

Michigan Heat-Related Illnesses

Syndromic Surveillance Summary: July 22, 2019

Executive Summary

There was a total of 406 hospital emergency department (ED) visits in Michigan categorized in the heat syndrome (see description of the data below) during the week of July 14 to July 20, 2019. This represents a 13.7% increase from the previous week (Figures 1 and 4, Table 1) and an average of 58 ED visits per day. Two statewide heat alerts and five county-level Heat syndrome alerts were generated this week (Figure 2). Temperatures were higher on average compared to the previous week. (Figure 4, Table 1). Excessive heat watches and warnings were in effect for numerous counties in Michigan from noon on Thursday, July 18 to 8pm on Saturday, July 20. The total number of heat-related ED visits to date in 2019 is comparable to the same time period in 2018 (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 July 20 increased for 2-4 year, 5-17 year, 18-49 year, and ≥65 year age groups, stayed the same for the 50-64 year age group, and decreased for the <2 year age group when compared to the previous week (Figure 5). Compared to previous weekly averages, the male to female ratio of those presenting with heat-related illness during the week ending July 20 was higher overall, and, by age group, the male to female ratio was elevated for all age groups ≥ 18 years of age (Table 2). The proportion of heat-related ED visits increased for all regions except Regions 2S and 7 (Figure 8, Table 3). Among all identified heat-related ED visits, the proportion of sun-associated and heat-associated visits increased for Regions 1, 2N, 2S, 5, and 8 and decreased for Regions 3, 6, and 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 Proportion of Statewide Heat-Related ED Visits (April 1 – July 20, 2019)

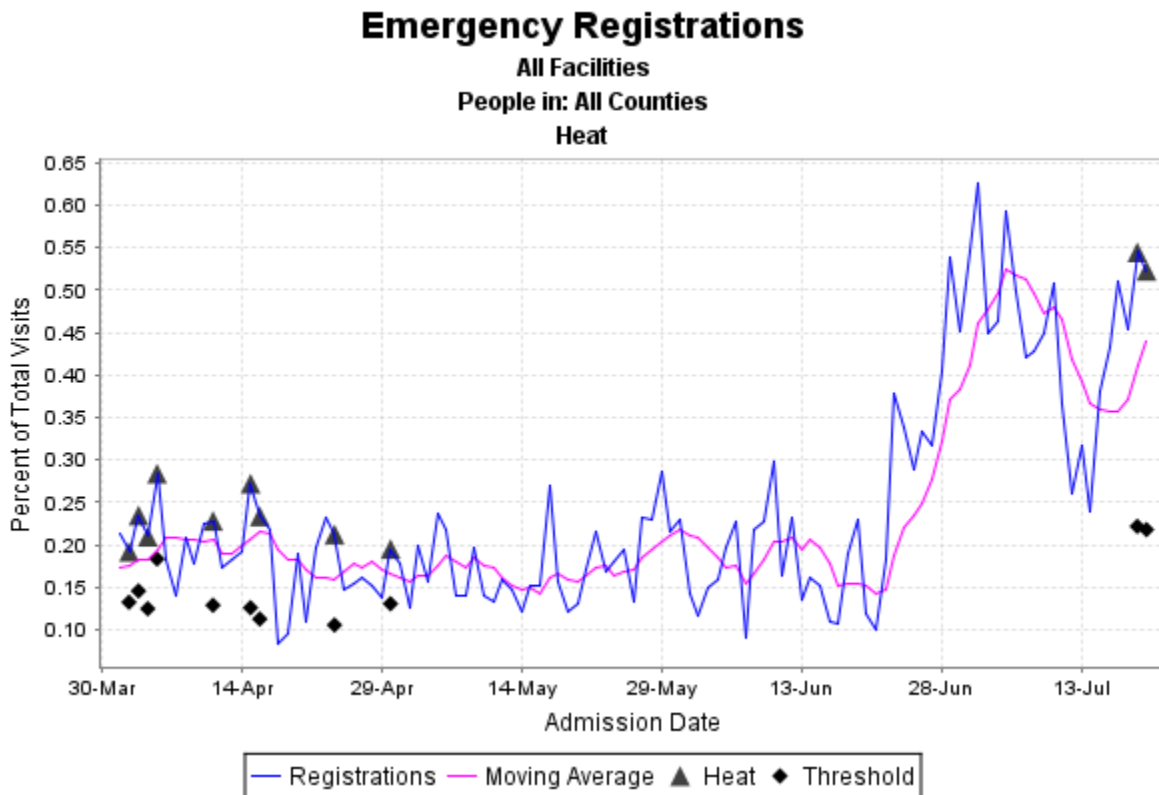


Figure 2: Daily Counts of Statewide and County-Level Heat Alerts (April 1 – July 20, 2019)

