Utah Health Status Update:
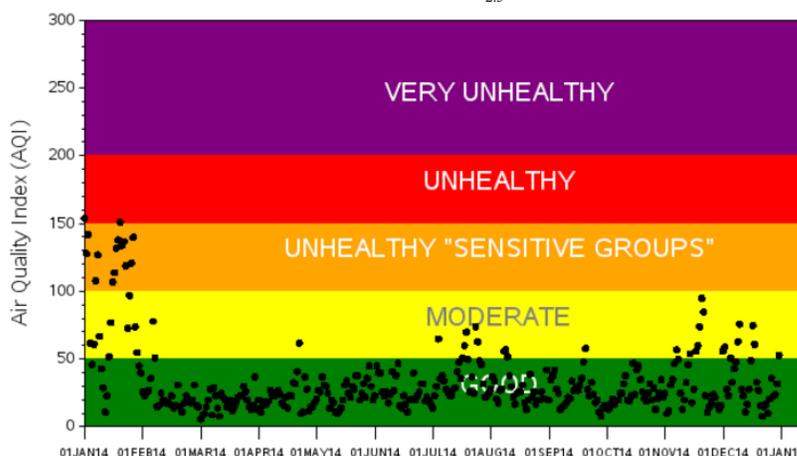## *Air Quality in Utah*

February 2016

Short-term exposure to high levels of ambient air pollution is a well documented cause of adverse health effects, including exacerbation of asthma and increases in emergency room/ emergency department (ER/ED) visits for respiratory conditions. The Utah Department of Health utilized syndromic surveillance data to assess the association between air quality in Salt Lake County and ER/ED visits for selected respiratory conditions. Air quality data for fine particulate matter ($PM_{2.5}$) levels were obtained from the Environmental Protection Agency (EPA) website for the year 2014. Air quality was categorized as good, moderate, unhealthy for "sensitive groups," unhealthy, and very unhealthy according to EPA criteria.[1] Real-time syndromic surveillance data were collected using BioSense 2.0, which was created by the Centers for Disease Control and Prevention (CDC) as a nationwide surveillance system to collect, store, and share electronic data from emergency departments and urgent care centers. The number of ER/ED visits for

KEY FINDINGS

- **Short-term exposure to high levels of ambient air pollution is a well documented cause of adverse health effects, including exacerbation of asthma and increases in emergency room/emergency department (ER/ED) visits for respiratory conditions.**
- **A total of 15 days with air quality levels of unhealthy for "sensitive groups" or worse was observed for $PM_{2.5}$ in 2014, all in the month of January.**
- **The number of ER/ED visits for these 15 days were significantly higher than the number of visits for the rest of the year for COPD, upper respiratory conditions, and respiratory.**
- **Positive correlation between $PM_{2.5}$ levels greater than or equal to 35.5 µg/m³ and the number of ER/ED visits for asthma was statistically significant for these 15 days.**

Daily PM₂.₅ Air Quality Index Values

Figure 1. Daily air quality index values for $PM_{2.5}$ in Salt Lake County for 2014

Source: U.S. EPA AirData, http://www.epa.gov/airdata, generated: 02/09/2016

Days of Poor Air Quality in Salt Lake County, 2014

Table 1. Number of emergency room/emergency department visits for selected respiratory conditions and average levels of $PM_{2.5}$ for days of poor air quality,* Salt Lake County, 2014

Date	Asthma	COPD	Upper Respiratory	Respiratory	PM₂.₅ (µg/m³)
1/1/2014	13	3	93	380	56.58
1/2/2014	8	0	110	418	44.80
1/3/2014	11	0	87	475	44.55
1/7/2014	11	3	93	396	38.20
1/8/2014	7	2	83	335	40.95
1/16/2014	7	0	62	259	38.00
1/17/2014	2	3	69	277	38.45
1/18/2014	7	1	55	262	41.20
1/19/2014	9	2	77	318	43.87
1/20/2014	7	2	69	325	48.83
1/21/2014	5	2	90	295	42.98
1/22/2014	8	1	80	273	46.85
1/23/2014	6	0	65	314	40.40
1/26/2014	7	2	73	299	39.96
1/27/2014	7	1	94	324	46.45

