

Utah's Children And The Environment: A Health Status Update



A report describing how Utah's environment is affecting Utah children's health.



Utah Department of Health

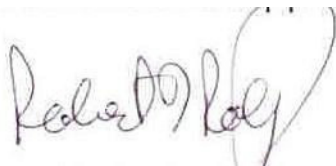
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This report, Utah’s Children and the Environment, provides an accessible overview of the influence of environmental factors on the health of Utah’s children. Within its pages you will not only find a snapshot of children’s environmental health, we have also provided information about how Utah compares with the rest of the nation, what we are doing to improve, and what you personally can do to protect the health of Utah’s children.

We have created the sections of this report in a similar format to the indicator reports published on Utah’s Indicator-Based Information System for Public Health (IBIS-PH). We hope that as you read this report, you will feel comfortable turning to IBIS-PH for additional information. We, at the Utah Department of Health, will do our best to answer any questions not addressed on IBIS-PH.

This report was made possible by the efforts of several Utah agencies. A special thanks to the Environmental Epidemiology Program within the Division of Disease Control and Prevention for putting together this report. In addition, I would like to acknowledge the collaborative efforts of all those agencies within Utah who share data, maintain public information sources, and promote public and environmental health.

The environmental health of Utah’s children can only be protected through the cooperative efforts of both the public and private sectors. This report marks just one step in evaluating how we are doing and measuring our progress. I urge you to read this report and use its contents to help promote a healthier environment for our children.



Robert T. Rolfs, MD, MPH
Director



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This report was compiled to provide a clear picture of the health of Utah's children, particularly as it relates to the environment. It was modeled after similar reports produced by the U.S. Environmental Protection Agency (Woodruff T. J., 2003) and the State of Maryland (<http://hispanic.maryland.gov/documents/hispanic/mdchild2.pdf>).

This report uses current data and indicators to describe children's environmental health in Utah. We hope this report will provide valuable information to everyone involved in children's health, including parents, educators, pediatricians, public health and environmental professionals, and members of the general public.

Utah has a distinctive climate that can affect children in ways unique from other states. A list of the fifteen most important environmental health concerns for Utah's children is presented with background and Utah's current status. Although this list is not comprehensive, it provides a good snapshot of where we are and where we still need improvement.

Opportunities

We are working to improve key environmental health indicators, particularly as they relate to children. Several initiatives such as the National Children's Study and Healthy People provide opportunities for improving the health of Utah's children.

National Children's Study

Cache and Salt Lake Counties are two of 105 study locations in the National Children's Study. This multiyear study will examine the effects of environmental influences on the health and development of more than 100,000 children across the United States, following them from before birth until age 21. The goal of the study is to improve the health and well being of children by improving our understanding of:

- physical surroundings, including the natural and built environment and geography;
- biological, chemical, and genetic factors; and
- behavioral, family, social, and cultural influences (The National Children's Study, 2009).

Healthy People

Healthy People builds on initiatives pursued by the U.S. Department of Health and Human Services since 1979. The document Healthy People 2010 has guided the nation's health goals and efforts for the past ten years, and it is referred to frequently in this booklet. The U.S. Department of Health and Human Services is currently working with the public and several additional stakeholders to develop Healthy People 2020. Its science-based objectives for promoting health and preventing disease will guide the Utah Department of Health's efforts for the next decade (U.S. Department of Health & Human Services, 2009).



The overarching goals of Healthy People 2010 are to increase the quality and years of healthy life and eliminate health disparities. These goals include 28 focus areas, several of which include environmental health topics:

- food safety
- nutrition and overweight
- occupational safety and health
- physical activity and fitness
- respiratory diseases
- tobacco use (DHHS, 2005)

Environmental Public Health Tracking

The Environmental Public Health Tracking Network (Tracking Network) is one way to fill gaps between what we know about the environment and its impact on health. The Tracking Network is being created through the collaborative effort of CDC and four other federal agencies, 23 state and city health departments, and four universities. These cooperating organizations are bringing together data and expertise on pertinent topics in environmental and health science and making information available on national and local web portals.

Utah's Tracking Network portal is called Utah's Indicator-Based Information System for Public Health (IBIS-PH). Members of the public, researchers, and public health professionals can find the answers to their questions and concerns about health and the environment at Utah's IBIS-PH and at CDC's national portal.

- Utah's portal: <http://ibis.health.utah.gov>
- CDC's portal: <http://ephtracking.cdc.gov>

These websites provide an additional resource if you have additional questions about any of the information in this booklet (EEP, 2009G).

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Acknowledgements

The Utah Environmental Public Health Tracking Program would like to thank all the people who were so helpful in the creation of this book. Countless individuals within these agencies generously provided their time and expertise to ensure that this booklet would contain the most accurate and pertinent information for Utah's children.

We are particularly grateful for the contributions of the following organizations:

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Salt Lake Valley Health Department

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- Department of the Environment
- Department of Health

U.S. Department of Housing and Urban Development

- Office of Healthy Homes and Lead Hazard Control

U.S. Environmental Protection Agency

Utah Department of Environmental Quality

- Division of Air Quality
- Division of Drinking Water
- Division of Radiation Control

Utah Department of Health

- Bureau of Children with Special Health Care Needs
- Bureau of Emergency Medical Services
- Bureau of Epidemiology

- Bureau of Health Promotion
- Office of Health Care Statistics
- Office of Public Health Assessment
- Office of Vital Records and Statistics
- Utah Birth Defect Network
- Utah Registry of Autism and Developmental Disabilities

Utah Department of Public Safety

Utah Poison Control Center

Utah State Office of Education

University of Utah

Westminster College, Master of Public Health Program



List of Acronyms

ACS: American Cancer Society	PM: Particulate matter
ADHD: Attention deficit/hyperactivity disorder	U of U: University of Utah
AFHH: Alliance for Healthy Homes	UL: Upper limit
ALA: American Lung Assotiation	UAP: Utah Asthma Program
ASD: Autism spectrum disorder	UATF: Utah Asthma Task Force
CI: Confidence interval	UBLR: Utah Blood Lead Registry
DAR: Division of Administrative Rules	UCHD: Utah Center for Health Data
DHHS: U.S. Department of Health and Human Services	UDEQ: Utah Department of Environmental Quality
EEP: Environmental Epidemiology Program	UDOH: Utah Department of Health
LL: Lower limit	UMIHP: Utah Maternal and Infant Health Program of the Utah Department of Health
NCI: National Cancer Institute	UPCC: Utah Poison Control Center
NCSL: National Conference of State Legislatures	Utah Office of Vital Records and Statistics: UOVRS (Utah Department of Health)
ND: Neurodevelopmental Disorder	UTPCP: Utah Tobacco Prevention and Control Program (Utah Department of Health)
NYSDOH: New York State Department of Health	UVIPP: Utah Violence and Injury Prevention Program (Utah Department of Health)
OEHHA: Office of Environmental Health Hazard Assessment	PPM: Parts per million
UPANO: Utah Physical Activity, Nutrition & Obesity Program	PPB: Parts per billion
PCB: Polychlorinated biphenyl	

1.1 Ozone

Ozone, often referred to as smog, is created when sunlight, heat, and pollution (such as car exhaust) mix in the environment. While the ozone layer, located six to thirty miles above the earth, protects us from harmful ultraviolet rays, ozone located at ground level can cause a variety of health problems. People exposed to unhealthy levels of ozone might experience painful breathing, chest tightness, headaches, coughing, lung inflammation, temporary reduction in lung capacity, and increased asthma symptoms. Long-term exposure can lead to respiratory infections and chronic lung problems.

Children are especially vulnerable to air pollutants because they breathe in more air per unit body weight than adults, they spend more time playing outdoors, and their lungs are developing and growing. Children are

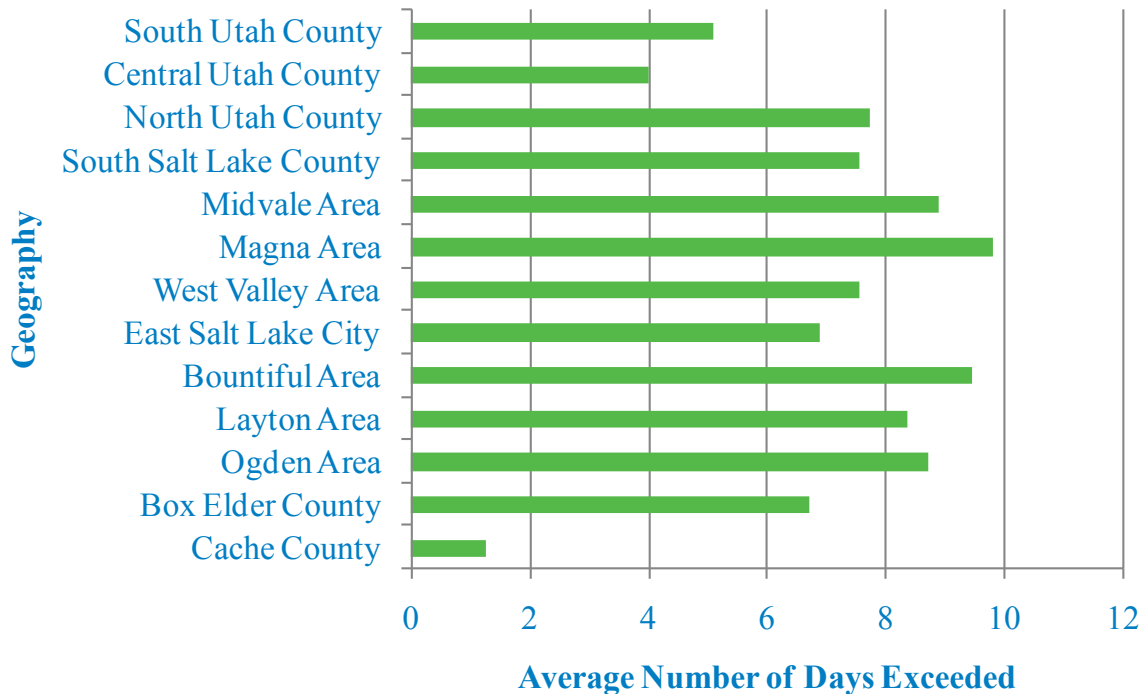
also less likely to feel discomfort or admit symptoms of health effects. This means that they are unlikely to recognize cues to limit their exposure to air pollution (Kleinman, 2000).

People are more likely to experience health effects when ozone levels exceed the EPA's standard. But health effects are possible below the standard, especially among sensitive populations (EEP, 2009).

How are we doing?

As shown in Figure 1, several of Utah's urban centers have days that do not comply with the 2008 ozone standard of 0.075ppm. These days occur in the warm summer months when light, heat, and pollutants react most easily (Figure 2).

Figure 1: Average number of days with maximum 8-hour average ozone concentrations over the National Ambient Air Quality Standard by geography, 1997-2007 (EEP, 2009)



What is being done?

In response to the EPA's 2008 ozone standard of 0.075 ppm, the UDEQ has begun fitting school buses with cleaner technology, and state office buildings have started using more energy-efficient practices and policies (UDEQ, 2009).

The UDEQ's three-day air quality forecasting uses a stoplight color code to inform the public about how they can help keep pollution levels low and safe. A green day informs the public that pollution levels are projected to be low, and they can safely drive. A yellow day strongly encourages the public to reduce driving and other pollution-generating activities to prevent pollution levels from exceeding the health standard. A red day means residents should not burn wood and drive as little as possible (Kleinman, 2000).

Ultimately the air quality for Utah's citizens is dependent on each individual taking steps to reduce the amount of energy being used and pollution being emitted (Kleinman, 2000).

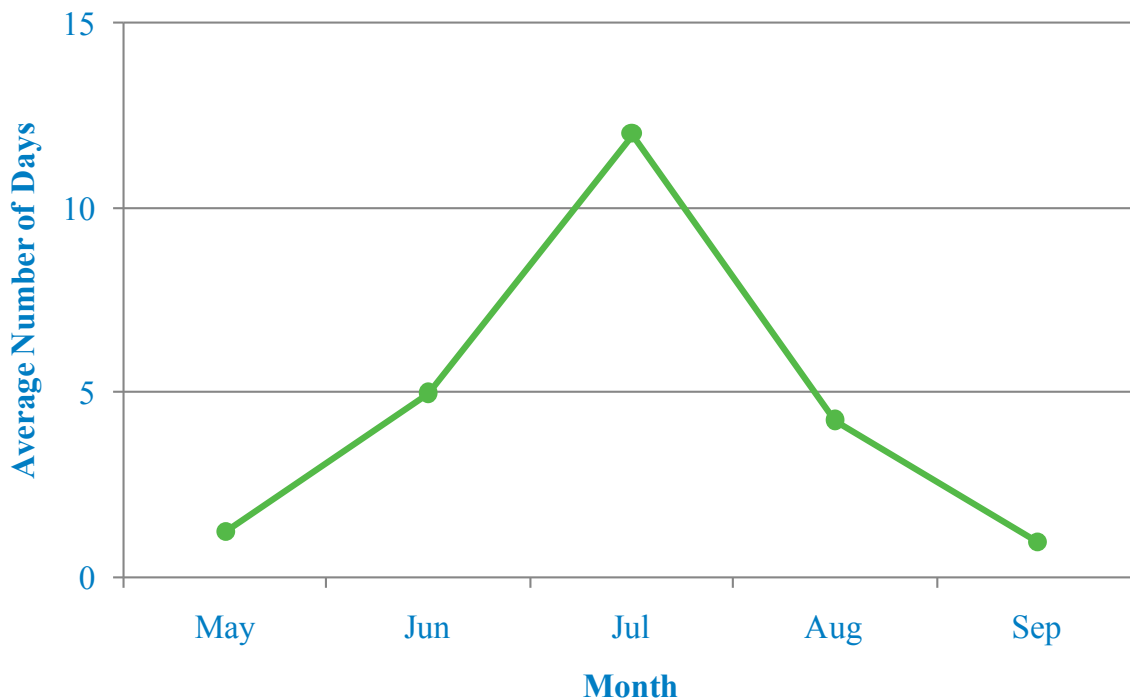
What can I do?

Check ozone levels at www.airquality.utah.gov.

Track your child's lung sensitivity by writing down symptoms and ozone levels so you know what levels of ozone cause him or her to feel health effects.

Cut back on driving whenever you can, but especially on yellow and red air days. Walk, bike, or take public transportation when possible. When you must drive, reduce miles by combining trips.

Figure 2: Average number of days with maximum 8-hour average ozone concentrations over the National Ambient Air Quality Standard by Month, 1997-2007 (EEP, 2009)



1.2 Particulate Matter

Particulate matter is a mixture of very small particles. Particulate matter smaller than 10 micrometers (PM_{10}) is small enough to get inside the lungs and cause serious health problems. Particulate matter smaller than 2.5 micrometers ($PM_{2.5}$) is the most dangerous because it can move deeper into the lungs and even into the bloodstream (EPA, 2006).

How small are these particles? A single hair on your head has a diameter of about 70 micrometers - that's at least 35 times larger than the biggest fine particles (EPA, 2006).

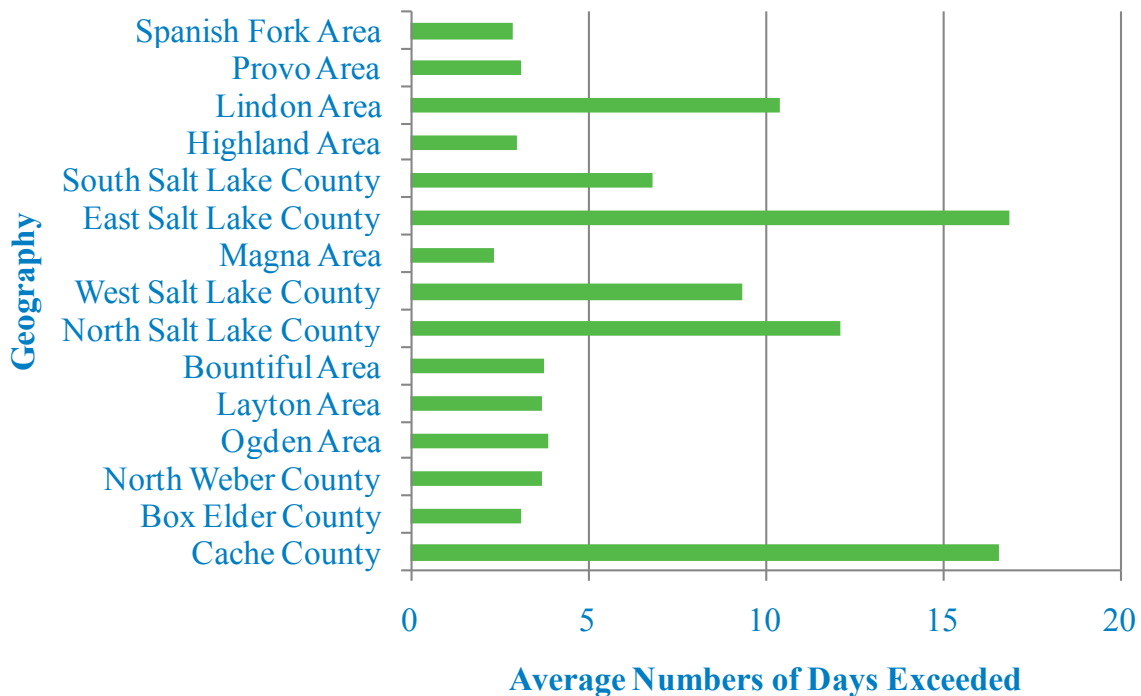
As with other air pollutants, children are especially vulnerable to health problems related to particulate matter. People exposed to particulate matter may experience painful breathing, coughing, increased

asthma symptoms, temporarily reduced lung capacity, chest tightness, an abnormal heart beat, and even fatal and nonfatal heart attacks. Long term exposure can lead to infections and chronic lung disease (EEP, 2009). However, even if damage is occurring, children may not recognize or admit to feeling symptoms (Kleinman, 2000).