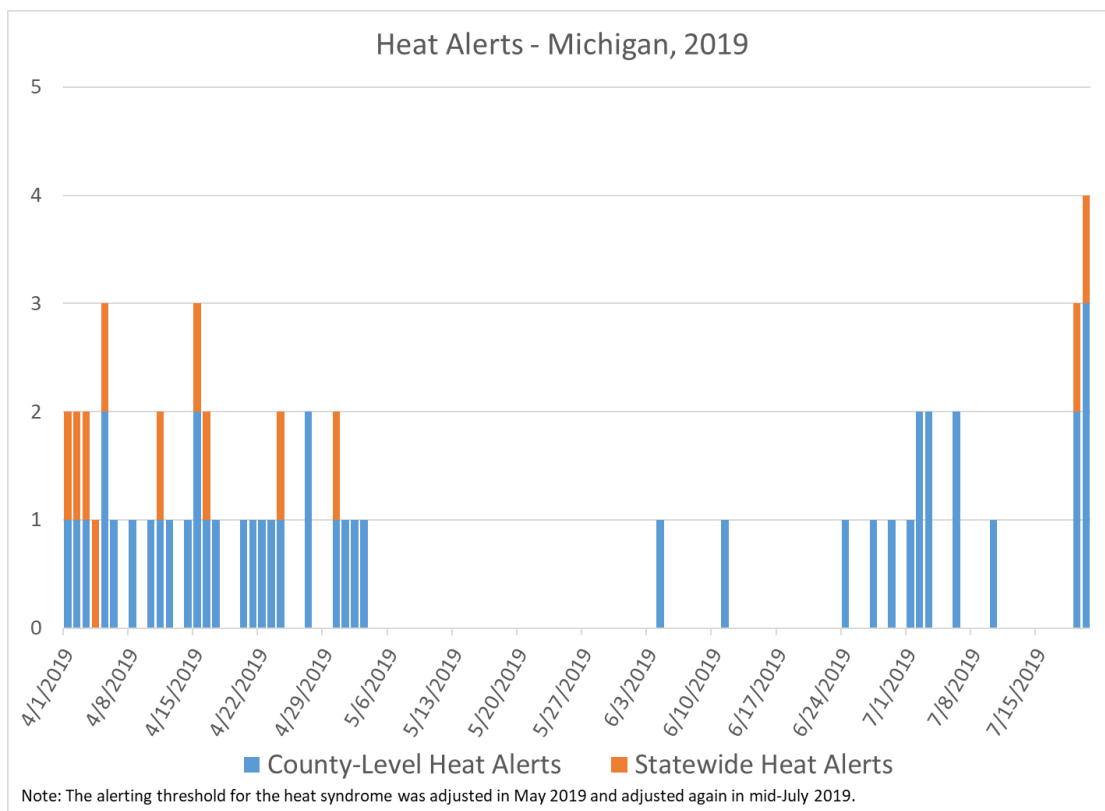


Figure 3: Seasonal (May 15 – Sept 15) Daily Heat-Related ED Visits, 2015 – 2019 (to date)