*categorized as unhealthy for "sensitive groups" or worse (35.5+ µg/m³))
Source: U.S. EPA AirData, http://www.epa.gov/airdata, generated: 02/09/2016 and CEDC. BioSense 2.0 <biosen.se>

1. Defined using EPA's Air Quality Index (AQI), http://www.airnow.gov/index.cfm?action=aqibasics.aqi

Air Quality Category	PM2.5
Good	0-12 µg/m³
Moderate	12.1–35.4 µg/m³
Unhealthy for "sensitive groups"	35.5–55.4 µg/m³
Unhealthy	55.5–150.4 µg/m³
Very unhealthy	150.5-250.4 µg/m³
Hazardous	above 250.4 µg/m³

each syndromic surveillance indicator, including asthma, chronic obstructive pulmonary disease (or COPD), upper respiratory infections, and respiratory was used for the analysis.

A total of 15 days with air quality levels of unhealthy for "sensitive groups" or worse was observed for $PM_{2.5}$ in 2014 (Figure 1, Table 1), all in the month of January. Syndromic surveillance data showed similar trends with higher numbers of ER/ED visits related to the aforementioned respiratory conditions in January of 2014 (Figure 2). T-tests showed the number of visits for these 15 days were significantly higher than the number of visits for the rest of the year for selected syndromic indicators: COPD (p-value <0.05), upper respiratory infections (p-value <0.0001), and respiratory (p-value <0.0001). Positive correlation between $PM_{2.5}$ levels greater than or equal to 35.5 µg/m³ and the number of ER/ED visits for asthma was statistically significant for these 15 days (Pearson correlation coefficient=0.53, p-value=0.04). However, there are a number of factors not taken into account in this analysis that can influence ER/ED visits for respiratory conditions, such as temperature and precipitation. Detailed statistical analysis is needed to adjust for confounding factors and interaction among these factors. In addition, expanding the analysis to include multiple years and more jurisdictions would be necessary to ascertain the relationship between statewide air quality and its impact on ER/ED visits.

Syndromic Surveillance Data, Salt Lake County, 2014

Figure 2. Number of emergency room/emergency department visits for selected conditions (asthma, COPD, upper respiratory, and respiratory), Salt Lake County, Utah, 2014
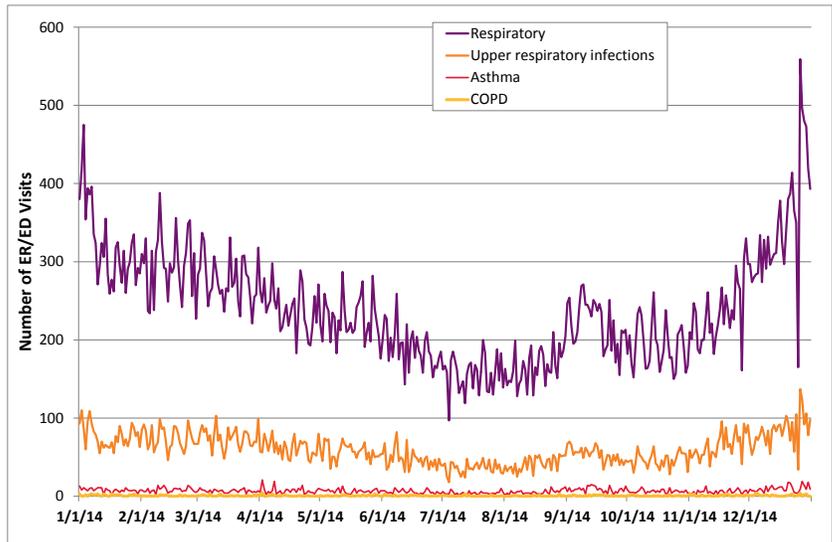
Source: CDC. BioSense 2.0 biosen.se

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Breaking News, February 2016

Influenza

During the 2015-2016 influenza season, Utah influenza-like illness (ILI) activity has remained "minimal." Utah outpatient providers report weekly the total number of patients seen for any reason and the number of patients seen with ILI (defined as a fever ≥ 100° F and a cough or sore throat). These data are used to determine the amount of ILI circulating in the community, as well as provide insight into regional differences in ILI activity.

