Michigan Heat-Related Illness, Emergency Department Visits: 2016 Summary

Highlights

- There were a total of 4,784 hospital emergency department (ED) visits in Michigan with self-reported dehydration (3494, 73.0%), sun-associated complaints (870, 18.2%), and/or heat-associated complaints (451, 9.4%) between April 1, 2016 and August 31, 2016. (Figures 1 & 4)
- There were more ED visits for heat-related illnesses in 2016 than the previous three summers (2013-2015) but less than during the summer of 2012 when several spikes in heat-related illnesses were observed. (Figure 3)
- During the summer of 2016, no heat waves were declared for the state of Michigan, but elevated temperatures were experienced in July and August. At or above 90 °F days were experienced for the majority of the state for one day in June, three days in July, and three days in August (Figure 2).
- Table 1 shows weekly counts of heat-related illness ED visits and comparisons to the previous week. The highest number of weekly heat-related illness ED visits occurred in June and July when at or above 90 °F days were experienced for many cities across the state.
- During periods of hot weather, increases in heat-related ED visits were seen among all age groups but most significantly among those age groups between 18 years and 64 years as seen in the months of June and July. (Figure 5)
- The highest male to female ratios are observed during periods of hot weather as seen in the months of July and August. (Figure 6)
- Increases in sun-associated complaints, heat-associated complaints, and dehydration are observed during periods of hot weather. Sun-associated complains were highest in June, while heat-associated complaints and dehydration complaints were highest in July. (Figures 4 and 7)
- The greatest number of heat-related illness ED visits occurred in Regions 2S and 6, likely due to the higher population centers in those regions compared to the other regions. (Table 2)
- Regions 6 and 7 experienced the highest proportion of heat-related ED visits compared to all ED visits within those regions. (Figure 8 and Table 2)

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. “Heat-related illness” complaints are defined as daily ED visits with the primary complaints of: “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.

Heat-related illness complaints were categorized into one of three syndromes 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 – August 31, 2016)

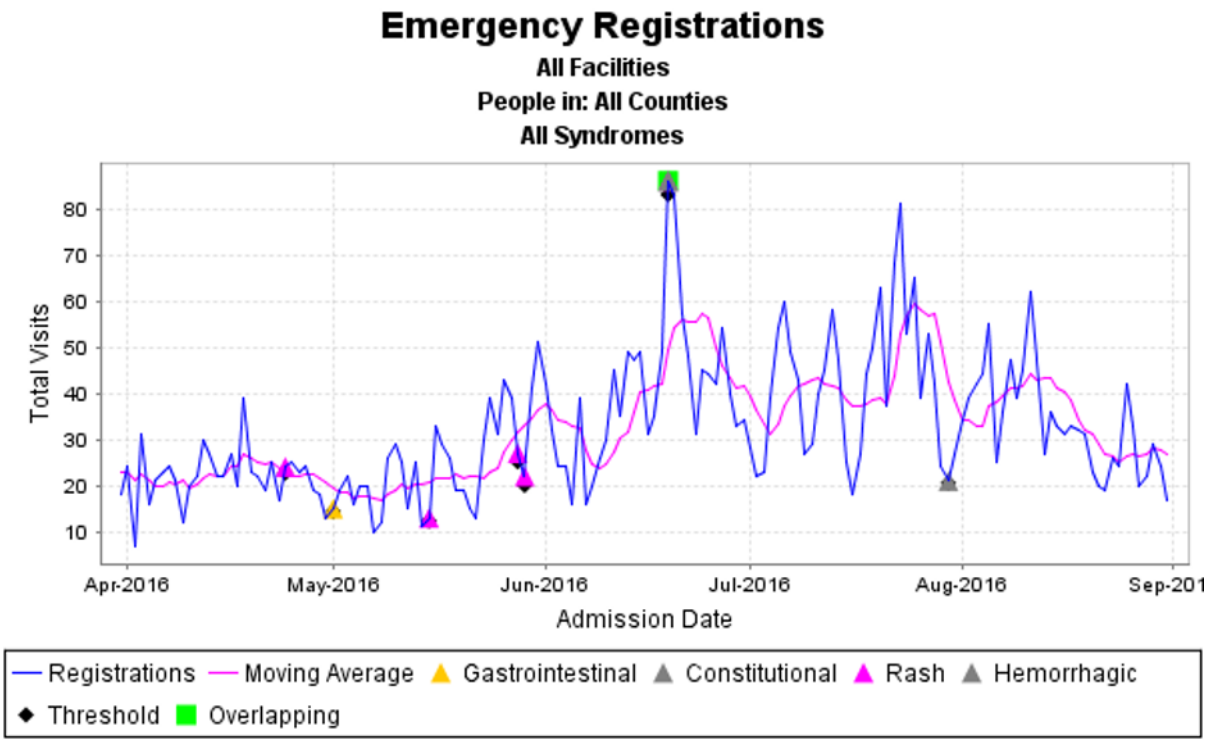

Figure 2: Statewide Heat-Related ED Visits and National Oceanic and Atmospheric Administration (NOAA) Maximum Daily Temperature Averages for 6 Select Cities (April 1 – August 31, 2016)