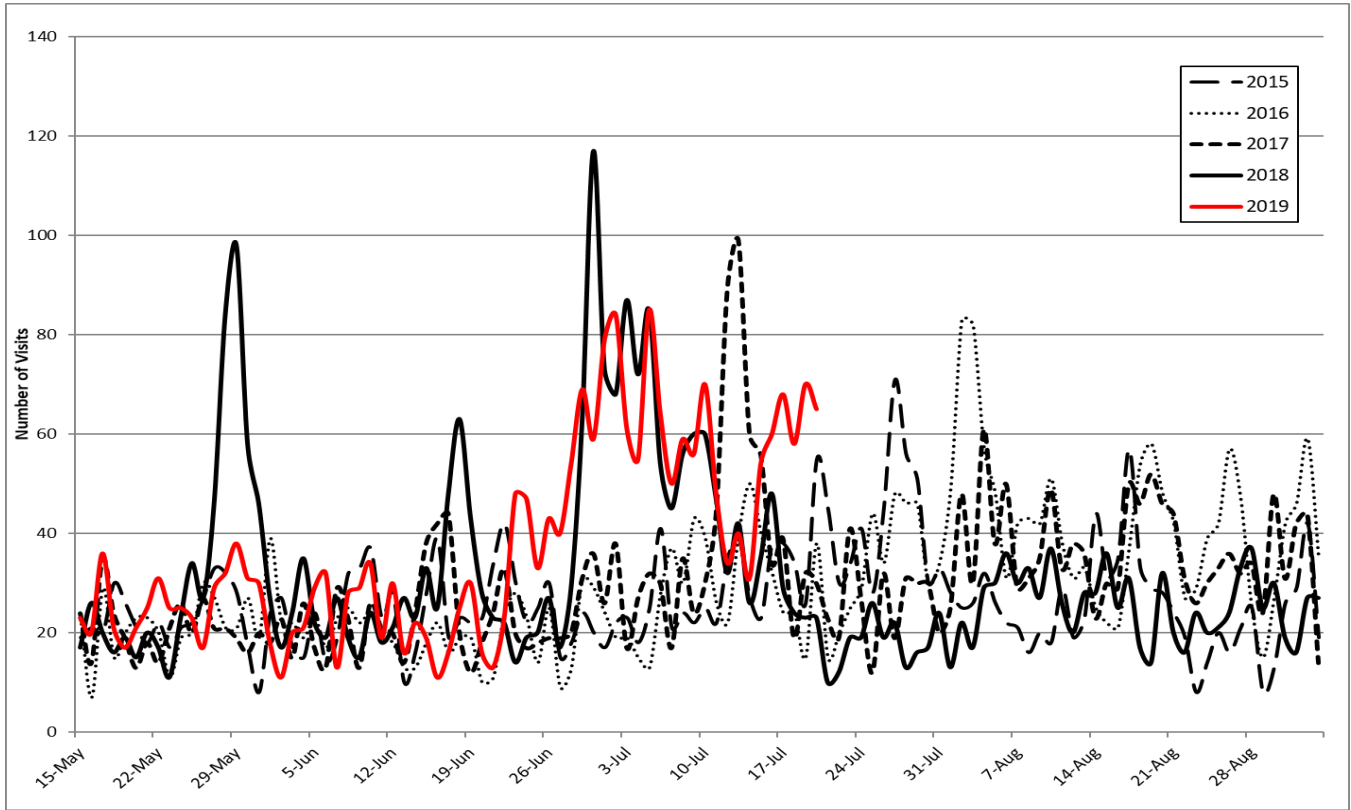


Figure 4: Statewide Heat-Related ED Visits and National Oceanic and Atmospheric Administration (NOAA) Maximum Daily Temperature Averages for 6 Select Cities (April 1 – July 20, 2019)

