Asthma in Schools: Data from the Utah Prevention Needs Assessment

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Acknowledgments: This report was prepared by Holly Uphold, PhD with assistance from Michael Friedrichs, MS and Kellie Baxter, BS.

Published January 2016. Utah Asthma Program has permission to publish all photographs.

Funding for this publication was provided by the Centers for Disease Control and Prevention, Cooperative Agreement #5U59EH000489, Comprehensive Asthma Control Through Evidence-based Strategies and Public Health - Health Care Collaboration. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

Executive Summary

This report utilizes data from the 2013 Prevention Needs Assessment Survey (PNA) to highlight the asthma burden among Utah youth in grades 6, 8, 10, and 12. This report is intended to identify students with poor asthma control, highlight disproportionately affected groups, and help guide funded local health districts (LHDs), Utah County LHD and Salt Lake County LHD, to target populations in need of asthma resources.

Asthma is an important public health issue for children because it is one of the leading causes of school absences due to illness. Missing school due to asthma can have far-reaching academic and social consequences. Students who miss school due to chronic illnesses like asthma cannot maximize their full academic potential leading to negative impacts on future health and academic success.

Schools play an important role in helping students manage their asthma. Schools that strive to be asthma-friendly and provide a positive social environment will minimize the risk of poor asthma outcomes and thereby be an environment where students with asthma can thrive.

Key findings

- In Salt Lake County LHD, black youth (21.3%) had a higher current asthma prevalence compared to the total (12.2%), other (10.5%), and Hispanic youth (8.1%).
- Although not statistically significant, Hispanic youth had the lowest current asthma prevalence rate in Salt Lake County LHD (8.1%) and Utah County LHD (9.1%).
- Hispanic youth (23.2%) had a higher rate of missing school due to asthma when compared to white youth (13.4%) in Salt Lake County LHD.
- Being female (vs. male), or Hispanic (vs. white), or having had an asthma attack in the past 12 months (vs. none), or having an action plan (vs. none) was related to an increased risk for missing at least one day of school in the past 12 months due to asthma.

Recommendations

- It is recommended that interventions in Salt Lake County LHD target the following areas:
  - West Jordan
  - West Jordan (West) Copperton
- It is recommended that interventions in Utah County LHD target the following areas:
  - North Orem
  - Utah Co. South
- Intervention efforts should also focus on:
  - females
  - black and Hispanic youth
  - youth who have had an asthma attack in the past 12 months
  - youth with an asthma action plan on file at school
- Partners in student health should work together to improve the physical environment and increase opportunities in schools for students to feel valued and safe.

Introduction

The purpose of this report is to help funded Utah Asthma Program (UAP) partners, Salt Lake County LHD and Utah County LHD, identify populations that have a high burden of asthma in order to target strategic interventions. As part of the UAP's mission to provide comprehensive asthma care through guidelines-based medical care and home and school based education and services, LHDs will identify areas and target homes, schools, and clinics within those areas.

School environments can have a profound impact on a student's health, especially those with asthma. The physical environment related to poor indoor air quality and exposure to allergens, dust, and mold can increase the incidence of asthma attacks (Smedje, 2001). Also, school social environments can affect asthma outcomes. Stress is a trigger for asthma attacks and schools that lack warm and supportive atmospheres can become places where students are exposed to high levels of stress which can then lead to an increased risk of poor asthma outcomes (Haczku, 2010). One study found that children with asthma were more vulnerable to poor outcomes when they were exposed to poor school social environments (Murdock, 2014).

Data

Data in this report came from the 2013 Utah PNA. PNA data contain information from Utah students in grades 6, 8, 10, and 12. In 2013, the survey was randomly administered to 6,942 students in Salt Lake County LHD and 3,388 students in Utah County LHD. The survey was administered by school and school district. The overall participation rate in 2013 was 64.8%. PNA data is unique because it provides a sufficient sample to analyze child asthma prevalence by Utah Small Area and race/ethnicity groups.

