Michigan Heat-Related Illnesses

Syndromic Surveillance Summary: May 29, 2018

Executive Summary

There were a total of 149 hospital emergency department (ED) visits in Michigan categorized in the heat syndrome (see description of the data below) during the week of May 20 to May 26, 2018. This represents a 24.2% increase from the previous week (Figures 1 and 4, Table 1) and an average of 21.3 ED visits per day. The Michigan Syndromic Surveillance System generated 3 statewide Heat syndrome alerts and 3 county-level Heat syndrome alerts this week (Figure 2). Temperatures were higher when compared to the previous week (Figure 4, Table 1) as the state experienced unseasonably high temperatures. The total number of heat-related ED visits to date in 2018 is greater to date when compared to 2017 (Figure 3). Numbers of ED complaints specifically associated with heat and sun can be seen in Figures 6, 7 and 9. Heat-related ED visits during the week ending May 26 increased for all age groups except those less than 2 years and 65 years and older (Figure 5). Compared to previous weekly averages, the overall male to female ratio of those presenting with heat-related illness during the week ending May 26 was higher, and by age group the male to female ratio was elevated for age groups 49 years and younger (Table 2). The proportion of heat-related ED visits increased for all regions except Regions 2N and 2S (Figure 8, Table 3). Among those heat-related ED visits, the proportion of sun-associated and heat-associated visits increased for all regions except Region 7 (Figure 9, Table 4).

Description of the Data

Heat-related emergency department (ED) visits were identified using the Michigan Syndromic Surveillance System which gathers data from participating hospital emergency departments across the state and categorizes visits into one of ten syndromes based on text in the chief complaint.

Visits assigned to the Heat syndrome including chief complaints with terms such as “hyperthermia”, “heat”, “sun”, “prostration”, or “dehydration” (including word derivatives and misspellings). Terms that have been identified in the search, but do not indicate heat-related illness, such as “wheat”, are excluded.

A weighting system is used to accurately categorize chief complaints into the correct syndrome when keywords for more than one syndrome are detected in chief complaint text. For example, a chief complaint of “fever and dehydration” would be categorized in the Constitutional syndrome, not the Heat syndrome, because the complaint of fever is of higher significance and therefore given more weight than that of dehydration.

Heat-related illness complaints identified by the heat syndrome were divided into one of three categories based on the chief complaint.

- Sun-associated: sunburn, sun poisoning, sunscreen reactions
- Heat-associated: heat exhaustion, heat stroke, heat reaction
- Dehydration

Note: Due to the nature of categorizing ED complaint data, these visits do not represent all potential cases of heat-related illness. These data may also represent non-heat-related illnesses, e.g. dehydration due to other causes. However, the data can be used to describe trends in illness presentations over time.

Figure 1: Daily Counts of Statewide Heat-Related ED Visits (April 1 – May 2, 2018)