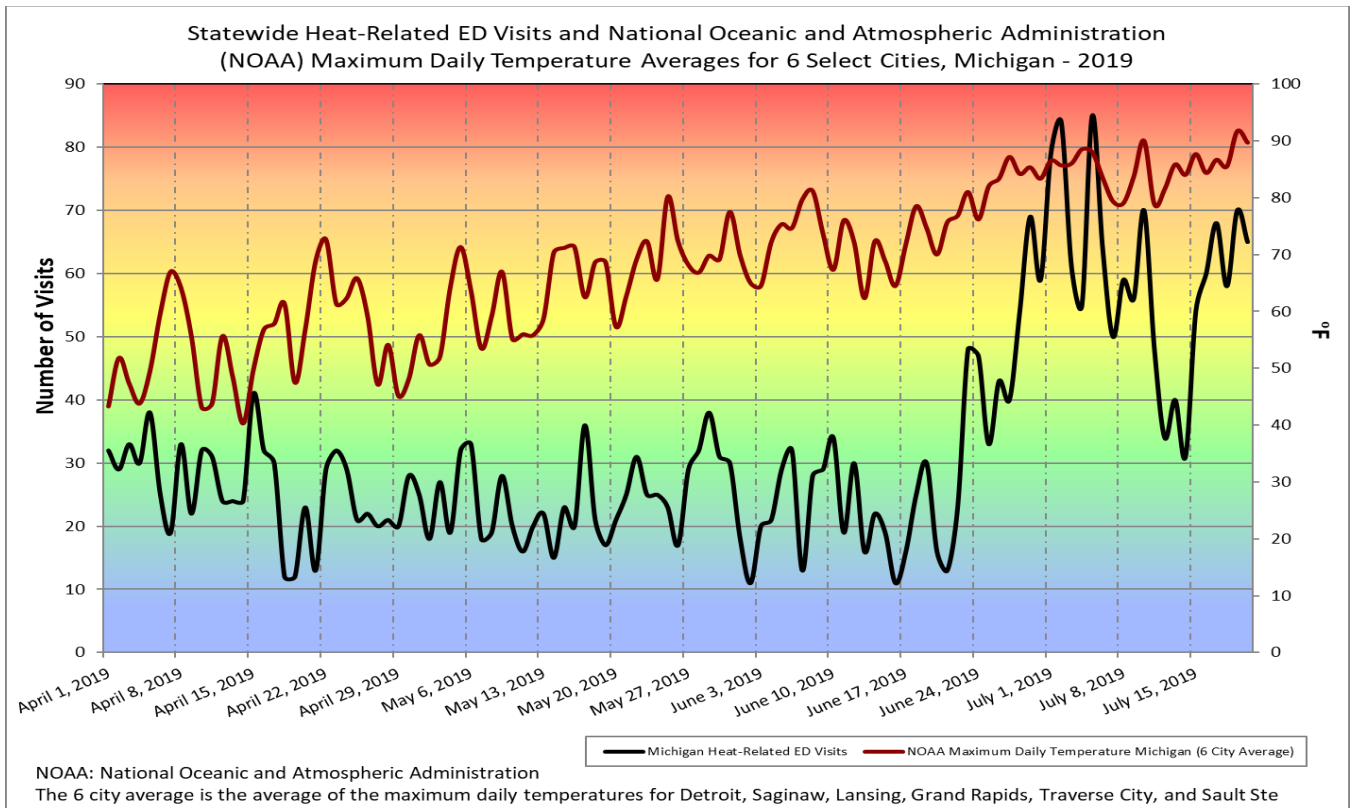


Figure 5: Age Distribution of Heat-Related ED Visits by Week (May 26 – July 20, 2019)