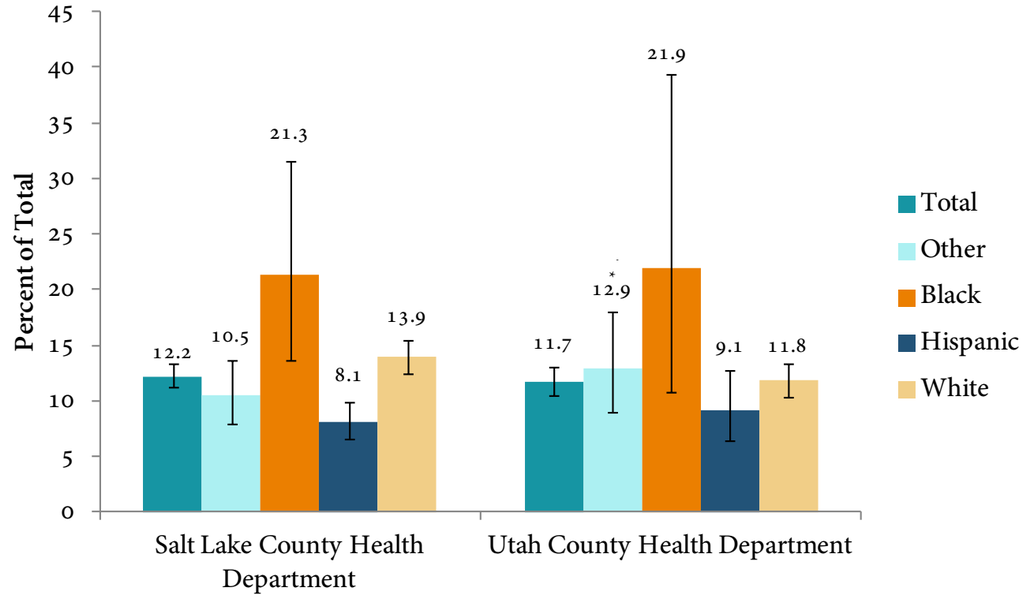
Methods

This report analyzes data by race/ethnicity. Due to small sample sizes several categories were combined to create an "Other" category. The "Other" category includes: American Indian, Alaska Native, Asian, Native Hawaiian, and Other Pacific Islander. This report also analyzes data by Utah Small Areas. The following link provides information on the boundaries and the creation of Utah's Small Areas: http://health.utah.gov/opha/IBIShelp/sarea/UtahSmallAreaInfo.pdf. This information can also be found in Appendix I.

A logistic regression model controlling for sex, grade, and race/ethnicity examined the effect of two asthma management variables (action plan usage and asthma attack in the past 12 months) on missing at least one day of school in the past 12 months due to asthma.