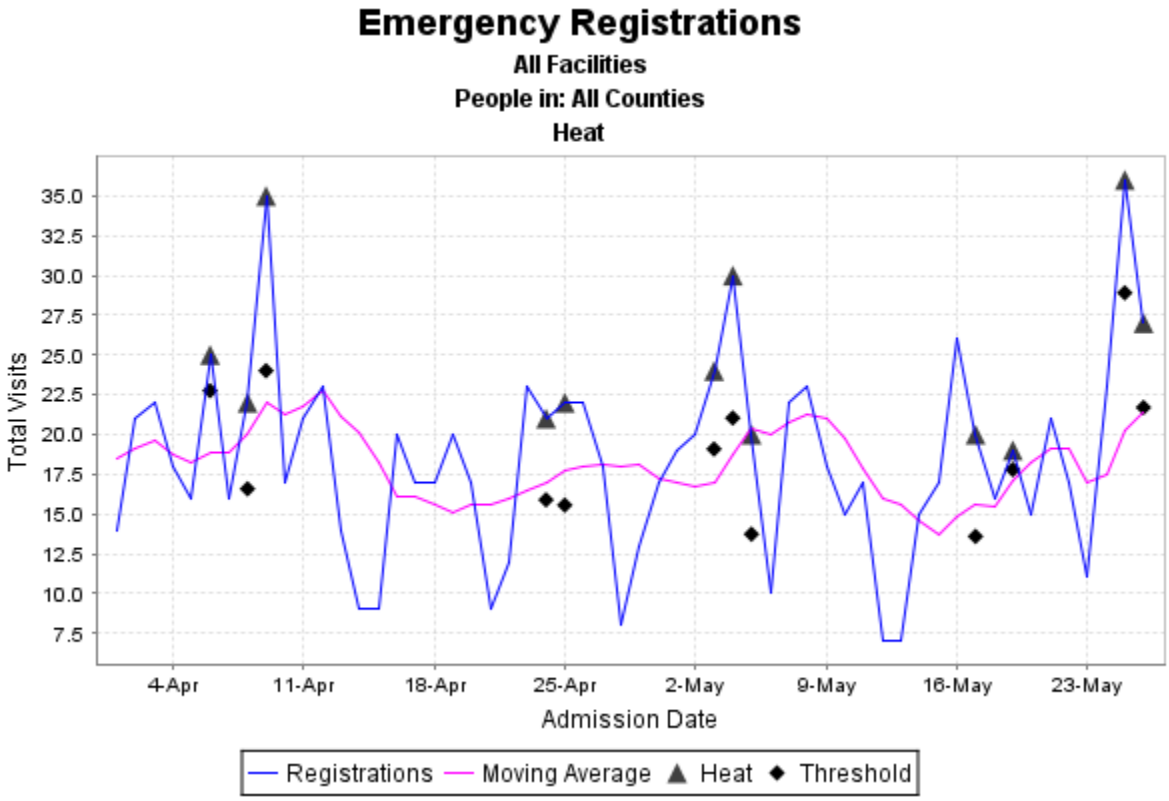


Figure 2: Daily Counts of Statewide and County-Level Heat Alerts (April 1 – May 26, 2018)

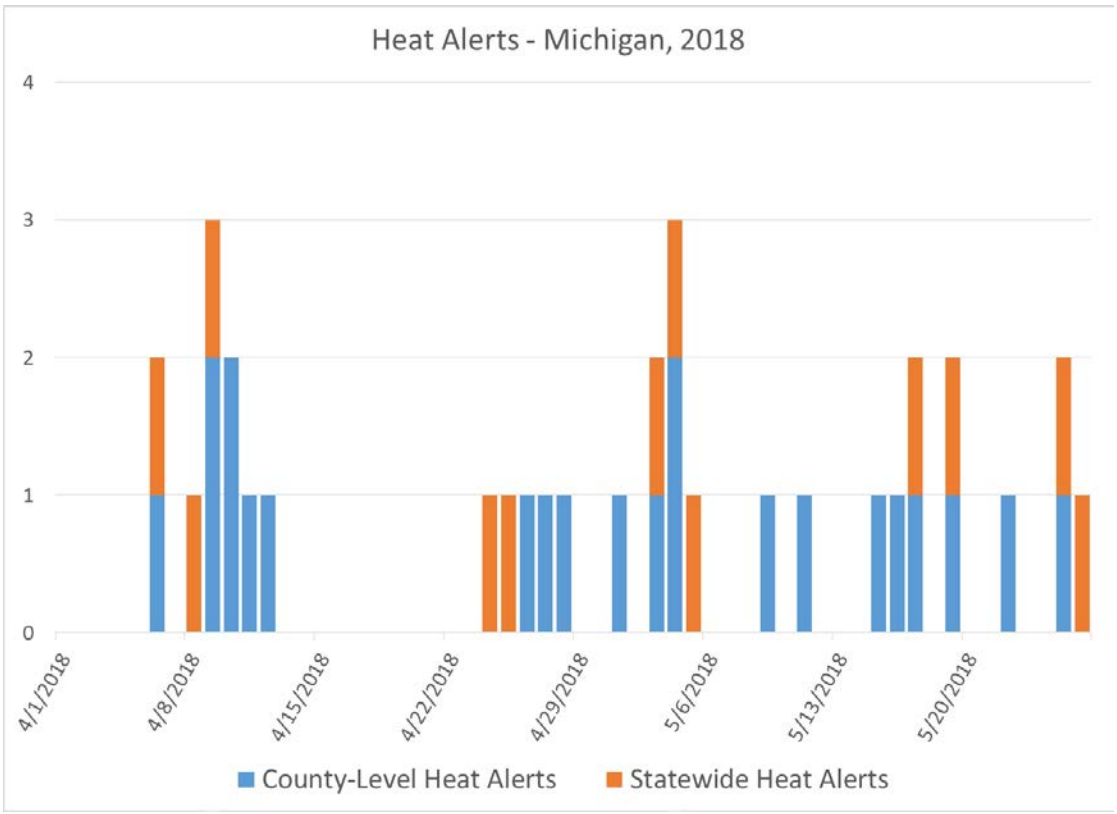


Figure 3: Seasonal (May 15 – Sept 15) Daily Heat-Related ED Visits, 2014 – 2018 (to date)

