

Asthma in Homes: Exposure to Triggers and Use of Modifications

Utah Department of Health
Asthma Program
288 North 1460 West
PO Box 142106
Salt Lake City, UT 84114-2106
health.utah.gov/asthma

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Executive Summary

Asthma is an important public health issue. It is responsible for about 10.5 million missed school days and 14.2 million missed work days in the United States (Asthma's Impact on the Nation, 2014). Asthma affects about 8.7% of adults and about 6.4% of children in Utah (2014) (Utah Fast Stats). An important strategy in controlling asthma is to reduce or eliminate asthma triggers that may cause or make symptoms worse. Indoor environmental modifications or changes such as using mattress and pillow covers can reduce exposure to triggers.

This report utilizes data from the Utah Asthma Call-back Survey (ACBS) to highlight the burden of common asthma triggers among adults and children with asthma in Utah. Trigger data assesses the prevalence of potential triggers in the home; not necessarily if that trigger is an asthma trigger for the respondent. This report is intended to identify populations with a high trigger burden and low usage of trigger modification techniques like pillow and mattress covers. Findings will assist currently funded local health departments (LHDs), Utah County LHD and Salt Lake County (SLC) LHD, in targeting their resources to populations with a high asthma burden.

Key findings

- Glendale had the highest prevalence of two or more triggers reported in the home (59.5%) for those with asthma in SLC LHD and North Orem had the highest prevalence (48.2%) for Utah County LHD. Results were not statistically different than other Utah Small Areas in those LHDs.
- Asthma triggers most commonly reported were carpet or rugs in the bedroom (76.2%), pets allowed in the house and bedroom (59.1%, 74.5%), and mold (8.2%).
- About 40% of those with asthma reported two or more asthma triggers in their home.
- Those with three or more indoor home triggers (36.2%) had a higher prevalence of missing at least one day of school/work/usual activity in the past year due to asthma than those with two or less (26.8%) triggers, although results were not statistically significant.
- Most people with asthma do not use common indoor environmental modifications like pillow (82.0%) and mattress (75.7%) covers.

Recommendations

- LHD partners should target the following areas with the Utah Asthma Home Visiting Program to reduce exposure to indoor home triggers.
 - » SLC LHD
 - Glendale
 - Kearns V.2
 - » Utah County LHD
 - North Orem
- LHD partners should be prepared to purchase mattress and pillow covers for about 90% of their program participants.
- LHD partners should be prepared to assist program participants in remediating several indoor home triggers, most likely carpet/rugs in the bedroom, pets in the house and bedroom, and mold.

Introduction

Asthma is an important public health issue because it is responsible for about 10.5 million missed school days and 14.2 million missed work days in the United States (Asthma's Impact on the Nation, 2014). It affects about 8.7% of adults and 6.4% of children in Utah (2014) (Utah Fast Stats). In 2013, costs for emergency department (ED) visits associated with asthma in Utah were about 28.5 million dollars.

Currently, there is no cure for asthma, but through the use of appropriate medication, routine doctor visits, and the reduction of trigger exposures it can be controlled, thereby preventing asthma-related ED visits and hospitalizations. An important strategy in controlling asthma is to reduce or eliminate person-specific asthma triggers that cause or make symptoms worse. Everyone responds differently to potential asthma triggers. Common triggers include: dust mites, mold, pests, household pets, pollen, grass, outdoor air pollution, smoke from burning wood or grass, infections linked to the flu or colds, physical exercise, strong emotions, and tobacco smoke (Common Asthma Triggers, 2012). Environmental modifications or changes such as using mattress and pillow covers and washing linens and bedding in hot water can reduce exposure to triggers that are more difficult to avoid, such as dust mites and other airborne allergens. The most effective environmental change is to reduce exposure to tobacco smoke. A physician or allergy/asthma specialist can help determine person-specific asthma triggers and discuss possible ways to reduce exposures.

The purpose of this report is to help funded LHDs, SLC LHD and Utah County LHD, identify populations that have a high asthma burden in order to target participants for the Utah Asthma Home Visiting Program (for more information on this program, contact asthma@utah.gov). This report will identify populations and Utah Small Areas (Appendix 1) with a high asthma trigger burden and a low usage of indoor modifications (i.e. pillow and mattress covers). As part of the Utah Department of Health Asthma Program's mission to provide comprehensive asthma care, LHDs will identify geographic areas in which to target services.