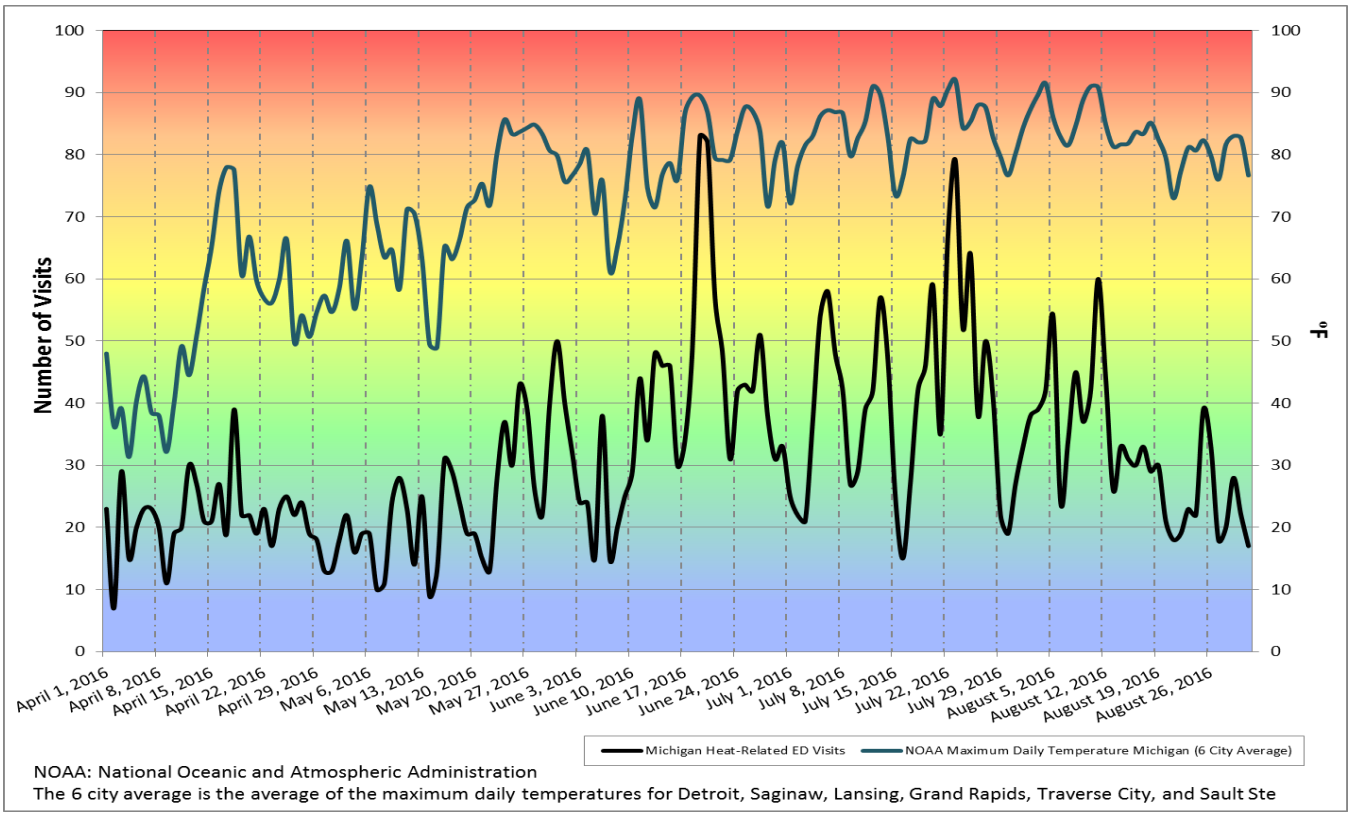

Figure 3: Seasonal (May 15 - August 31) Daily Heat-Related ED Visits, 2012 – 2016