Results

Current Asthma Prevalence by LHD and Race and Ethnicity

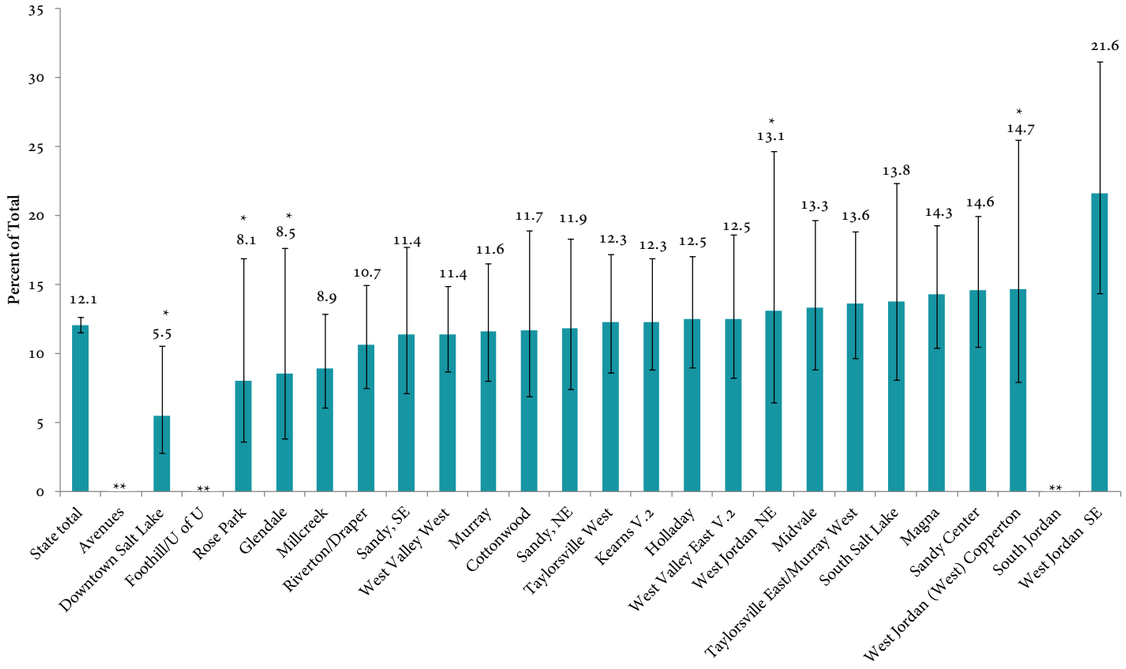


Source: PNA 2013. Grades 6, 8, 10, 12.
*The estimate has a coefficient of variation > 30 and should be interpreted with caution.

All bulleted results are statistically significant unless otherwise noted.

- In Salt Lake County LHD, black youth (21.3%) had a higher current asthma prevalence when compared to the total (12.2%), other (10.5%), and Hispanic youth (8.1%). Black youth (21.9%)* also had the highest prevalence in Utah County LHD.
- Although not statistically significant, Hispanic youth had the lowest current asthma prevalence rate in Salt Lake County LHD (8.1%) and Utah County LHD (9.1%).
- The total asthma prevalence for each area was around 12% with Salt Lake County LHD at 12.2% and Utah County LHD at 11.7%.

Current Asthma Prevalence by Salt Lake County LHD Utah Small Areas



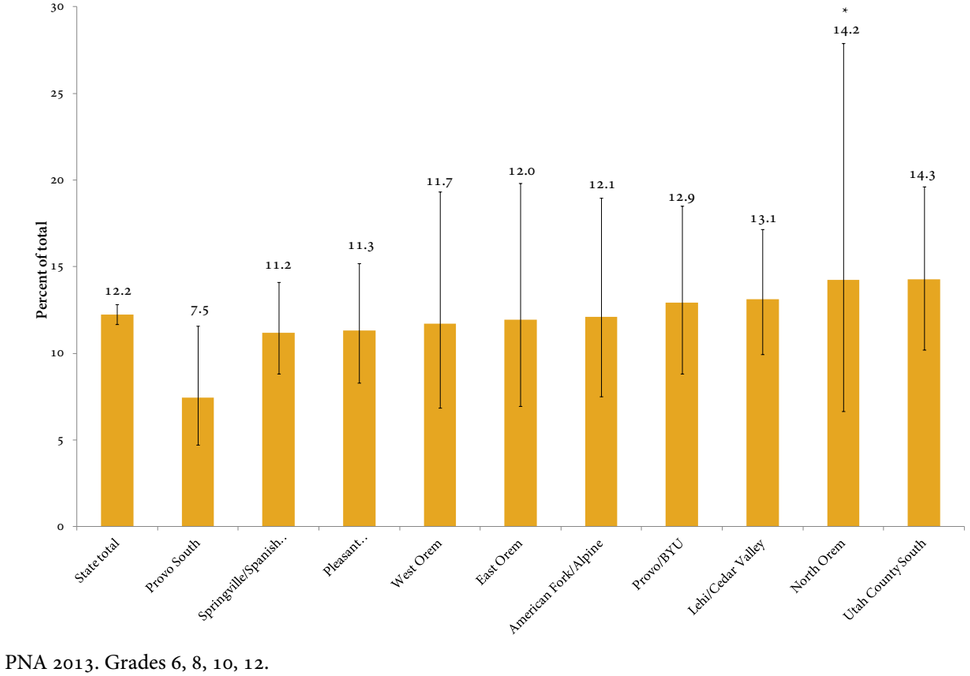
Source: PNA 2013. Grades 6, 8, 10, 12.

