2022 Annual Excessive Heat Report

County of San Diego
Health and Human Services Agency
Public Health Services

June 2023

2022 Annual Excessive Heat Report

June 29, 2023

This document was developed by the Public Health Services Administration Branch, the Public Health Preparedness and Response Branch, and the Community Health Statistics Unit of the County of San Diego Public Health Services Department and is in support of Live Well San Diego.

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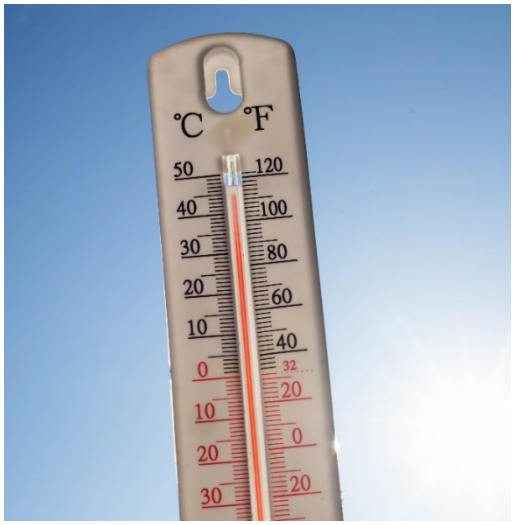
Introduction

Heat-related deaths and illnesses are preventable. Still, more than 600 people in the United States are killed by extreme or excessive heat every year according to the Centers for Disease Control and Prevention (CDC). Heat is the number one weather related killer in the U.S.[1] On average, more people are killed by heat in the U.S. than by other natural disasters (i.e., tornadoes, earthquakes, hurricanes, floods) combined.[1]

Extreme heat is defined as temperatures that are much hotter and/or humid than average for a particular location and the time of year. Extreme heat events are becoming more frequent, due to the warming of our planet. Prolonged hot weather can cause dehydration and increase the body's core temperature, making it difficult for the body to function normally.



In an excessive heat event, the Public Health Services (PHS) branch of the County of San Diego Health and Human Services Agency is responsible for coordinating response efforts with other County departments and external partners to disseminate information relevant to the heat emergency to the public. San Diego County had 8 heat events during 2022, ranging from 2 to 11 days long, with the longest occurring at the end of August and into early September. The tables and figures contained in this report show the number of activations year-to-year; prehospital data and outcomes, provided by County of San Diego Emergency Medical Services (EMS); Aging and Independence Services (AIS) activities, such as Cool Zone coordination and electric fan distribution; 2-1-1 activities; and the outreach efforts that County Communications Office (CCO) completed. An Appendix is included with trended health data for the years through 2021.

Historical Assessment: Heat Alerts Issued by Year

Three phases of the *Excessive Heat Response Plan (EHRP)* are recognized.[2]

- **Phase I:** Seasonal Readiness
- **Phase II:** Heat Alert
- **Phase III:** Heat Emergency

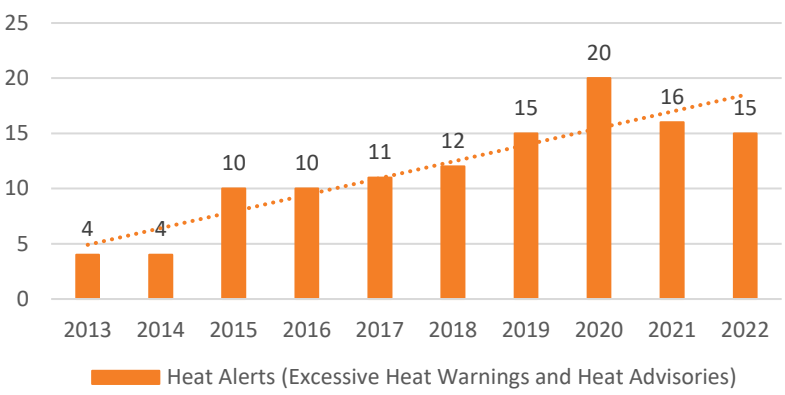
Phase I is dedicated to planning and awareness, while Phases II and III are initiated based on Heat Advisory and Excessive Heat Warnings, collectively called heat alerts, from the National Weather

Service (NWS). When the County of San Diego receives this information, Public Health Services (PHS) initiates the activation procedures.

During the past 15 years, the region has seen increasing temperatures, evidenced by an increased number of heat alerts. With increasing temperatures due to climate change, even in the coastal areas, it is vital to adequately prepare for excessive temperatures.

When temperatures are forecast to be significantly above normal, as compared to a 30-year climatology average, the NWS will issue a heat alert for the area (climate zone) at risk. If temperatures will be excessively hot, NWS issues an Excessive Heat Warning, the highest alert level. When temperatures are significantly higher than normal, but not the most extreme, a lower-level alert, the Heat Advisory, will be issued. ***Figure 1*** shows that over the past ten years, the combined number of Heat Advisories and Excessive Heat Warnings has generally increased from 2013 through 2022, peaking in 2020. The highest numbers of heat alerts were issued by NWS in 2020 (20) and 2021 (16).

FIGURE 1: NUMBER OF HEAT ALERTS ISSUED.