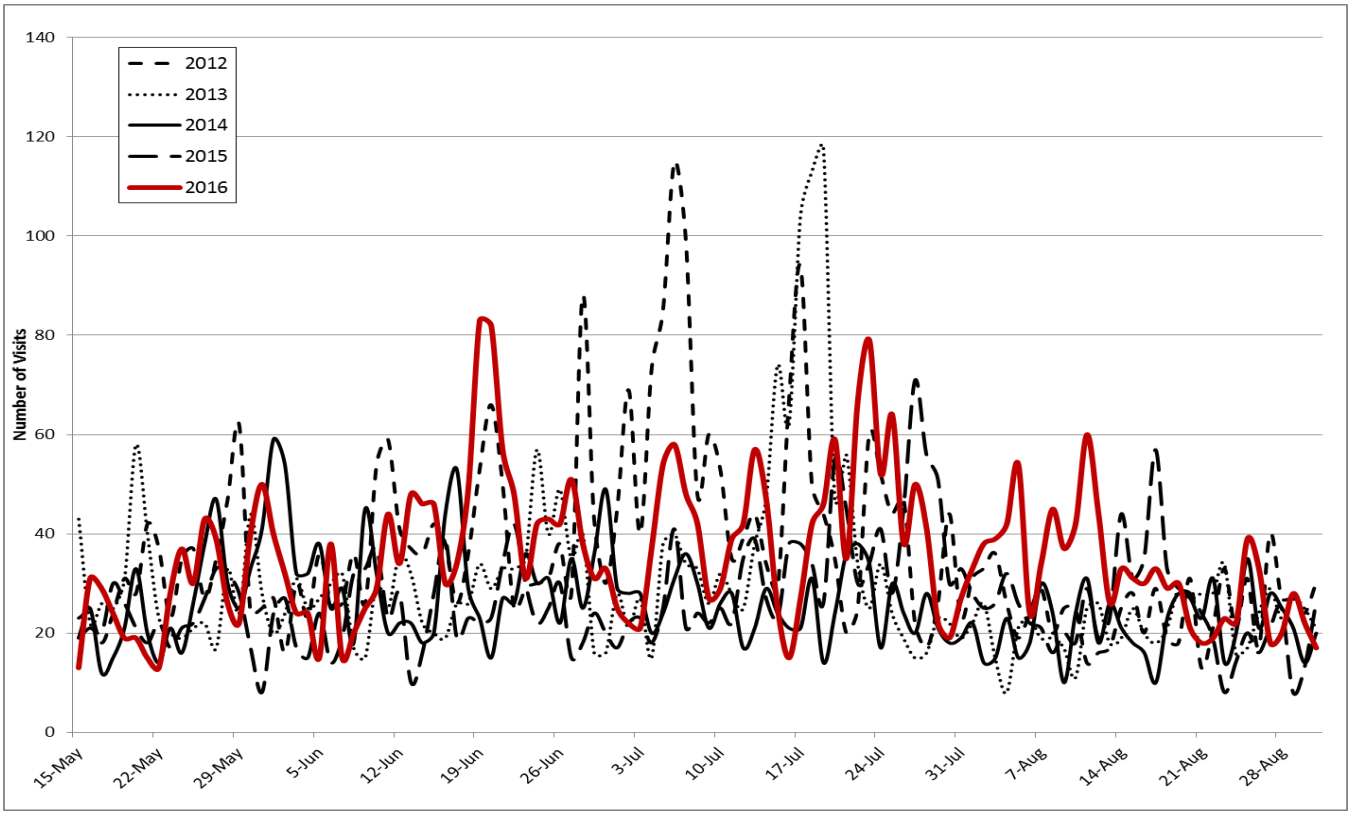

Table 1: Weekly Heat-Related ED Visits and Average Weekly Maximum Temperatures

Week	Total Heat-Related ED visits	Average Visits Per Day	Comparison From Prior Week	Average Weekly Max. Temps (°F)
April 3 – April 9	141	20.1	--	37.7
April 10 – April 16	165	23.6	17.0%	54.6
April 17 – April 23	161	23.0	-2.4%	65.1
April 24 – April 30	144	20.6	-10.6%	56.1
May 1 – May 7	117	16.7	-18.8%	63.1
May 8 – May 14	134	19.1	14.5%	63.0
May 15 – May 21	150	21.4	11.9%	66.2
May 22 – May 28	216	30.9	44.0%	82.0
May 29 – June 4	232	33.1	7.4%	79.3
June 5 – June 11	186	26.6	-19.8%	73.9
June 12 – June 18	287	41.0	54.3%	79.1
June 19 – June 25	386	55.1	34.5%	83.7
June 26 – July 2	242	34.6	-37.3%	79.1
July 3 – July 9	287	41.0	18.6%	84.5
July 10 – July 16	254	36.3	-11.5%	83.0
July 17 – July 23	355	50.7	39.8%	86.6
July 24 – July 30	286	40.9	-19.4%	83.5
July 31 – Aug 6	257	36.7	-10.1%	86.0
Aug 7 – Aug 13	288	41.1	12.1%	86.1
Aug 14 – Aug 20	207	29.6	-28.1%	82.5
Aug 21 – Aug 27	172	24.6	-16.9%	78.6
Aug 28 – Sept 3	161	23.0	-6.4%	78.3