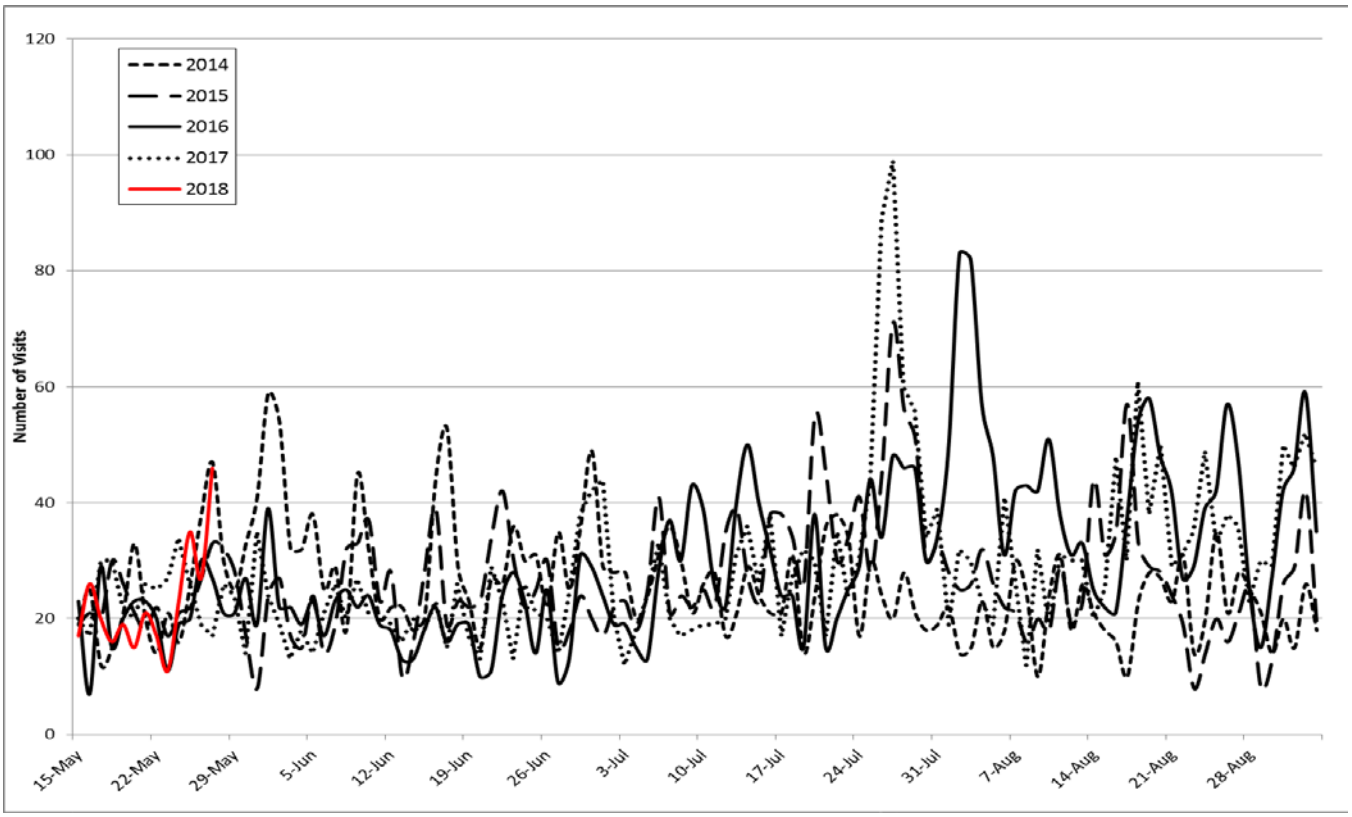


Figure 4: Statewide Heat-Related ED Visits and National Oceanic and Atmospheric Administration (NOAA) Maximum Daily Temperature Averages for 6 Select Cities (April 1 – May 27, 2018)