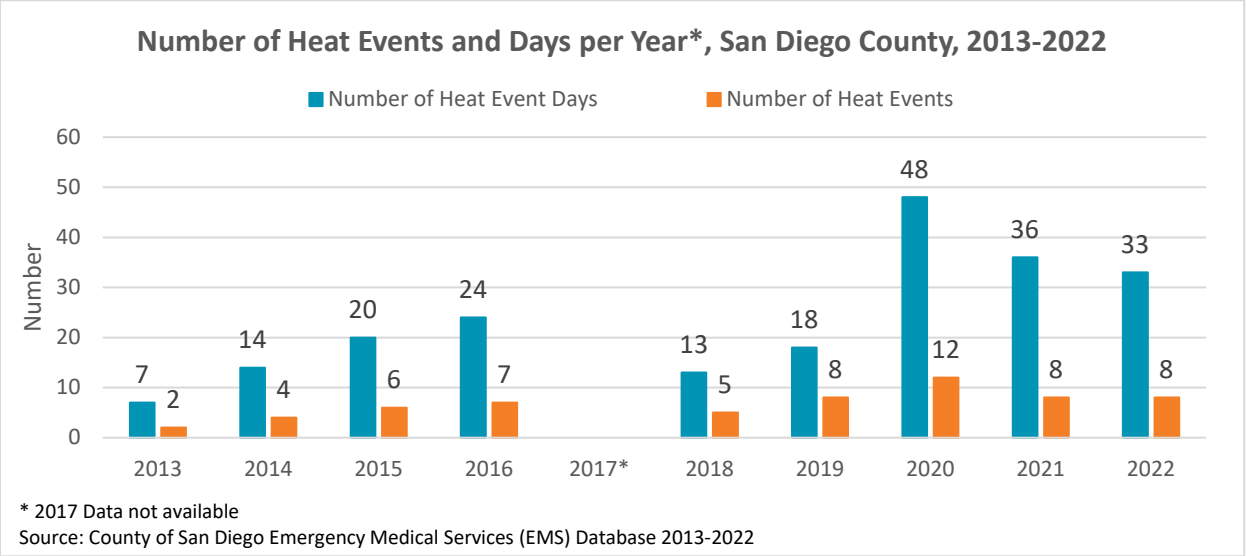
Heat Alerts include Heat Advisories and Excessive Heat Warnings issued for one or more areas annually. Total = 117. Source: NOAA, National Weather Service, San Diego.

Year	Warning	Advisory	Sum of Heat Alerts
2013	2	2	4
2014	0	4	4
2015	1	9	10
2016	2	8	10
2017	5	6	11
2018	7	5	12
2019	6	9	15
2020	10	10	20
2021	8	8	16
2022	6	9	15

Since heat alerts are issued for affected areas within the county, there may be multiple heat alerts issued by NWS for a single heat event. Overall, the *heat event* indicates the weather condition where the *EHRP* is activated to Phase II or III. In 2022, NWS issued 15 heat alerts – nine Heat Advisories and six Excessive Heat Warnings – for San Diego County, which resulted in eight heat events, lasting a total of 33 days. The number of events was the same as the previous year,

with three less heat event days, as seen in ***Figure 2.*** Notably, over a ten-year span from 2013 to 2022, the number of heat event days more than quadrupled.

FIGURE 2: NUMBER OF HEAT EVENTS AND DAYS PER YEAR.



* 2017 Data not available
Source: County of San Diego Emergency Medical Services (EMS) Database 2013-2022

Typically, heat events occur in four consecutive months, June through September. However, 2022 saw the earliest heat event on record, occurring in February and lasting three days. There was also a three-day heat event in April, before the typical heat season. ***Table 1*** shows the number of days in a heat event, by month, from 2013 to 2022.

TABLE 1: NUMBER OF DAYS IN HEAT EVENT BY YEAR AND MONTH.

	2013	2014	2015	2016	2017*	2018	2019	2020	2021	2022	Total
January	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	3	3
March	0	0	0	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	7	0	3	10
May	0	4	0	0	0	0	0	8	0	0	12
June	3	0	6	13	0	2	2	4	12	7	49
July	3	2	0	6	0	8	4	5	5	5	38
August	0	0	6	2	0	3	8	12	9	2	42
September	1	5	4	3	0	0	2	6	10	13	44
October	0	3	4	0	0	0	2	6	0	0	15
November	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0
Total	7	14	20	24	0	13	18	48	36	33	180

* 2017 Data not available
Source: County of San Diego Emergency Medical Services (EMS) Database 2013-2022