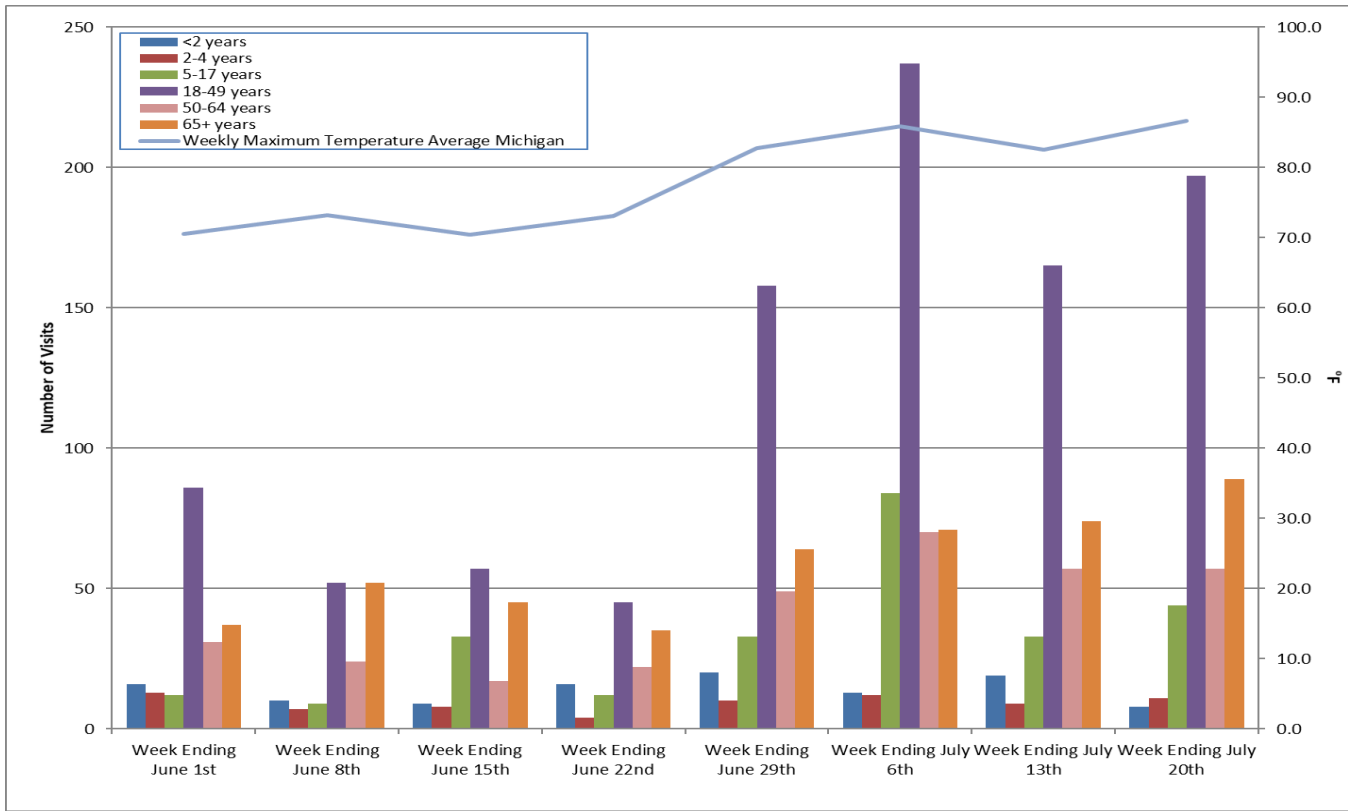


Table 1: Weekly Heat-Related ED Visits and Average Weekly Maximum Temperatures (Past 4 Weeks)

Week	Total Heat-Related ED visits	Average Weekly Max. Temps (°F)
June 23 – June 29	334	82.7
June 30 – July 6	487	85.9
July 7 – July 13	357	82.6
July 14 – July 20	406	87.1

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

Age Group	Weekly Average (April 1 – July 13)			Current Week (Week Ending July 20)		
	Gender		Male to Female Ratio	Gender		Male to Female Ratio
	Male	Female		Male	Female	
<18 years	26	24	1.10	32	31	1.03
18-34 years	19	28	0.69	61	56	1.09
35-49 years	12	14	0.86	47	33	1.42
50-64 years	12	17	0.72	34	23	1.48
65+ years	20	28	0.73	45	44	1.02
Total	90	111	0.82	219	187	1.17

Bold indicates a Male to Female Ratio that is higher when compared to the average. Our data from previous years suggests that 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 – July 20, 2019)