Figure 4: Statewide Heat-Related ED Visits by Syndrome (April 1 – August 31, 2016)

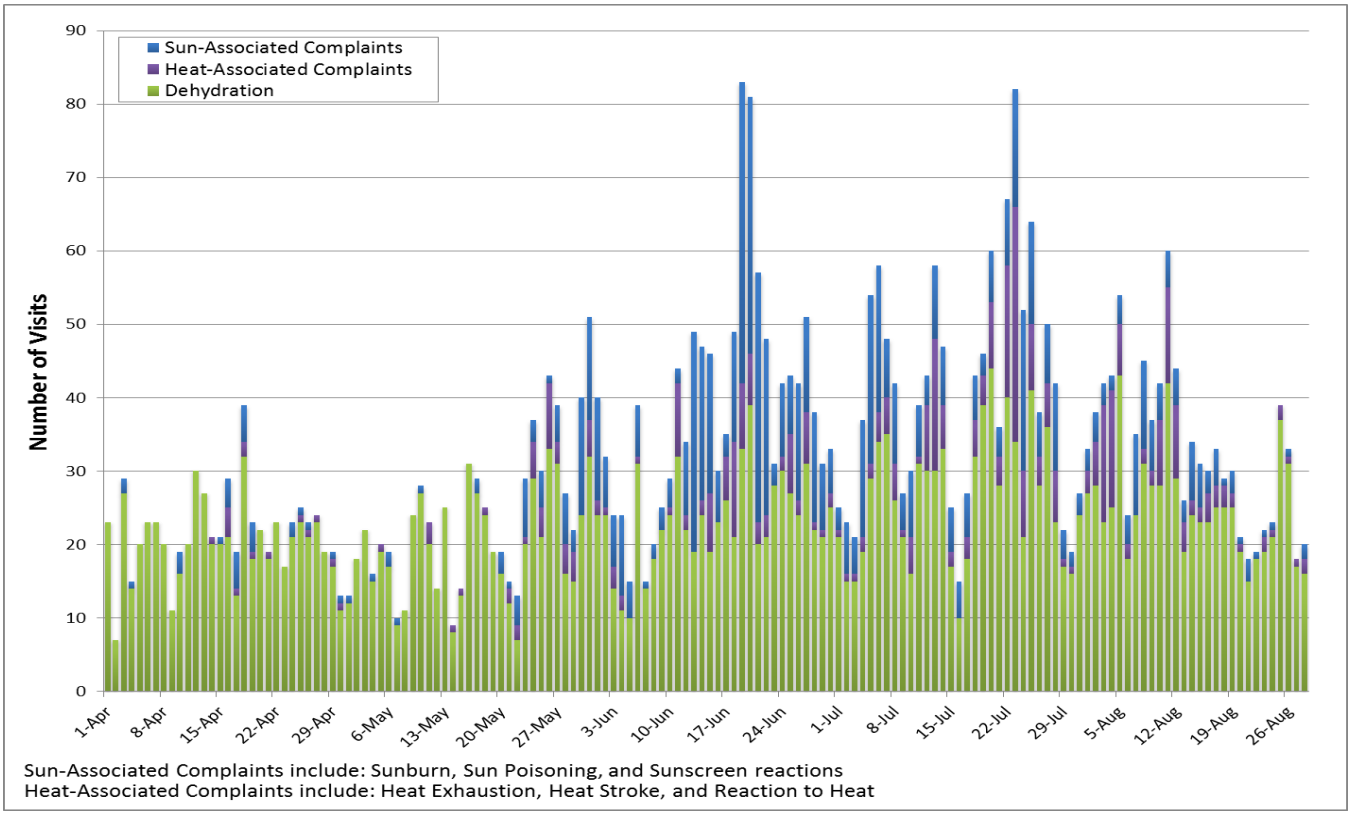

Figure 5: Age Distribution of Heat-Related ED Visits by Month (April 1 – August 31, 2016)