How are we doing?

Several of the most urban counties in Utah have days that do not comply with the $PM_{2.5}$ standard (Figure 3). This is, in part, due to Utah's unique geography and seasonal conditions. $PM_{2.5}$ levels increase seasonally in the winter and often become trapped within Utah's mountain valleys (Figure 4) (EPA,2006).

Figure 3: Average number of days with $PM_{2.5}$ levels over the National Ambient Air Quality Standard by geography, 1998-2007 (EEP, 2009)



What is being done?

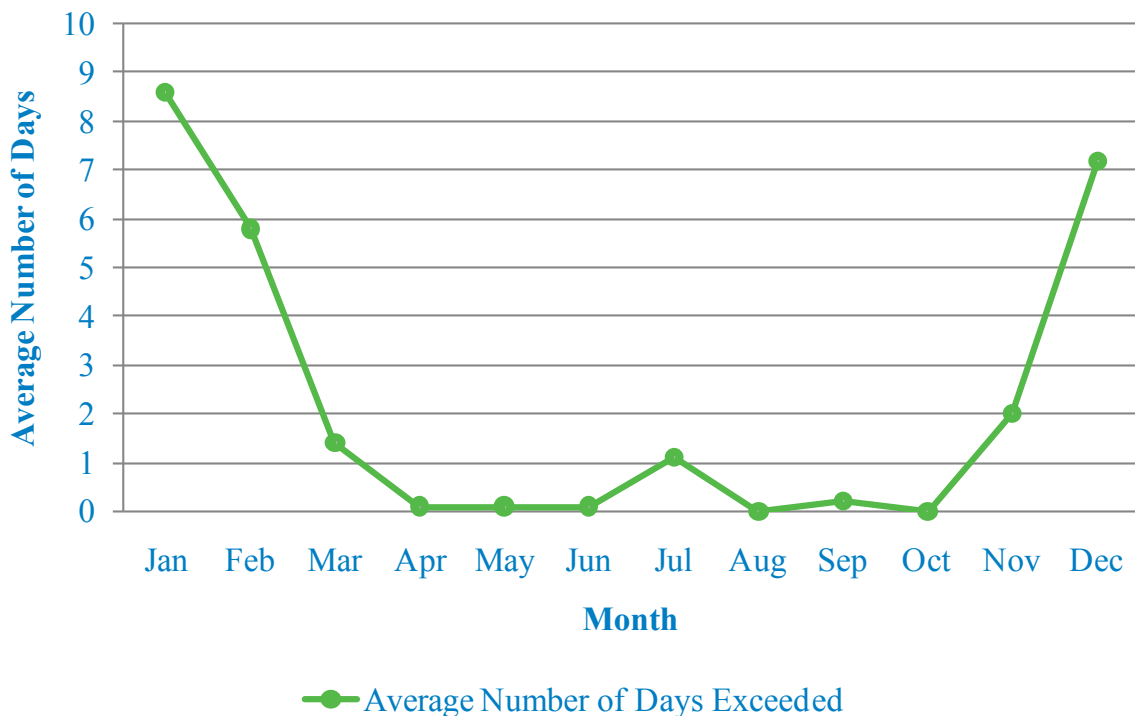
The UDEQ is working to decrease particulate matter levels to comply with national standards. The UDEQ provides a red, yellow, and green stoplight color code to inform the public about pollution levels and steps that should be taken to decrease pollution and protect health. When pollution levels are high, the UDEQ encourages the public to decrease driving as much as possible (EEP, 2009).

In addition, the UDEQ and the UDOH provide schools guidance for when children should be kept indoors (EEP, 2009).

What can I do?

- Some people are sensitive to particulate matter even when pollution levels are below the EPA standard.
- Be aware of your children's health and sensitivity.
- Track particulate pollution at the UDEQ's website www.airquality.utah.gov, and keep them inside when pollution levels would cause them to feel adverse health effects (EEP, 2009).

Figure 4: Average number of days with PM_{2.5} levels over the National Ambient Air Quality Standard by month, 1998-2007 (EEP, 2009)



1.3 Radon

Radon is a naturally occurring radioactive gas produced by the breakdown of uranium in soil, rocks, and water.

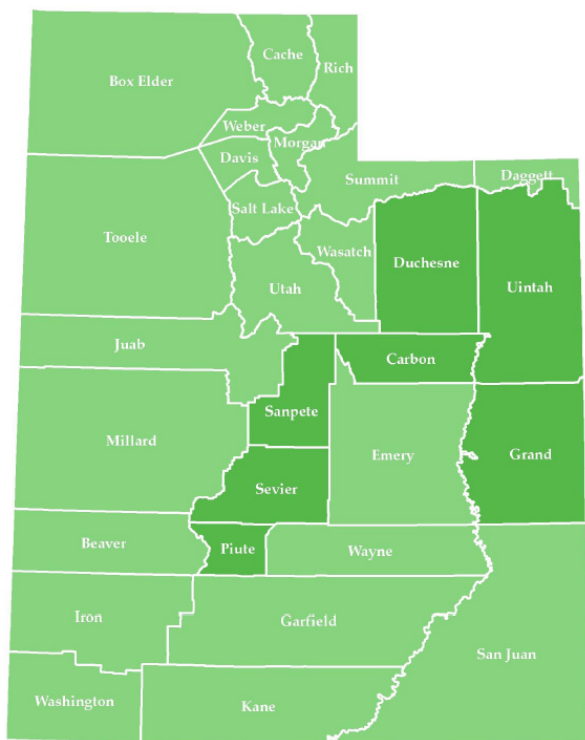
Between 15,000 and 22,000 people in the United States die of radon-related lung cancer every year. Radon exposure is the second leading cause of lung cancer after cigarette smoking. People who smoke and are exposed to radon gas have an especially high risk for developing cancer (NCI, 2004).

You can't see, smell, or taste radon. Radon can get into your home through pipes, cracks in the foundation and walls, and construction joints (UDEQ, 2010).

Because health problems from radon may not be known for several years after exposure, testing for radon is the only way

to know if there are unsafe levels in your home. Testing is inexpensive and easy (NCI, 2004).

Figure 5: Radon zones by county (EPA, 2010)

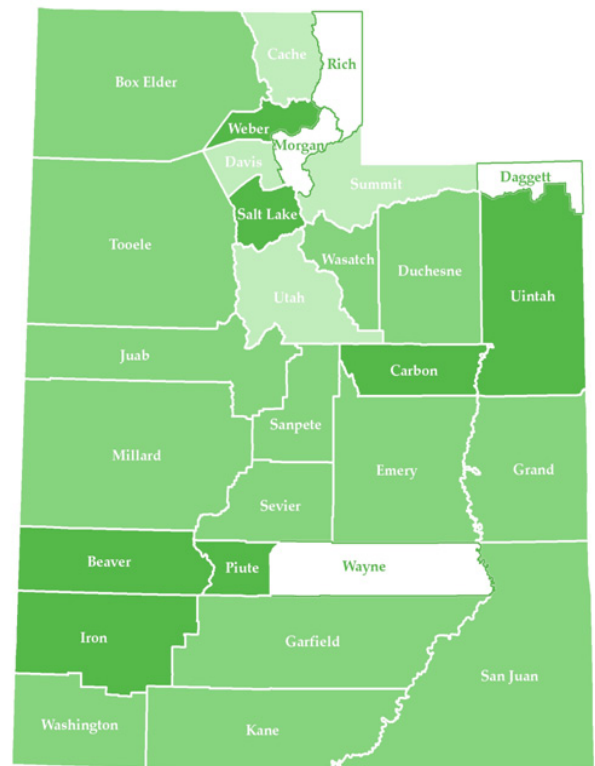


Highest Potential
Zone 1 counties have a predicted average indoor radon screening level greater than 4 pCi/L

Moderate Potential
Zone 2 counties have a predicted average indoor radon screening level between 2 and 4 pCi/L

Low Potential
Zone 3 counties have a predicted average indoor radon screening level lower than 2 pCi

Figure 6: Age-adjusted lung and bronchus cancer incidence per 100,000, by county, 2003-2007 (UCHD, 2010)



Above state rate **Same as state rate** **Below state rate** **Insufficient Data**



How are we doing?

Only a very small number of Utah's homes have been tested for radon gas because testing is voluntary. Because not every home is tested, the data for radon does not accurately represent the population of Utah as a whole (EEP, 2009). Still, current data is sufficient to predict the average indoor levels of radon by county (Figure 5). This map alone should not be used to decide whether or not a home in a certain county should be tested for radon. Radon tests have found homes with elevated radon levels in every county (EPA, 2010).

What is being done?

The UDEQ, Division of Radiation Control is alerting Utahns to make testing their homes for radon gas a high priority. Governor Gary Herbert declared January 2010 "Radon Action Month."

The Utah Cancer Control Program and UDEQ are collaborating to increase the distribution of radon test kits around the state.

The EEP at the UDOH and the Radon Program at the UDEQ cooperate to provide radon test kits to residents of high-risk counties.

These programs also raise awareness about radon prevention and mitigation by providing educational materials to parents

WHAT CAN I DO?

The Surgeon General and EPA recommend that all houses below the third floor be tested for radon (UDEQ, 2010).

You can purchase discounted radon test kits at the state website, www.radon.utah.gov, or at full price in many hardware stores, online, and at retail outlets.

If you are buying or selling a home, or if you are uncomfortable with a do-it-yourself test, contact the state radon office at www.radon.utah.gov for a list of qualified radon testers. If your home does test high for radon, the state radon office can also help you find a qualified

professional to fix your home.

Short-term tests need to remain in your home for anywhere from two to 90 days, depending on the type of detector. If the average of two short-term tests is 4 pCi/L or higher, you should consider taking measures to lower radon in your home.

Long-term tests take at least 90 days and will provide a better understanding of the year-round average radon level in your home. If this test returns results of 4 pCi/L or higher, contact the state radon office for consultation about measures to lower radon in your home (UDEQ, 2010).

and public offices throughout Utah (EEP, 2009). You can find more information in the purple box above.

1.4 Tobacco Smoke

Children are exposed to more secondhand smoke than nonsmoking adults, on average, because they have less control than adults over their exposure to secondhand smoke.

Children exposed to tobacco smoke may experience acute lower respiratory infections and more frequent and severe asthma attacks if they already have asthma. They may also experience other respiratory symptoms, and ear infections (UTPCP, 2010).

Babies born to mothers who smoked during pregnancy and babies exposed to tobacco smoke after birth are more likely to die of Sudden Infant Death Syndrome (SIDS). Babies whose mothers smoke during pregnancy are more likely to suffer from low birth weight, and they tend to have

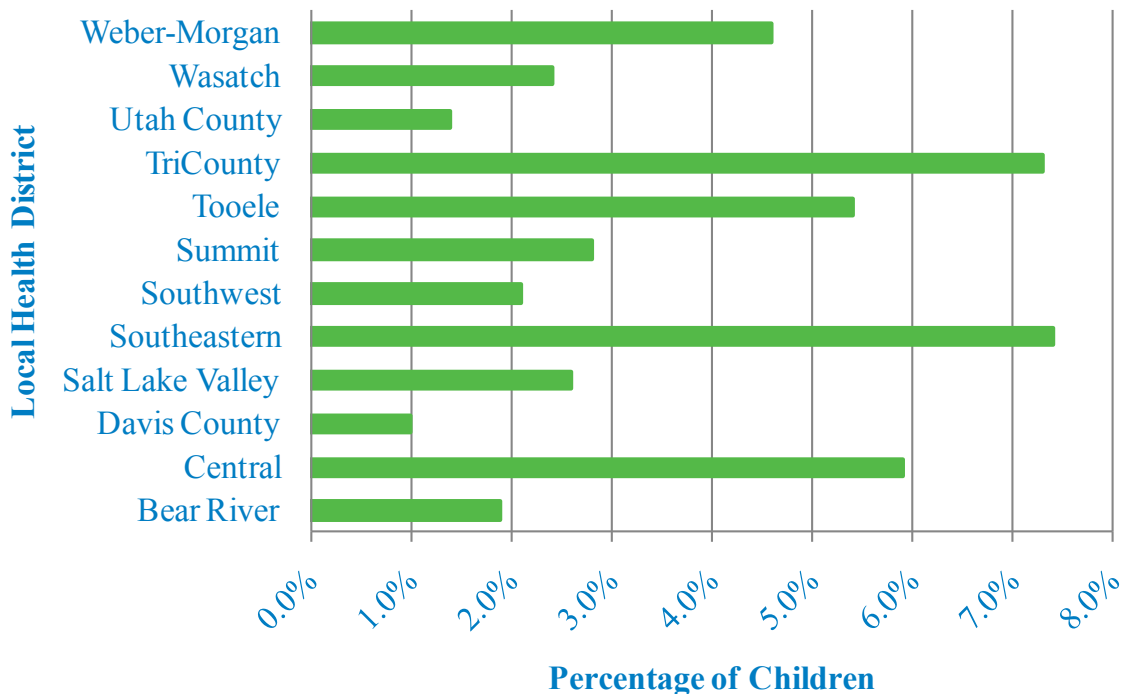
weaker lungs than other babies (Office of the Surgeon General, 2007).

Recent studies have found relationships between tobacco smoke and childhood health problems. Problems such as attention-deficit/hyperactivity disorder, behavior problems, dental caries, and metabolic syndrome (King, 2009).

How are we doing?

Child exposure to secondhand smoke in the home has declined by 68% since 2001. The 2007 Utah Healthcare Access Survey showed that 1.8% of Utah children (nearly 15,000) were exposed to secondhand smoke at home in the preceding month (UTPCP, 2010).

Figure 7: Percentage of children under 18 who had been exposed to cigarette smoke at home, by local health district, 2006-2008 aggregated (UTPCP, 2010)



The age-adjusted rate of smokers in Utah was 9.1% in 2008 (UTPCP, 2009).

What is being done?

The UTPCP (Utah Tobacco Prevention and Control Program) and its partners warn about the dangers of secondhand smoke through the TRUTH anti-tobacco marketing campaign, community-based education, and an extensive website. When necessary, both state and local health departments enforce the Utah Indoor Clean Air Act which prohibits smoking inside public access buildings (UTPCP, 2010).

What can I do?

- Support Utah's Indoor Clean Air Act: do not smoke in buildings.
- Support friends and family in efforts to quit smoking.
- Call the Utah Tobacco Quit Line (1-866-567-TRUTH) for support and facts about quitting.
- Join Utah's online tobacco cessation support service at utah.quitnet.com
- Do not smoke at home or around children.
- Do not smoke while pregnant (UTPCP, 2010).

Figure 8: Percent of women reporting smoking during the third trimester of pregnancy, Utah, 1999-2008 (UMIHP, 2009)



1.5 Drinking Water

People drink and use water every day. The majority of Americans have access to high quality drinking water. About 90% of Americans (262 million in 2006) get their water from a community water system, instead of a household well or other small supply.

The EPA sets regulations for treating and monitoring drinking water delivered by community water systems. The EPA has set standards for over 90 contaminants. Drinking water protection programs play a critical role

in ensuring high quality drinking water and protecting the public's health (EEP, 2009).

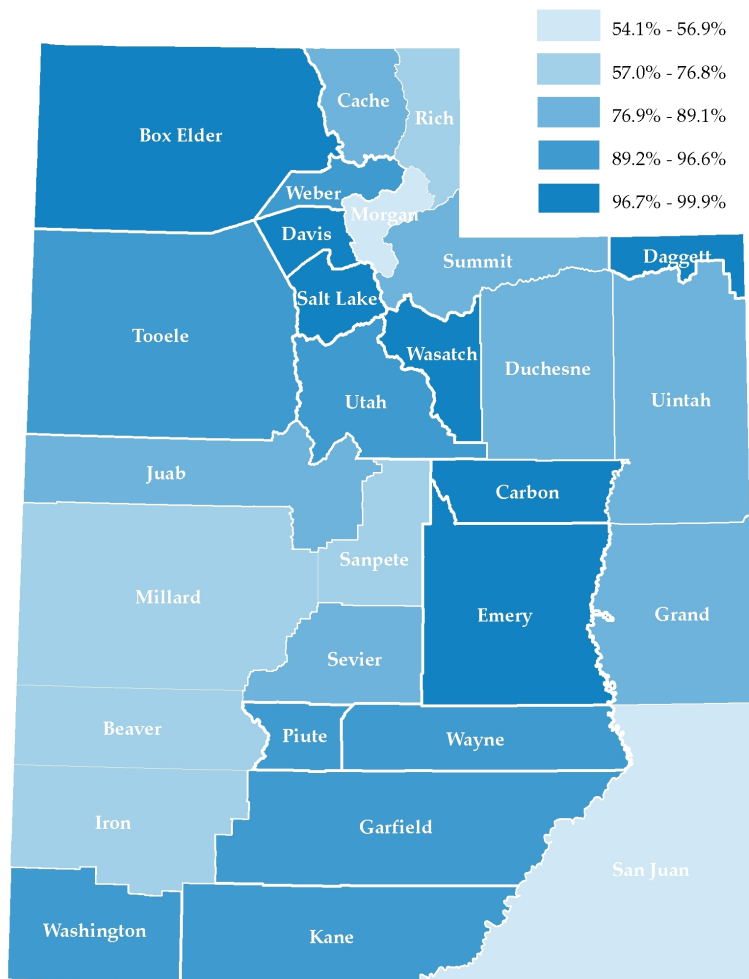
Arsenic

Arsenic is a toxic chemical that is naturally found in soil, rocks, and minerals. Arsenic levels vary by community water systems and private water supplies.