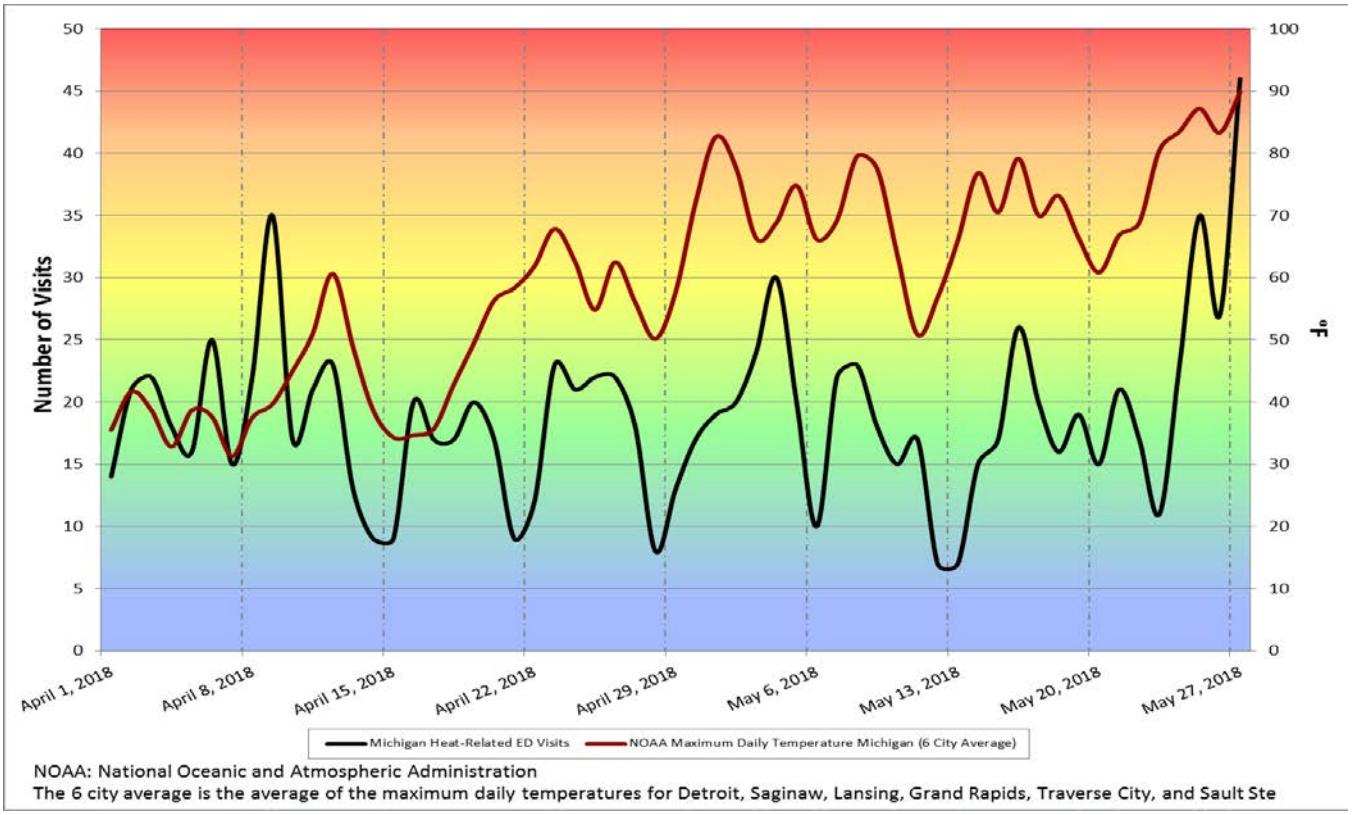


Figure 5: Age Distribution of Heat-Related ED Visits by Week (May 1 – May 26, 2018)