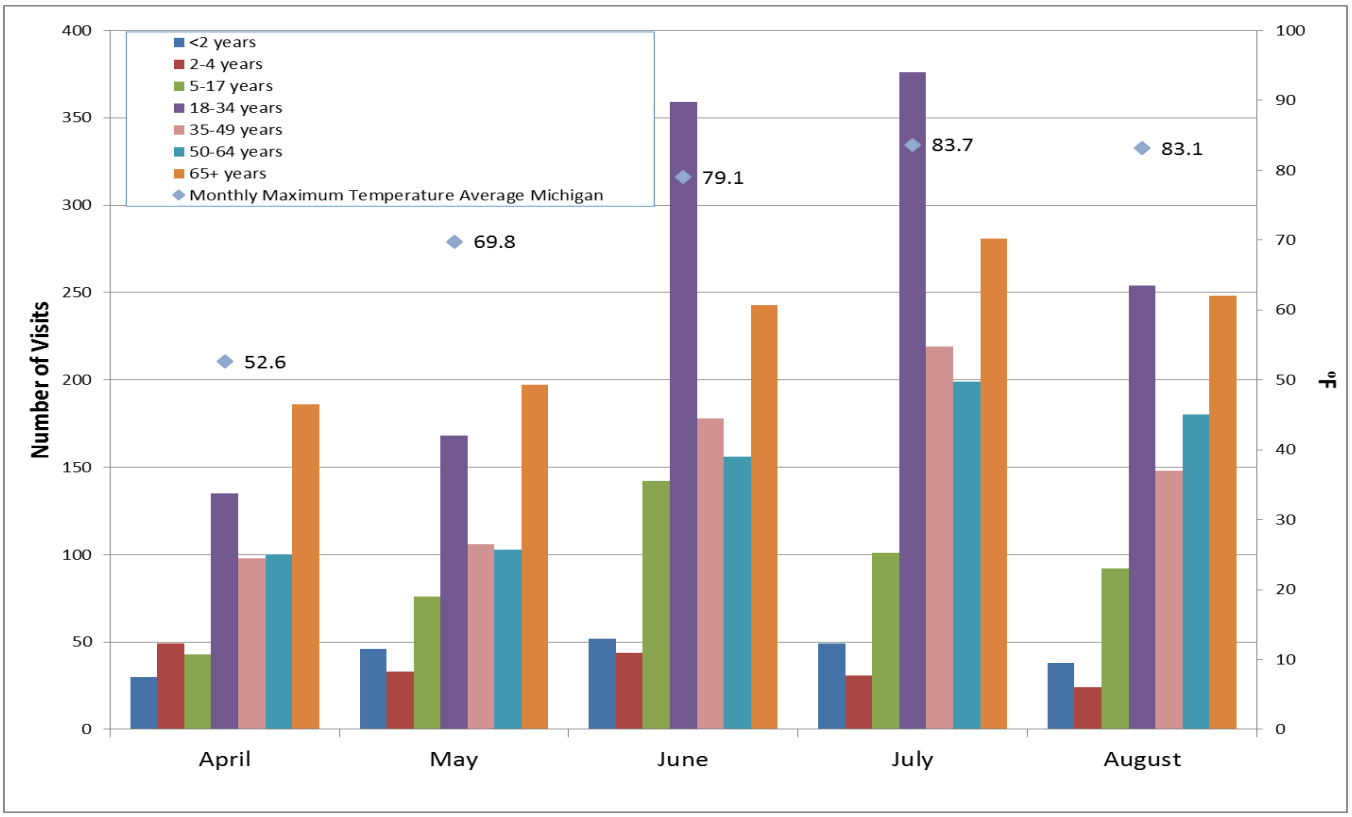

Figure 6: Male to Female Ratio of Heat-Related ED Visits by Month (April 1 – August 31, 2016)

