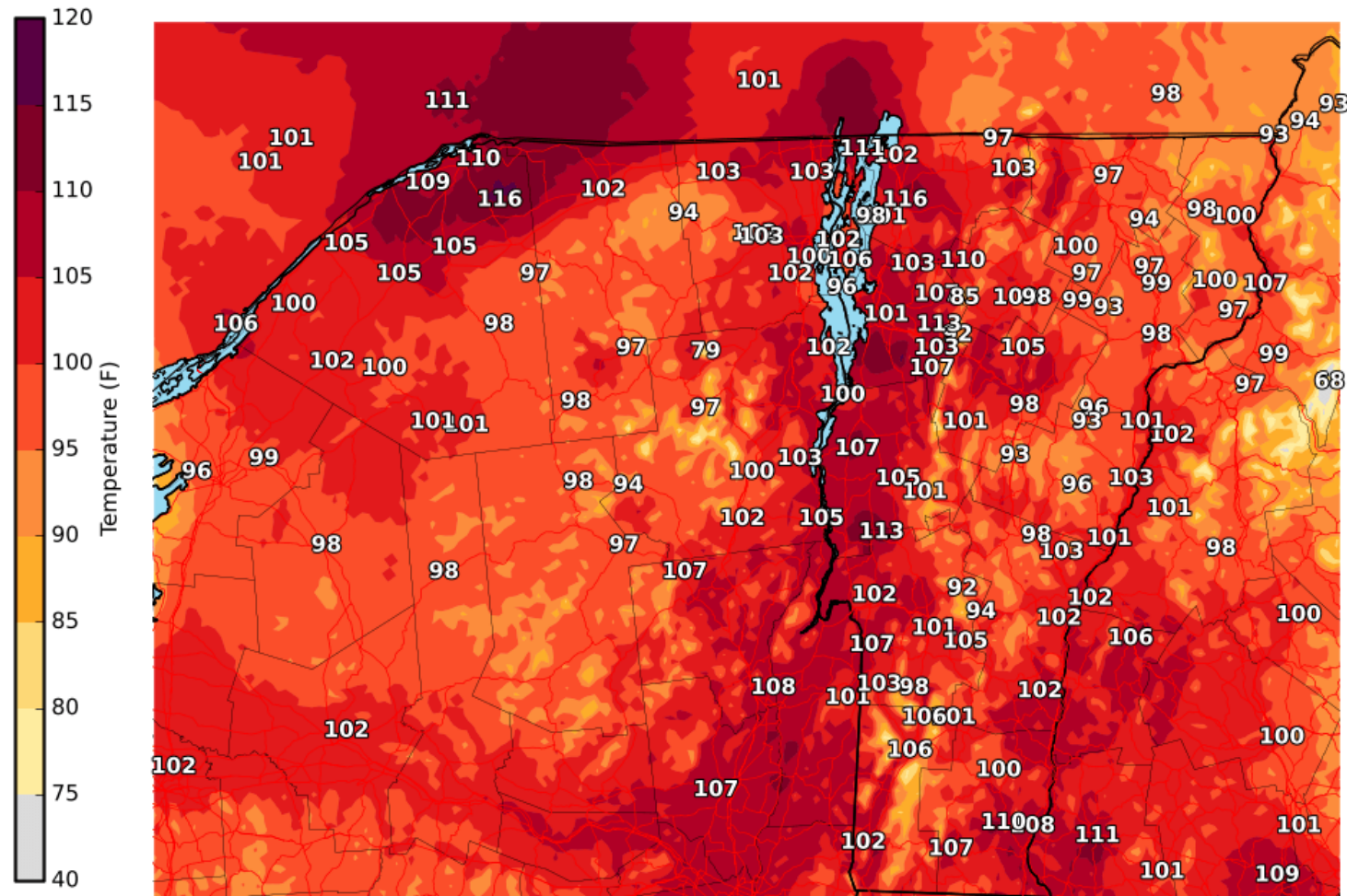


Too Hot in Vermont: Impacts of the 2018 Heat Wave

MAX Heat Index for Sunday 7/1/18

Valid: Sunday, July 01, 2018 at 04 PM EDT



National Weather Service
Burlington, VT
07/11/2018 12:30 PM EDT

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Objectives



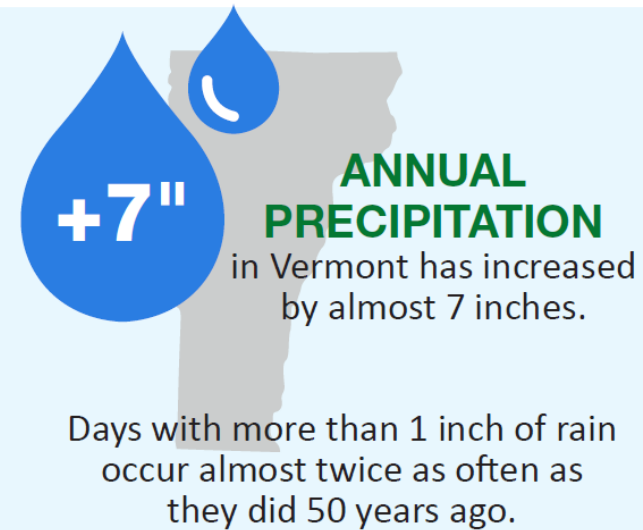
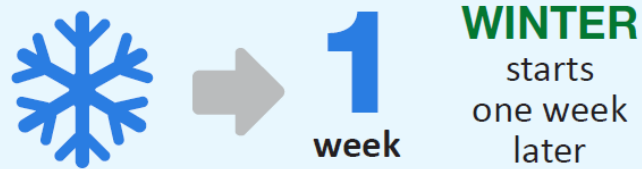
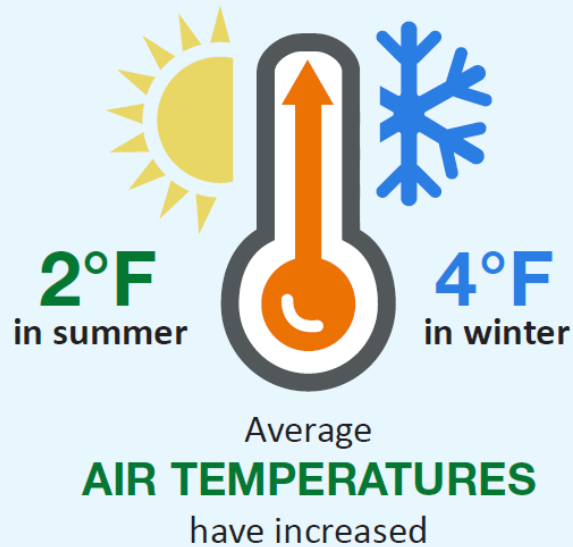
- Describe climate change in Vermont
- Explain factors that increased vulnerability to heat-related illness in Vermont
- Describe health impacts of the heat wave that occurred in late June/early July 2018

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Background: What do we know?