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

** The data cannot be reported because the estimate is unreliable. The estimate has a coefficient of variation >50% and does not meet Utah Department of Health standards to report.

- West Jordan SE (21.6%) had a higher current asthma prevalence among youth than the state (12.2%).
- Although not statistically significant, West Jordan (West) Copperton (14.7%)*, Sandy Center (14.6%), and Magna (14.3%) appear to have a higher current asthma prevalence rate among youth when compared to the state total (12.2%).

Current Asthma Prevalence by Utah County LHD Utah Small Areas

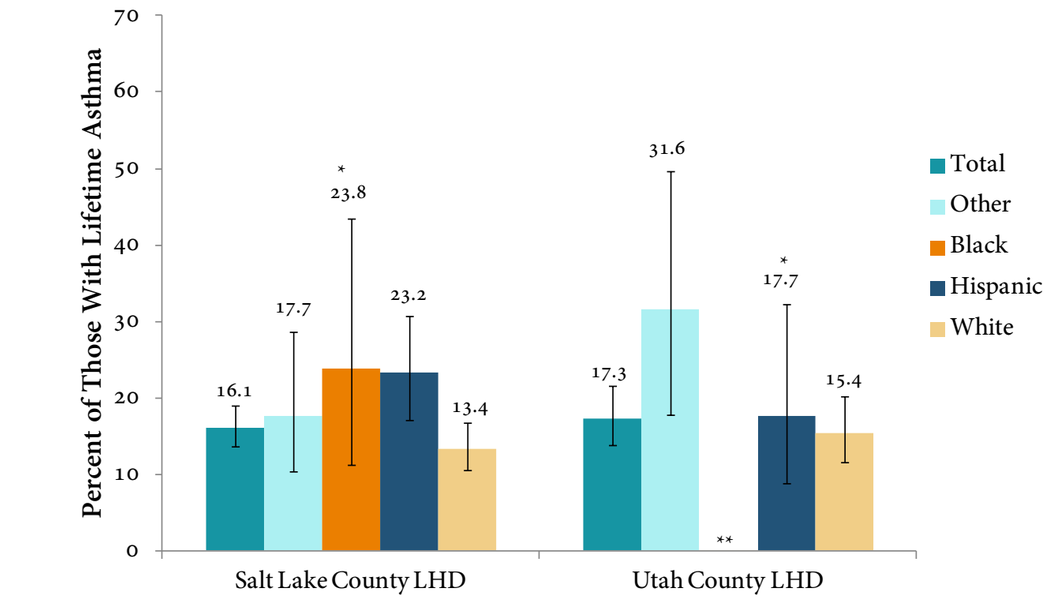


Source: PNA 2013. Grades 6, 8, 10, 12.

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

- Most small areas in Utah County LHD appear to have a similar asthma prevalence rate among youth as the state (12.2%).
- Although not statistically significant, Provo South (7.5%) appears to have a lower asthma prevalence rate among youth than Utah County South (14.3%).

Missed 1-3 Days of School Due to Asthma by LHD and Race and Ethnicity



Source: PNA 2013. Grades 6, 8, 10, 12.

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

** The data cannot be reported because the estimate is unreliable. The estimate has a coefficient of variation >50% and does not meet Utah Department of Health standards to report.

- Hispanic youth (23.2%) had a higher rate of missing school due to asthma when compared to white youth (13.4%) in Salt Lake County LHD.
- Although not statistically significant, "other" youth (31.6%) had a higher rate of missing school due to asthma when compared to white youth (15.4%) in Utah County LHD.
- Utah County LHD (17.3%) and Salt Lake County LHD (16.1%) had similar total rates for missing 1-3 days of school in the past year due to asthma.