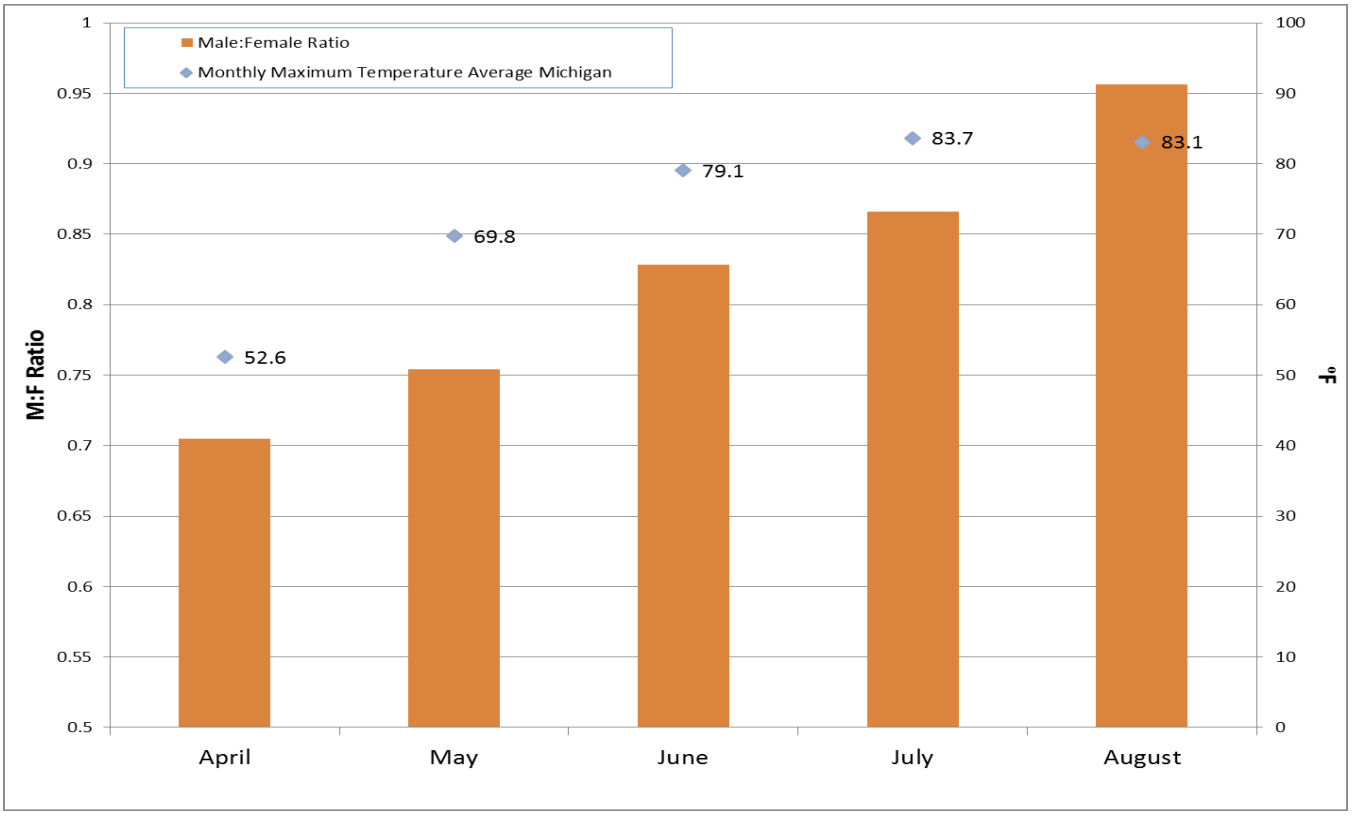

Figure 7: Statewide Heat-Related ED Visits by Syndrome (April 1 – August 31, 2016)

