

The ongoing mission of Utah's Health is to inform interested individuals about the status of health and health care in the state. It is our desire that Utah's Health will help the reader comprehend and discuss these critical health and health care issues, and continue to drive future research, education, and awareness to these crucial areas.

To submit an article, please either e-mail your submissions to **uhreview2008@yahoo.com** or hand deliver/mail them to:

Editor-in-Chief
Utah's Health: An Annual Review
175 North Medical Drive East
Salt Lake City, UT 84112

Article submissions are due by January 16, 2012. A cover letter should also be included at the time of submission. For detailed instructions please visit our website at: **http://www.matheson.utah.edu/Annual_Review/UHReview/submissions.html**

Submission Guidelines for Original Manuscripts

Authorship

All contributing authors must be named. Authorship includes conception, drafting, and final approval of the submitted article. Submitting authors must indicate whether any writing assistance other than copy editing was provided.

Please submit, along with each authors' name, a brief biography, which includes their credentials, their current place of employment/research institution, and any relevant information.

Assurances

If applicable, please provide a written statement that research protocol was approved relevant institutional review boards or ethics committees (such as the University of Utah IRB). Additionally, provide a written statement that all human participants gave written informed consent, if applicable.

Electronic Files, Figures, & Illustrations

All text, references, figures, and tables should be in **one** double-spaced electronic document (Microsoft Word document – .doc).

In addition, any tables, graphs, or illustrations must be submitted in **one** Microsoft Excel document (please use tabs on the bottom to separate multiple graphs or tables).

All figures and graphs must be submitted in black and white only, although grayscale is also acceptable.

Any images must be submitted as high-resolution files. Acceptable formats for pictures/photos are PDF, JPG, and TIF.

Please note, all photos, figures, and graphs will be turned to black and white if submitted in color. Additionally, any and all graphs, figures, and/or illustrations may be redrawn or edited to meet our specifications for publication.

Article Format

All articles must contain the following sections:

Key Words

Please provide a list of relevant key words – no less than 3, and no more than 8 – that relate to the article.

Abstract

Provide an abstract of 250 words or less. It should consist of four paragraphs, labeled Background, Methods, Results, and Conclusions. Each paragraph should briefly describe the problem being addressed in the study, how the study was performed, the salient results, and the authors' conclusions from the results.

References

APA format is preferred. If APA will not be used, references must be double-spaced and numbered consecutively as they are cited. References first cited in a table, figure, and/or illustration legend should be numbered so that they will be in sequence with references cited in the text at the point where the table, figure, or illustration is first mentioned.

List all authors when there are six or fewer; when there are seven or more, list the first three, followed by "et al."



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GOVERNOR SCOTT M. MATHESON CENTER FOR HEALTHCARE STUDIES

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