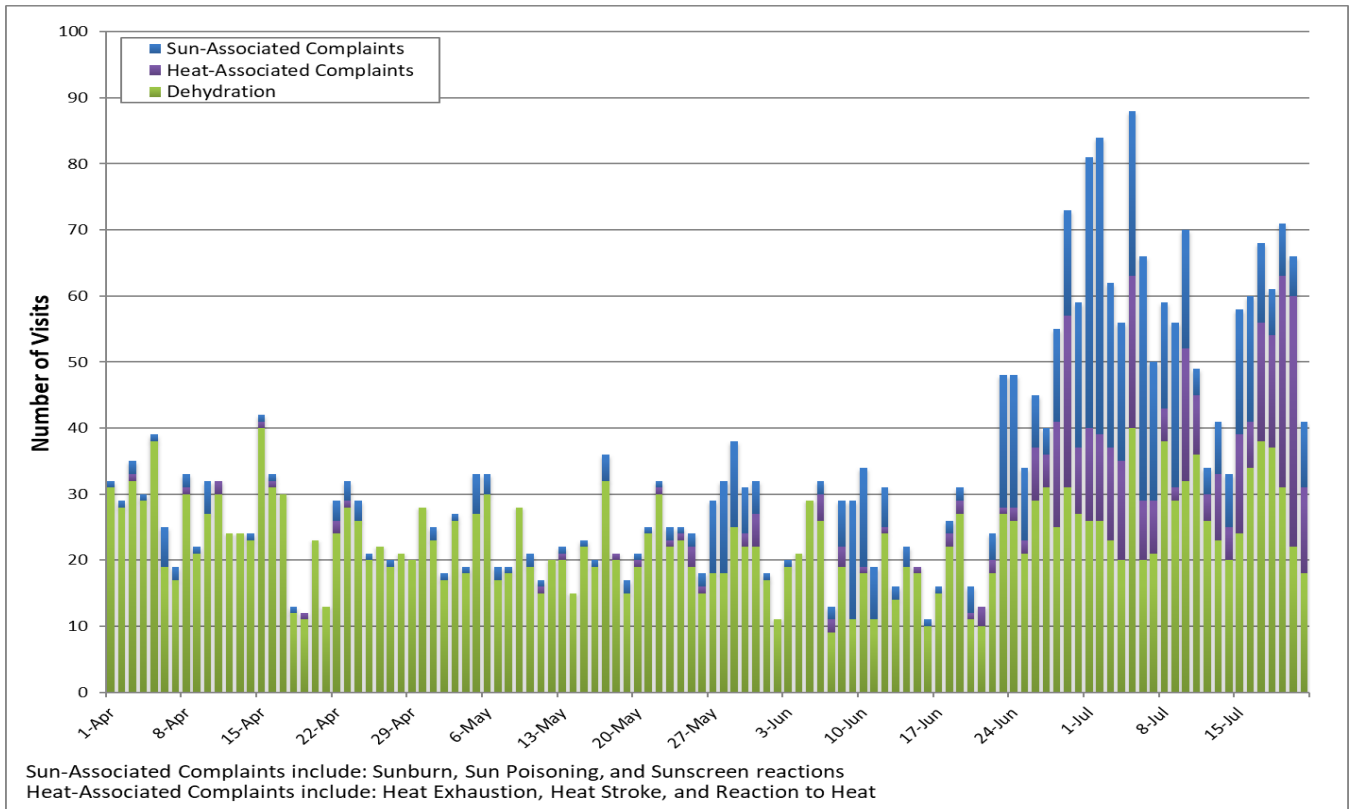


Figure 7: Statewide Heat-Related ED Visits by Syndrome Excluding Dehydration (April 1 – July 20, 2019)