Data

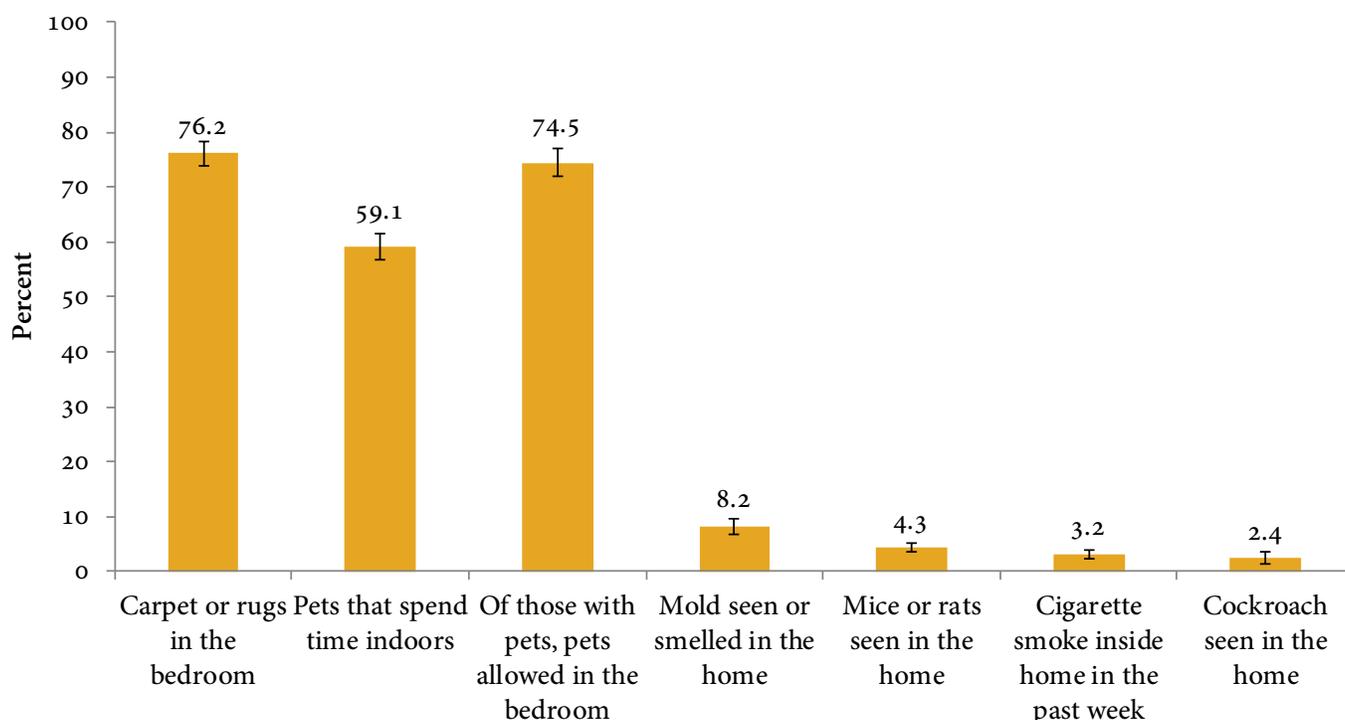
Data in this report came from the Utah Behavioral Risk Factor Surveillance System Asthma Call-Back Survey (2009-2014) (ACBS) and includes adults and children with asthma. The ACBS is conducted each year and is a representative survey of people with asthma in Utah. The ACBS assesses many components of asthma, including exposure to asthma triggers and environmental modifications. In this survey, adults with asthma and the guardians of children with asthma are asked questions regarding their specific exposures to triggers and their use of home environmental modifications or changes. Data on triggers assesses the prevalence of potential triggers in a home; not necessarily if that trigger is an asthma trigger for the respondent.

A variable was created to measure the amount of indoor home triggers for each respondent. Another variable was created to measure outcomes related to poor asthma control. The indoor home trigger variable was created from the CDC's list of the most common triggers (<http://www.cdc.gov/asthma/triggers.html>). These included mold, indoor pets, pets allowed in the bedroom, cockroaches, exposure to second-hand tobacco smoke in the home, and mice/rodents. If a respondent answered yes to having been exposed to one of these triggers in the past 30 days it was counted as one exposure. Trigger exposures were added up to create a trigger count variable with the categories of 0 triggers, 1 trigger, 2 triggers, and 3+ triggers. Other triggers assessed on the ACBS but not included in this report because they were not listed as CDC common triggers

include: exposure to gas used for cooking; wood burning fireplace; and use of unvented gas logs, fireplaces, or stoves in the home. Other common triggers not assessed on the ACBS survey include: infections linked to the flu, colds, sinus infections, allergies, breathing in chemicals, acid reflux, physical exercise, some medicines, poor air quality, air that is cold or dry, fragrances, and strong emotions (Common Asthma Triggers, 2012). Poor asthma outcomes were measured using missed school days for children aged 0-18 (at least one day in the past 12 months due to asthma) and missed work or usual activities for adults aged 18+ (at least one missed day in the past 12 months due to asthma). These variables were combined into one variable. Although this variable measures different activities for children and adults, it does measure the age appropriate outcome for poor asthma control and therefore can be used as indicator of poor asthma control.