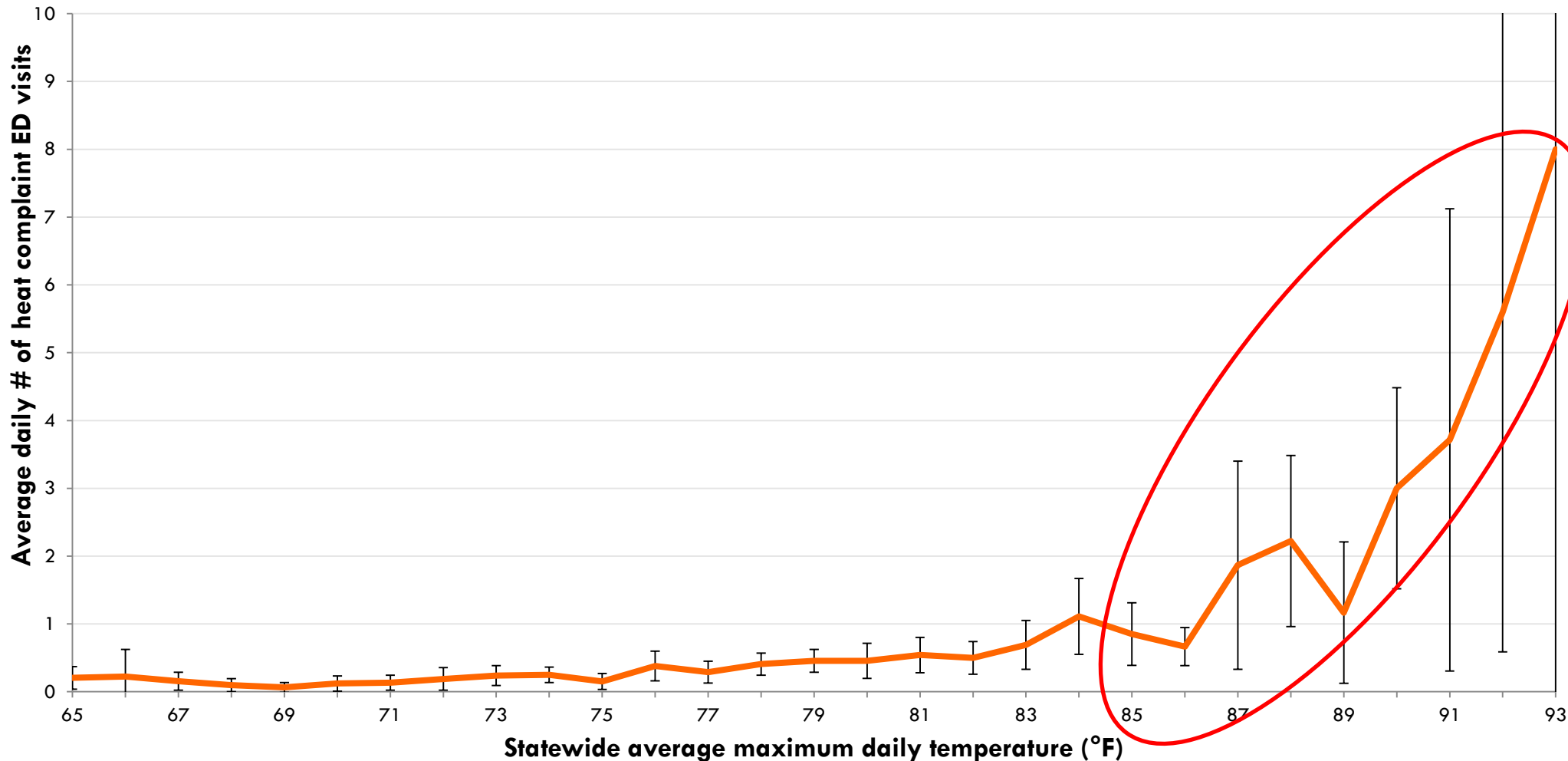
Climate change is already happening in Vermont

IN THE PAST 50 YEARS:

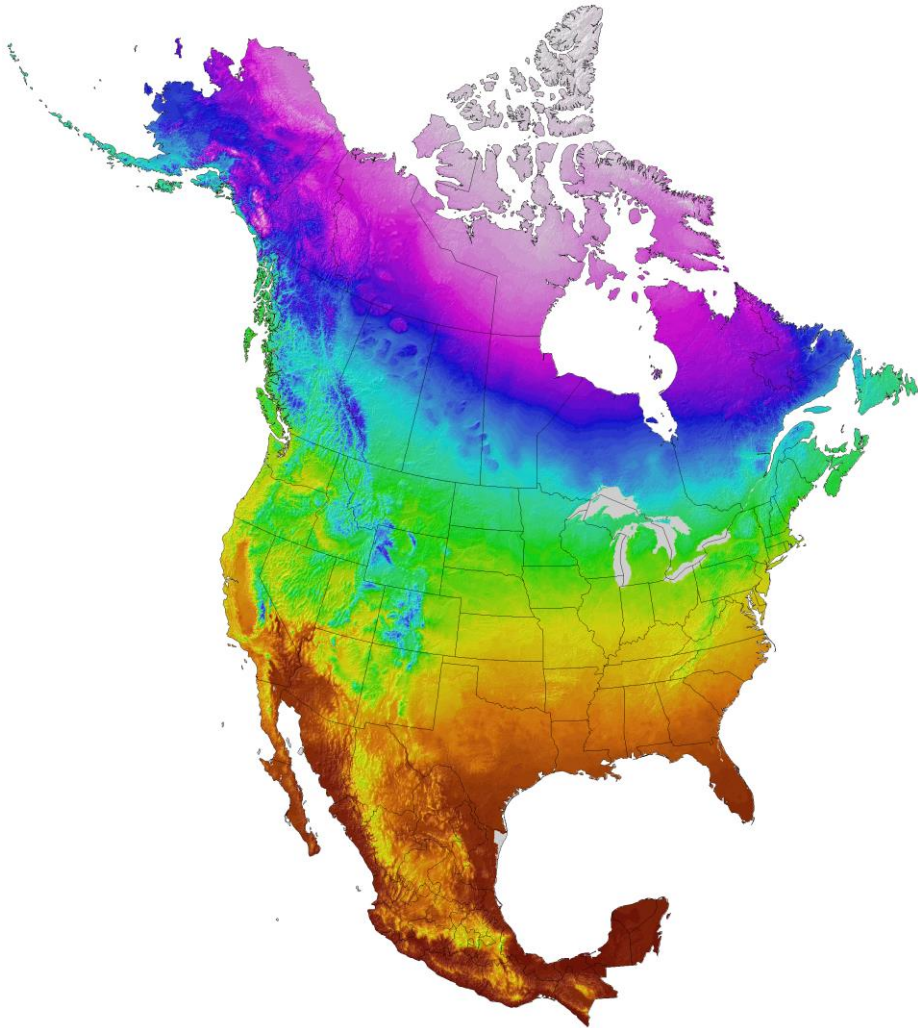


Hot weather already leads to increased illness & death in Vermont

Average daily emergency department visits for heat complaints in Vermont, by maximum daily temperature, 2004 - 2013



Lack of acclimation in Vermont



- Possible reasons for the relatively low threshold for heat illness in Vermont:
 - Limited physiological adaptation due to infrequent hot summer temperatures
 - Behaviors are difficult to change when extreme heat is so infrequent
 - Many homes/businesses in Vermont are not designed to deal with extreme heat

Climate & health vulnerability

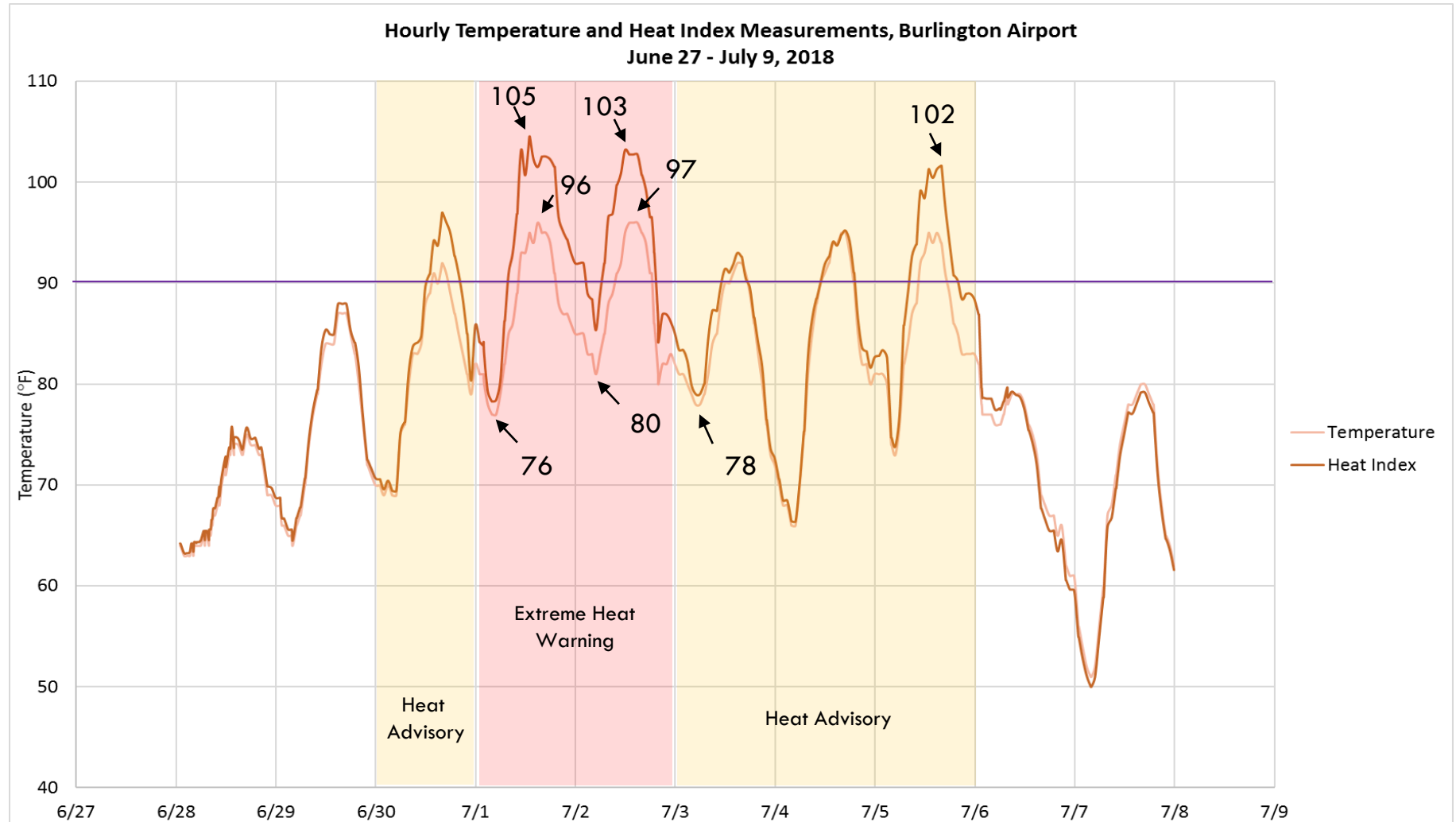
- Climate change will disproportionately affect:
 - People more exposed to climate effects
 - People with pre-existing health vulnerabilities
 - People with limited adaptation resources