While health problems related to long-term exposure are most common, short-term exposures to large doses of arsenic are also dangerous. People who drink water

with arsenic in excess of regulatory standards over many years could experience thickening and discoloration of the skin, stomach pain, nausea, vomiting, diarrhea, liver problems, cardiovascular, pulmonary, immunological, neurological, reproductive and endocrine problems, and cancer of the bladder, skin, kidney, liver and lung (EEP, 2009).

Figure 9: Percentage of population served by community water systems, 2007 (EEP, 2009)



Nitrates

Nitrate and nitrite are nitrogen-oxygen molecules which can combine with various organic and inorganic compounds. Nitrate is the form commonly found in water, often in areas where nitrogen-based fertilizers are used. Nitrate is most harmful to infants younger than six months of age.

Short-term exposure can cause serious illness and sometimes death in this vulnerable population. Longterm exposure



to nitrates may lead to reproductive problems and some cancers, primarily stomach cancer (EEP, 2009).

How are we doing?

In 2006, the EPA changed the arsenic standard from 50ppb to 10 ppb in order to protect vulnerable populations against longterm arsenic exposure (EPA, 2006). The EPA requires that nitrates in water not exceed 10ppm (EPA, 2010).

What is being done?

The State of Utah has a goal for 100% of the population to have access to drinking water with arsenic levels below 10ppb and nitrate levels below 10ppm (EEP, 2009). Utah's Division of Drinking Water is accomplishing this goal by testing all water treatment and delivery systems to ensure healthy drinking water.

WHAT CAN I DO?

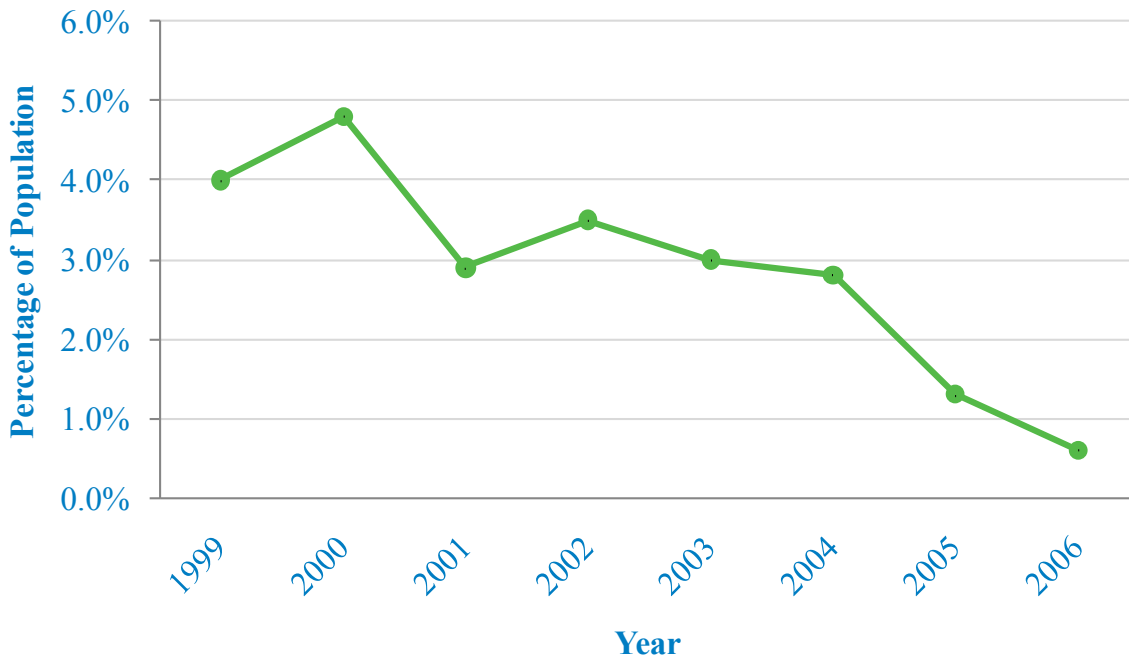
If you own a well that is used for drinking water, test the well water regularly to ensure there are no contaminants above regulatory or health levels.

Don't drink water that does not come from community water sources. Or, if you aren't sure of its source, avoid drinking it.

Don't drink water from lakes, streams or rivers, especially when near livestock or animals.

If you feel ill after drinking water from an unknown source or a private well, see a doctor.

Figure 10: Annual percentage of population served by a community water system with arsenic levels over 10 micrograms per liter by year, Utah, 1999-2006 (EEP, 2009)



1.6 Pesticides

Pesticides are chemicals used to prevent, destroy, or repel insects, weeds, and other agricultural and household pests. Americans use approximately two billion pounds of pesticides each year in farms, homes, businesses, schools, parks, hospitals, and other places (CDC, 2004).

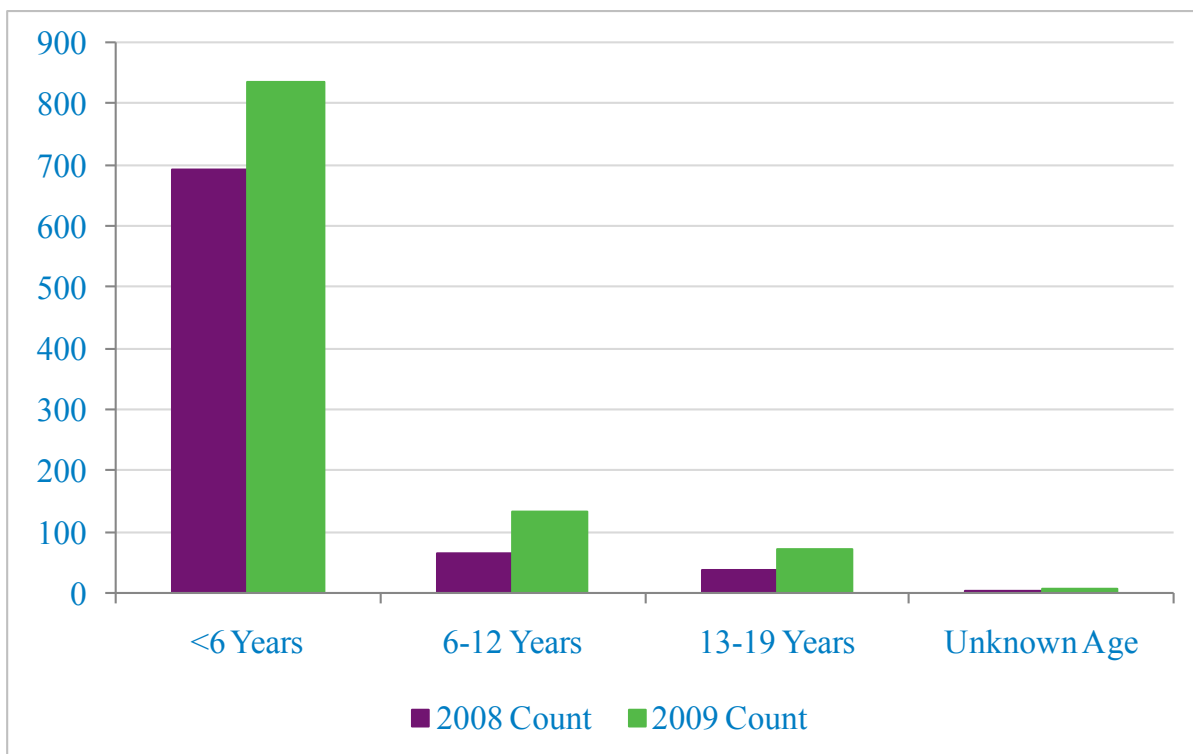
There are many kinds of pesticides, some are more dangerous to health than others. Acute exposure to pesticides can cause dizziness, nausea, respiratory, allergic, neurological, and gastrointestinal symptoms as well as dermatological and ocular lesions (EPA, 2002) (National Institute for Occupational Safety and Health, (NIOSH) 2005). Longterm exposure can result in pesticide poisonings, organ damage, neurological damage, disruption of hormone signaling, and reproductive disorders (Landrigan P. J., 2002) (EPA, 2002).

Certain pesticides can be absorbed into body fat and accumulate over time. They are stored and released when the body uses the fat cells for energy. Pesticides may cross the placental barrier or be released in breast milk, placing developing and nursing infants at special risk (OEHHA, 2002).

Children are especially vulnerable to pesticides because their developing organ systems are more sensitive and provide less protection than those of an adult.

Their high metabolisms, close proximity to the ground, and hand/object-to-mouth behaviors increase children's exposure to pesticides compared with adults. Additionally children tend to eat more foods that are treated with pesticides or contain pesticide residues, such as milk, applesauce, and orange juice (EPA, 2002).

Figure 11: Pesticide poisonings in children by age group, Utah, 2008 vs. 2009 (UPCC, 2010)



How are we doing?

According to the Utah Poison Control Center, in 2009 a total of 1,989 pesticide exposures were reported. Of these exposures, 1,050 (53%) occurred among children. The majority (836 exposures, 80%) of children exposed were younger than six years old, and among this group insecticides were the most common exposure (UPCC, 2010).

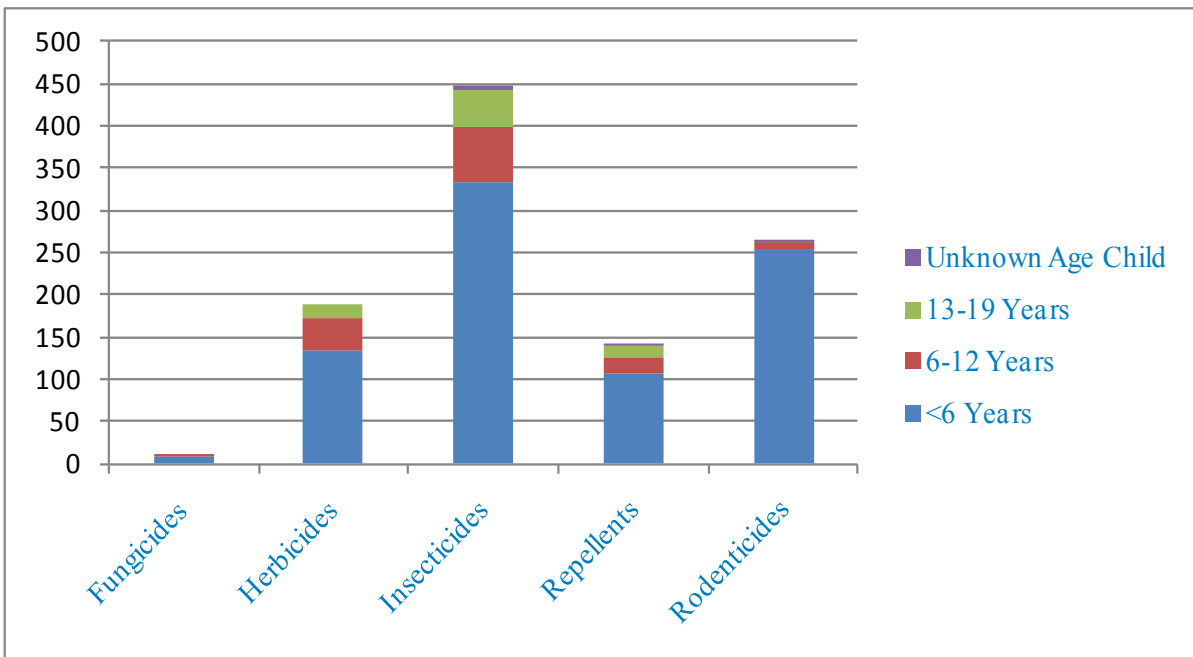
What is being done?

The National Toxic Substance Incidents Program within the UDOH educates the public, emergency responders, and medical providers on pesticide safety as well as conducts emergency surveillance activities as they relate to pesticide exposures and poisonings (EEP, 2010). The Utah Department of Agriculture and Food regulates and trains applicants to use pesticides appropriately. Utah State University’s agriculture resource center provides assistance to the public www.extension.usu.edu.

What can I do?

- Always read and follow label instructions.
- Allow time for ventilation before reentering the area where pesticides have been used (EPA, 2007).
- Store pesticides in original containers, never in containers that could be mistaken for food or beverages.
- Store pesticide containers in locked or childproof cabinets.
- Close child-resistant containers correctly if interrupted during application.
- Place containers out of reach of children while you are absent (NYSDOH, 1999).
- Remove clothes and shoes outside immediately after working with pesticides, and wash contaminated clothes separately from other laundry (EPA, 2007).
- Avoid applying repellent to face and hands of children (CDC, 2010).

Figure 12: Pesticide poisonings in children, by type and age, 2009 (UPCC, 2010)



1.7 Chemicals

Children are more vulnerable to chemical exposure than adults because they are more likely to come into contact with toxic substances and their small bodies are still developing. Children are able to consume more, pound for pound, than adults, and they absorb more of the toxins they ingest. Because children's organs are still developing, they are more susceptible to functional damage (AFHH, 2010).

How are we doing?

The distribution of poison-related emergency department visits peaks twice from 2003 to 2007: among children aged 1-4 and among teens aged 15-19. This trend is seen nationwide and typically reflects unintentional poisonings

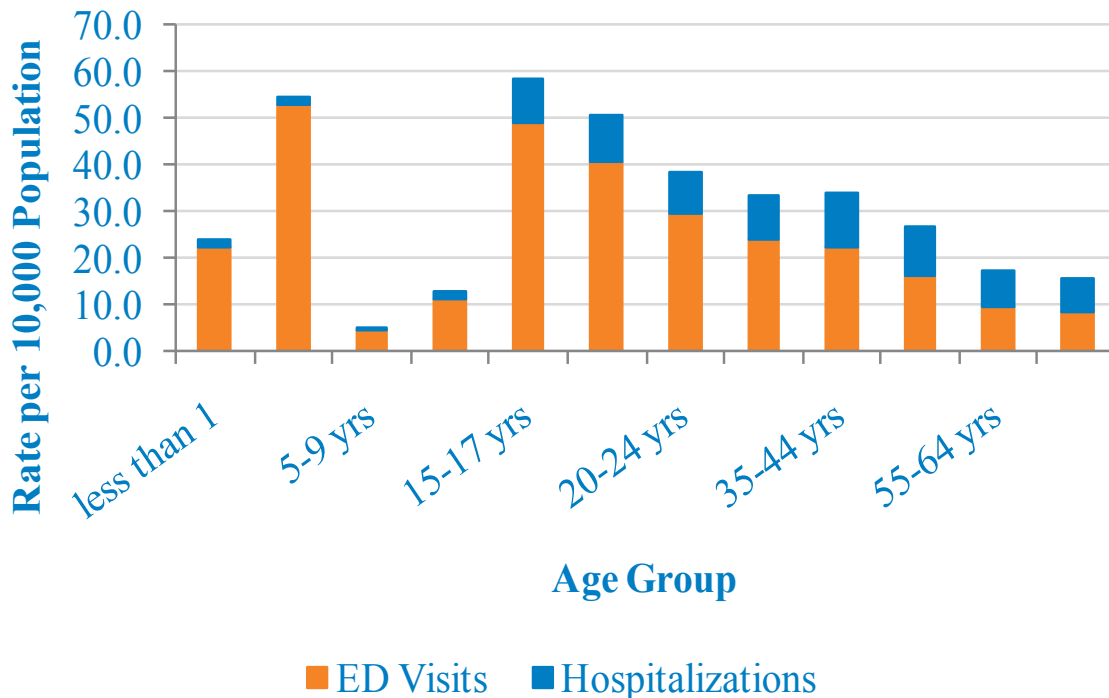
among small children and intentional drug ingestion among adolescents (Goepf, 1996).

Age-adjusted poisoning hospitalization rates increased from 1998 (4.5 admissions per 10,000 population) to 2008 (8.7 admissions per 10,000 population). Age-adjusted poisoning emergency department treat-and-release visit rates have not changed significantly from 1999 to 2007, but median treat-and-release charges have increased 159% (from \$456 in 1999 to \$1,182 in 2007) (UVIPP, 2009).

What is being done?

The State of Utah has several objectives related to poisonings including decreasing the number of emergency department visits as well as deaths.