Results

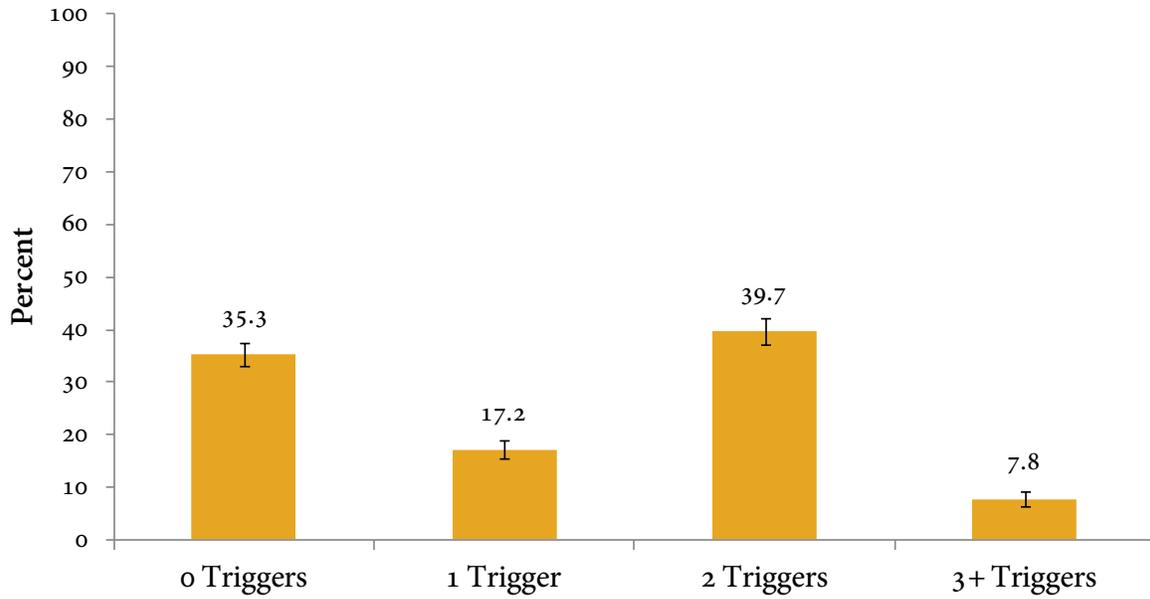
Figure 1. Asthma Triggers in the Homes of Those with Asthma, Utah, 2009-2014



Source: Utah Behavioral Risk Factor Surveillance System, Asthma Call-back Survey, 2009-2014.

- The most common asthma trigger in Utah was carpet or rugs in the bedroom (76.2%).
- The second most common trigger in Utah was pets that spend time indoors (59.1%) of which 74.5% reported allowing their pets into the bedroom.
- Mold was reported in 8.2% of homes for those with asthma and was more common than mice or rats seen in the home (4.3%), cigarette smoke inside the home in the past week (3.2%), and cockroach seen in the home (2.4%).