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2018 Heat Wave

Heat Wave: NWS Burlington Station



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Surveillance Methods

Health-related data sources

- The Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE)
 - Emergency Department and Urgent Care Facility Utilization
- The Statewide Incident Reporting Network (SIREN)
 - Emergency Medical Services Calls
- The Office of the Chief Medical Examiner / Vermont Vital Statistics
 - Death Records

Case Definitions

- ESSENCE: used the pre-defined “heat-related illness” syndrome
 - Searches chief complaint field for various key words, excludes based on other key words
- SIREN
 - Adapted the ESSENCE syndrome to search the patient care report narrative for heat-related key words
 - Dispatch Complaint Report or Reason = “Heat/Cold Exposure”
 - Primary Impression (2015 and 2016) = “Heat Exhaustion/Stroke” or “Hyperthermia”
 - Working Diagnosis (2017 and 2018) = “Heat Exhaustion” or “Heat Stroke”
 - Patient Care Report Narrative contains variations on “heat” or “hot” AND “dehydrat”

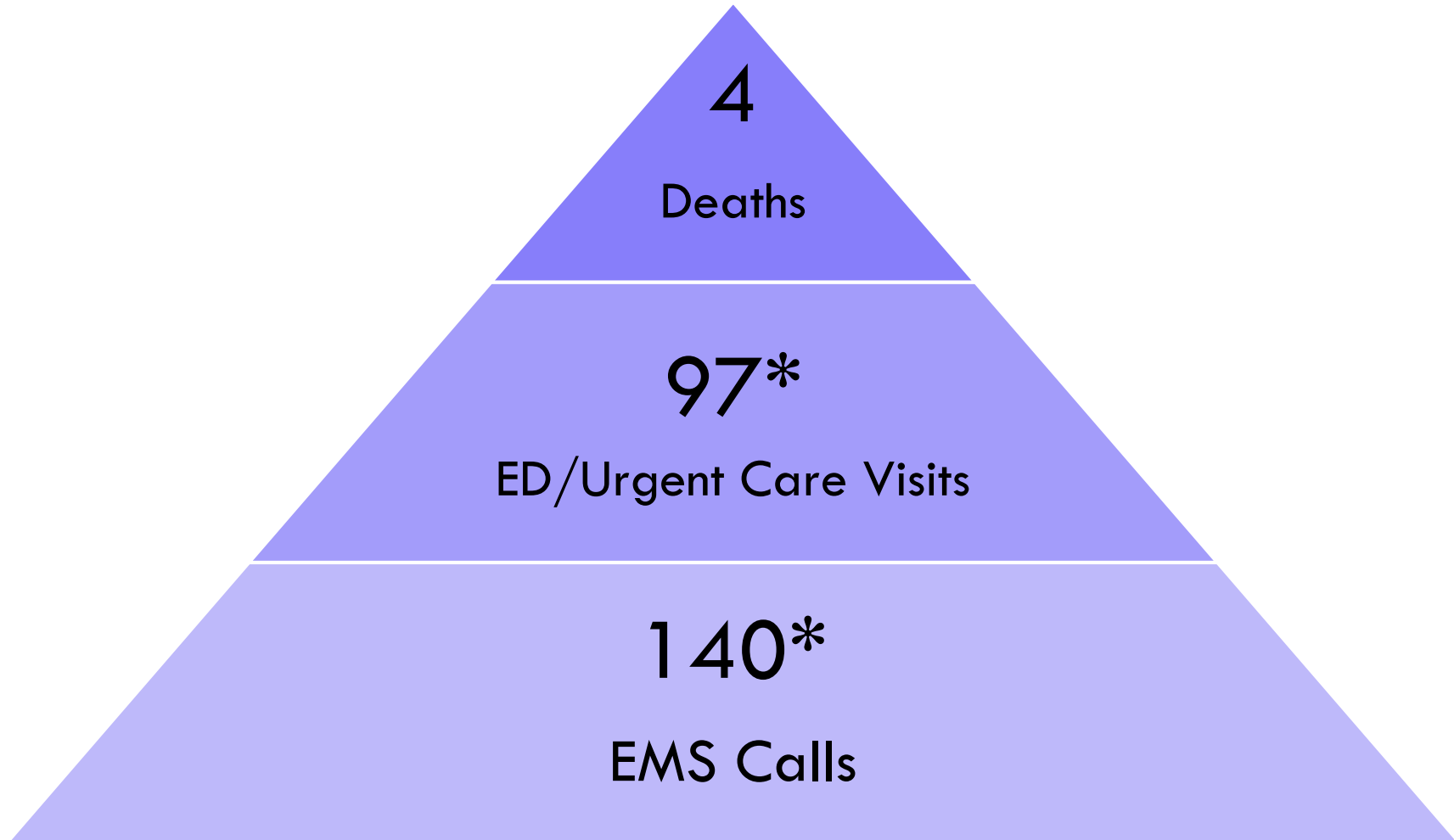
Challenges with Real Time Surveillance

- Timeliness vs. data quality
- Keyword searches
- Changes in number of reporters over time
 - How do you make a historic comparison?