Figure 13: Poison ingestion ED visit and hospitalization rates by age group, Utah, 2003-2007 (UVIPP, 2009)



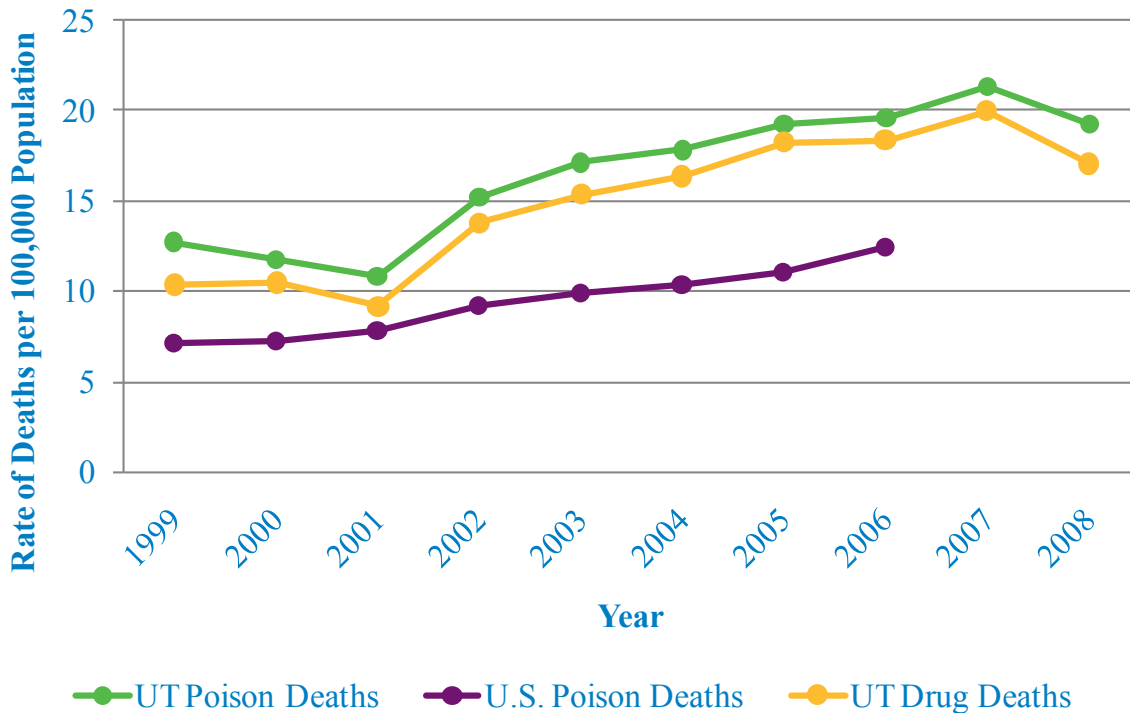
Health educators within the EEP conduct outreach activities targeting schools, hospitals, industries that use or release chemicals, and other locations. Presentations focus on hazardous substance response and the proper use, disposal of, and cleanup of chemicals.

What can I do?

- Put the poison control number, 1-800-222-1222, on or near every phone. Program it into your cell phone. This number operates 24 hours a day, seven days a week. Call this number if you think a child has been poisoned.
- Call 911 if a child is collapsed or is not breathing.

- Follow label directions, and read all warnings when giving medicine to children.
- Never mix chemicals, including cleansers or gardening chemicals.
- Keep medicines, cleaning solutions, and other toxic products, in their original childproof containers so they are protected and easily identifiable.
- Keep medicines and toxic products, such as cleaning solutions, in locked or childproof cabinets, even if there are no children in your home (CDC, 2008).

Figure 14: Poisoning death rates by year, Utah and United States, 1999-2008 (UVIPP, 2009)



1.8 Mold

Mold can grow anywhere where there is moisture and an organic food source such as leaves, food, wood, or dirt. Indoor mold commonly grows in damp places from flooding, leaky pipes, poorly ventilated steam, or condensation, such as in showers and basements. Outdoor mold grows commonly in shady areas where leaves or other waste is decomposing (CDC, 2010).

People who are sensitive to molds may experience eye irritation, a stuffy nose, wheezing, or skin irritation when exposure occurs. Mold may be a trigger for asthma attacks in people with asthma who are also sensitive to molds. Mold and other damp conditions may cause wheezing, coughing, and upper respiratory tract symptoms in otherwise healthy children (Institutes of Medicine, 2004).

How are we doing?

No federal or state agency has established standards for acceptable or safe levels of mold (CDC, 2010). This makes it difficult to compare Utah's levels of indoor or outdoor mold with the rest of the United States.

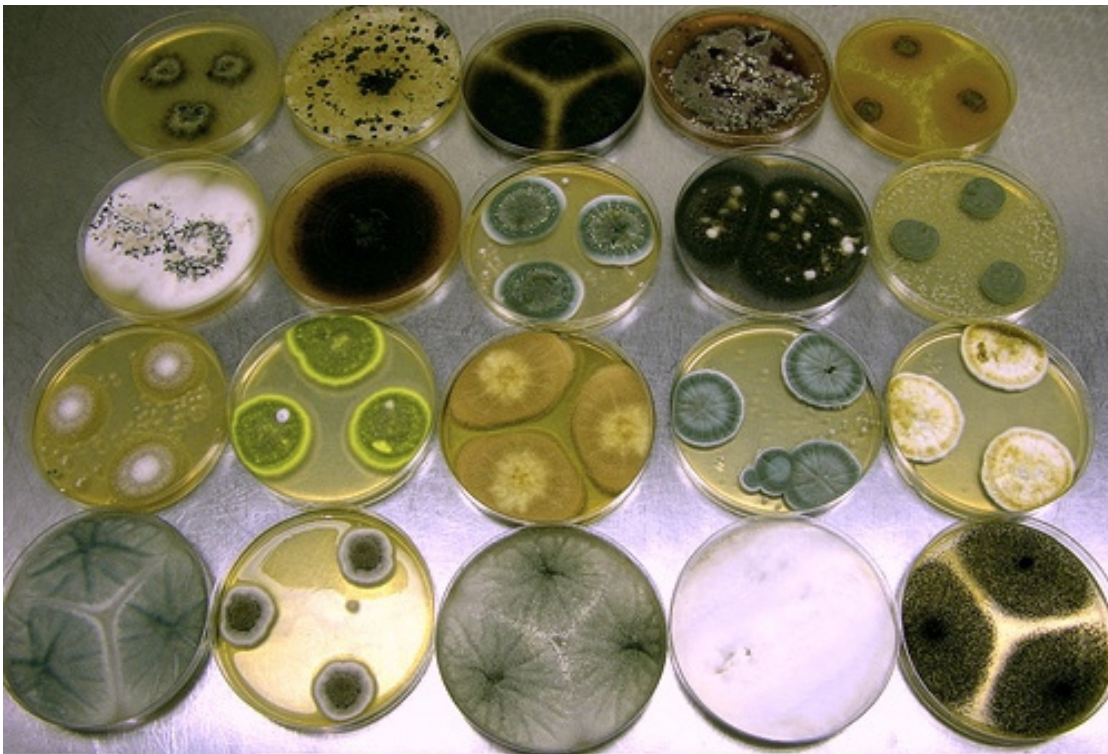
What is being done?

The Utah Fit Premises Act describes the responsibilities of landlords and renters for providing and maintaining healthy and safe rental property. This law is available at http://le.utah.gov/~code/TITLE57/57_22.htm (UATP and UEPHTP, 2010).

The Healthy Homes Program at the UDOH provides information to homeowners, landlords, and renters about mold remediation and home safety.

The Program also answers questions and provides health education to the general population.

Photo A1. Various *Penicillium*, *Aspergillus* spp. (and other fungi) growing in axenic culture.



WHAT CAN I DO?

The best way to reduce mold in your home is to control moisture.

- Replace furniture and carpets that have been soaked (CDC, 2010).
- Replace water damaged sheet rock or walls.
- Do not carpet in basements or bathrooms.
- Vent your clothes dryer to the outside.
- Open a window or use an exhaust fan while cooking and washing dishes.
- Always open a window or use an exhaust fan while showering. Keep the fan going or the window open for at least 30 minutes after showering.
- Fix leaks in the roof, foundation, pipes, and faucets. Clean up water spills and leaks within 24 to 48 hours.
- Ensure that landscaping, gutters, and downspouts are not blocked and are not leading water into or under your house (UATP and UEPHTP, 2010).

The CDC and UDOH do not recommend testing for the type or amount of mold present. The most important thing is to remove the mold and moisture source, regardless of the kind or amount that is present (CDC, 2010).

Photo A1. Opposite: Various *Penicillium*, *Aspergillus* ssp. (and other fungi) growing in axenic culture.

Photo by: Dr. David Midgley, 2006

Cultures: Dr. David Midgley, University of Sydney, Australia Source: Soil.

2.1 Lead

Children are vulnerable to lead exposure before they are even born (EEP, 2009). Children's bodies absorb nutrients and minerals more readily than adults because they need more energy to grow. But it also increases their risk from ingesting toxic substances like lead (AFHH, 2010). Additionally, children's brains and nervous systems are more sensitive to the damaging effects of lead. Children with untreated high levels of lead in their bodies can suffer from brain and nervous system damage, headaches, and problems with hearing, learning, and behavior (EPA, 2010).

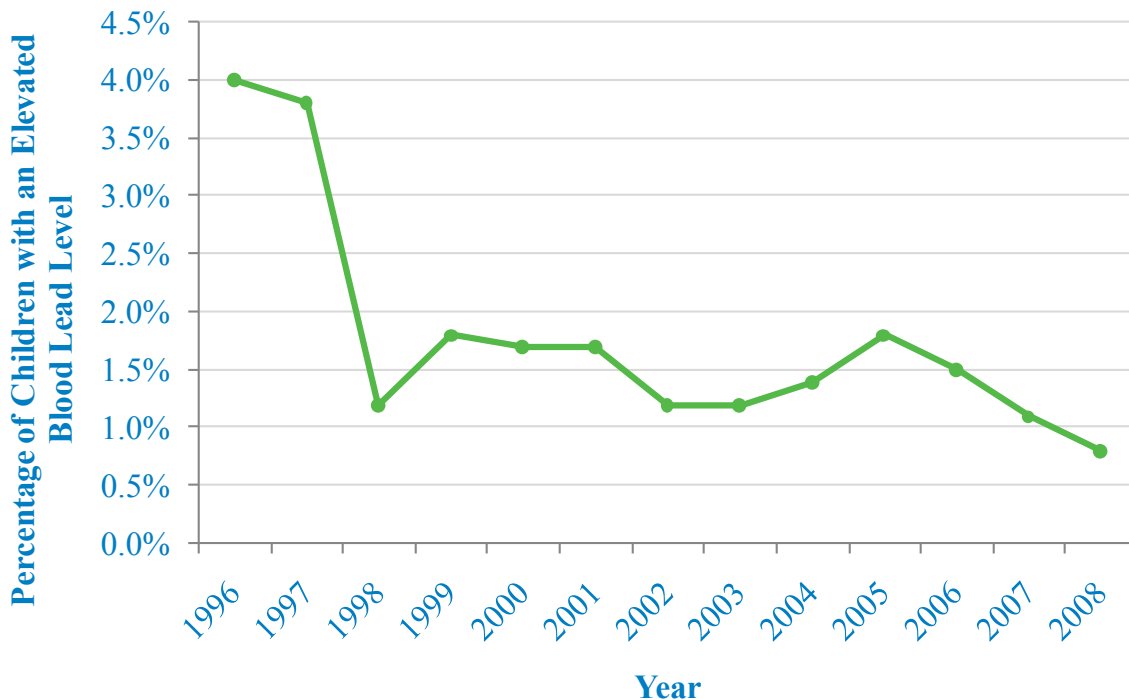
Lead poisoning is the most significant and prevalent disease of environmental origin among children in the United States. Despite increases in knowledge, screening,

and intervention, lead exposures remain prevalent. Environmental lead affects the growth and development of up to one million U.S. preschool children today, with effects ranging from learning disabilities to death (AFHH, n.d.).

How are we doing?

Scientists have found that lead is toxic at even lower levels than previously thought, especially over a long period of time. Even though lead-based paint was banned from home use after 1977, many older homes contain aged lead-based paints that may chip or be disturbed during renovations. Dust and paint chips can easily find their ways into the mouths of young children.

Figure 15: Prevalence of Utah children aged 0-5 years with blood lead levels $\geq 10 \mu\text{g/dL}$, 1996-2008 (EEP, 2009)



Utah has fewer pre-1977 homes than many other areas of the country. In Utah, lead contaminated dust and soil from mining and smelting waste may pose a risk to nearby communities. Occupational settings are another significant source of lead. Children may be exposed to lead dust carried home on clothing, shoes, and other materials (EEP, 2009).

What is being done?

In 1990, lead poisoning was added to the list of reportable injuries in the Utah Injury Reporting Rule (www.rules.utah.gov/publicat/code/r386/r386.htm). Laboratories and physicians report all cases of whole blood lead concentrations containing 10 micrograms or more of lead per deciliter of

blood ($\geq 10\mu\text{g/dL}$) to the Utah Blood Lead Registry (DAR, 2010). The Utah Blood Lead Registry uses this information to look for trends and prevalence of elevated blood lead in children, to monitor screening rates among high risk populations, and to track the progress of high risk communities (such as mining communities and areas with older housing).

The Utah Blood Lead Registry collaborates with several other state and federal agencies to remediate high-risk areas, educate populations, and distribute prevention and educational materials. In particular, these programs focus on groups that are at risk because of income and location (EEP, 2009).

WHAT CAN I DO?

- Do not disturb or remove lead-based paint. If the paint is in good condition and is not peeling, it is usually not a problem except in places where painted surfaces rub against each other to create dust (such as opening a window).
- Use barriers to separate renovation areas from the rest of the home.
- Keep places where children live and play clean and free of dust.
- Do not bring lead-contaminated work materials or clothing into the home.
- If your plumbing uses lead pipes, test your home's water for lead contamination.
- Eat well. Children with diets rich in iron and calcium absorb less lead (EPA, 2010).

2.2 Mercury

Mercury is an element that occurs naturally in air, water, and soil. The most common way people are exposed to mercury is by eating contaminated fish. Mercury in water can accumulate in fishes' body tissues, particularly in large fish and waterfowl that eat smaller, contaminated fish. Mercury in fish cannot be removed or reduced by cooking because it is tightly bound to the muscle tissue (State of Utah, 2010).

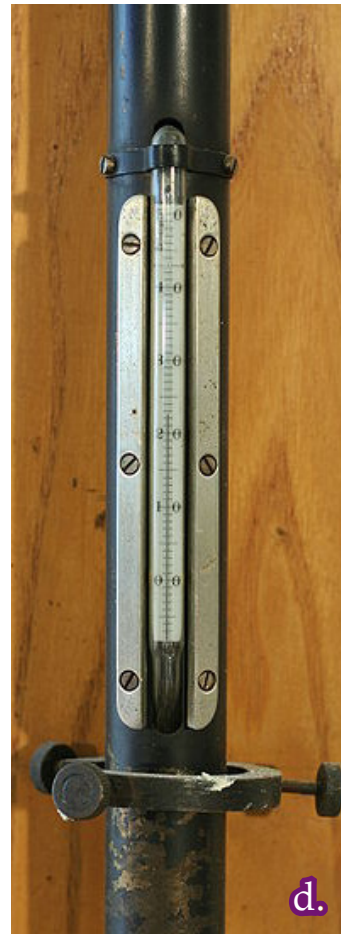
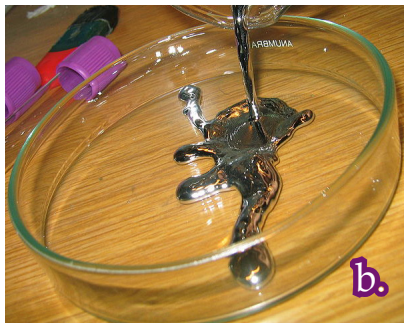
While mercury is dangerous for everyone, pregnant women are of special concern because consuming mercury-contaminated fish or shellfish puts unborn babies' growth and nervous systems at risk. Mercury exposure can impact an unborn child's cognitive thinking, memory, attention, language, and fine motor and visual spatial

skills. Mercury can also be passed from mother to child through breast milk.

Elemental (metallic) mercury may be inhaled as a vapor when products that contain mercury, such as thermometers, spill or break and expose mercury to the air. Mercury exposure can cause tremors, insomnia, headaches, and changes in emotion, neuromuscular behavior and cognitive functions (EPA, 2010).

How are we doing?

Mercury is released into the environment through power plants, mining, incinerators, other industrial sources and wild fires which re-aerosolize mercury that has deposited on the ground. This includes land, air, and water emissions.



Utah's mercury releases represent approximately 1.6% of the total mercury-containing compounds released in the United States as a whole (EPA, 2010).

Fish Advisories

There are several lakes, rivers, reservoirs, fish species and even a few species of duck that have mercury advisories. You can check which areas in the state have mercury advisories by going to www.fishadvisories.utah.gov (UDEQ, 2010).

What is being done?