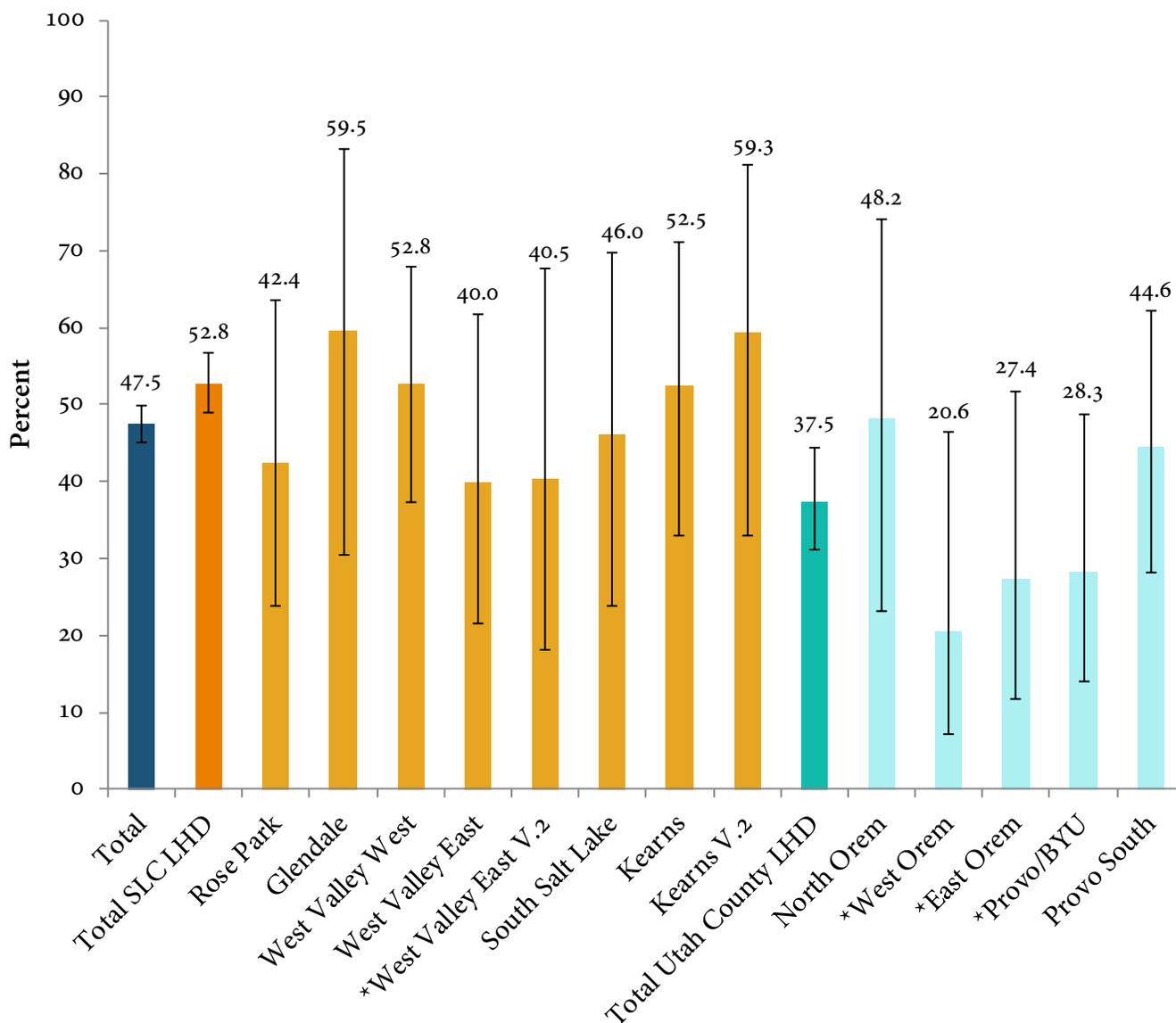
Figure 2. Number of Asthma Triggers in the Homes of Those with Asthma, Utah, 2009-2014



Source: Utah Behavioral Risk Factor Surveillance System, Asthma Call-back Survey, 2009-2014.

- Of those with asthma, 35.3% reported no indoor triggers.
- About 40% of those with asthma reported having two triggers in their home.
- About 8% of those with asthma reported having three or more triggers in their home.
- About 64% (addition of all trigger categories) of those with asthma reported at least one trigger in their home.

Figure 3. Two or More Triggers in the Homes of Those with Asthma by Utah Small Area, Salt Lake and Utah County LHD, 2009-2014