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Health Impact Overview

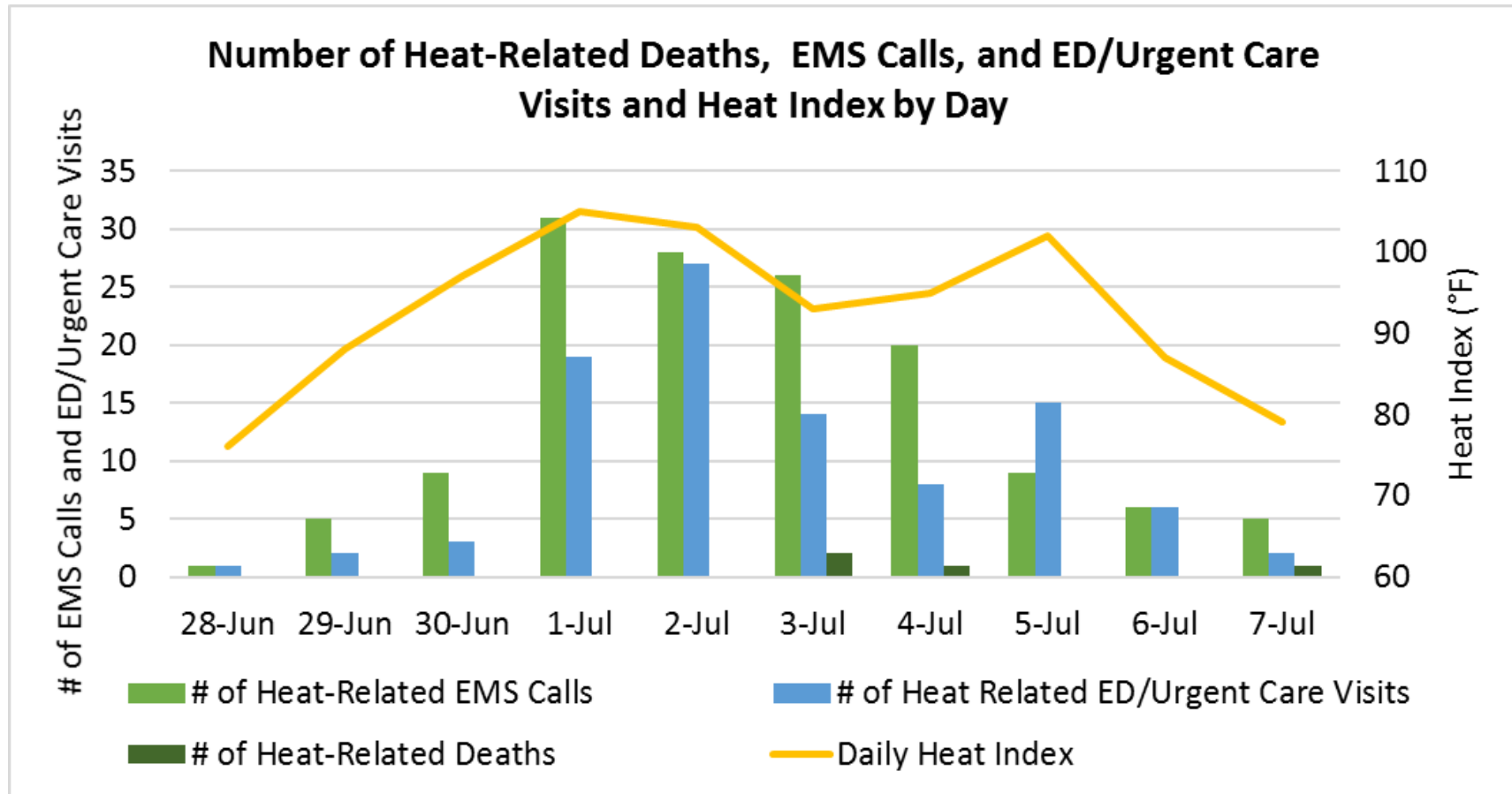
Estimated heat-related health impacts



* Estimate based on preliminary surveillance data.

Data sources: The Statewide Incident Reporting Network (SIREN), 2018. The Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE), 2018. Vermont Vital Statistics, 2018 (preliminary).