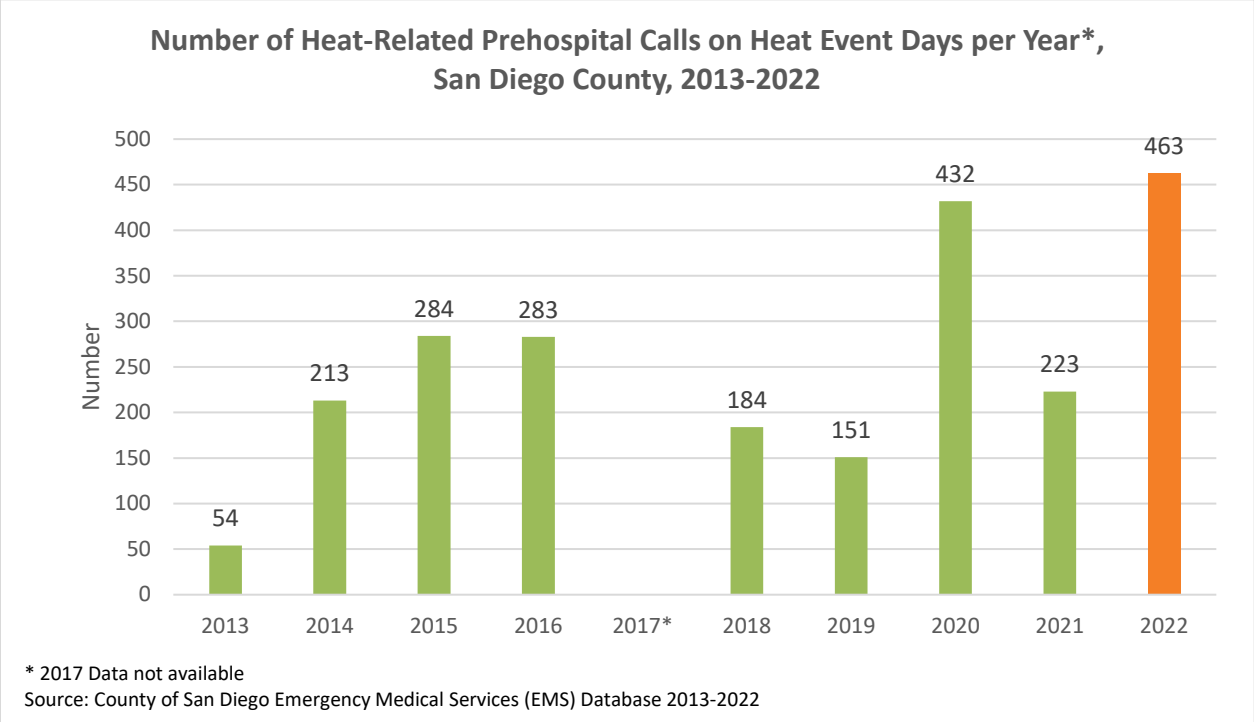
Prehospital Calls Related to Excessive Heat

During extreme or excessive heat events, the risk of heat-related illnesses increases. Heat illness occurs when the body cannot cool down. The body normally cools itself by sweating, however, sometimes that is not enough. In excessive heat, especially when humidity is high, sweat does not evaporate as quickly, and the body must work harder to maintain its normal temperature. Other factors can also contribute to how our body regulates temperature, such as age, health conditions, and medication or drug use.[1]

Prehospital care is an essential part of emergency health care that is frequently initiated by a 911 call to a dispatch center. Trained personnel, such as emergency medical technicians (EMT) and other emergency medical services (EMS) responders, triage, treat, and transport the patient(s) to the appropriate health care facility, where definitive care is ultimately provided.[3]

In 2022, there were 463 heat-related prehospital calls on heat event days, which was more than double the number in the 2021, as seen in ***Figure 3.*** This was an average of 14 prehospital calls on heat event days, which is higher than the overall (multi-year) average of 10.7.

FIGURE 3: NUMBER OF HEAT-RELATED PREHOSPITAL CALLS ON HEAT EVENT DAYS PER YEAR.



* 2017 Data not available
Source: County of San Diego Emergency Medical Services (EMS) Database 2013-2022

Table 2 shows how many calls were made for each heat event. The heat event starting on August 30, 2022, was the longest event, lasting 11 days. During this heat alert, there were 285 total calls, with most individuals (220) being transported to an emergency department (ED).

TABLE 2: PREHOSPITAL CALLS RELATED TO EXCESSIVE HEAT, SAN DIEGO COUNTY, 2022.