Several agencies work together to fight mercury poisoning. The UDOH educates pregnant women about the risks of eating fish with elevated levels of mercury. The UDOH, UDEQ, and UDNR collaborate to update fish advisories for water bodies around

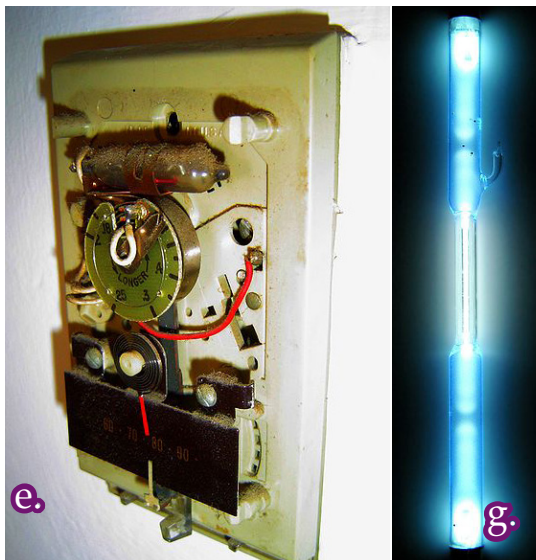
the state (State of Utah, 2010). The UDEQ's *Get the Mercury Out!* program (see website below) works with local health departments to coordinate the disposal of products that contain mercury (UDEQ, 2010).

What can I do?

Go to www.mercury.utah.gov for instructions on how to dispose of mercury-containing products and how to clean mercury spills.

Rather than throwing these items away, you should drop them off at your local health department for appropriate disposal (UDEQ, 2010).

Immediately report any spill of two tablespoons (one pound) or more of mercury to the National Response Center by calling 1-800-424-8802. Do not try to clean up mercury without first getting advice. Report spills to your local health department for cleanup guidelines and information (UDEQ, 2010).



Common products that contain mercury:

- a. fluorescent light bulbs
- b. old chemistry sets
- c. blood pressure gauges
- d. barometers
- e. thermostats
- f. mercury (smooth) light switches
- g. neon lights
- h. thermometers

3.1 Asthma

Asthma affects more children in the United States than any other chronic disease. About seven million children were affected with asthma in 2008, and 4.1 million of them suffered at least one asthma attack or episode (ALA, 2010).

Asthma affects the airways and can obstruct breathing. People with asthma are more sensitive to irritants such as allergens, respiratory infections, cold temperatures, tobacco smoke, mold, and air pollution (ALA, 2010).

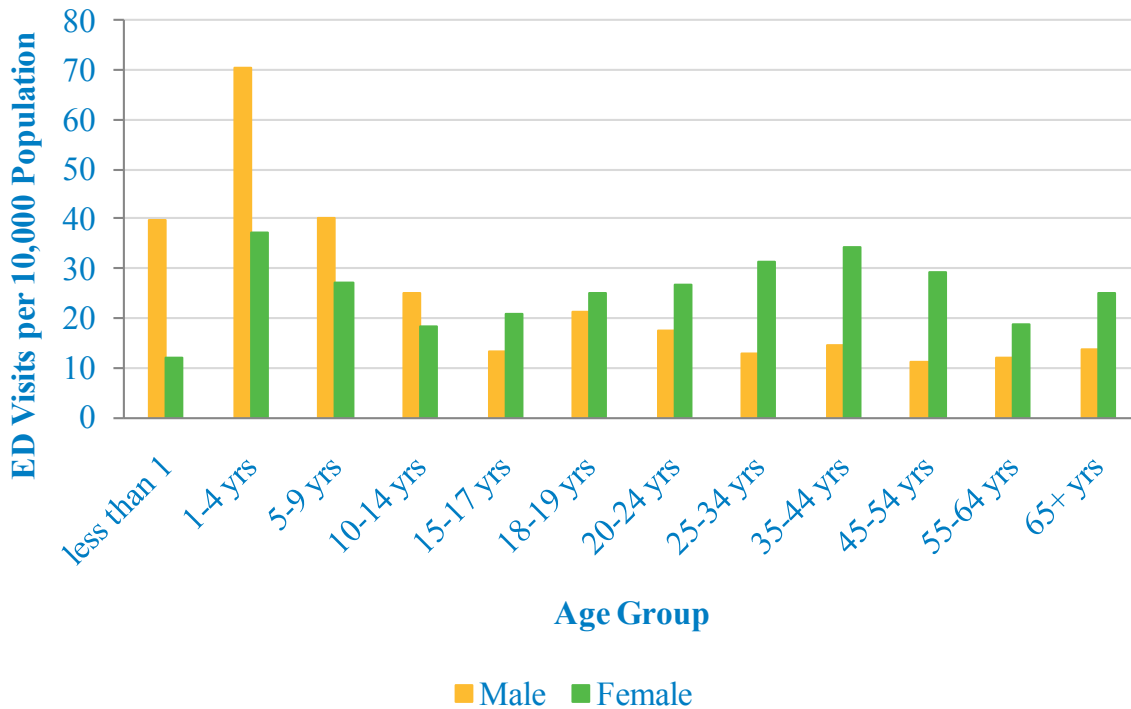
Asthma that is not managed properly can be life-threatening. But with proper management, children and adults with asthma can live normal, happy lives.

How are we doing?

Most Utah adults with asthma were diagnosed by the time they were 17 (54.6%). Just over 10% of Utah high school students had asthma in 2009 (UDOH, 2009). This is comparable with the 9.4% of children with asthma nationwide (Bloom, 2009). Similarly consistent with nationwide prevalence, asthma in Utah adults increased gradually from 2001 (7.0%) to 2007 (8.2%) (UAP, 2009).

Asthma is a significant cause of school absenteeism both in Utah and nationwide. One-third of school-aged Utah children missed at least one day of school because of asthma symptoms in a 12-month period during 2008 and 2009 (UAP, 2009).

Figure 16: Emergency department visits due to asthma by age and sex, Utah, 2007 (UAP, 2009)



The national estimated average cost per visit for children with asthma is: \$5,240 for a hospital admission and \$2,495 for an emergency department visit (Hubble et Al. 2005, Levy et Al. 2001, Steib et Al. 2002).

What is being done?

Programs within the UDOH, including the Asthma Program and the EEP, have partnered with the American Lung Association of Utah, local health care providers, educational organizations, and other interested parties to form the Utah Asthma Task Force. The Utah Asthma Task Force focuses on improving asthma management by addressing health systems, issues within specific populations, and

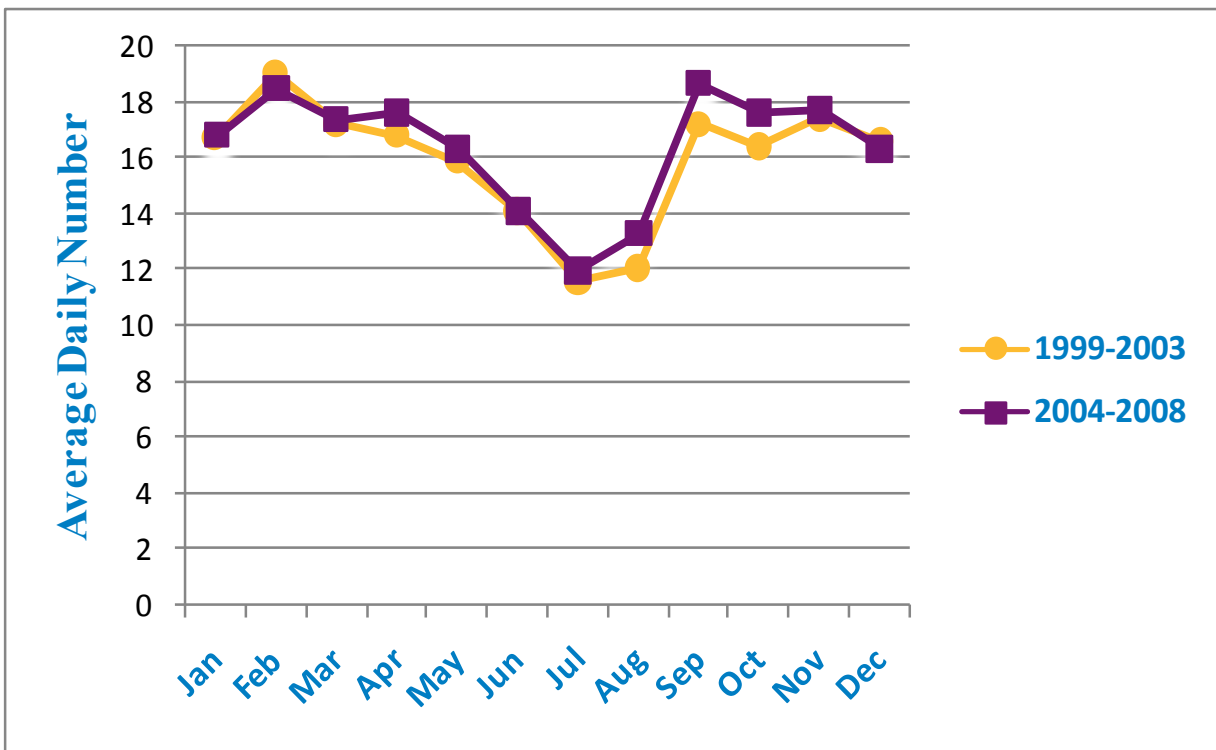
other factors that can increase the risk of asthma events (UAP, 2009).

What can I do?

Good asthma management skills empower children to take control of their asthma and live normal, healthy lives:

- Identify and avoid asthma triggers.
- Monitor symptoms to be aware of what activities and triggers to adjust and avoid.
- Some people benefit from measuring their peak flow so they can adjust daily medicine doses if their air flow measures worsen.
- Work with schools to ensure your child’s needs are understood so your child can carry and self-administer inhaled medicines (ALA, 2010).

Figure 17: Emergency department visits due to asthma by Month, Utah, 1999-2008 (EEP, 2010)



3.2 Cancer

Nationally, cancer is a leading cause of death among children ages 1 to 14, second only to unintentional injuries (CDC, 2009). Approximately 10,400 children younger than 15 were diagnosed with cancer during 2007, and about 1,545 will die from the disease. Still, only about 10 or 20 out of every 100,000 children in the United States are diagnosed with cancer each year (NCI, 2008).

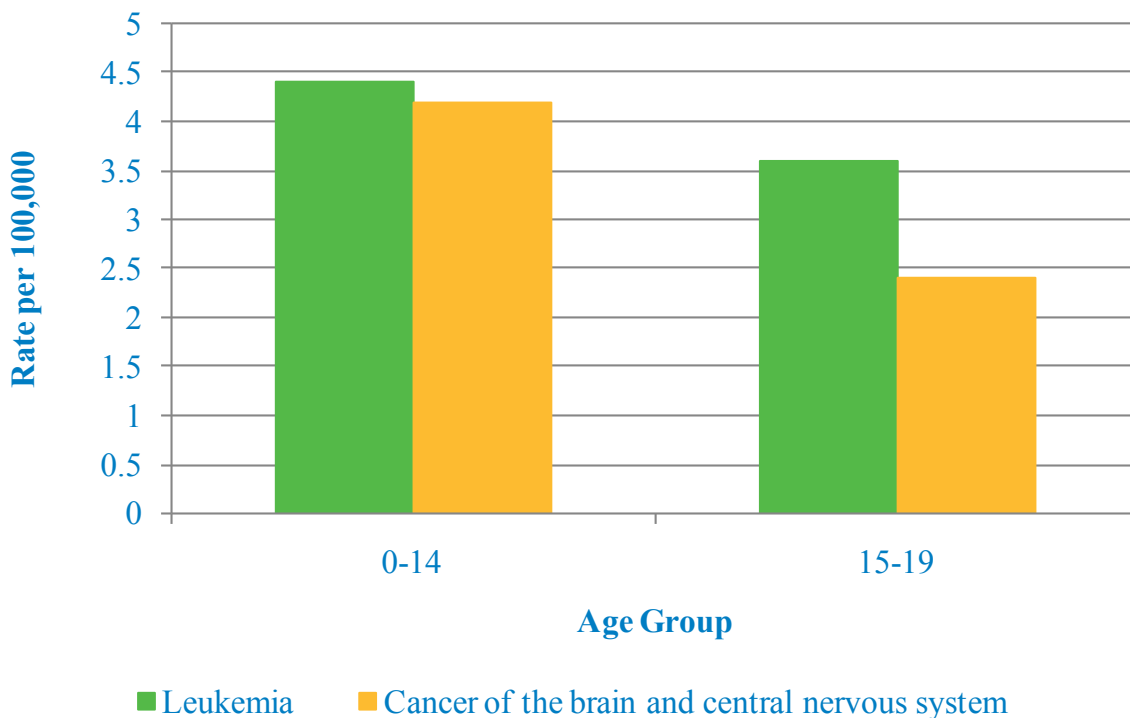
Leukemias and cancers of the brain and central nervous system are the most common cancers among children. Leukemia accounts for approximately 25% of cancer cases among people younger than 20. Cancers of the central nervous system make up 16.6% of childhood cancers. The incidence rates for both of these cancers decrease substantially as children age (Ries, 1999).

Although the causes of most childhood cancer remain a mystery, many risk factors for childhood cancers are genetic, associated with race, sex, and inherited conditions such as Down Syndrome. Scientists are still researching what other agents might be causing cancer in children (National Environmental Public Health Tracking Program, 2009).

How are we doing?

Over the past 20 years, the incidence of childhood cancer has increased from 11.5 cases per 100,000 children in 1975 to 14.8 per 100,000 children in 2004. At the same time, the death rate for childhood cancers dropped substantially, and 5-year survival rates increased from 58.1% in 1975-77 to 79.6% in 1996-2003 (NCI, 2008). Survival rates improved mainly because of more effective chemotherapy agents (Ries, 1999).

Figure 18: Leukemia vs. cancer of the brain and central nervous system incidence among children under 20 by age group, Utah, 2002-2006 (Utah Cancer Control Program, 2009a, 2009b)



What is being done?

Utah is home to many organizations that treat cancer, research its causes, and support individuals and families affected by cancer, including:

The Huntsman Cancer Institute is the only NCI designated Cancer Center in the Mountain West. The Huntsman Cancer Institute's Center for Children's Cancer Research has a mission to improve understanding, diagnosis, and treatment of childhood cancers <http://www.hci.utah.edu/>. (Huntsman Cancer Institute, 2009).

The Rocky Mountain Candlelighters for Childhood Cancer is a nonprofit organization devoted to providing practical and emotional support, patient advocacy, research, and education for children with cancer and their families <http://www.childhoodcancer.org> (Rocky Mountain Candlelighters for Childhood Cancer, 2009).

The Ronald McDonald House Charities of the Intermountain Area provides a home away from home for families with children being treated for cancer and other serious diseases <http://rmhslc.org>. (Ronald McDonald House Charities, 2010).

What can I do?

Take your children to regular medical checkups. Many cancer symptoms are easy to overlook. Ask a doctor if any unexplained symptoms become serious or last longer than normal including:

- unusual mass,
- swelling,
- vision or eye changes,
- rapid weight loss,
- frequent headaches,
- vomiting,
- fever or illness,
- localized pain,
- paleness, or
- loss of energy (ACS, 2010).

3.3 Obesity

Childhood obesity has increased substantially over the past thirty years. From the years 1976-1980 to the years 2007-2008, obesity in the United States increased from 5.0% to 10.4% for children aged 2-5. For children aged 6-11, obesity increased from 6.5% to 19.6% and from 5.0% to 18.1% for adolescents aged 12-19 (CDC, 2010).

The environment where children grow up has a large influence on obesity. Children are less likely to get physical activity when they live and go to school in neighborhoods where walking, bicycling, and other outdoor activities are unsafe or difficult. If sidewalks, parks, or recreational facilities are not available, or if crime rates are high, children are unlikely to participate in outdoor recreation.

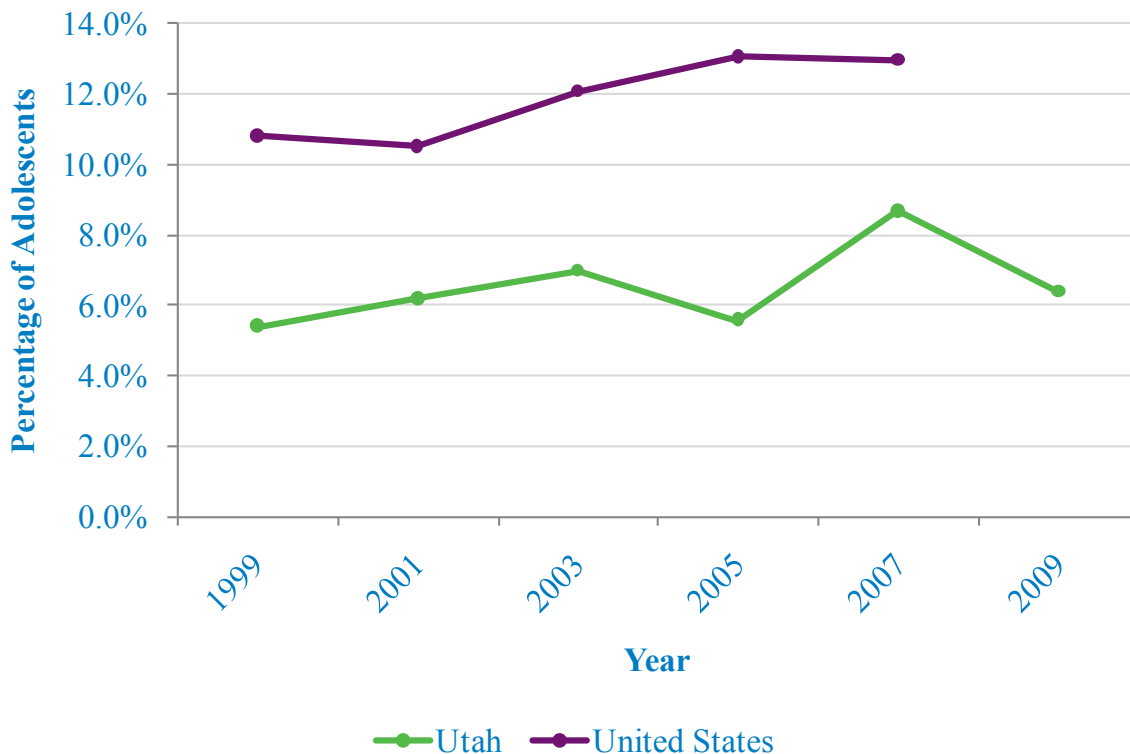
Similarly, high calorie and pre-packaged snacks and meals are easily accessible in today's environment. Marketing campaigns aggressively promote junk foods among children and teens (PANO, 2009).