Heat-related health impacts, by day

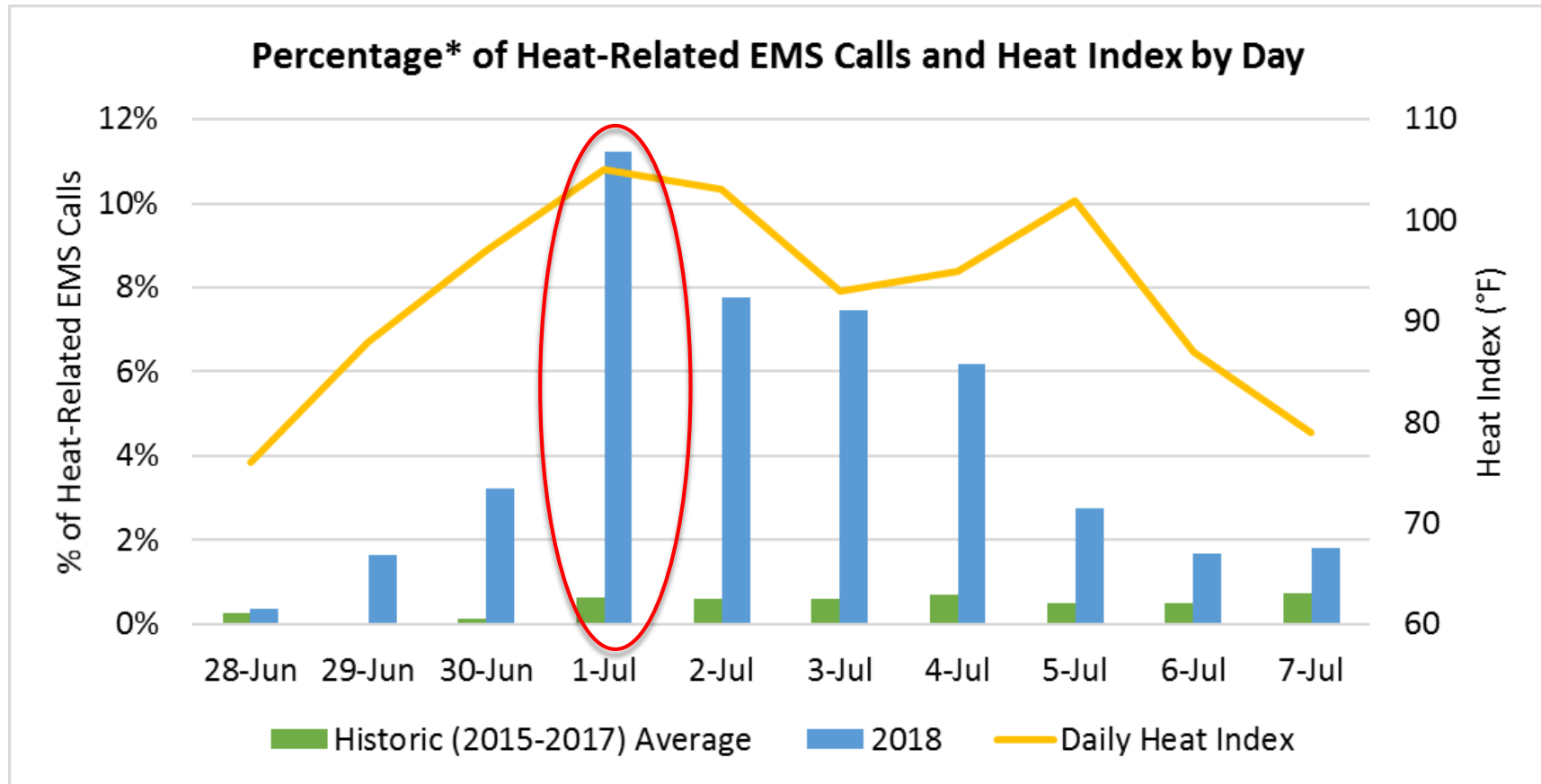


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EMS Data

SIREN

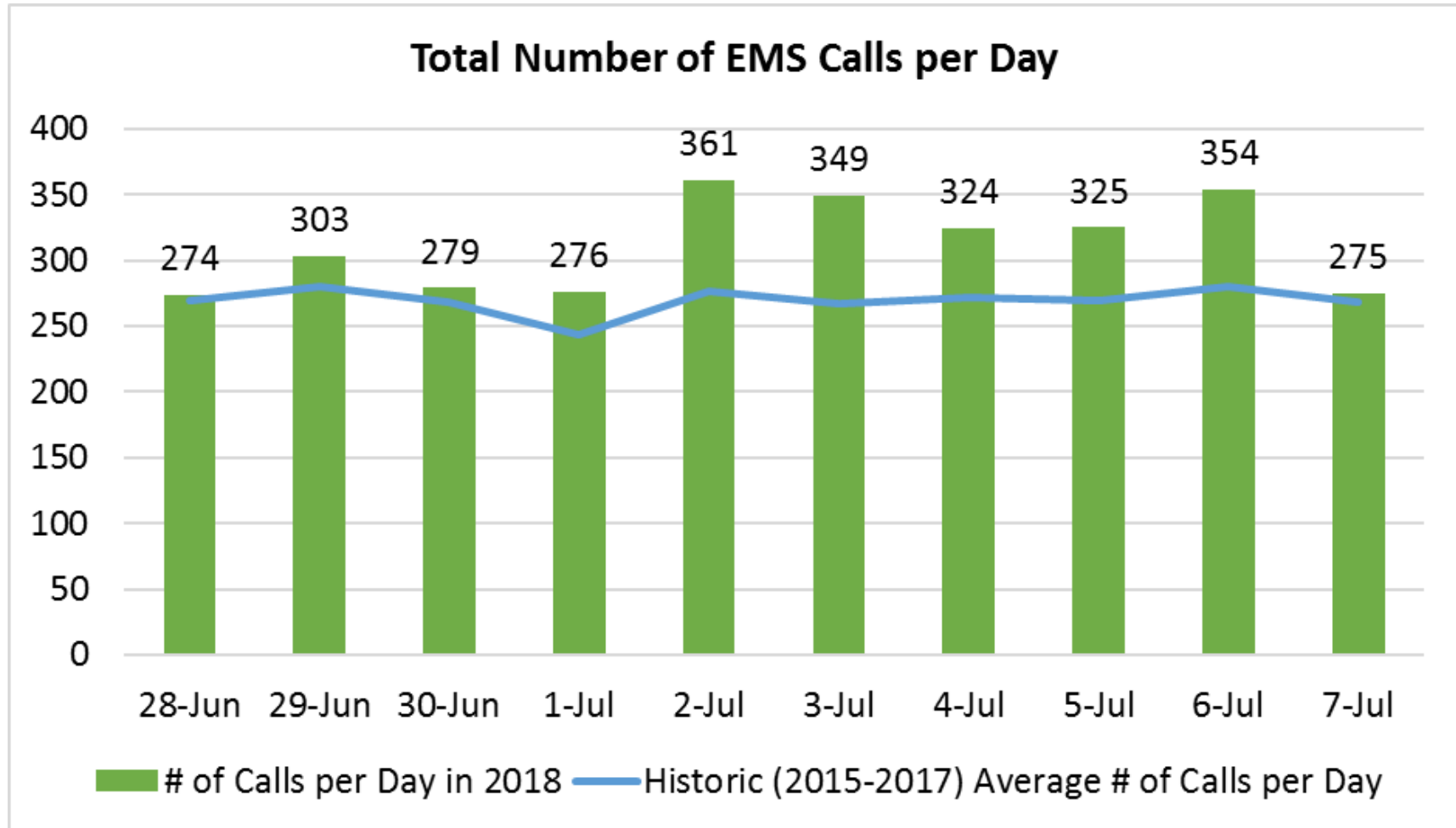
Heat-related EMS calls



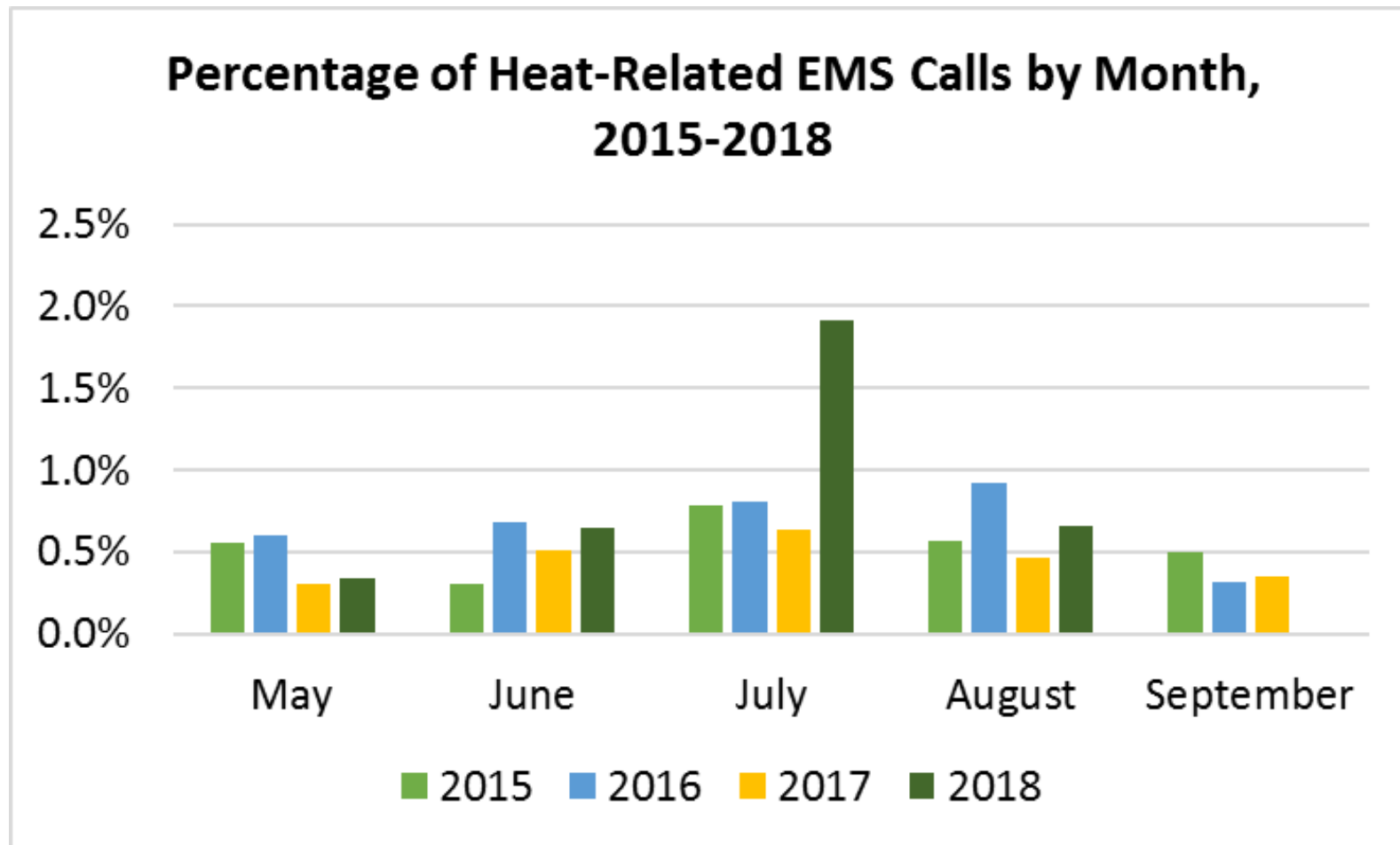
*Calculated out of all EMS calls on a given day

Data sources: The Statewide Incident Reporting Network (SIREN), 2015-2018. The National Weather Service, 2018.

Total EMS calls