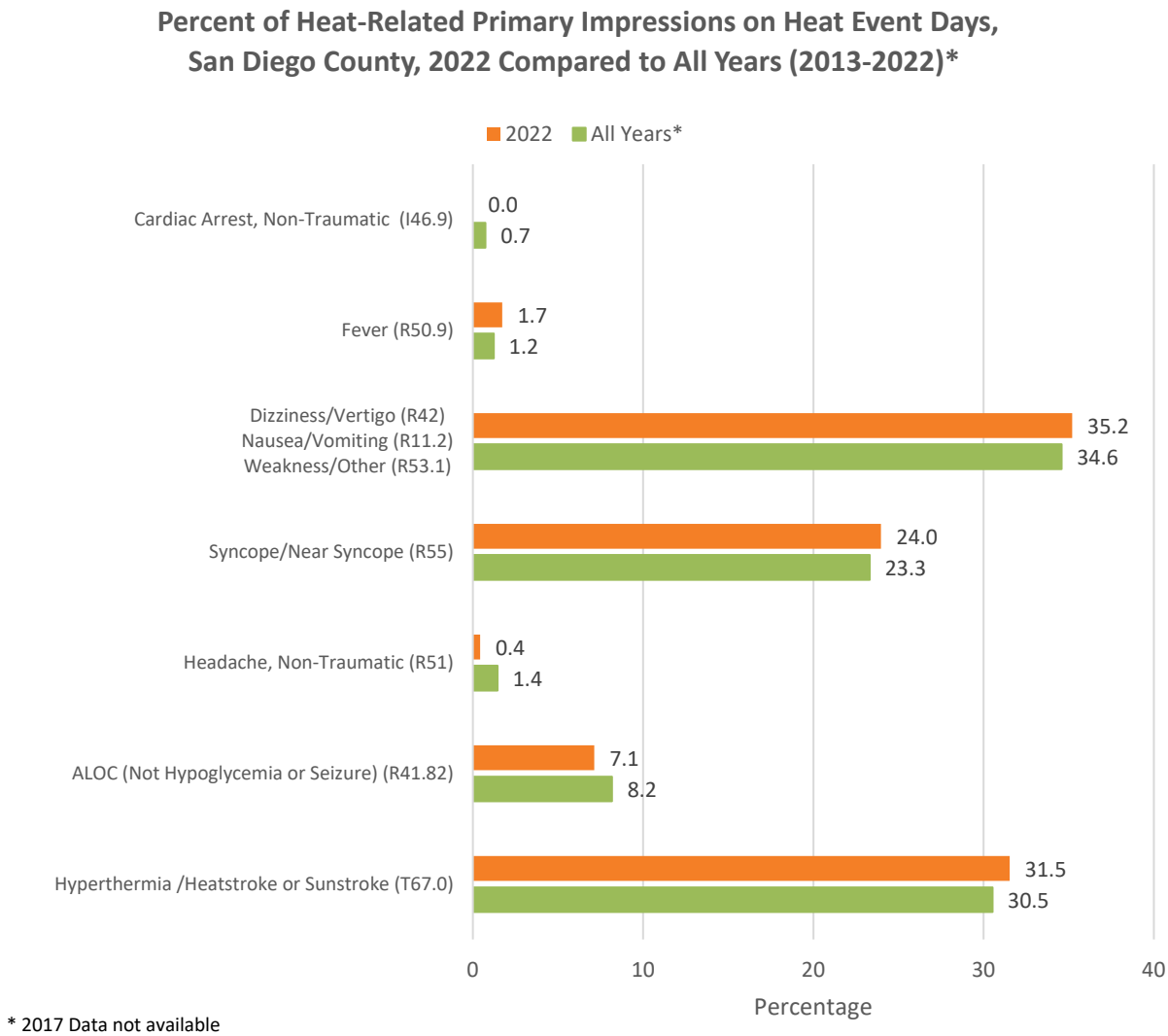
Heat Event Start Date	Length of Event (days)	Total Calls	Run Outcome*	Run Outcome Count
2/11/2022	3	12	Transported	9
			AMA	3
			DOS	0
4/6/2022	3	59	Transported	52
			AMA	7
			DOS	0
6/9/2022	4	25	Transported	14
			AMA	11
			DOS	0
6/26/2022	3	33	Transported	27
			AMA	6
			DOS	0
7/15/2022	3	20	Transported	16
			AMA	4
			DOS	0
7/21/2022	2	8	Transported	5
			AMA	3
			DOS	0
8/30/2022	11	285	Transported	220
			AMA	65
			DOS	0
9/25/2022	4	21	Transported	19
			AMA	2
			DOS	0

***AMA - Against Medical Advice**
***DOS - Dead On-Scene**
Data compiled and reported by County of San Diego Emergency Medical Services (EMS).

Some heat-related illnesses include heat rash, heat cramps, heat exhaustion, and heat stroke. Effects of these illnesses include, but are not limited to, dizziness, nausea or vomiting, muscle cramps or spasms, headache, fainting, or unconsciousness. When first responders arrive for prehospital calls, they record their primary impressions of the individual.

Figure 4 shows heat-related primary impressions on heat event days. In 2022, the dizziness/vertigo, nausea/vomiting, and weakness/other impressions were most reported, followed by syncope/near syncope and hyperthermia/heatstroke or sunstroke, all with proportions similar to the multi-year average from 2013 to 2022.

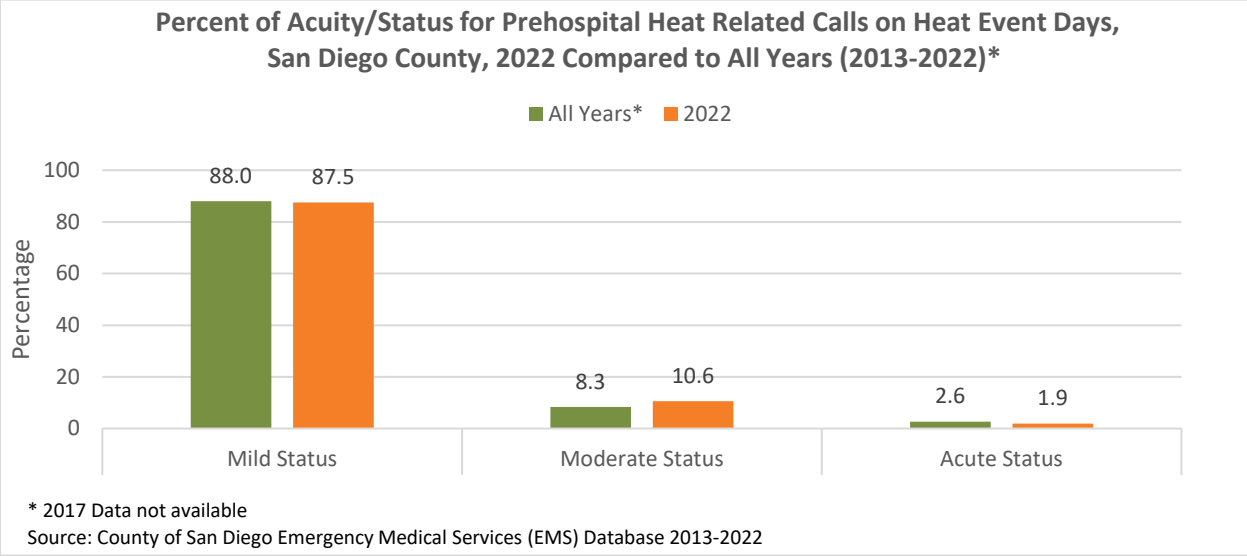
FIGURE 4: PERCENT OF HEAT-RELATED PRIMARY IMPRESSIONS ON HEAT EVENT DAYS.