To date, 104 confirmed influenza-associated hospitalizations have been reported. Influenza hospitalizations are a reportable condition in Utah. A person meets the case definition for an influenza hospitalization if they are hospitalized for any length of time and have an influenza positive serology, DFA, PCR, culture, or rapid influenza diagnostic test. Data from influenza hospitalizations allows public health to better understand subgroups of the Utah population that are most severely affected by influenza and to guide prevention messages and interventions.

Weekly Influenza-like Illness Activity as Measured by the Number of Standard Deviations from the Epidemic Threshold, Utah, Oct. 2011–Jan. 2016

Nationally, and in Utah, both influenza A and influenza B viruses are circulating and are similar to the vaccine virus components for this season's influenza vaccines. It is not too late to get a flu vaccination to prevent illness.
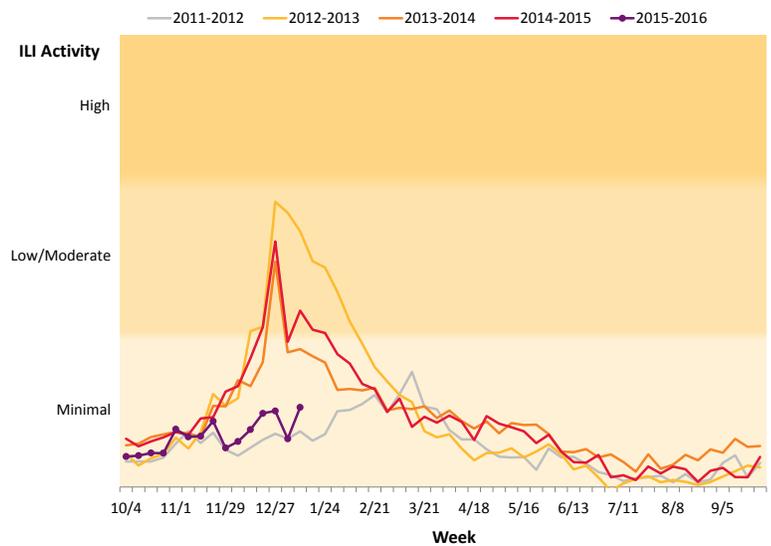
## Community Health Indicators Spotlight, February 2016

Food Insecurity and Pregnancy Outcomes in Utah

Food insecurity is defined as the state of being without reliable access to a sufficient quantity of affordable, nutritious food. To assess how food insecurity affects pregnancy outcomes in Utah, the Pregnancy Risk Assessment Monitoring System (PRAMS) asks women the following question: *During the 12 months before your new baby was born, did you ever get emergency food from a church, a food pantry, or a food bank, or eat in a food kitchen?*

In 2012–2013, 7.5% of respondents (7,400 women) indicated they had sought emergency food during pregnancy. Food insecurity was more likely to be reported by women who had less than a high school education, were unmarried, of non-White race or Hispanic ethnicity, or were living at or below 100% of the federal poverty level. As shown in the accompanying figure, women who noted food insecurity were significantly more likely to deliver a low birthweight infant, have inadequate prenatal care, and report postpartum depression symptoms. Women who reported food insecurity were also significantly less likely to be breastfeeding at the time the PRAMS survey was completed (52.6% vs 71.8%).

The Women, Infants, and Children (WIC) program offers supplemental food and nutrition education for women who meet qualifications. Efforts to educate women on the benefits of WIC enrollment should be a priority. Our analysis found that among food insecure women, 35.6% were not enrolled in the WIC program, despite 91% reporting incomes that would presumably qualify them for the program. More research is needed on why Utah women who appear to qualify for WIC do not enroll in this beneficial program.