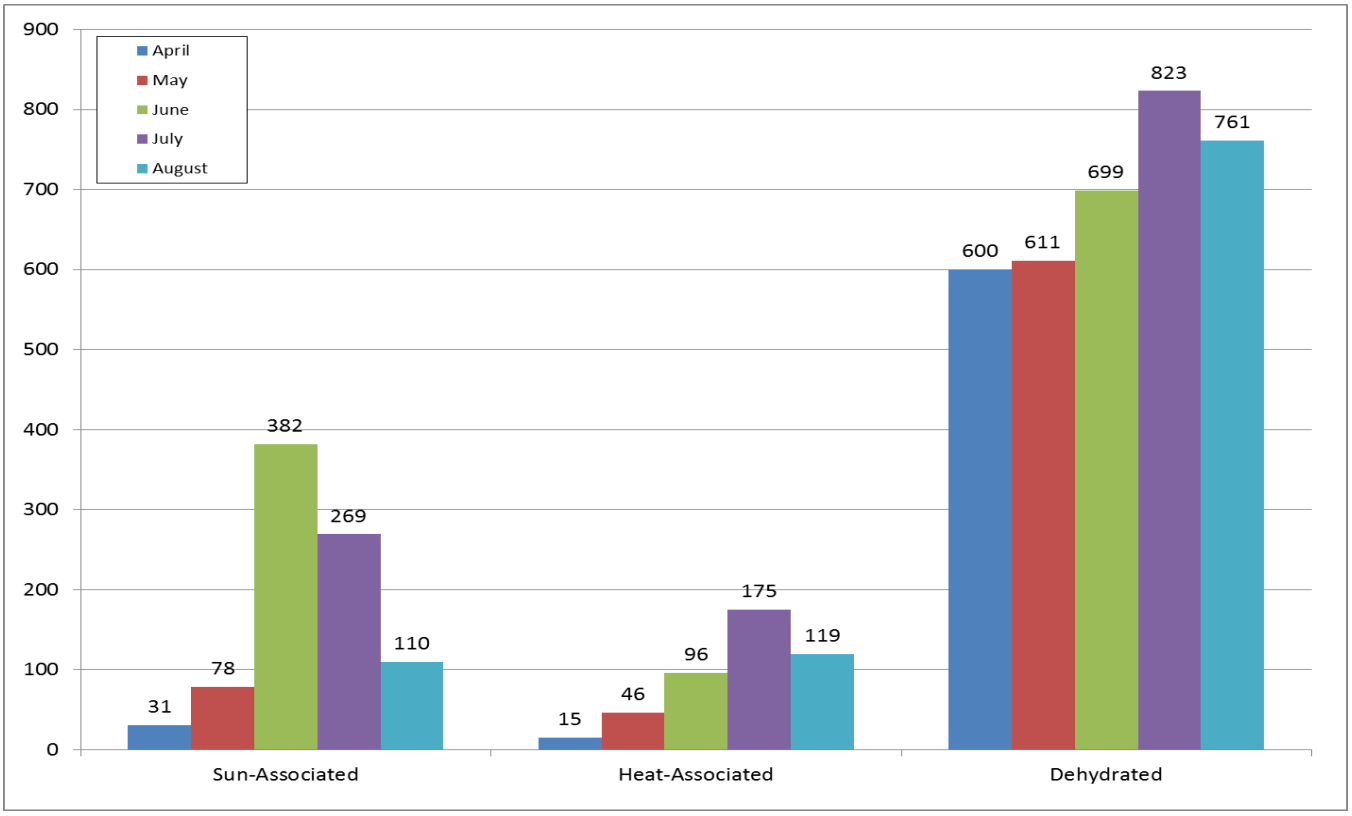

Figure 8: Proportion of Heat-Related ED Visits of all ED Visits (April 1 – August 31, 2016)