* 2017 Data not available
Source: County of San Diego EMS Database 2013-2022

The severity of the calls is also recorded, as seen in ***Figure 5***. The percent of acuity/status for prehospital heat-related calls for 2022 was similar to previous years and the overall percent. The majority of calls (87.5%) were of mild status in 2022.

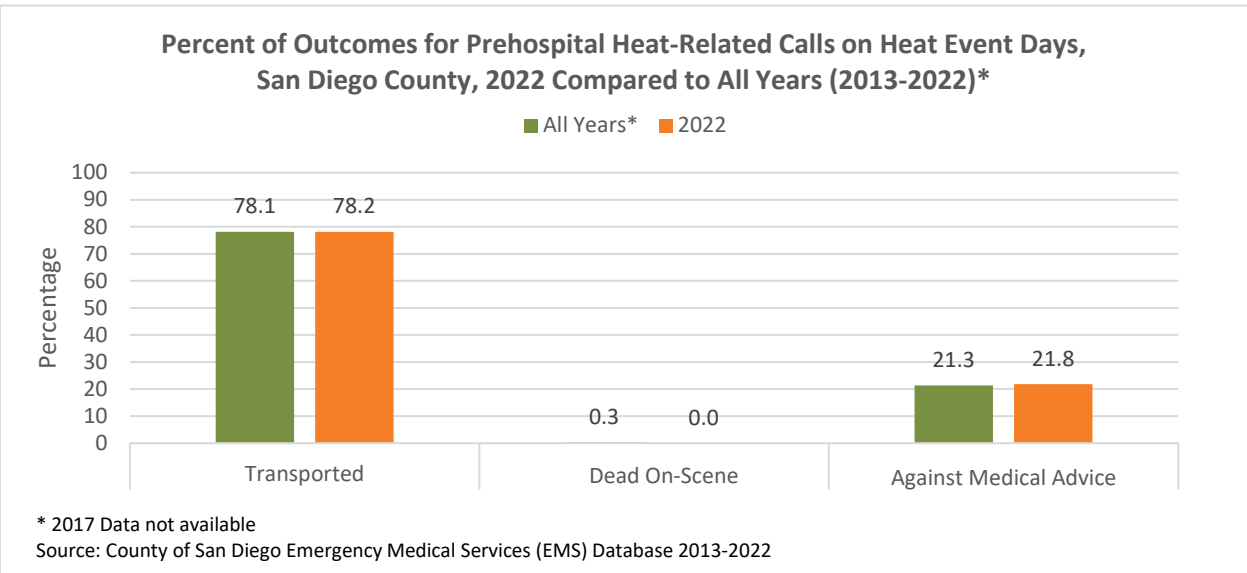
FIGURE 5: PERCENT OF ACUITY/STATUS FOR PREHOSPITAL HEAT-RELATED CALLS ON HEAT EVENT DAYS.



* 2017 Data not available
Source: County of San Diego Emergency Medical Services (EMS) Database 2013-2022

Outcomes for prehospital heat-related calls for 2022 were similar to previous years and the overall percent (***Figure 6***). Most calls (78.2%) resulted in transportation to an emergency department (ED).

FIGURE 6: PERCENT OF OUTCOMES FOR PREHOSPITAL HEAT-RELATED CALLS ON HEAT EVENT DAYS.



* 2017 Data not available
Source: County of San Diego Emergency Medical Services (EMS) Database 2013-2022

The health data available through 2021 show an upward trend in the number of residents experiencing heat illness or injury during May to September.

DEATH

Between 1991 and 2021, there were 85 heat illness/injury deaths among San Diego County residents. On average, there have been 3 deaths per year; 6 deaths occurred in both 2004 and 2018. In 2021, there were 8 deaths, the highest number of deaths from heat illness/injury since 1991.

HOSPITALIZATION

Between 1991 and 2021, there was a total of 727 hospitalizations for heat illness/injury. The average number per year was 23. There were 46 hospital discharges reported in 2021.

EMERGENCY DEPARTMENT DISCHARGE

Between 2006 and 2021, there were 3,064 emergency department (ED) discharges for heat illness/injury among San Diego County residents. The average number of discharges per year was 192. There were 153 emergency department discharges reported in 2021.