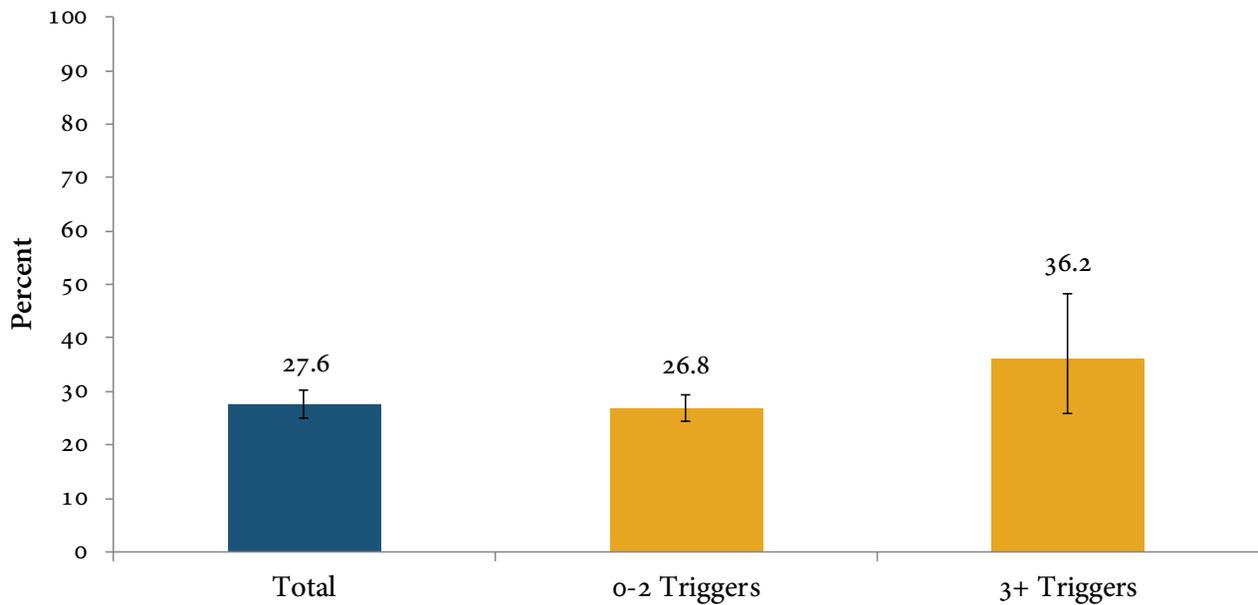


Source: Utah Behavioral Risk Factor Surveillance System, Asthma Call-back Survey, 2009-2014. Age-adjusted prevalence.

*The estimate has a coefficient of variation > 30 and should be interpreted with caution.

- SLC LHD had a higher prevalence of two or more indoor home triggers (52.8%) than the state (47.5%) and Utah County LHD (37.5%).
- The area with the highest prevalence of two or more indoor triggers in SLC LHD appears to be Glendale (59.5%) followed by Kearns V.2 (59.3%); however, results are not statistically different.
- The area with the highest prevalence of two or more indoor triggers in Utah County LHD appears to be North Orem (48.2%) followed by Provo South (44.6%); however, results are not statistically different.

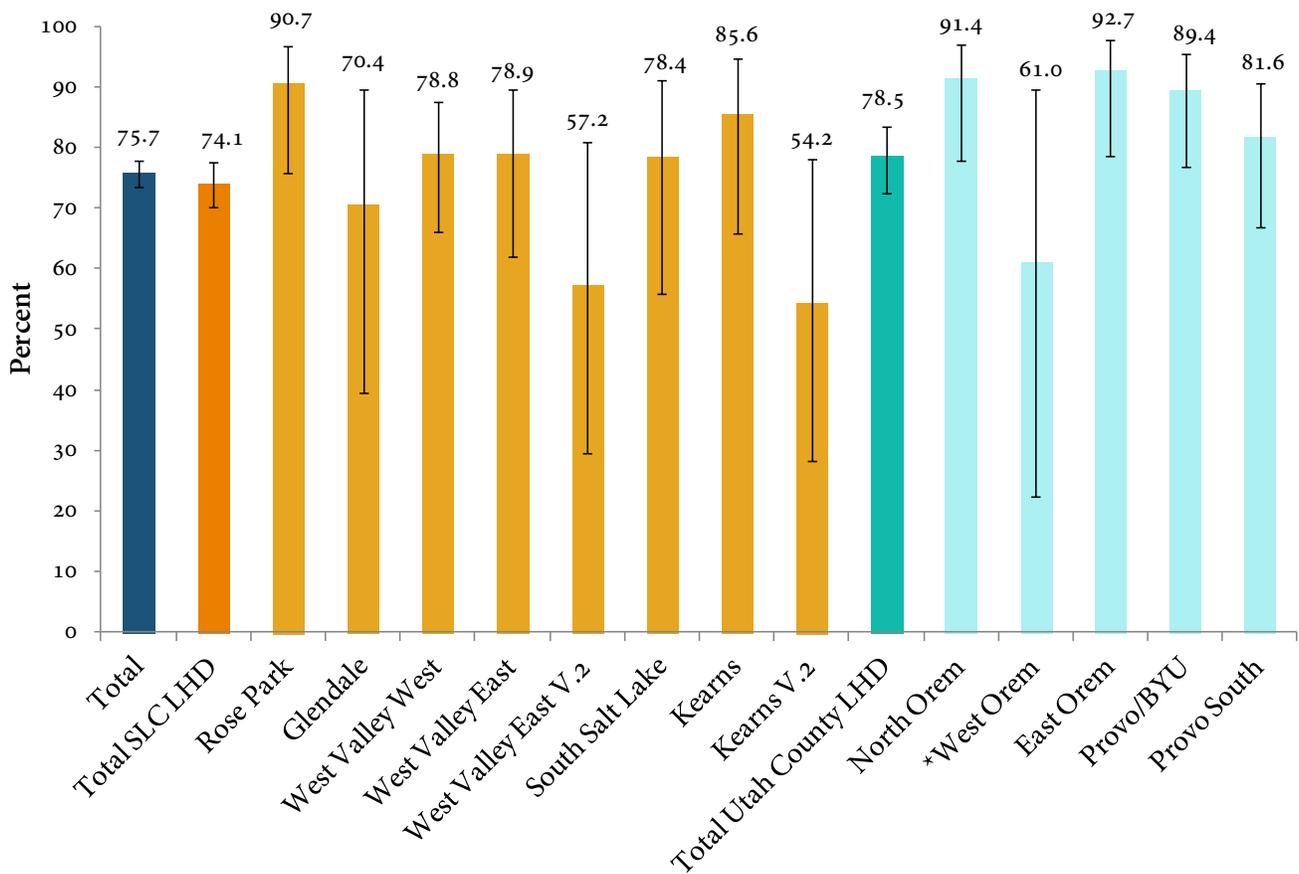
Figure 4. Missed At Least One Day of School, Work, or Usual Activities in the Past 12 Months Due to Asthma by Number of Home Asthma Triggers, Utah, 2009-2014