Logistic Model

While controlling for sex, grade, and race/ethnicity, regression analysis found that being female, Hispanic, having had an asthma attack in the past 12 months, and having an asthma action plan meant that a child was at higher risk for missing at least one day of school in the past 12 months due to asthma.

- Female youth when compared to males had a 47% increased risk of missing at least one day of school in the past 12 months due to asthma.
- Hispanic youth when compared to white youth had a 60% increased risk of missing at least one day of school in the past 12 months due to asthma.
- Youth who had an asthma attack in past 12 months were four times more likely to have missed at least one day of school in the past 12 months due to asthma when compared to youth who had not had an asthma attack in the past 12 months.
- Youth who had ever been given an asthma action plan were 2.51 times more likely to have missed at least one day of school in the past 12 months due to asthma when compared to youth who had never been given an asthma action plan.

Odds Ratios of Missing at Least 1 Day of School in the Past 12 Months Due to Asthma

	Odds Ratio	95% Confidence Limits	
		Lower Bound	Upper Bound
Female vs. Male	1.47	1.10	2.00
8th grade vs. 6th grade	0.78	0.54	1.11
10th grade vs. 6th grade	0.53	0.35	0.81
12th grade vs. 6th grade	0.38	0.23	0.61
Other vs. White	1.66	1.02	2.70
Black vs. White	1.77	0.77	4.11
Hispanic vs. White	1.60	1.10	2.41
Had an asthma attack in the past 12 months vs. No asthma attack in the past 12 months	4.00	2.98	5.37
Ever given an asthma action plan vs. Never given an asthma action plan	2.51	1.74	3.61
Ever given an asthma action plan vs. Not sure if given an asthma action plan	1.10	0.76	1.59
Highlighted areas represent significantly different effects between groups at the p<.05 level.			

Source: PNA 2013. Grades 6, 8, 10, 12.

Conclusion

Asthma is complex disease that disproportionately affects different groups of children. This report has highlighted some vulnerable populations with a high asthma burden in Utah youth. Hispanic youth are one group that is disproportionately affected by asthma. Although they had a low asthma prevalence, they had the highest prevalence of missing school due to asthma. This suggests that the asthma morbidity is higher among the Hispanic youth population. Females were also more likely to miss school due to asthma when compared to males. Sex differences in asthma outcomes have been attributed to biology and sociocultural differences (Trawick, 2001).

There were few geographical disparities highlighted across Utah Small Areas in Salt Lake County LHD and Utah County LHD. This is likely due to small sample sizes. Most small areas in Utah County did not show any statistically different results for current asthma prevalence. However, a previous analysis completed for Utah County LHD examined asthma-related ED rates by zip code and showed some disparities by zip code when compared to the county as a whole.

The regression results for asthma action plans which showed that youth with an action plan had a higher likelihood of missing school due to asthma seem counterintuitive because asthma action plans are meant to prevent poor asthma outcomes like missed school days. However, a previous evaluation completed by the UAP suggests that asthma action plans may be a marker for poor asthma management and/or disease severity. The evaluation found that healthcare providers in Utah reported giving asthma action plans to only the most severe asthma cases due to the time constraints in creating them and the lack of willingness in patients to use them (Sugiyama, 2011). This evaluation is available at http://health.utah.gov/asthma/pdfs/evaluation/actionplanevaluation.pdf.

Recommendations

Based on the findings of this report, the UAP recommends that Salt Lake County LHD should target future school asthma efforts in West Jordan Utah Small Area. Utah County LHD should target interventions in North Orem and Utah Co. South. Special attention should be paid to racial and ethnic minorities in both areas, especially black and Hispanic youth. Other target groups include: females, youth who have had an asthma attack in the past 12 months, and youth with an action plan on file at school. Factors that can be used to identify students at high risk of missing school due to asthma include those with action plans, those who have previously missed school due to asthma, and those who have had an asthma attack in the past 12 months. Finally, partners in student health should work together to improve resources and opportunities in schools for students to feel valued and safe.

Appendix 1 - 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

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