Adverse Pregnancy Outcomes by Food Insecurity Status, Utah PRAMS Data, 2012–2013
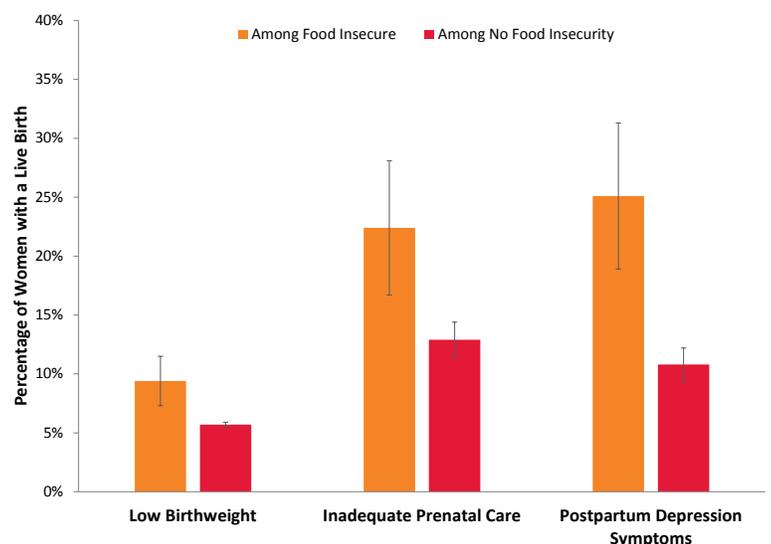
Monthly Health Indicators Report
(Data Through December 2015)

Monthly Report of Notifiable Diseases, December 2015	Current Month # Cases	Current Month # Expected Cases (5-yr average)	# Cases YTD	# Expected YTD (5-yr average)	YTD Standard Morbidity Ratio (obs/exp)
Campylobacteriosis (*Campylobacter*)	16	23	425	491	0.9
Shiga toxin-producing *Escherichia coli* (*E. coli*)	3	3	96	100	1.0
Hepatitis A (infectious hepatitis)	0	1	7	9	0.8
Hepatitis B, acute infections (serum hepatitis)	0	0	10	9	1.1
Influenza*	Weekly updates at http://health.utah.gov/epi/diseases/influenza				
Meningococcal Disease	0	1	2	5	0.4
Pertussis (Whooping Cough)	4	71	418	969	0.4
Salmonellosis (*Salmonella*)	20	21	459	329	1.4
Shigellosis (*Shigella*)	1	3	36	41	0.9
Varicella (Chickenpox)	20	19	200	297	0.7

Quarterly Report of Notifiable Diseases, 4th Qtr 2015	Current Quarter # Cases	Current Quarter # Expected Cases (5-yr average)	# Cases YTD	# Expected YTD (5-yr average)	YTD Standard Morbidity Ratio (obs/exp)
HIV/AIDS†	24	26	89	106	0.8
Chlamydia	2,194	1,878	8,630	7,431	1.2
Gonorrhea	464	200	1,564	692	2.3
Syphilis	13	10	56	49	1.2
Tuberculosis	9	7	37	31	1.2

Medicaid Expenditures (in Millions) for the Month of December 2015	Current Month	Expected/ Budgeted for Month	Fiscal YTD	Budgeted Fiscal YTD	Variance - over (under) budget
Capitated Mental Health	$ 16.0	$ 15.6	$ 86.9	$ 87.1	$ (0.2)
Inpatient Hospital	$ 7.2	$ 6.1	$ 50.6	$ 50.8	$ (0.2)
Outpatient Hospital	$ 2.9	$ 4.1	$ 19.7	$ 22.8	$ (3.1)
Long Term Care	$ 14.6	$ 14.7	$ 92.5	$ 92.8	$ (0.3)
Pharmacy	$ 9.2	$ 9.4	$ 52.3	$ 52.8	$ (0.5)
Physician/Osteo Services	$ 3.0	$ 3.0	$ 19.2	$ 23.5	$ (4.3)
TOTAL MEDICAID	$ 173.0	$ 178.0	$ 1,177.6	$ 1,186.4	$ (8.8)