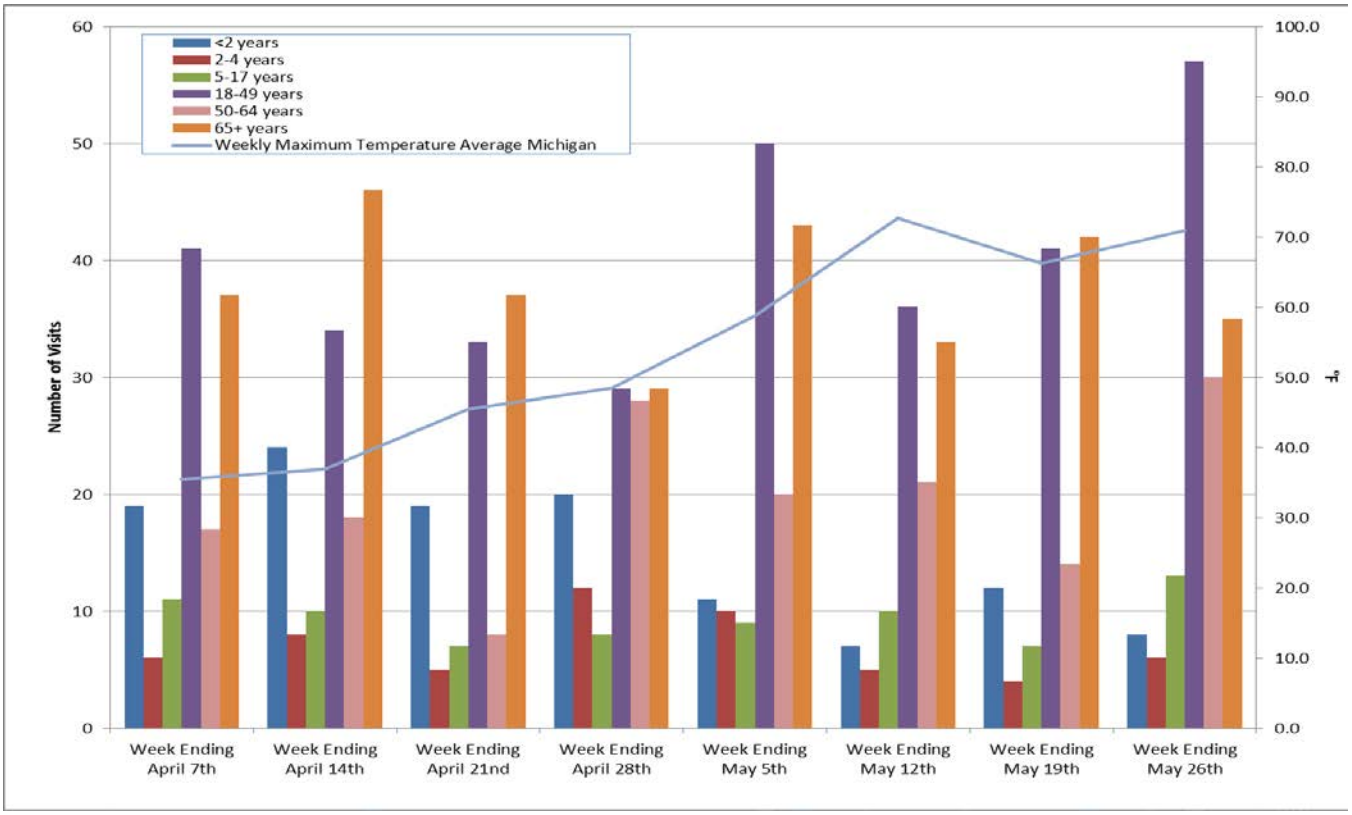


Table 1: Weekly Heat-Related ED Visits and Average Weekly Maximum Temperatures (Past 4 Weeks)

Week	Total Heat-Related ED visits	Average Weekly Max. Temps (°F)
April 29 – May 5	143	71.5
May 6 – May 12	112	66.2
May 13 – May 19	120	71.7
May 20 – May 26	149	75.9

Table 2: Heat-Related ED Visits by Age and Gender, Current Week Compared to the Weekly Average

	Weekly Average (April 1 – May 19)			Current Week (Week Ending May 26)		
	Gender		Male to Female Ratio	Gender		Male to Female Ratio
Age Group	Male	Female		Male	Female	
<18 years	15	17	0.87	13	13	**1.00**
18-34 years	8	14	0.55	19	16	**1.19**
35-49 years	6	10	0.66	13	9	**1.44**
50-64 years	9	9	1.07	13	17	0.76
65+ years	20	18	1.15	17	18	0.94
Total	59	67	0.87	75	73	**1.03**

Bold indicates a Male to Female Ratio that is higher when compared to the average. Our data from previous years suggests than an increase in males presenting to EDs with heat-related illnesses may be characteristic of a heat event.

Figure 6: Statewide Heat-Related ED Visits by Syndrome (April 1 – May, 26, 2018)