How are we doing?

Healthy People 2010 identified obesity as one of ten leading health indicators (DHHS, 2000). Despite this target, the Healthy People 2010 Midcourse Review found that childhood obesity has continued to increase nationwide (DHHS, 2005).

While the percentage of obese children in Utah has increased over the past decade, Utah is still doing better than the nation as a whole. The percentage of obese adolescents was significantly lower in Utah than in the

Figure 19: Percentage of Adolescents who were obese, grades 9-12, Utah vs. United States (PANO, 2009)



rest of the United States from the years 1999 to 2007. In fact, Utah leads the nation as the state with the lowest overall prevalence of overweight and obese children aged 10-17 (NCSL, 2010).

What is being done?

Several interventions work to provide Utah's children with an environment that facilitates physical activity:

Healthy Community Awards recognize communities that make policy and infrastructure changes (such as improving trails, walking, and biking

routes) to encourage healthier behaviors. More information can be found at <http://health.utah.gov/ahy/index.htm> (UDOH, 2010).

The Gold Medal Schools Program encourages schools to provide structured physical activity and to provide healthy food choices. More information can be found at http://health.utah.gov/ahy/School/School_home.htm (UDOH, 2010).

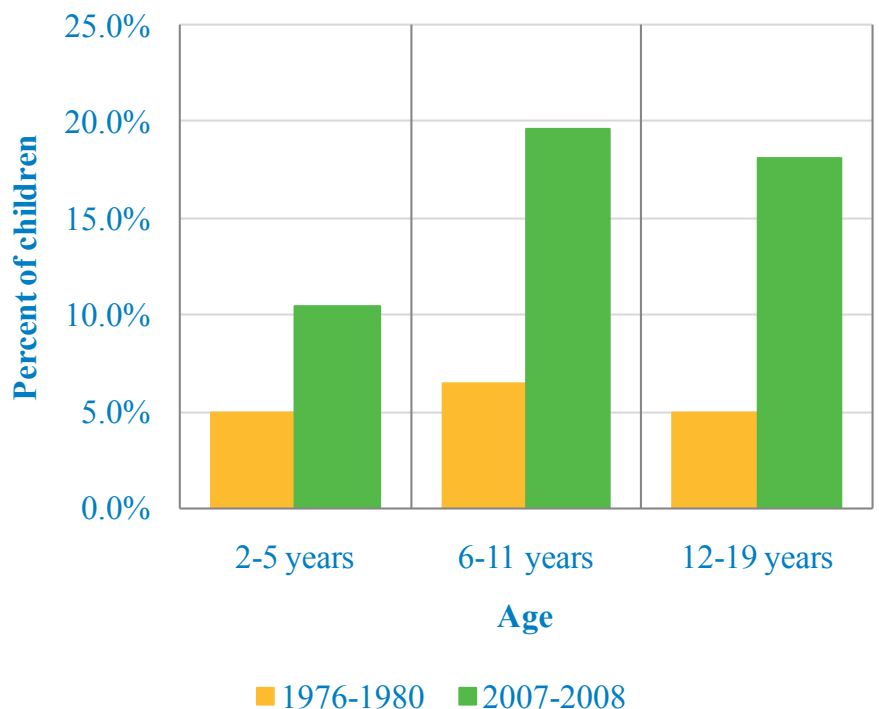
Utah Action for Healthy Kids cooperates with the Utah PTA and the Utah Department of Health to encourage physical activity, make healthy foods available, and to promote them among children. More information can be found at <http://take.actionforhealthykids.org>. (Action for Healthy Kids, 2009).

WHAT CAN I DO?

A few small changes in daily habits and environment can make a big difference:

- Surround your kids with healthy foods. Fill your kitchen with fruits, vegetables, and whole grains. Keep healthy snacks on hand instead of junk foods and sugary drinks.
- Eat in. Rather than eating out, sit down to eat as a family. Have fun trying new, healthy recipes.
- Limit screen time. Set rules for TV and computer time, and follow those rules yourself, too!
- Don't allow eating in front of a screen, and keep TVs and computers out of bedrooms.
- Make physical activity a part of daily routines. Walk or bike instead of driving. Go on family outings to the park, and participate in physical activities together.

Figure 20: Percentage of children who were obese by age group, United States, 1976-1980 vs. 2007-2008 (CDC, 2010)



3.4 Neurodevelopmental Disorders

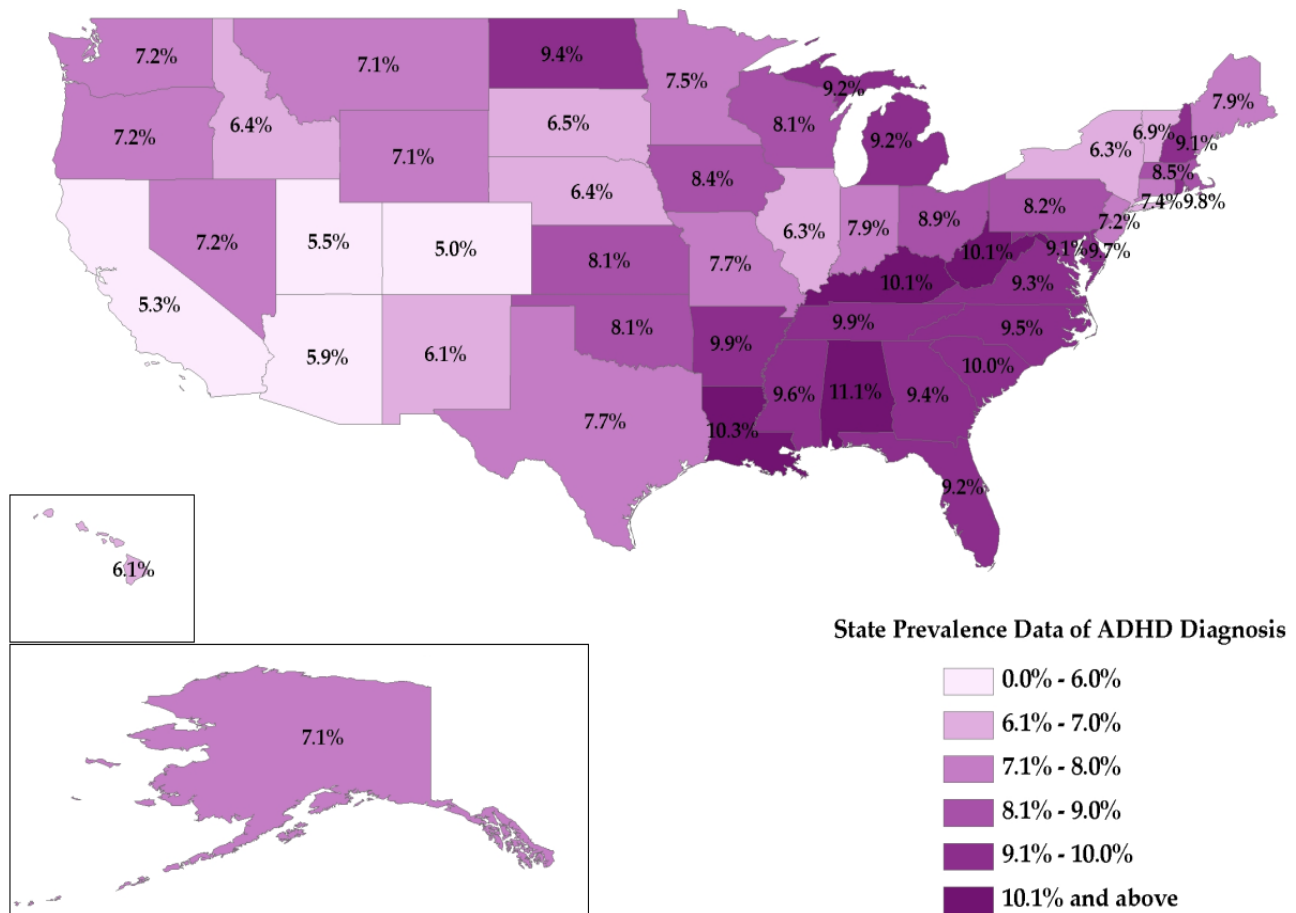
Neurodevelopmental disorders (NDs) include a number of conditions that affect a child’s mental, emotional, and physical development. Some of these disorders are autism spectrum disorders, attention deficit hyperactivity disorders, learning disabilities, sensory deficits, developmental delays, cerebral palsy, and mental retardation. The causes for many NDs are not fully understood but are believed to be related to genetics and, to a lesser extent, environmental factors.

Nationally, an estimated 3-8 % of infants born per year will have an ND (Woodruff T. A., 2004). It is possible that recent increases in NDs are due to better public awareness,

changes in diagnostic criteria, and improved eligibility for special education services. At the same time, there is increasing concern over the potential effects that environmental exposures may have on the rate of NDs.

Several chemicals, both natural and synthetic, have been shown to have neurotoxic effects. These include lead, manganese, mercury, polychlorinated biphenyls (PCBs), environmental tobacco smoke, air pollutants, pesticides, and arsenic. This list represents just a few of the industrial chemicals that have been tested for their effects on children’s neurodevelopment. When children are exposed to neurotoxins during critical periods of development, their

Figure 21: Percent of Youth 4-17 ever diagnosed with ADHD (CDC, 2010)



risk for developing NDs increases. Some people's genetic makeup may increase their susceptibility to toxic chemical exposure (EPA, 2009).

How are we doing?

Attention deficit/hyperactivity disorder (ADHD) and autism spectrum disorders (ASDs) are among the most common NDs in Utah and across the country.

Attention deficit/hyperactivity disorder

The core symptoms of ADHD are inattention, hyperactivity, and impulsivity that cause significant difficulties both at home and in school. With proper support, most children with ADHD can make steady gains and even outgrow their need for ongoing treatment (Mayo Clinic Staff, 2009). Utah's rate of ADHD diagnosis among children aged 4-17 is lower than that among other states. Similarly, a smaller percentage of children in Utah are prescribed medication to treat ADHD (CDC, 2010).

Autism spectrum disorders

ASDs are a group of three conditions that are characterized by deficits in social skills, communication and by the presence of

unusual interests and repetitive behaviors. The severity of these varies widely from individual to individual. About one in 110 children in the United States has an ASD (CDC, 2009).

What is being done?

The Bureau of Children with Special Health Care Needs within the UDOH serves children who have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions. Bureau programs work

to reduce preventable death, disability, and illness by facilitating access to screenings, diagnostic evaluations, specialty health care, and case management (Utah Bureau of Children with Special Health Care Needs, 2010).

The Department of Pediatrics at the University of Utah is leading one of the first seven sites piloting the National Children's Study. This study will follow more than 100,000 children from

before birth until age 21. Scientists will examine neighborhoods, schools, genetics, food and water, chemical exposures, as well as children's behavioral and social environments to determine the causes of neurodevelopmental and other childhood disorders (U of U Department of Pediatrics, 2010).

WHAT CAN I DO?

Educate yourself, especially if you are pregnant or may become pregnant. Talk to your doctor about neurodevelopmental disorders and how you can protect your child.

You can also find information online:

- Utah Birth Defect Network:
<http://health.utah.gov/birthdefect>
- Center for Disease Control and Prevention:
www.cdc.gov
- National Institutes of Health:
www.nih.gov
- Utah Registry of Autism and Developmental Disabilities:
<http://health.utah.gov/autism/>

3.5 Unintentional Injuries

Children are particularly susceptible to injury because their curiosity and desire to experiment often develop ahead of their ability to understand risks and respond to danger. Additionally, certain physical aspects make them more vulnerable and prone to injury. A child's skin burns more deeply and quickly than an adult's. A child's smaller airway makes it easier for objects to get caught and increases the likelihood of choking (Peden, 2008).

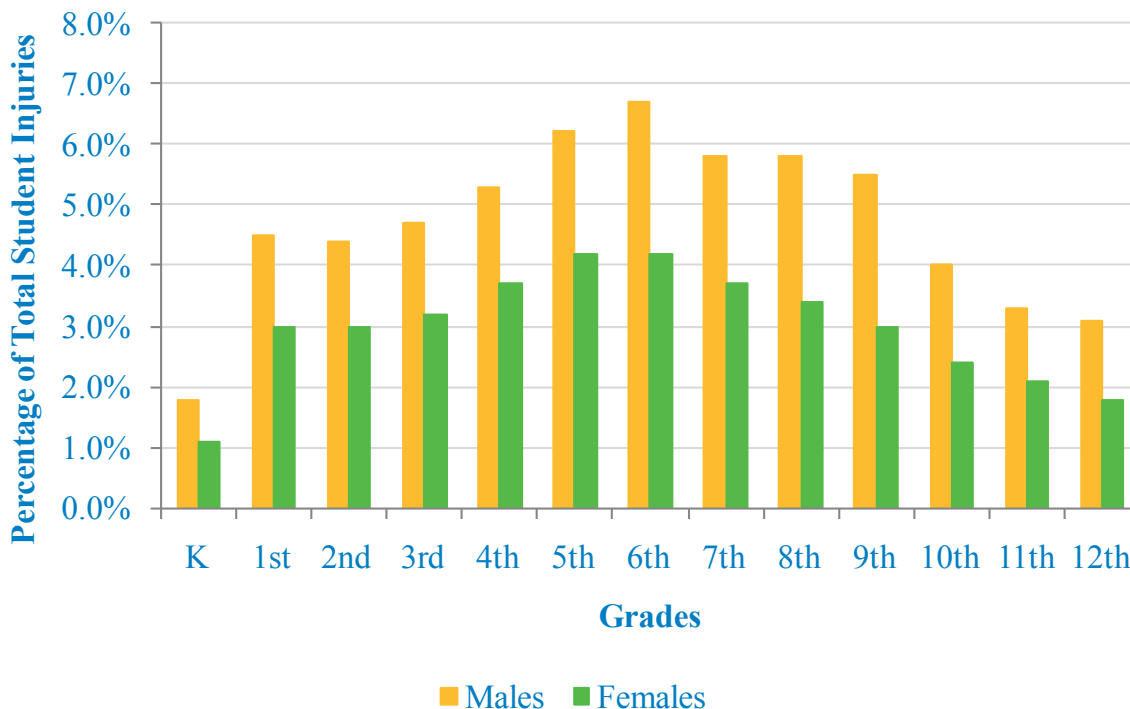
Unintentional injuries are a leading cause of death and disability among children in Utah. There were 819 unintentional injury deaths among Utah children aged 0-17 from the years 1999 to 2008 (UOVRS, 2010). At the same time, there were 12,666 unintentional injury hospitalizations among children aged 0-17 (UOVRS, 2010) and 924,143 emergency department visits for unintentional injuries (UVIPP, 2010).

In most cases, though, unintentional injuries can be prevented, often through changes in a child's environment. For example, fencing in and covering swimming pools decreases the likelihood of drowning (Peden, 2008).

How are we doing?

Healthy People 2010 identifies injury and violence as one of ten leading health indicators (DHHS, 2000). Since the year 1999, the United States' rate of unintentional injury death has increased while Utah's rate has remained essentially unchanged (UVIPP, 2009). For the years 2000 to 2005, Utah had 13.7 unintentional injuries per 100,000 children aged 0 to 19. This was below the national rate of 15.0 per 100,000 children (Borse, 2008).

Figure 22: Percentage of total student injuries by gender and grade, 1990-2005 (UVIPP, 2007)



What is being done?