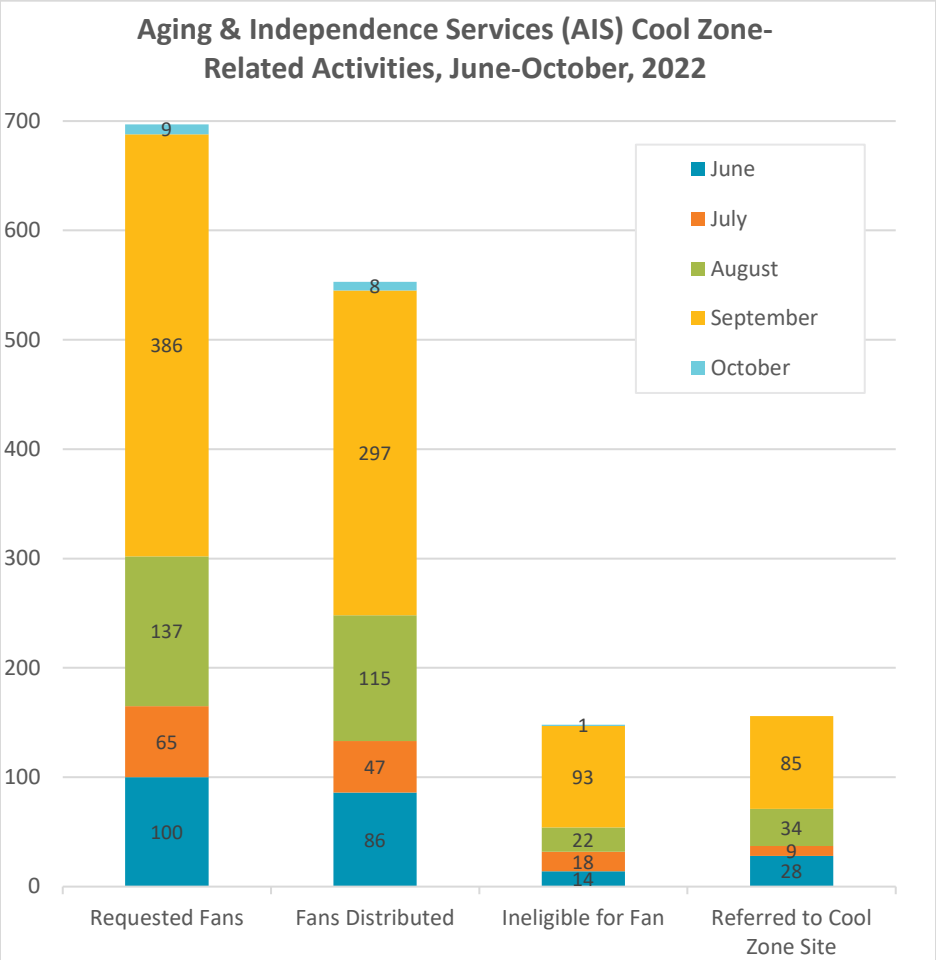
See the ***Appendix*** for the historical trends of heat illness or injury outcomes through 2021.

Aging and Independence Services (AIS) Activities

Anyone can be affected by extreme or excessive heat, but heat risk increases with age. Aging and Independence Services (AIS), part of the County of San Diego Health and Human Services Agency, provides assistance, information, and referrals to older adults, those with disabilities, and their family members.[4] For assistance, individuals can call the AIS Call Center.

AIS manages the Cool Zone program, which is a network of free, air-conditioned settings across the county, including San Diego County libraries and County of San Diego Parks and Recreation spaces, for anyone looking to escape excessive heat. This program was launched out of concern for older adults, persons with disabilities, and those with health conditions leading to increased heat illness risk. Cool Zones are also a way for residents to lower individual utility usage and help conserve energy for the whole community.

FIGURE 7: AGING AND INDEPENDENCE SERVICES (AIS) COOL ZONE-RELATED ACTIVITIES.