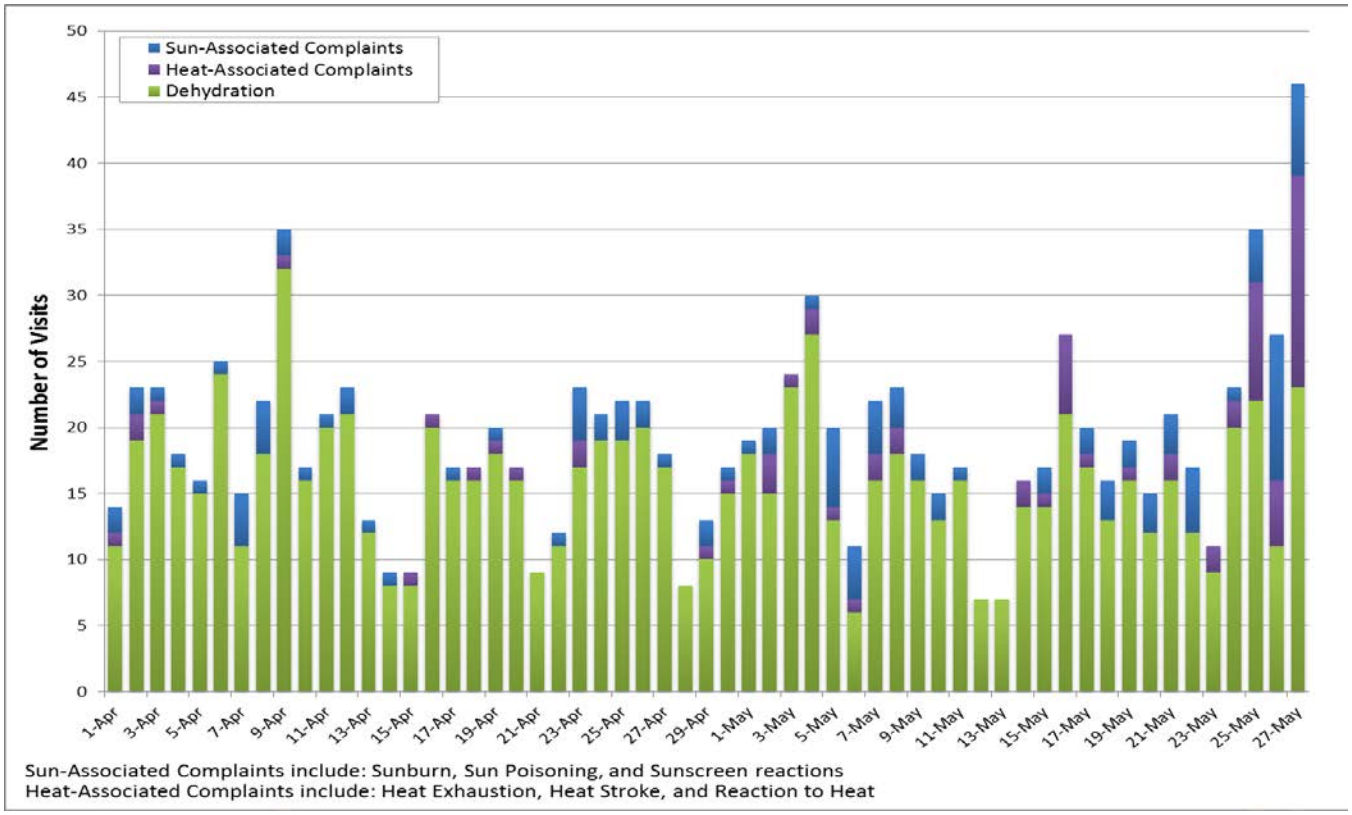


Figure 7: Statewide Heat-Related ED Visits by Syndrome Excluding Dehydration (April 1 – May 26, 2018)