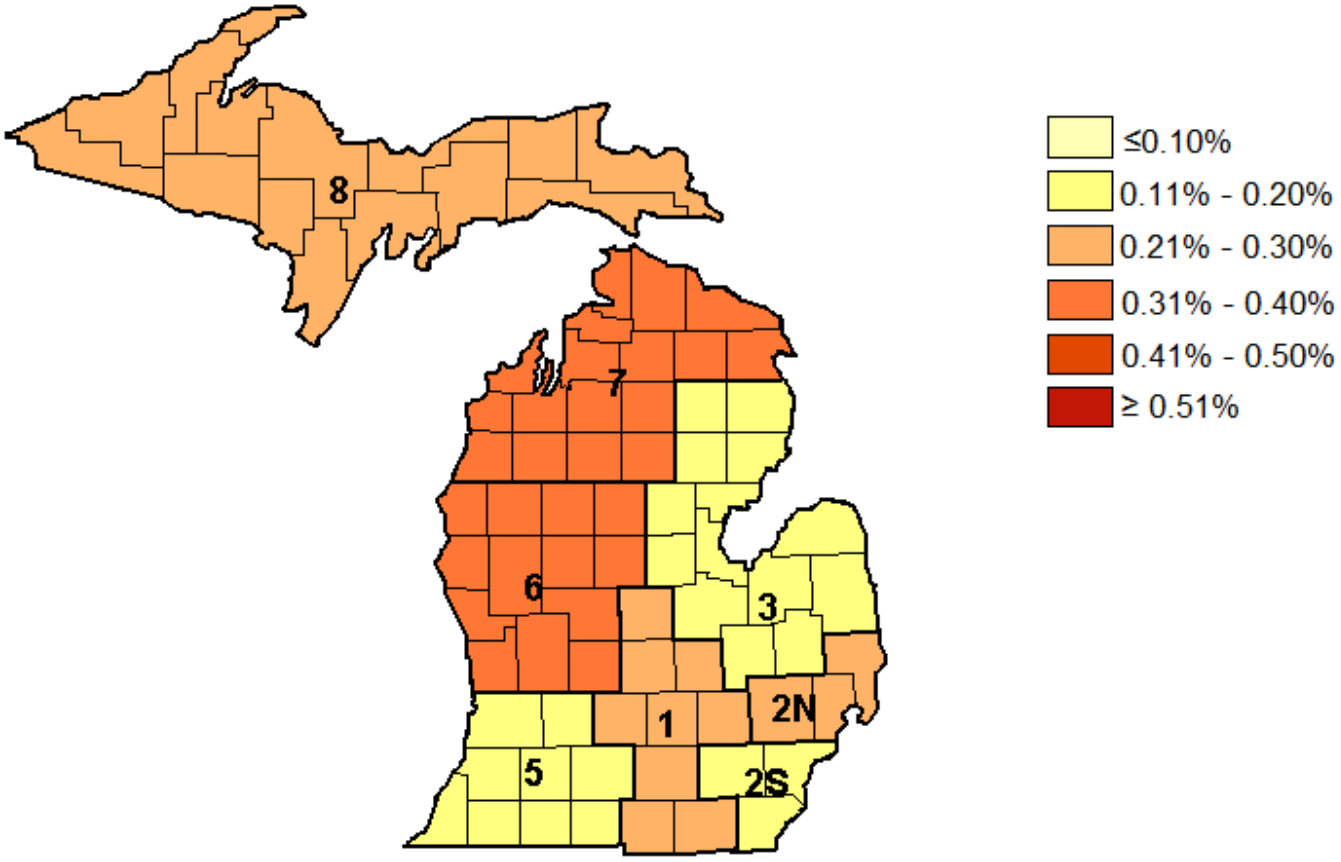

Table 2: Summary of Heat-Related ED Visits by Region (April 1 – August 31, 2016)

Region	Heat-Related ED Visits	All ED Visit	Proportion of Heat-Related ED Visits	Distribution of Heat-Related ED Visits Across Regions
1	552	266,175	0.207%	11.54%
2N	693	330,370	0.210%	14.49%
2S	1127	565,932	0.199%	23.56%
3	463	266,071	0.174%	9.68%
5	354	188,076	0.188%	7.40%
6	1194	332,250	0.359%	24.96%
7	278	82,318	0.338%	5.81%
8	123	42,971	0.286%	2.57%
Michigan Total	4784	1,922,426	0.231%	100.0%

Tips to Avoid Heat Illness:

- Use air conditioning or spend time in air-conditioned locations, when possible. Public authorities may set up cooling centers in your area to provide air-conditioned locations. Call 211 or check with local authorities for more information, including city and county websites.
- Take a cool bath, shower, or swim.
- Minimize direct exposure to the sun.
- Limit time outdoors as much as possible, but take frequent breaks if you must be outside.
- Stay hydrated - drink water or nonalcoholic fluids; try to avoid fluids with caffeine, because they can dehydrate you.
- Wear loose fitting, light-colored clothes.
- Check on your neighbors, friends and family members, especially those who are older, those with very young children, or those who have health problems.
- Never leave children, the elderly, or pets unattended in a vehicle. Even with the windows rolled down, or just for a few minutes, it is never OK to leave anyone in a vehicle in extreme heat.
- Use a fan when the windows are open or the air conditioner is on when the weather begins to heat up. Once the temperature reaches the high 90s, fans will not prevent heat illness.

Understanding Heat Illness:

1. Dehydration is the first stage of heat-related illness. Dehydration occurs when body fluids are lost, and not replaced, by sweating. Symptoms include dry mouth, thirst, headache, dizziness, cramps, excessive fatigue and irritability.

   If you are experiencing dehydration, move to a shaded or air-conditioned area, replace fluids by drinking water, and consult a physician if symptoms persist or if there is an existing condition that could be complicated by increased fluid intake.

2. The next, more serious stage of heat-related illness is heat exhaustion. Heat exhaustion occurs when people exercise heavily or work in a warm, humid place where body fluid loss occurs greatly from sweating. This fluid loss can cause reduced blood flow to vital organs, which results in shock.

   Signs of heat exhaustion include headache, moist and pale skin, nausea, dizziness, weakness and exhaustion. To treat exhaustion, seek shade or a cool place. Drink a half glass of cool water every 15 minutes, remove or loosen any tight clothing, and apply a cool, wet towel or compress. Heat exhaustion can develop into heat stroke, so if symptoms persist or worsen, seek emergency medical treatment.

3. Heat stroke is the most severe stage of heat-related illness. A heat stroke, also called sunstroke, can be deadly. Symptoms include vomiting, decreased alertness level or complete loss of consciousness, high body temperature (sometimes as high as 105 degrees) or red, hot, and dry skin with a rapid, weak pulse.

   Call 911 for immediate medical help and try to cool the person down. If possible, put them in a tub of cool water or shower them with a garden hose.

Source: Michigan Department of Community Health (2013), MDCH Advises Caution in Hot Weather: Simple steps can reduce threat of dangerous heat-related illnesses [Press Release]. Retrieved from http://michigan.gov/mdch/0,4612,7-132-8347-308332--,00.html

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