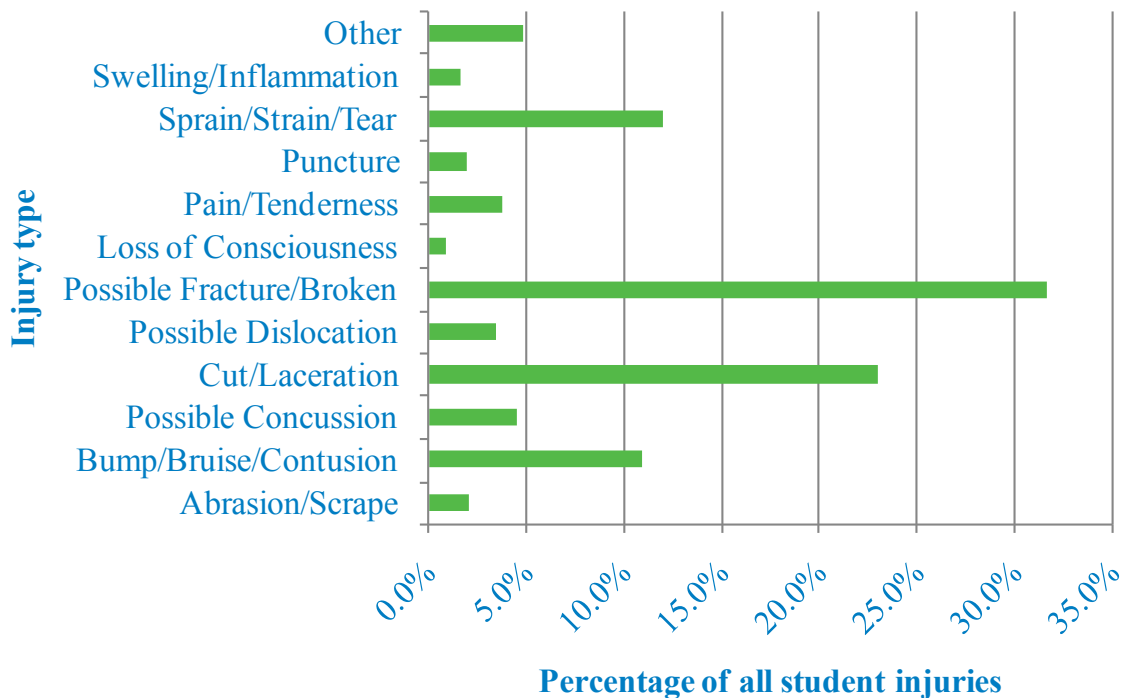
The UVIPP collaborates with local health districts, the Utah Department of Public Safety, Primary Children’s Medical Center and other agencies to promote safe practices and injury prevention. These programs promote seat belts, child safety seats, booster seats, helmets and other safe practices (UVIPP, 2009).

What can I do?

There are many ways you can keep your children safe from unintentional injuries. Many small changes in a child’s environment can prevent accidents.

- Install smoke alarms in your home
- Lower your water heater’s thermostat to 120 degrees Fahrenheit or lower to prevent water scalding
- Put secure four-sided fences around pools and hot tubs and any other water (CDC, 2009).
- A child can drown in as little as an inch of water. Do not leave a child unattended in a bath for even a few seconds (Oregon Safe Kids, 2007).
- Prevent falls by using guards on windows, guard rails, and stair gates (CDC, 2009).

Figure 23: Percentage of all student injuries by injury type, Utah, 1999-2005 (VIPP, 2007)



Overview of Utah's Children

Low Birth Weight

Low birth weight poses a significant risk to newborn health. Lower birth rates increase the risk for morbidity and mortality. Children born with a low birth weight generally require more intensive care at birth and are prone to chronic diseases that require special health care and special education services. In Utah, infants that weigh between 3.3 and 5.5 pounds at birth have six times higher medical costs than the average infant. Infants that weigh less than 3.3 pounds at birth can cost up to 85 times more (UMIHP, 2009).

Infant Mortality

The infant death rate is a critical indicator of the health of a population. More than half of Utah's infant mortality is caused by one of three major causes: birth defects (1.22 per 1,000 live births), perinatal conditions:

health problems occurring from the 20th week of gestation to the 28th day after birth (2.07 per 1,000 live births), and Sudden Infant Death Syndrome (0.31 per 1,000 live births) (UMIHP, 2010).

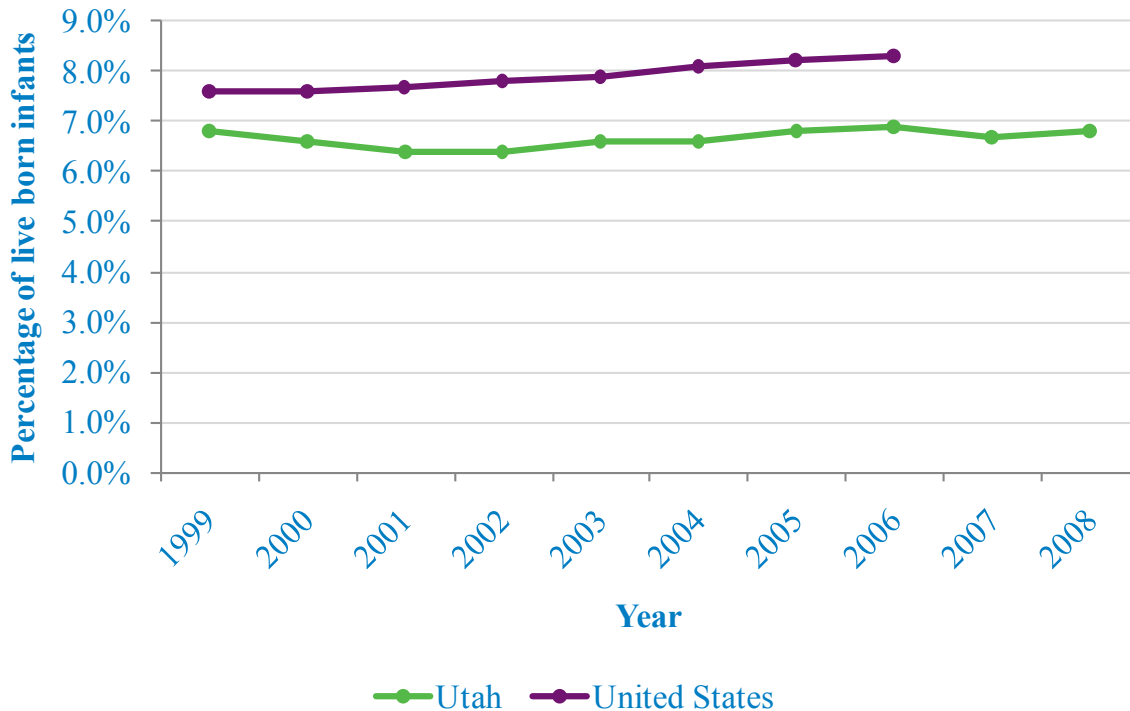
Life Expectancy at Birth

Life expectancy at birth has improved radically over the past century. Life expectancy increased from 48 to 74 years for men, and 51 to 79 years for women between the years 1900 to 2000 (UCHD, 2009). These improvements are largely due to preventive measures such as better food, water, and waste sanitation and the promotion of hygienic practices (Guyer, 2000).

Death Rates

The yearly death rate is the ratio of the people to die in a given year divided by the number who are left alive. In 2008,

Figure 24: Percentage of live born infants with low birth weight, Utah vs. United States, 1999-2008 (UMIHP, 2009)



Utah's death rate (707.9 per 100,000) was significantly lower than that of the United States (810.0 per 100,000). Utah has a lower death rate when compared to the U.S. as a whole. This is attributed to lower rates of tobacco, alcohol, and substance use, lower rates of poverty, and better access to health care (UCHD, 2009).

Education Level

Higher levels of education can improve socioeconomic status, mental health, self-determination, and social and family support systems, all of which directly or indirectly impact health.

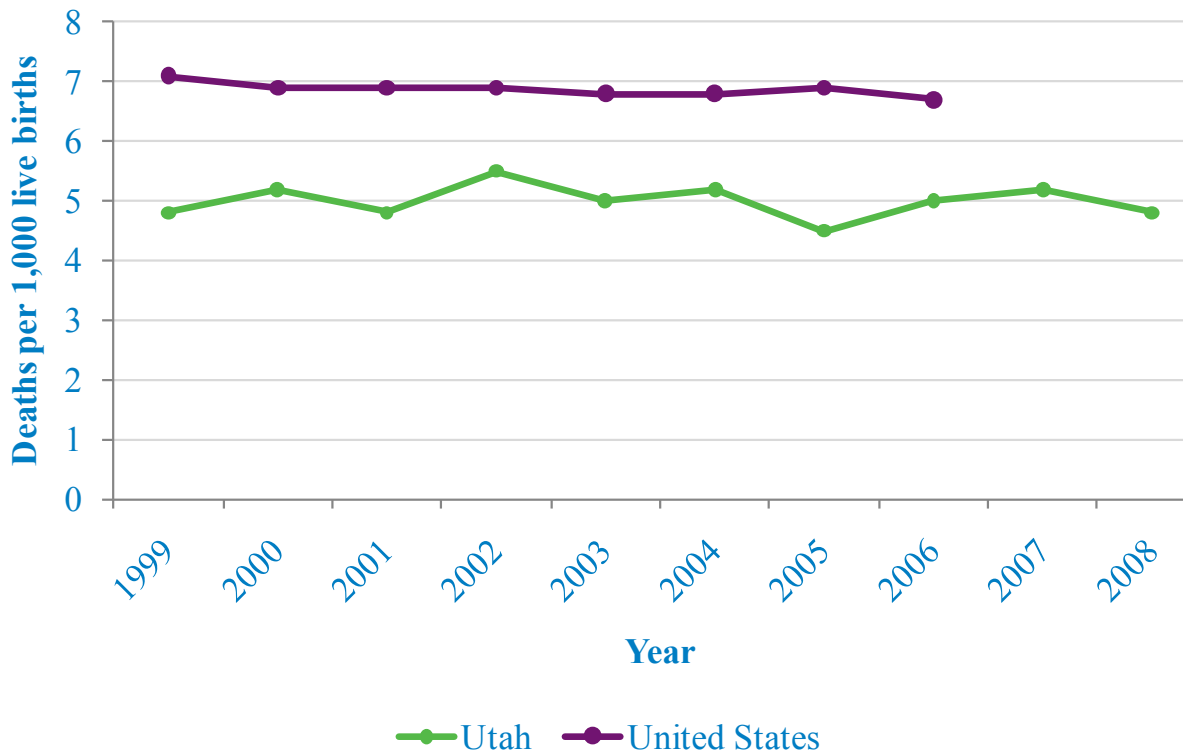
Utah consistently has higher levels of education than the United States as a whole. In 2008, only 9.6% of Utahns aged 25 and older had not completed high

school compared to 15.0% of their U.S. counterparts. Utah continues to increase its education level. In the year 2000, 26.1% of Utahns had a bachelor's or advanced degree; this number had increased to 29.1% by 2008 (UCHD, 2010).

Cost: A Barrier to Health Care

Healthy People 2010 Objective 1:6 is to "reduce the proportion of families that experience difficulties or delays in obtaining health care or do not receive needed care for one or more family members to 7 percent." In 2008, fewer people in Utah (12.0%) than in the United States (13.6%) as a whole reported delaying health care over the past 12 months due to cost (Utah Behavioral Risk Factor Surveillance System, 2009).

Figure 25: Deaths within the first year of life, Utah vs. the United States, 1999-2008 (UMIHP, 2010)



Household Income

Income and health are closely related. People with low incomes are frequently unable to afford health care. Conversely, serious chronic, mental or physical diseases may prevent people from earning a sustainable income.

Utah consistently has a higher median household income than the United States. In 2008, Utah's median income was \$56,633 per household. In the same year, the United States' median household income was \$52,029 (UCHD, 2009).

Children Living in Poverty

Children are particularly vulnerable to the impact of poverty. Children who live below the poverty level are less likely to receive

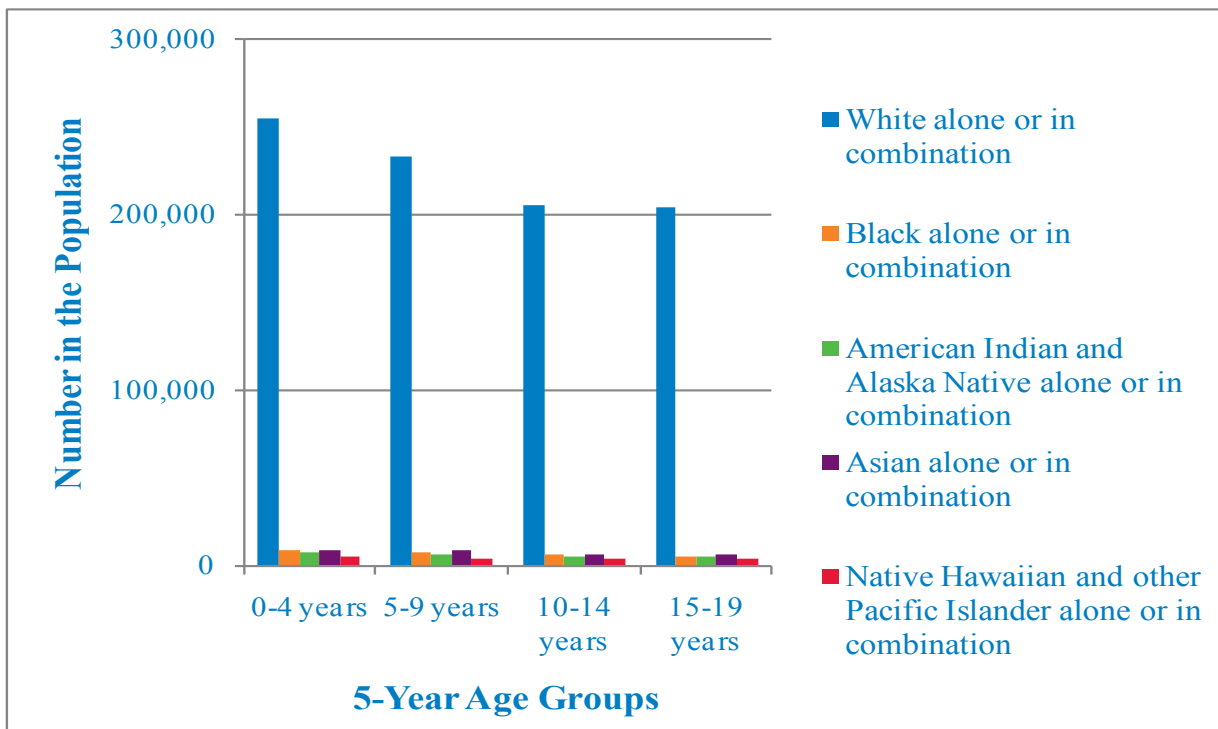
regular health care, proper nutrition, and opportunities for mental development. The poor conditions that are often associated with poverty can lead to increased levels of developmental delays, infant mortality, teen pregnancy, substance abuse, and poor academic achievement.

Utah's levels of child poverty are consistently lower than those for the rest of the country. In 2007, 12.6% of Utah children lived in poverty compared to 18.0% of children living in poverty on a national level (UCHD, 2009).

Health Insurance

People with insurance are more likely to receive regular preventive health care. People without insurance often delay medical treatment because they are unable to afford it. This is particularly dangerous among

Figure 26: Number in the Population by 5-Year Age Groups and Race. Utah, 2009 (UCHD, 2010)



children whose health requires special attention as they continue to develop. As of 2008, Utah ranked 27th in the nation for having the lowest percentage (10.7%) of persons without insurance (UCHD, 2010).

who are not eligible for Medicaid but whose families earn 200% of the poverty level or below. In 2008, approximately 9.5% of Utah children lacked health insurance coverage (Utah Division of Health Care Financing, 2009).