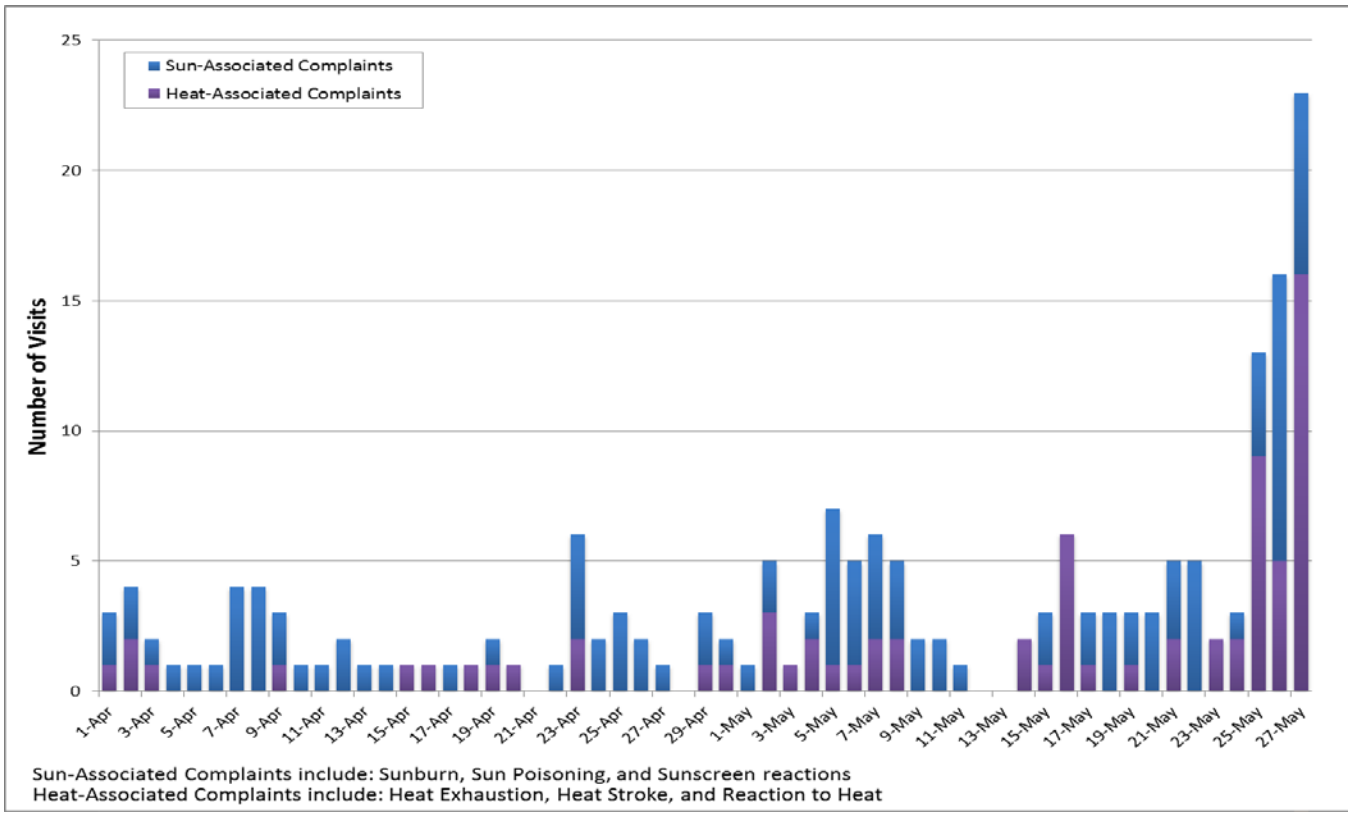
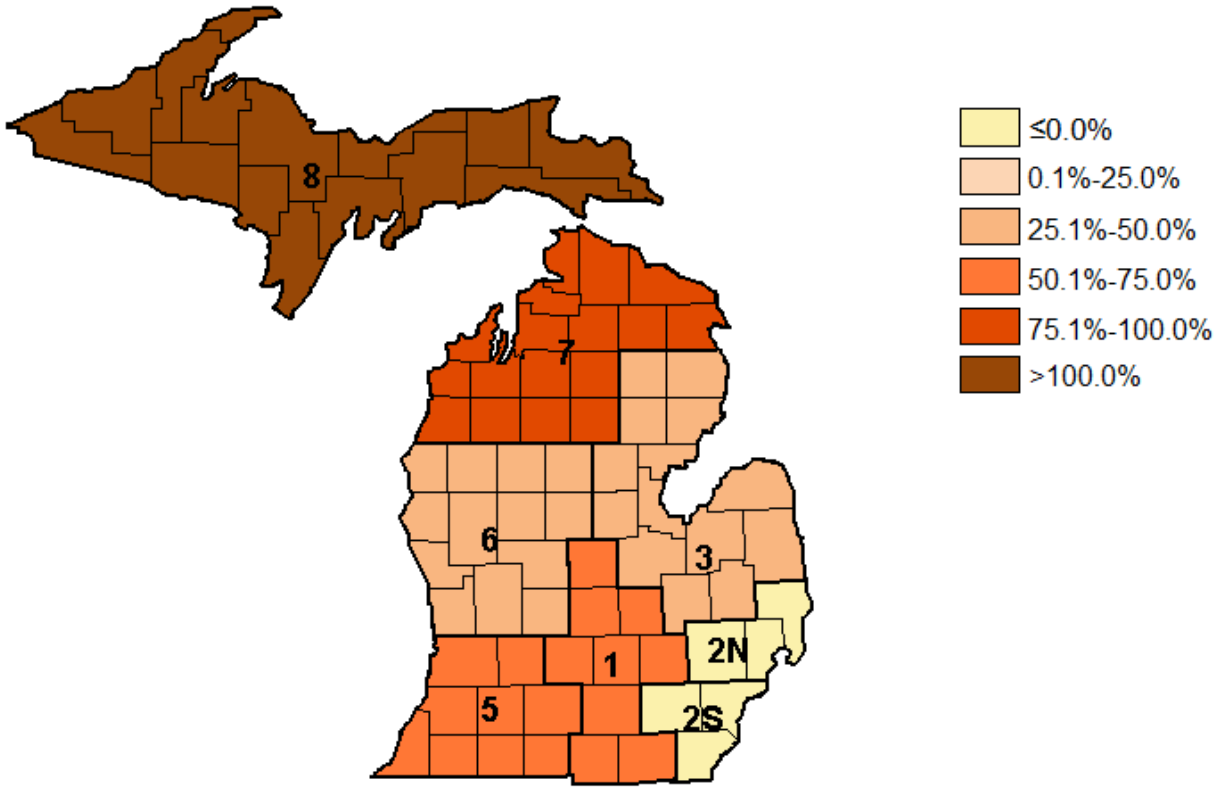


Figure 8: Percent Change of Heat-Related Emergency Department Visits by Region: Current week compared to the previous week