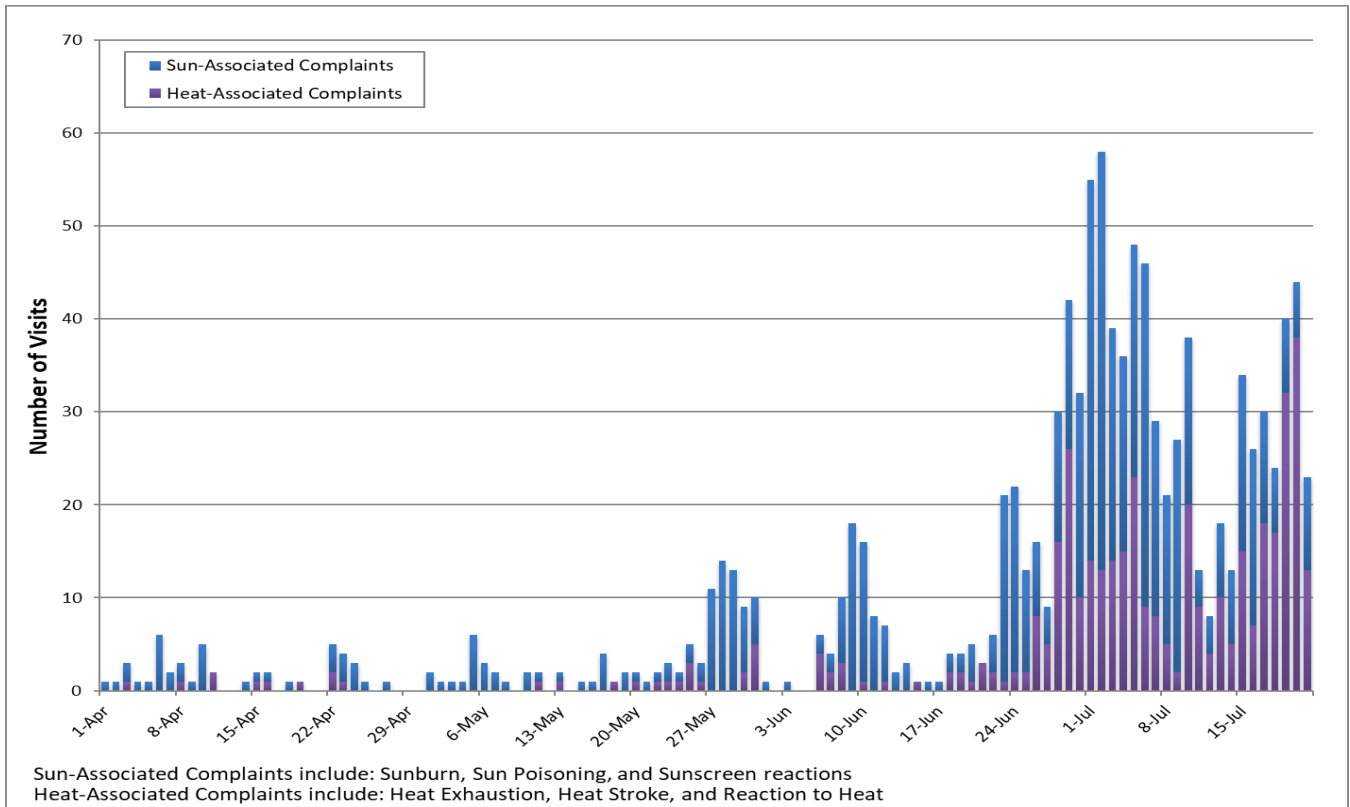
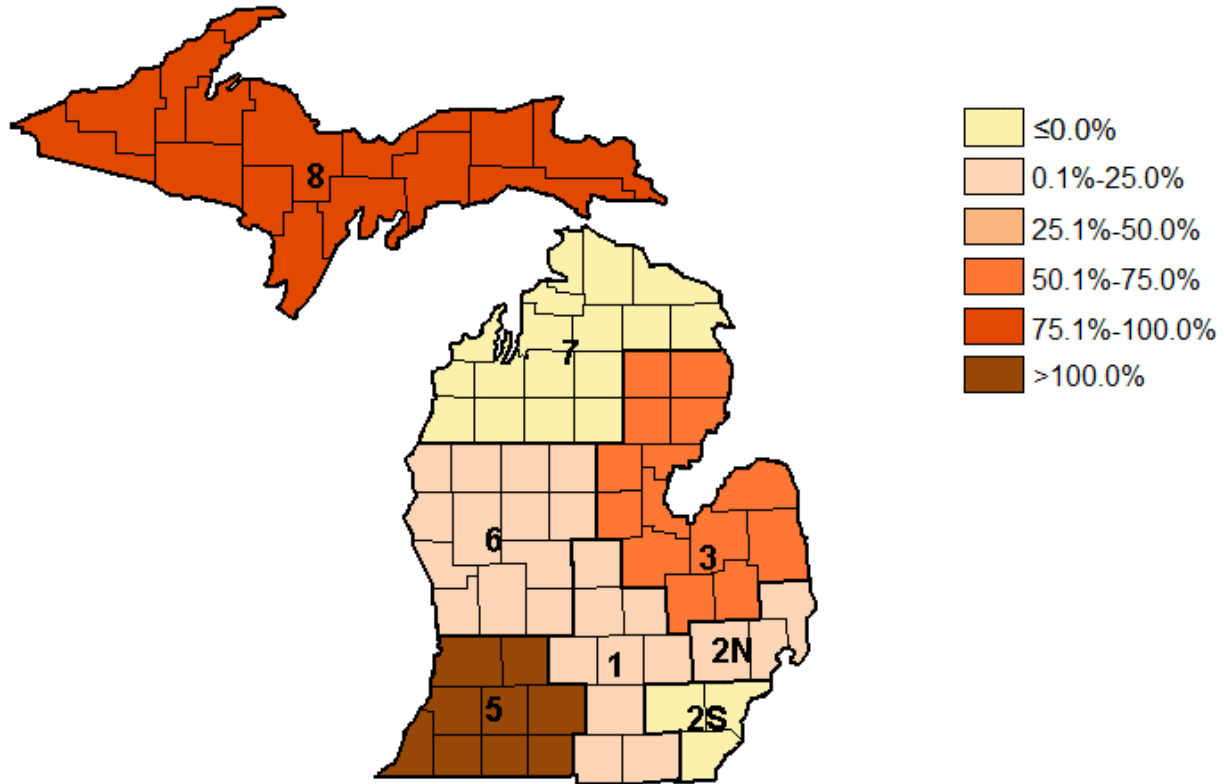


Figure 8: Percent Change of Heat-Related Emergency Department Visits by Region: Current week compared to the previous week