Medicaid and CHIP

Medicaid and the Children’s Health Insurance Program (CHIP) are programs provided by the state and federal government to provide insurance for low income families. Medicaid is available for families living at incomes equal to or lower than 133% of the poverty level. CHIP is available to children

Population Estimates*

	Utah	United States
Total Population (2009)	2,784,572	307,006,550
Children under 18 years old (2008)	31.0%	24.3%
Population, percent change, April 1, 2000 to July 1, 2009	24.7%	9.1%
Racial Subgroups (2008)		
White	92.9%	79.8%
Black	1.3%	12.8%
American Indian or Alaska Native	1.4%	1.0%
Asian and Pacific Islander	2.8%	4.7%
Hispanic or Latino	12.0%	15.4%
White Non-Hispanic	81.7%	65.6%

*(U.S. Census Bureau, 2010)

Figure 1: Average number of days with maximum 8-hour average ozone concentrations over the National Ambient Air Quality Standard by geography, 1997-2007 (EEP, 2009)

Monitoring area	Average number of days
Cache County	1.25
Box Elder County	6.71
Ogden Area	8.71
Layton Area	8.36
Bountiful Area	9.45
East Salt Lake City	6.91
West Valley Area	7.56
Magna Area	9.82
Midvale Area	8.91
South Salt Lake County	7.55
North Utah County	7.73
Central Utah County	4.00
South Utah County	5.10

Figure 2: Average number of days with maximum 8-hour average ozone concentrations over the National Ambient Air Quality Standard by Month, 1997-2007 (EEP, 2009)

Month	Average number of days
May	1.27
June	5.00
July	12.00
August	4.27
September	1.00



Figure 3: Average number of days with PM_{2.5} levels over the National Ambient Air Quality Standard by geography, 1998-2007 (EEP, 2009)

Monitoring area	Average number of days
Cache County	16.60
Box Elder County	3.13
North Weber County	3.71
Ogden Area	3.86
Layton Area	3.71
Bountiful Area	3.78
North Salt Lake County	12.10
West Salt Lake County	9.33
Magna Area	2.33
East Salt Lake County	16.90
South Salt Lake County	6.80
Highland Area	3.00
Lindon Area	10.44
Provo Area	3.10
Spanish Fork Area	2.89

Figure 4: Average number of days with PM_{2.5} levels over the National Ambient Air Quality Standard by month, 1998-2007 (EEP, 2009)

Month	Average number of days
January	8.6
February	5.8
March	1.4
April	0.1
May	0.1
June	0.1
July	1.1
August	0.0
September	0.2
October	0.0
November	2.0
December	7.2

Figure 5: Radon zones by county (EPA, 2010)

County	Radon zone
Beaver	2
Box Elder	2
Cache	2
Carbon	1
Daggett	2
Davis	2
Duchesne	1
Emery	2
Garfield	2
Grand	1
Iron	2
Juab	2
Kane	2
Millard	2
Morgan	2
Piute	1
Rich	2
Salt Lake	2
San Juan	2
Sanpete	1
Sevier	1
Summit	2
Tooele	2
Uintah	1
Utah	2
Wasatch	2
Washington	2
Wayne	2
Weber	2



Figure 6: Age-adjusted lung and bronchus cancer incidence per 100,000, by county, 2003-2007 (UCHD, 2010)

County	Incidence count	Population	Age-adjusted rate per 100,000	95% CI LL	95%CI UL
State Total	2,663	12,744,920	28.53	27.45	29.64
Beaver	16	31,828	53.31	30.47	86.57
Box Elder	48	227,458	24.89	18.34	33.02
Cache	35	516,615	11.09	7.7	15.48
Carbon	43	97,515	40.18	29.05	54.16
Daggett	**	**	**	**	**
Davis	235	1,391,808	24.93	21.79	28.39
Duchesne	25	76,616	36.93	23.76	54.76
Emery	20	52,360	40.84	24.8	63.35
Garfield	5*	23504*	19.64*	6.18*	46.64*
Grand	19	44,050	39.45	23.72	61.66
Iron	63	206,118	38.93	29.89	49.84
Juab	8*	45482*	21.70*	9.33*	42.84*
Kane	16	30,938	41.22	22.95	68.25
Millard	15	66,010	23.82	13.31	39.34
Morgan	**	**	**	**	**
Piute	10*	6850*	101.28*	48.54*	186.33*
Rich	.	10,493	.	.	.
Salt Lake	1,118	4,889,194	31.48	29.64	33.41
San Juan	12	72,618	20.28	10.44	35.51
Sanpete	31	127,547	28.7	19.5	40.75
Sevier	36	98,808	36.87	25.76	51.15
Summit	19	180,729	14.47	8.35	23.34
Tooele	56	262,075	31.11	23.41	40.53
Uintah	58	135,679	49.4	37.46	63.92
Utah	212	2,293,858	17.05	14.81	19.53
Wasatch	15	100,695	18.97	10.49	31.58
Washington	215	630,017	29.4	25.53	33.68
Wayne	**	**	**	**	**
Weber	323	1,065,764	36.56	32.67	40.79

* Use caution in interpreting when the estimate has a count greater than 5 and lower than 15. It does not meet UCR standards for reliability. Consider aggregating years to decrease the relative standard error and improve the reliability of the estimate.

** The estimate has been suppressed because the numerator is lower than 5 and the denominator is lower than 1000. Consider aggregating years to increase the numerator or denominator and improve the reliability of the estimate.

Figure 7: Percentage of children under 18 who had been exposed to cigarette smoke at home, by local health district, 2006-2008 aggregated (UTPCP, 2010)

Local Health District	Percentage of children	CI LL	CI UL
Bear River	1.9%	0.6%	5.2%
Central	5.9%	3.6%	9.4%
Davis County	1.0%	0.5%	2.3%
Salt Lake Valley	2.6%	1.6%	4.2%
Southeastern	7.4%	4.7%	11.6%
Southwest	2.1%	0.7%	5.9%
Summit	2.8%	1.3%	5.9%
Tooele	5.4%	3.2%	8.8%
TriCounty	7.3%	4.1%	12.6%
Utah County	1.4%	0.7%	2.7%
Wasatch	2.4%	1.1%	5.2%
Weber-Morgan	4.6%	2.7%	7.9%

Figure 8: Women reporting smoking in the third trimester of pregnancy, Utah, 1999-2008 (UMIHP, 2009)

Year	Percent of women reporting third trimester smoking	CI LL	CI UL
1999	6.2%	4.7%	8.0%
2000	7.3%	5.7%	9.3%
2001	7.7%	6.4%	9.3%
2002	6.8%	5.2%	8.7%
2003	3.9%	2.9%	5.2%
2004	4.7%	4.5%	4.9%
2005	4.3%	4.2%	4.5%
2006	4.3%	4.2%	4.5%
2007	4.2%	4.0%	4.3%
2008	3.9%	3.7%	4.1%



Figure 9: Percentage of population served by community water systems, 2007 (EEP, 2009)

County	Percentage of population
Beaver	75.8%
Box Elder	99.9%
Cache	87.1%
Carbon	99.9%
Daggett	99.9%
Davis	99.9%
Duchesne	81.2%
Emery	99.9%
Garfield	94.3%
Grand	88.8%
Iron	74.5%
Juab	89.1%
Kane	94.5%
Millard	72.5%
Morgan	56.9%
Piute	91.8%
Rich	76.8%
Salt Lake	99.9%
San Juan	54.1%
Sanpete	74.7%
Sevier	81.8%
Summit	86.6%
Tooele	96.6%
Uintah	83.5%
Utah	93.4%
Wasatch	99.9%
Washington	91.6%
Wayne	95.1%
Weber	95.0%
State	98.2%

Figure 11: Pesticide poisonings by age group, Utah, 2008 vs. 2009 (UPCC, 2010)

Age	2008 Count	2009 Count
<6 Years	692	836
6-12 Years	65	134
13-19 Years	36	73
Unknown	3	7

Figure 12: Pesticide poisonings in children, by type and age, 2009 (UPCC, 2010)

Pesticide Type	<6 Years	6-12 Years	13-19 Years	Unknown Age Child	Total
Fungicides	8	2	0	0	10
Herbicides	134	39	15	0	188
Insecticides	334	66	43	4	447
Repellents	106	19	14	1	140
Rodenticides	254	8	1	2	265
Total	836	134	73	7	1050



Figure 13: Poison ingestion ED visit and hospitalization rates by age group, Utah, 2003-2007 (UVIPP, 2009)

Emergency Department Visits

Age Group	Rate per 100,000	CI LL	CI UL	Numerator	Denominator
<1	22.1	20.3	24.0	568	256,621
1-4 yrs	52.8	51.4	54.2	5,219	9,888,088
5-9 yrs	4.7	4.3	5.1	517	1,098,582
10-14 yrs	11.1	10.4	11.7	1,119	1,008,545
15-17 yrs	48.8	47.0	50.6	2,956	605,756
18-19 yrs	40.4	38.5	42.3	1,811	448,257
20-24 yrs	29.6	28.7	30.6	3,610	1,218,594
25-34 yrs	23.9	23.3	24.6	4,877	2,037,073
35-44 yrs	22.4	21.6	23.1	3,529	1,576,571
45-54 yrs	16.2	15.5	16.8	2,366	1,461,944
55-64 yrs	9.4	8.8	10.0	916	971,146
65+ yrs	8.3	7.8	8.8	892	1,073,743

Hospitalization Visits

Age Group	Rate per 100,000	CI LL	CI UL	Numerator	Denominator
<1	1.7	1.2	2.2	43	256,621
1-4 yrs	1.7	1.4	2.0	168	988,088
5-9 yrs	0.3	0.2	0.4	30	1,098,582
10-14 yrs	1.6	1.4	1.9	163	1,008,545
15-17 yrs	9.7	8.9	10.5	589	605,756
18-19 yrs	10.0	9.0	10.9	446	448,257
20-24 yrs	8.9	8.4	9.4	1,086	1,218,594
25-34 yrs	9.2	8.8	9.6	1,872	2,037,073
35-44 yrs	11.4	10.9	11.9	1,800	1,576,571
45-54 yrs	10.7	10.2	11.2	1,566	1,461,944
55-64 yrs	7.9	7.4	8.5	771	971,146
65+ yrs	7.1	6.6	7.6	764	1,073,743

Figure 14: Poisoning death rates by year, Utah and United States, 1999-2008 (UVIPP, 2009)

Utah

Year	Rate per 100,000	CI LL	CI UL	Numerator	Denominator
1999	12.7	11.2	14.2	249	2,193,006
2000	11.7	10.3	13.1	238	2,246,553
2001	10.8	9.4	12.1	221	2,305,652
2002	15.2	13.6	16.8	318	2,358,330
2003	17.1	15.4	18.8	383	2,413,618
2004	17.8	16.2	19.5	404	2,469,230
2005	19.2	17.5	20.9	451	2,547,389
2006	19.6	17.9	21.3	473	2,615,129
2007	21.3	19.5	23.0	535	2,699,554
2008	19.2	17.6	20.9	500	2,781,954

United States

Year	Rate per 100,000	CI LL	CI UL	Numerator	Denominator
1999	7.1	7.0	7.2	19,741	279,040,181
2000	7.2	7.1	7.3	20,230	281,421,906
2001	7.8	7.7	7.9	22,242	285,112,030
2002	9.2	9.0	9.3	26,435	287,888,021
2003	9.9	9.7	10.0	28,700	290,447,644
2004	10.3	10.2	10.4	30,308	293,191,511
2005	11.0	10.8	11.1	32,691	295,895,897
2006	12.4	12.3	12.5	37,286	298,362,973



Figure 15: Prevalence of Utah children aged 0-5 years with blood lead levels $\geq 10 \mu\text{g}/\text{dL}$, 1996-2008 (EEP, 2009)

Year	Percentage of children with an elevated blood level
1996	4.0%
1997	3.8%
1998	1.2%
1999	1.8%
2000	1.7%
2001	1.7%
2002	1.2%
2003	1.2%
2004	1.4%
2005	1.8%
2006	1.5%
2007	1.1%
2008	0.8%

Figure 16: Emergency department visits due to asthma by age and sex, Utah, 2007 (UAP, 2009)

Age Group	Male			Female		
	Rate per 10,000	CI LL	CI UL	Rate per 10,000	CI LL	CI UL
less than 1	39.6	32.3	47.0	12.3	8.0	16.6
1-4 yrs	70.3	65.3	75.4	37.4	33.7	41.2
5-9 yrs	40.2	36.6	43.7	27.3	24.3	30.3
10-14 yrs	25.0	22.0	28.0	18.3	15.7	21.0
15-17 yrs	13.5	10.7	16.3	21.1	17.5	24.8
18-19 yrs	21.2	16.9	25.6	25.0	20.6	29.5
20-24 yrs	17.4	15.0	19.7	26.9	24.0	29.8
25-34 yrs	12.9	11.4	14.4	31.3	29.0	33.7
35-44 yrs	14.6	12.8	16.5	34.4	31.6	37.3
45-54 yrs	11.4	9.7	13.0	29.4	26.7	32.1
55-64 yrs	12.0	10.0	14.1	18.8	16.2	21.4
65+ yrs	13.7	11.5	16.0	25.0	22.2	27.7

Figure 17: Emergency department visits due to asthma by year, Utah, 2000-2007 (UAP, 2009)

5 year Groups	Month	Average Daily Number
99-03	January	16.7
99-03	February	19
99-03	March	17.2
99-03	April	16.8
99-03	May	15.9
99-03	June	14.1
99-03	July	11.6
99-03	August	12.1
99-03	September	17.2
99-03	October	16.4
99-03	November	17.4
99-03	December	16.6
2004-08	January	16.8
2004-08	February	18.5
2004-08	March	17.4
2004-08	April	17.6
2004-08	May	16.3
2004-08	June	14.1
2004-08	July	12
2004-08	August	13.3
2004-08	September	18.7
2004-08	October	17.6
2004-08	November	17.7
2004-08	December	16.3



Figure 18: Leukemia vs. cancer of the brain and central nervous system incidence among children under 20 by age group, Utah, 2002-2006 (Utah Cancer Control Program, 2009a, 2009b)

Brain and Central Nervous System				
Age Group	Incidence per 100,000	CI LL	CI UL	
0-14	4.2	3.6	5.0	
15-19	2.4	1.5	3.5	
Leukemia				
Age Group	Incidence per 100,000	CI LL	CI UL	
0-14	4.4	3.7	5.2	
15-19	3.6	2.6	5.0	

Figure 19: Percentage of Adolescents who were obese, grades 9-12, Utah vs. United States (PANO, 2009)

Year	Utah	United States
1999	5.4%	10.8%
2001	6.2%	10.5%
2003	7.0%	12.1%
2005	5.6%	13.1%
2007	8.7%	13.0%
2009	6.4%	

Figure 20: Percentage of children who were obese by age group, United States, 1976-1980 vs. 2007-2008 (CDC, 2010)

Grade in School	2007-2008	1976-1980
2-5 years	10.4%	5.0%
6-11 years	19.6%	6.5%
12-19 years	18.1%	5.0%

Figure 21: Percent of Youth 4-17 ever diagnosed with ADHD (CDC, 2010)

State	Diagnosed	State	Diagnosed
United States	7.7%	Montana	7.1%
Alabama	11.1%	Nebraska	6.4%
Alaska	7.1%	Nevada	7.2%
Arkansas	9.9%	New Hampshire	9.1%
Arizona	5.9%	New Jersey	7.2%
California	5.3%	New Mexico	6.1%
Colorado	5.0%	New York	6.3%
Connecticut	7.4%	North Carolina	9.5%
Delaware	9.7%	North Dakota	9.4%
Florida	9.2%	Ohio	8.9%
Georgia	9.4%	Oklahoma	8.1%
Hawaii	6.1%	Oregon	7.2%
Idaho	6.4%	Pennsylvania	8.2%
Illinois	6.3%	Rhode Island	9.8%
Indiana	7.9%	South Carolina	10.0%
Iowa	8.4%	South Dakota	6.5%
Kansas	8.1%	Tennessee	9.9%
Kentucky	10.1%	Texas	7.7%
Louisiana	10.3%	Utah	5.5%
Maine	7.9%	Vermont	6.9%
Maryland	9.1%	Virginia	9.3%
Massachusetts	8.5%	Washington	7.2%
Michigan	9.2%	Washington, DC	6.7%
Minnesota	7.5%	West Virginia	10.1%
Mississippi	9.6%	Wisconsin	8.1%



Figure 22: Percentage of total student injuries by gender and grade, 1990-2005 (UVIPP, 2007)

Grade in School	Males	Females
Kindergarten	1.8%	1.1%
1st	4.5%	3.0%
2nd	4.4%	3.0%
3rd	4.7%	3.2%
4th	5.3%	3.7%
5th	6.2%	4.2%
6th	6.7%	4.2%
7th	5.8%	3.7%
8th	5.8%	3.4%
9th	5.5%	3.0%
10th	4.0%	2.4%
11th	3.3%	2.1%
12th	3.1%	1.8%

Figure 23: Percentage of all student injuries by injury type, Utah, 1999-2005 (VIPP, 2007)

Injury Type	Percentage of Student Injuries
Abrasion/Scrape	2.0%
Bump/Bruise/Contusion	10.9%
Possible Concussion	4.5%
Cut/Laceration	22.9%
Possible Dislocation	3.4%
Possible Fracture/Broken	31.6%
Loss of Consciousness	0.9%
Pain/Tenderness	3.7%
Puncture	1.9%
Sprain/Strain/Tear	11.9%

Figure 24: Percentage of live born infants with low birth weight, Utah vs. United States, 1999-2008 (UMIHP, 2009)

Year	Utah	United States
1999	6.8%	7.6%
2000	6.6%	7.6%
2001	6.4%	7.7%
2002	6.4%	7.8%
2003	6.6%	7.9%
2004	6.6%	8.1%
2005	6.8%	8.2%
2006	6.9%	8.3%
2007	6.7%	
2008	6.8%	



Figure 25: Deaths within the first year of life, Utah vs. the United States, 1999-2008 (UMIHP, 2010)

Year	Utah	United States
1999	4.8	7.1
2000	5.2	6.9
2001	4.8	6.9
2002	5.5	6.9
2003	5	6.8
2004	5.2	6.8
2005	4.5	6.9
2006	5	6.7
2007	5.2	
2008	4.8	

Figure 26: Number in the population by 5-Year Age Groups and Race, Utah, 2009 (UCHD, 2010)

5-Year Age Groups	White alone or in combination	Black alone or in combination	American Indian and Alaska Native alone or in combination	Asian alone or in combination	Native Hawaiian and other Pacific Islander alone or in combination	Total
0-4 years	255,379	8,183	6,656	8,946	4,625	283,789
5-9 years	233,103	7,701	5,783	7,958	4,029	258,574
10-14 years	205,890	6,247	4,735	6,331	3,226	226,429
15-19 years	203,945	5,009	5,311	6,042	3,167	223,474

Photograph Citations

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- G. Mercury discharge tube. Spectrum = gas discharge tube filled with mercury Hg. Used with 1, KV, 18mA, 35kHz. ~8" length. Adapted from a photo by Heinrich Pniok., October 4, 2006. Altered by Heinrich Pniok, July 18, 2010. Retrieved, August 18, 2010, from Wikimedia Commons: http://commons.wikimedia.org/wiki/File:Mercury_discharge_tube.jpg
- H. Maximum mercury thermometer. Left – technical, right – medical. Adapted from photo by Eitan f, November 7, 2007. Retrieved, August 18, 2010, from Wikimedia Commons: http://commons.wikimedia.org/wiki/File:Thermometer,_max.JPG



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