How bad was July 2018?



*Note: No September data for 2018 yet

Data source: The Statewide Incident Reporting Network (SIREN), 2015-2018.

Who was impacted?

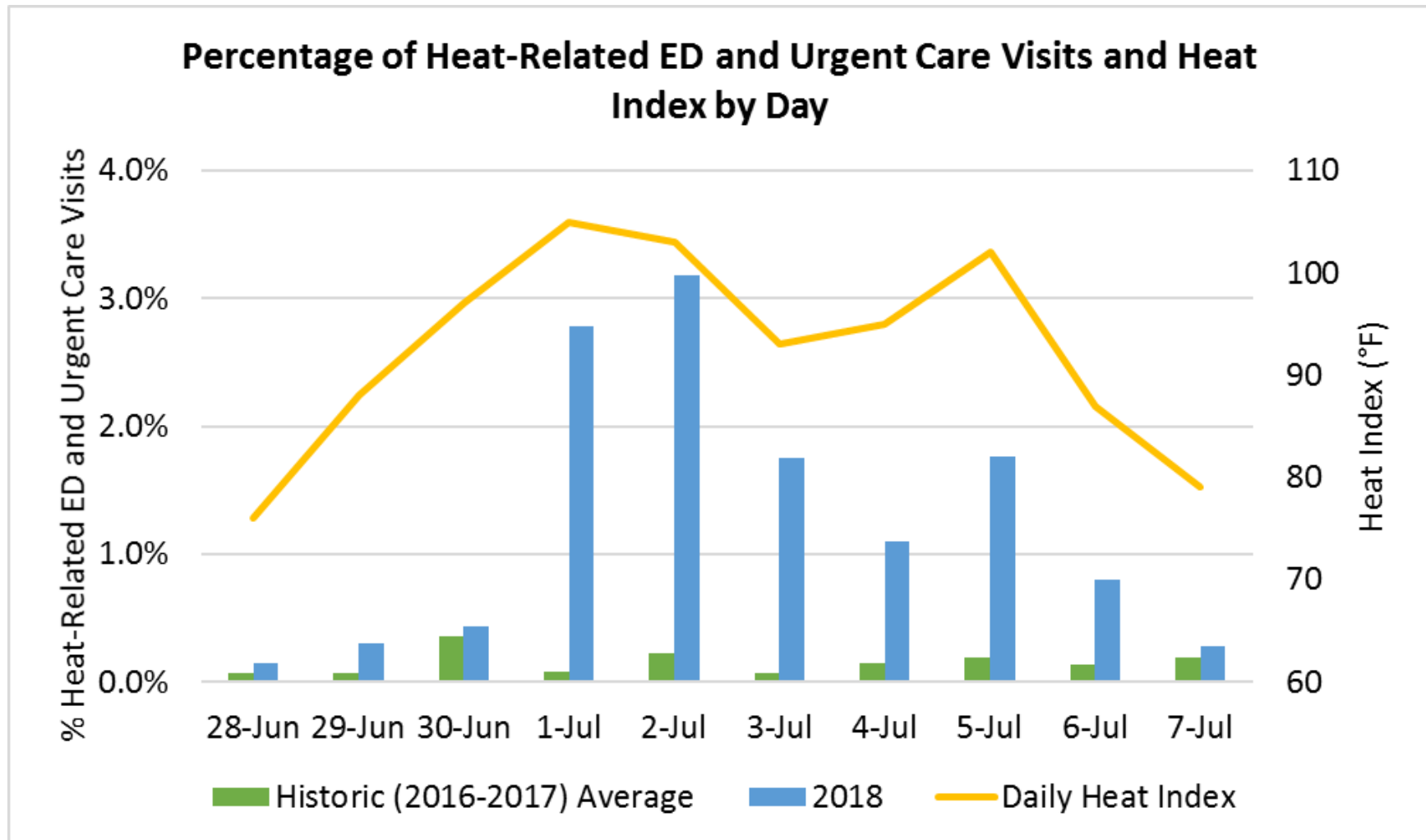
- More males (60%) than females (40%)
- 65+ age group (41%)
- About 50% of calls were to the patient's home
 - 55% of these calls were for those 65+
- Most calls came in between noon and 6 PM
- 73% of calls resulted in the patient being transported by EMS