Source: Utah Behavioral Risk Factor Surveillance System, Asthma Call-back Survey, 2009-2014.

- The total prevalence for missing at least one day of school/work/usual activities in the past year due to asthma was 27.6%.
- About 36% of those who reported three or more triggers in their home also reported missing at least one day of school/work/usual activities in the past year due to asthma.
- Those who reported three or more triggers in their home had a higher prevalence of missing at least one day of school/work/usual activities in the past year due to asthma when compared to those who reported 0-2 home triggers (36.2% vs. 26.8%), although results are not statistically different.

Figure 5. No Mattress Cover Used in the Homes of Those with Asthma by Utah Small Area, Salt Lake and Utah County LHD, 2009-2014

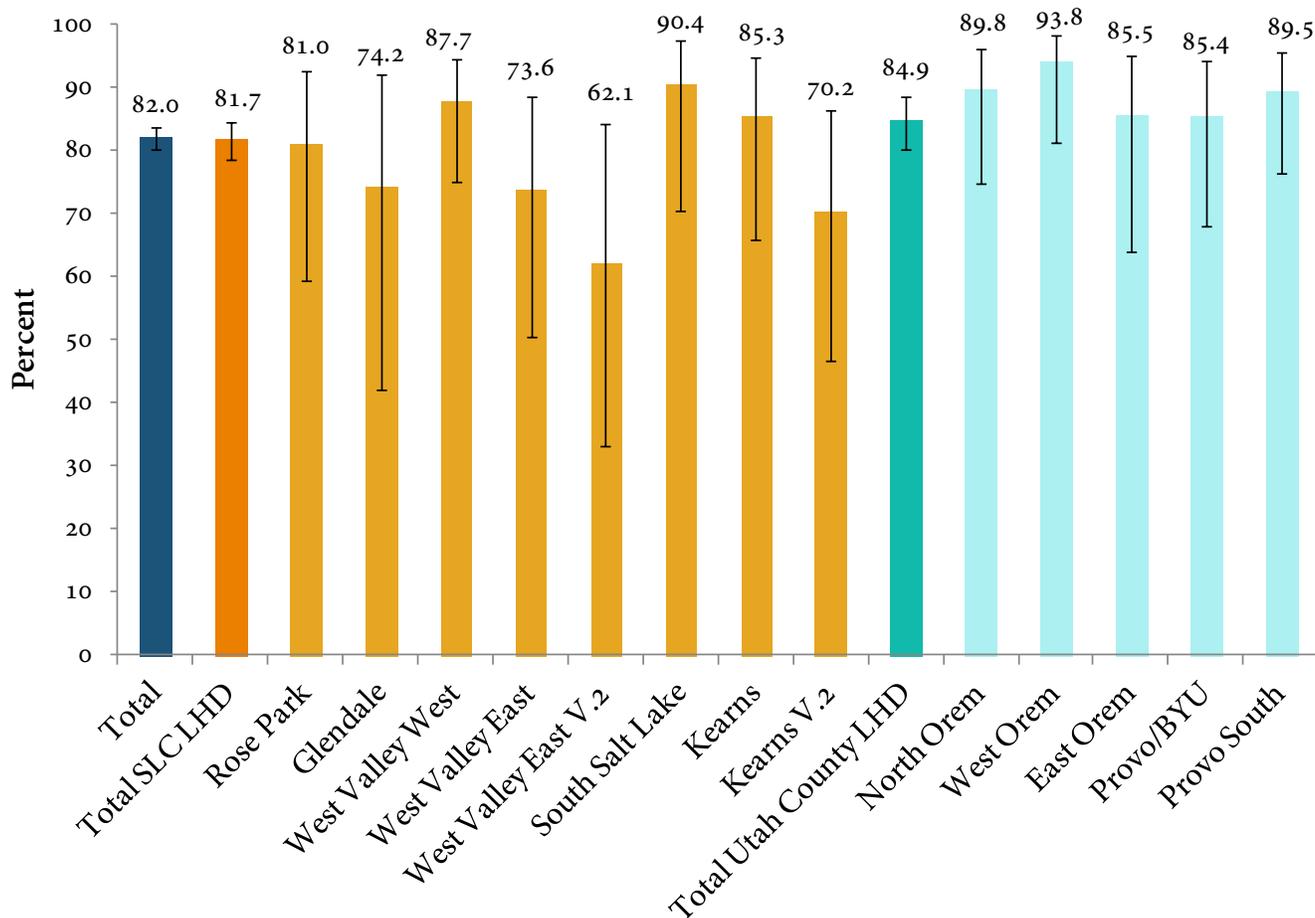


Source: Utah Behavioral Risk Factor Surveillance System, Asthma Call-back Survey, 2009-2014. Age-adjusted prevalence.

*The estimate has a coefficient of variation > 30 and should be interpreted with caution.

- Statewide, 75.7% of those with asthma do not use a mattress cover.
- Utah County LHD had a higher prevalence of those not using a mattress cover when compared to the state and SLC LHD, 78.5%, 75.7%, 74.4%, respectively, although results are not statistically different.
- Rose Park had the highest prevalence of no mattress cover (90.7%) in SLC LHD.
- North Orem had the highest prevalence of no mattress cover (91.4%) in Utah County LHD.

Figure 6. No Pillow Cover Used in the Homes of Those with Asthma by Utah Small Area, Salt Lake and Utah County LHD, 2009-2014



Source: Utah Behavioral Risk Factor Surveillance System, Asthma Call-back Survey, 2009-2014. Age-adjusted prevalence.

- Statewide, 82.0% of those with asthma do not use a pillow cover.
- Utah County LHD had a higher prevalence of those not using a pillow cover when compared to the state and SLC LHD, 84.9%, 81.7%, 82.0%, respectively, although results are not statistically different.
- South Salt Lake had the highest prevalence of no mattress cover (90.4%) in SLC LHD.
- West Orem had the highest prevalence of no mattress cover (93.8%) in Utah County LHD.

Conclusion