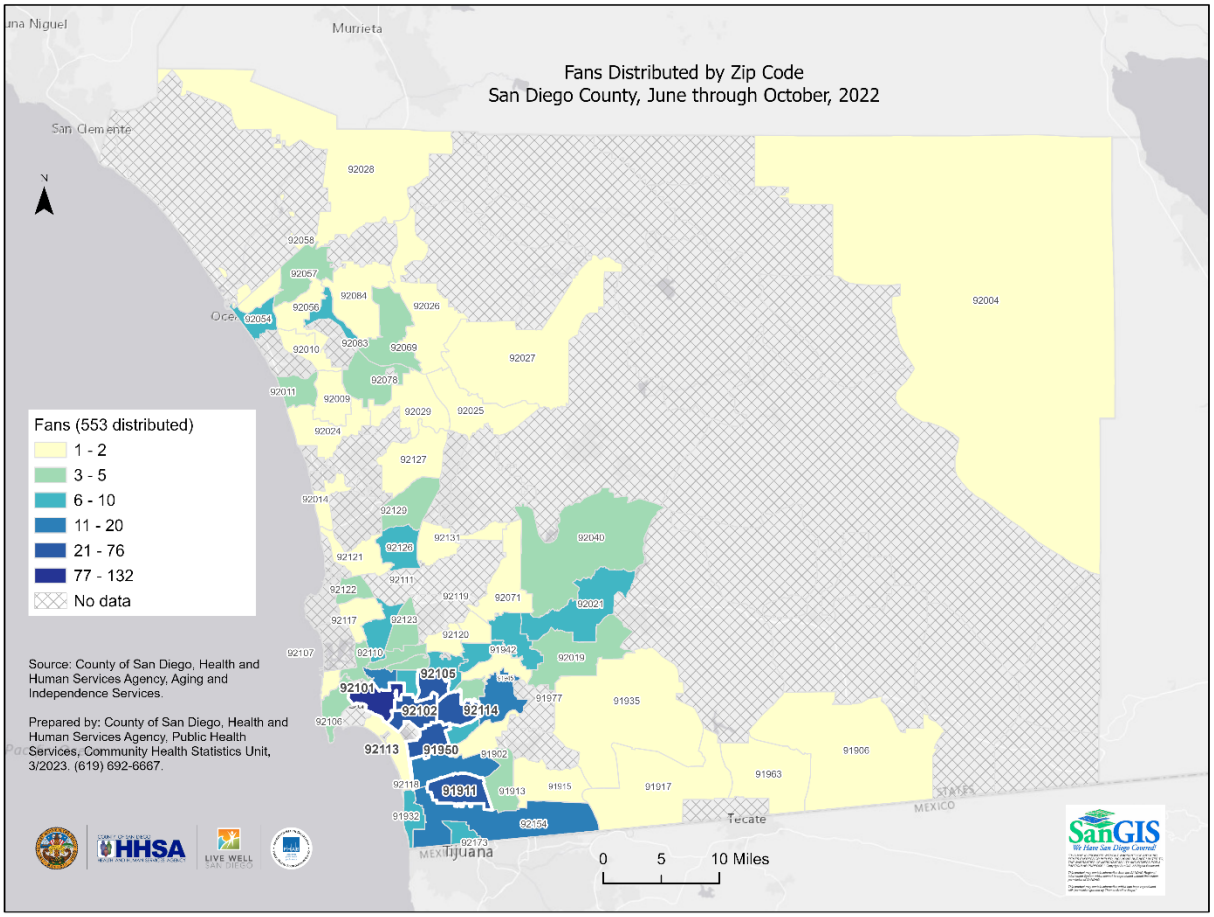


Source: County of San Diego Health and Human Services Agency, Aging & Independence Services, 4/2023.
Prepared by County of San Diego Health and Human Services Agency, Aging & Independence Services,

Figure 7 details the AIS Cool Zone-related activities. In 2022, between June and October, the AIS Call Center received 697 requests for fans. Of those, 553 requests were eligible and received fans (79%). Most of the fans were distributed in September (54%). In addition, the Call Center referred 156 requesters to Cool Zones in San Diego County.

Most fans were provided for residents in the south-west part of the county (Zip Codes 92101, 91911, and 91950 were provided 132, 32, and 31 fans, respectively). ***Figure 8*** shows a map of the total number of fans distributed by Zip Code.

FIGURE 8: TOTAL NUMBER OF FANS DISTRIBUTED BY ZIP CODE.



For more information about Aging and Independence Services, visit their website at https://www.sandiegocounty.gov/content/sdc/hhsa/programs/ais.html.

2-1-1 San Diego Activities

As a local nonprofit organization, 2-1-1 San Diego is the region's trusted source for information and connections to community, health, and disaster resources. Help is available 24 hours a day, every day of the week, and in more than 200 languages.[5] During excessive heat events, 2-1-1 assists in connecting people in San Diego without transportation assistance, such as older adults, people with disabilities, or people who are homebound, to a transportation or rideshare service at no cost. These resources transport San Diego County residents to and from Cool Zone locations.

Between June and October 2022, 2-1-1 received a total of 527 inquiries. There were 38 referrals for transportation. This was over three times that of the previous year, when there were 11 transportation referrals. The highest number of inquiries (252) and transportation referrals (19) were in September. See ***Table 3*** for the number of inquiries received through 2-1-1 and the number of transport referrals, per month.

TABLE 3: 2-1-1 SAN DIEGO ACTIVITIES BY MONTH.

Month (2022)	Inquiries Received Through 2-1-1	Number of 2-1-1 Transport Referrals
June	110	6
July	37	0
August	110	6
September	252	19
October	18	7
Total	**527**	**38**

Source: 2-1-1 San Diego.

More information about 2-1-1 San Diego's services is available at https://211sandiego.org/ or by calling 2-1-1.

County Communications Office Excessive Heat Outreach Activities

The County Communications Office (CCO) recognizes the importance of communicating directly with the public about programs and services that add value to their health, safety, neighborhood, and environment. To that end, CCO uses a variety of communication tools including social media, the Internet, and traditional media to keep San Diegans informed. When excessive heat is expected, the County Communications Office works with Public Health Services and other County departments to determine public messaging and whether those messages will be delivered via social media, a news release, or both.

Examples of social media communications are shown in ***Figures 9-11***. These examples provide tips for hiking in the heat, information on how to keep pets safe during extreme heat, and up-to-date Cool Zone information.

FIGURES 9-11: SOCIAL MEDIA COMMUNICATIONS DURING HEAT EVENTS.

Information and resources are posted to the County of San Diego Excessive Heat website, as well as to the County's Twitter (@SanDiegoCounty), Instagram (@countyofsandiego), and Facebook (County of San Diego - Government) accounts.