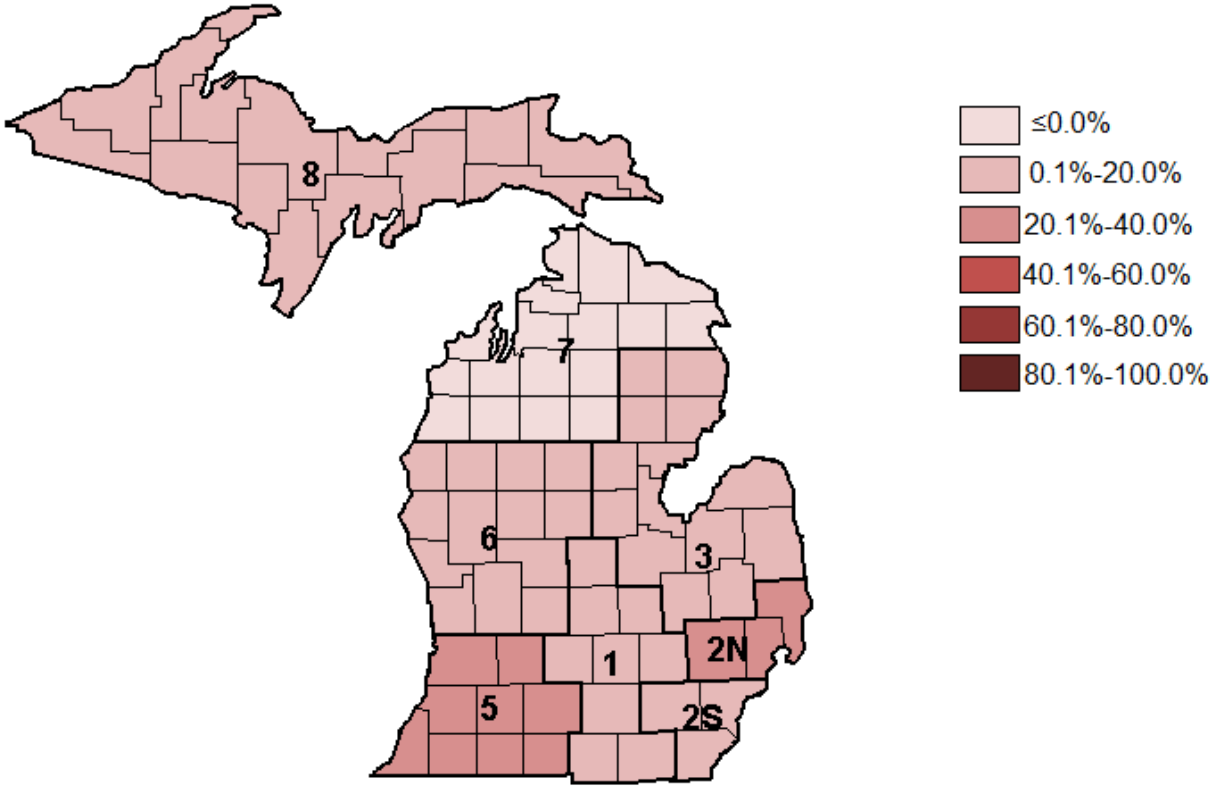
This regional map indicates the percent change in the normalized values of heat-related emergency department complaints from the previous week ending May 19, 2018, to the current week ending May 26, 2018.

Table 3: Number and percent of heat-related visits by region

Region	Week Ending May 19		Week Ending May 26		% Change
	# of Visits	% of All ED Visit	# of Visits	% of All ED Visit	
1	15	0.116%	23	0.178%	53.33%
2N	20	0.127%	18	0.114%	-10.00%
2S	40	0.156%	37	0.144%	-7.50%
3	17	0.122%	22	0.158%	29.41%
5	8	0.088%	14	0.154%	75.00%
6	15	0.107%	19	0.135%	26.67%
7	4	0.112%	8	0.224%	100.00%
8	1	0.054%	8	0.435%	700.00%

Note: Very low rates are sensitive to small changes in the numerator (heat-related illness visits) and dramatic rate movements should be expected. Fluctuations in the total number of ED visits (denominator) unrelated to heat illnesses can also strongly impact rate comparisons and introduce bias.

Figure 9: Risk Difference of Heat-Related Emergency Department Visits Due to Heat-Associated and Sun-Associated complaints by Region: Current week compared to the previous week



The regional map indicates the weekly difference in the proportion of sun/heat-associated ED visits out of all heat-related visits (sun/heat-associated and dehydration) from the previous week ending May 19, 2018, to the current week ending May 26, 2018.

Table 4: Number and percent of heat-associated and sun-associated visits by region

Region	Week Ending May 19		Week Ending May 26		Risk Difference
	# of Heat-Associated and Sun-Associated Visits	Proportion of All Heat-Related Visits	# of Heat-Associated and Sun-Associated Visits	Proportion of All Heat-Related Visits	
1	4	26.7%	9	39.1%	12.5%
2N	1	5.0%	6	33.3%	28.3%
2S	1	2.5%	8	21.6%	19.1%
3	3	17.6%	6	27.3%	9.6%
5	1	12.5%	5	35.7%	23.2%
6	5	33.3%	8	42.1%	8.8%
7	3	75.0%	4	50.0%	-25.0%
8	0	0.0%	1	12.5%	12.5%

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