Program Enrollment for the Month of December 2015	Current Month	Previous Month	% Change‡ From Previous Month	1 Year Ago	% Change‡ From 1 Year Ago
Medicaid	290,211	289,160	+0.4%	277,368	+4.6%
PCN (Primary Care Network)	17,096	13,477	+26.9%	19,875	-14.0%
CHIP (Children's Health Ins. Plan)	16,815	16,477	+2.1%	14,969	+12.3%

Health Care System Measures	Annual Visits			Annual Charges	
	Number of Events	Rate per 100 Population	% Change‡ From Previous Year	Total Charges in Millions	% Change‡ From Previous Year
Overall Hospitalizations (2013)	279,393	9.0%	-2.8%	$ 6,513.8	+5.9%
Non-maternity Hospitalizations (2013)	177,191	5.6%	-2.5%	$ 5,554.8	+6.6%
Emergency Department Encounters (2013)	683,415	22.3%	-1.5%	$ 1,555.4	+7.1%
Outpatient Surgery (2013)	404,303	13.1%	+7.3%	$ 2,167.9	+11.5%

Annual Community Health Measures	Current Data Year	Number Affected	Percent/ Rate	% Change‡ From Previous Year	State Rank§ (1 is best)
Obesity (Adults 18+)	2014	524,000	25.7%	+6.5%	8 (2014)
Cigarette Smoking (Adults 18+)	2014	197,800	9.7%	-6.1%	1 (2014)
Influenza Immunization (Adults 65+)	2014	171,300	58.0%	+1.0%	36 (2014)
Health Insurance Coverage (Uninsured)	2014	303,100	10.3%	-11.2%	n/a
Motor Vehicle Traffic Crash Injury Deaths	2014	234	8.0 / 100,000	+20.2%	9 (2013)
Poisoning Deaths	2014	641	21.8 / 100,000	+0.4%	47 (2013)
Suicide Deaths	2014	555	18.9 / 100,000	-4.0%	49 (2013)
Diabetes Prevalence (Adults 18+)	2014	144,800	7.1%	-0.1%	8 (2014)
Poor Mental Health (Adults 18+)	2014	324,200	15.9%	-3.0%	19 (2014)
Coronary Heart Disease Deaths	2014	1,574	53.5 / 100,000	+2.5%	1 (2013)
All Cancer Deaths	2014	3,033	103.1 / 100,000	+1.0%	1 (2013)
Stroke Deaths	2014	854	29.0 / 100,000	+1.4%	18 (2013)
Births to Adolescents (Ages 15-17)	2014	537	7.9 / 1,000	-8.8%	11 (2013)
Early Prenatal Care	2014	39,005	76.2%	-0.2%	n/a
Infant Mortality	2014	251	4.9 / 1,000	-4.7%	9 (2012)
Childhood Immunization (4:3:1:3:3:1)	2014	36,700	74.6%	n/a#	24 (2014)

* Influenza-like illness activity is minimal in Utah. As of January 23, 2016, 104 influenza-associated hospitalizations have been reported to the UDOH since the start of the influenza season on October 4, 2015. More information can be found at http://health.utah.gov/epi/diseases/influenza/surveillance/index.html.

† Diagnosed HIV infections, regardless of AIDS diagnosis.

‡ Relative percent change. Percent change could be due to random variation.

§ State rank based on age-adjusted rates where applicable.

In 2014, NIS analysis for the complete 4:3:1:3:3:1 series was updated to provide a more accurate assessment of Haemophilus influenzae type B vaccination. Due to this change, the 2014 results for 4:3:1:3:3:1 coverage are not comparable to prior years.

Notes: Data for notifiable diseases are preliminary and subject to change upon the completion of ongoing disease investigations. Active surveillance for West Nile Virus will start in June for the 2016 season.