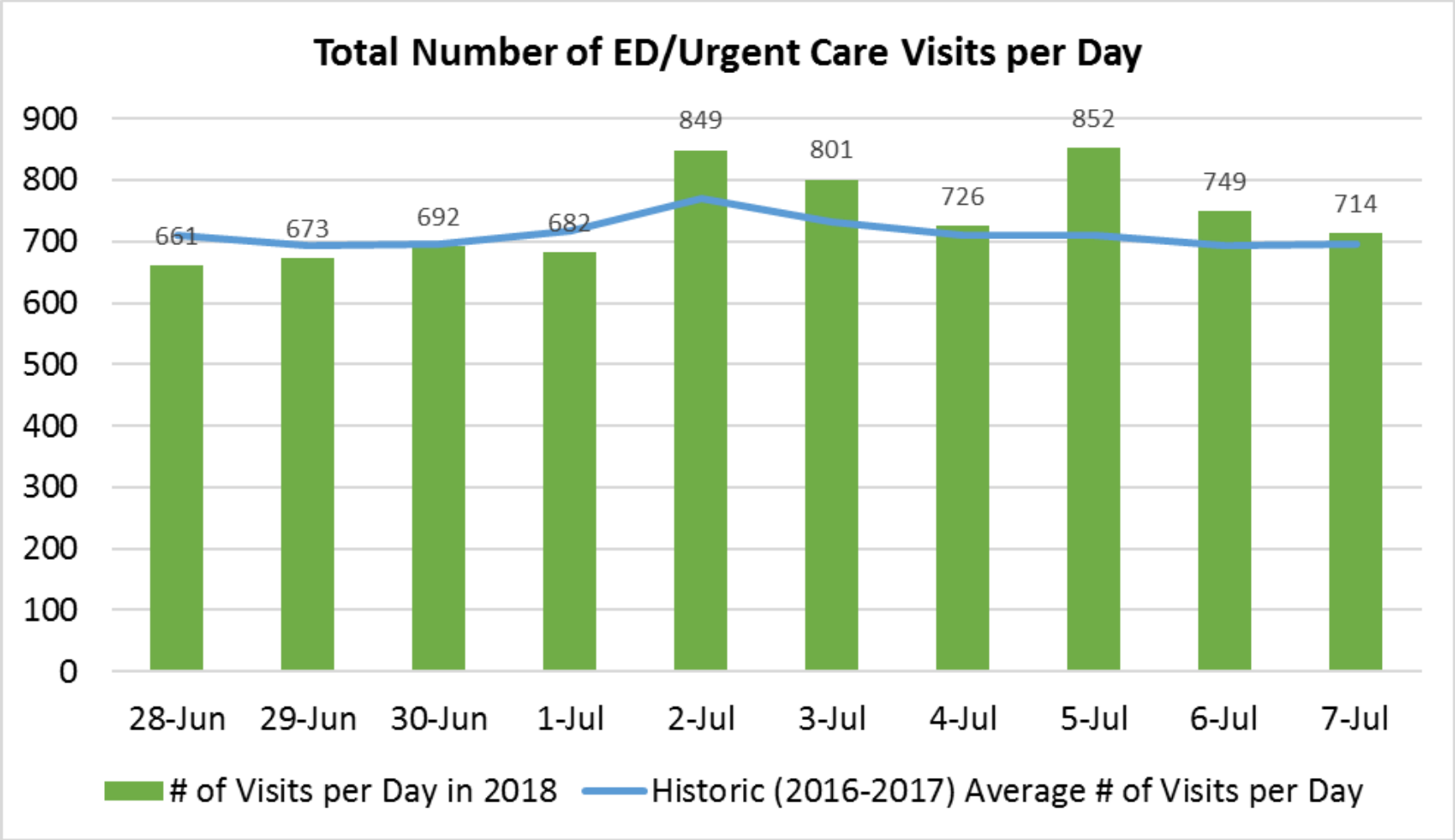
Emergency Department and Urgent Care Data

ESSENCE

Heat-Related ED and Urgent Care Visits



Total ED and Urgent Care Visits



Data source: The Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE), 2016-2018.

Who was impacted?

- More males (59%) than females (41%)
- Equal distribution among 18-44, 45-64, and 65+ age groups (about 30% each)
- Most patients admitted between noon and midnight

Mortality Data

Office of the Chief Medical Examiner

Vermont Vital Statistics

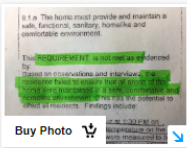
Heat-Related Deaths Over Time

Year	# of Heat-Related Deaths
2009	1
2010	2
2011	0
2012	0
2013	2
2014	0
2015	2
2016	0
2017	1
2018	4

Heat Vulnerability

Impaired man died during heat wave while under care of state-licensed facility in Waterbury

Elizabeth Murray, Burlington Free Press Published 6:00 a.m. ET Aug. 29, 2018



(Photo: Free Press Staff)



A Vermont man whose death during an early summer heat wave has been attributed to exposure to temperatures upward of 95 degrees was under the care of a state-licensed residential facility.

The state's investigation of Steven Katz's death showed that Kirby House in Waterbury violated two

regulations: the requirement that the facility have a written plan of care for each resident and that it ensures the home provides and maintains a "safe, functional, sanitary, homelike and comfortable environment."

□ Factors:

- Environmental characteristics
- Climate acclimation
- Age
- Pre-existing medical conditions/medication use
- Isolation

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Conclusions

Conclusions

- This heat wave was likely a preview of more frequent future conditions
- Heat has real and significant impacts on health in Vermont
 - Unprecedented health impacts, approaching Tropical Storm Irene in deaths
- Impacts appeared most severe for:
 - Older adults (and others with health vulnerabilities)
 - Those living alone
 - No air conditioning

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Questions or comments?



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