Overall, the most common asthma triggers in Utah were carpet in the bedroom, pets allowed in the house and bedroom, and mold. Reducing exposure to home triggers would help improve asthma symptoms. The majority of those with asthma reported not using environmental modifications like pillow and mattress covers. Increasing the use of these modifications would decrease exposure to asthma triggers and help improve asthma symptoms.

A previous report on Utah indoor home triggers and environmental modifications (<http://health.utah.gov/asthma/pdfs/data/triggers.pdf>), found that age was an important factor in trigger exposure. Those aged 18-34, 35-49, and 50-64 are 2.5, 3.0, and 2.1 times more likely to allow pets in the house when compared to those who were 65+, respectively. Furthermore, those who are aged 50-64 (OR: 1.5) and 65+ (OR: 2.9) were more likely than those aged 18-34 to have carpet or rugs in their bedrooms.

The report also found that gender is an important factor in modification use. Women were more likely than men to make changes to their environment. Differences in health beliefs and attitudes about asthma between men and women may contribute to women being more likely to use environmental modifications to reduce exposure to triggers and asthma symptoms. One study found that women with asthma have a higher and more positive attitude toward treatment adherence than men (Sundberg, 2010). Although women were more likely to use an environmental modification, those between the ages of 35-49 (OR: 1.7) and 50-64 (1.6) with asthma were more likely to be advised by a health care professional to make changes to their environments than those aged 18-34.

Asthma is an incurable chronic disease. In order for those with asthma to enjoy a high quality of life, they must control their asthma symptoms. An important component of control is reducing trigger exposures through environmental modifications. One way to accomplish this is for LHD partners to know and understand the geographical, gender, and age-related differences in trigger exposure and use of environmental modifications. This will help them give those with asthma the best possible information on avoiding triggers during their in-home visits.