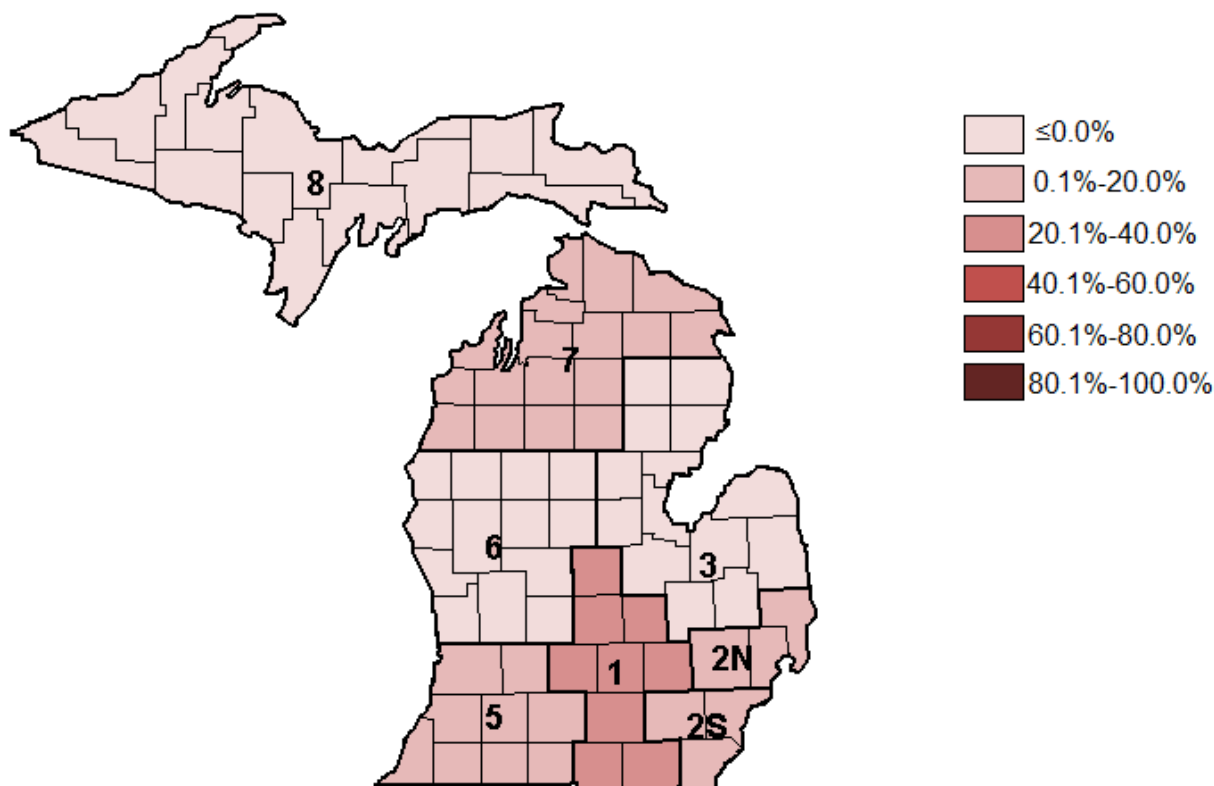
This regional map indicates the percent change in the normalized values of heat-related emergency department complaints from the previous week ending July 13, 2019, to the current week ending July 20, 2019.

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

Region	Week Ending July 13		Week Ending July 20		% Change
	# of Visits	% of All ED Visit	# of Visits	% of All ED Visit	
1	41	0.507%	44	0.554%	9.20%
2N	68	0.401%	68	0.416%	3.81%
2S	100	0.379%	79	0.309%	-18.52%
3	34	0.265%	53	0.416%	57.04%
5	26	0.285%	63	0.714%	149.96%
6	59	0.411%	62	0.494%	20.16%
7	17	0.386%	15	0.346%	-10.36%
8	12	0.561%	22	1.067%	90.18%

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 July 13, 2019, to the current week ending July 20, 2019.

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

Region	Week Ending July 13		Week Ending July 20		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	12	29.3%	24	54.5%	25.3%
2N	22	32.4%	27	39.7%	7.4%
2S	37	37.0%	39	49.4%	12.4%
3	20	58.8%	23	43.4%	-15.4%
5	15	57.7%	41	65.1%	7.4%
6	33	55.9%	29	46.8%	-9.2%
7	8	47.1%	10	66.7%	19.6%
8	5	41.7%	7	31.8%	-9.8%

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