Appendix 1 - Utah Small Areas and Zip Codes

Salt Lake County Small Areas and Zip Codes

Local Health District	County	#	Utah Small Area	Boundary Designation
Salt Lake County LHD (04)		17	Salt Lake City (Rose Park)	ZIP Codes 84116, 84122
		18	Salt Lake City (Avenues)	ZIP Codes 84103, 84114, 84150
		19	Salt Lake City (Foothill/ University of Utah)	ZIP Codes 84108, 84112, 84113
		20	Magna	ZIP Code 84044
		21	Salt Lake City (Glendale)	ZIP Codes 84101, 84104, 84110, 84180
		22	West Valley (West)	ZIP Codes 84120, 84128, 84170
		23	West Valley (East) [2011 AND BEFORE]	ZIP Codes 84119, 84199 [EFFECTIVE 2011 AND BEFORE]
Salt Lake County LHD (04)—continued		23.1	West Valley (East) V2 [2012 AND AFTER]	Revised ZIP Code 84119; 84199 [EFFECTIVE 2012 AND AFTER]
		24	Salt Lake City (Downtown)	ZIP Codes 84102, 84105, 84111, 84145, 84152
		25	South Salt Lake	ZIP Codes 84115, 84165
		26	Millcreek	ZIP Codes 84106, 84109, 84151
		27	Holladay	ZIP Codes 84117, 84124, 84127
		28	Cottonwood	ZIP Code 84121
		29	Kearns [2011 AND BEFORE]	ZIP Code 84118 [EFFECTIVE 2011 AND BEFORE]
		29.1	Kearns V2 [2012 AND AFTER]	Revised ZIP Code 84118 [EFFECTIVE 2012 AND AFTER]
		30	Taylorsville (East)/Murray (West) [RENAMED FROM TAYLORSVILLE IN 2012]	ZIP Code 84123
		30.1	Taylorsville (West) [2012 AND AFTER]	ZIP Code 84129 (new ZIP Code introduced in 2011) [EFFECTIVE 2012 AND AFTER]
		31	Murray	ZIP Codes 84107, 84157
		32	Midvale	ZIP Code 84047
		33	West Jordan (North) [2008 AND BEFORE]	ZIP Code 84084 [EFFECTIVE 2008 AND BEFORE]
		33.1	West Jordan (Northeast) [2009 THROUGH 2011]	Revised ZIP Code 84084 [EFFECTIVE 2009 THROUGH 2011]
		33.2	West Jordan (Northeast) V2 [2012 AND AFTER]	Revised ZIP Code 84084 [EFFECTIVE 2012 AND AFTER]
		34	West Jordan/Copperton [2008 AND BEFORE]	ZIP Codes 84006, 84088 [EFFECTIVE 2008 AND BEFORE]
		34.1	West Jordan (Southeast) [2009 AND AFTER]	Revised ZIP Code 84088 [EFFECTIVE 2009 AND AFTER]
		34.2	West Jordan (West)/Copperton [2009 AND AFTER]	ZIP Codes 84006, 84081 (new ZIP Code introduced in 2008) [EFFECTIVE 2009 AND AFTER]
		35	South Jordan	ZIP Code 84095
		36	Sandy (Center)	ZIP Codes 84070, 84091, 84094
	37	Sandy (Northeast)	ZIP Codes 84090, 84093	
	38	Sandy (Southeast)	ZIP Code 84092	
	39	Riverton/Draper	ZIP Codes 84020, 84065, 84096 (new ZIP Code introduced in 2006)	

Utah County Small Areas and Zip Codes

Local Health District	County	#	Utah Small Area	Boundary Designation
Utah County LHD (10)		41	Lehi/Cedar Valley	ZIP Codes 84005 (new ZIP Code introduced in 2006), 84013, 84043, 84045 (new ZIP Code Introduced in 2006)
		42	American Fork/Alpine	ZIP Codes 84003, 84004
		43	Pleasant Grove/Lindon	ZIP Codes 84042, 84062
		44	Orem (North)	ZIP Codes 84057, 84059
		45	Orem (West)	ZIP Code 84058
		46	Orem (East)	ZIP Code 84097
Utah County LHD (10) — continued		47	Provo (North)/Brigham Young University	ZIP Codes 84602, 84604
		48	Provo (South)	ZIP Codes 84601, 84603, 84605, 84606
		49	Springville/Spanish Fork	ZIP Codes 84653, 84660, 84663, 84664
		50	Utah County (South)	ZIP Codes 84626, 84633, 84651, 84655

References

Asthma's Impact on the Nation, http://www.cdc.gov/asthma/impacts_nation/asthmafactsheet.pdf

Common Asthma Triggers, <http://www.cdc.gov/asthma/triggers.html>

Sundberg, R. (2010) Asthma in men and women: Treatment adherence, anxiety, and quality of sleep. *Respiratory Medicine*. 104(3): 337-344.