Conclusion

As temperatures, and subsequent excessive heat events, increase, the County of San Diego's focus is on preventing adverse health effects in an equitable manner for all residents. While heat events typically occur in June through September, 2022 saw the earliest heat event on record, occurring in February and lasting three days. Over the course of the year, 8 heat events occurred, with the longest lasting 11 days.

The health effects of increasing heat events are evident. In 2022, there were 463 heat-related prehospital calls on heat event days, which was more than double the number of calls in 2021. During the 11-day heat event in late August and into early September, there were 285 calls with most being transported to an emergency department. Prehospital primary impressions included dizziness/vertigo, nausea/vomiting, and weakness/other impressions most reported. Historical surveillance, updated through 2021, showed an upward trend in ED and hospital visits among residents experiencing heat illness or injury. Additionally, there were 8 deaths due to heat illness or injury in 2021, the highest number on record since 1991.

The County Communications Office continues to provide public messaging to news and social media to alert San Diegans to upcoming hazards. Additional strategies to address excessive heat include opening Cool Zones, assisting with transportation to these locations, and providing fans to those who may need them. The number of fans distributed by AIS increased in 2022 with 553 fans distributed, compared to 313 fans distributed in 2021. The majority of fans went to residents with zip codes in the southwestern part of San Diego County. Similarly, 2-1-1 San Diego supported 38 transport referrals to Cool Zones in 2022, up from 11 transportation referrals the prior year.

There are several ways to keep yourself and those around you safe during heat events to prevent heat-related illnesses and injuries.[6]

- Stay somewhere cool or get to one of the Cool Zones.
- Take a cold shower or bath.
- Stay hydrated and drink plenty of water.
- Avoid drinks that contain alcohol, caffeine, and lots of sugar.
- Wear light clothing and hats.
- Avoid being outdoors during hottest part of the day (10am-4pm).
- Avoid strenuous activity.
- Do not leave children in cars on hot days.
- Do not leave pets in cars.
- Check in on neighbors, family, or friends at increased risk, especially if they live alone.

Sources

1. National Weather Service, National Oceanic and Atmospheric Administration. Heat Safety. https://www.weather.gov/psr//Heat

2. County of San Diego, Health and Human Services Agency, Public Health Services. Consumer Version Excessive Heat Response Plan. 30 August 2021. https://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/ExtremeHeat/EHRP_Consumer_Version.pdf

3. Committee on Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations; Institute of Medicine. Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response. Washington (DC): National Academies Press (US); 2012 March 21. 6, Prehospital Care Emergency Medical Services (EMS). https://www.ncbi.nlm.nih.gov/books/NBK201058/

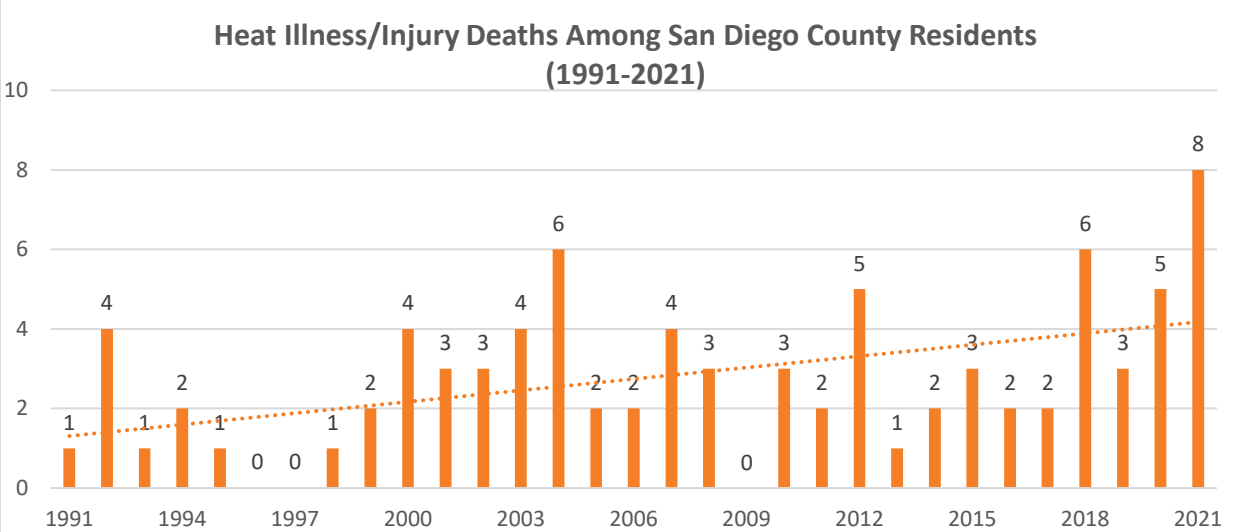
4. County of San Diego, Health and Human Services Agency, Aging and Independence Services. Aging and Independence Services. https://www.sandiegocounty.gov/content/sdc/hhsa/programs/ais.html

5. 2-1-1 San Diego. About Us. https://211sandiego.org/mission-values/

6. County of San Diego, Health and Human Services, Public Health Services. Extreme Heat. https://www.sandiegocounty.gov/hhsa/programs/phs/extreme_heat/

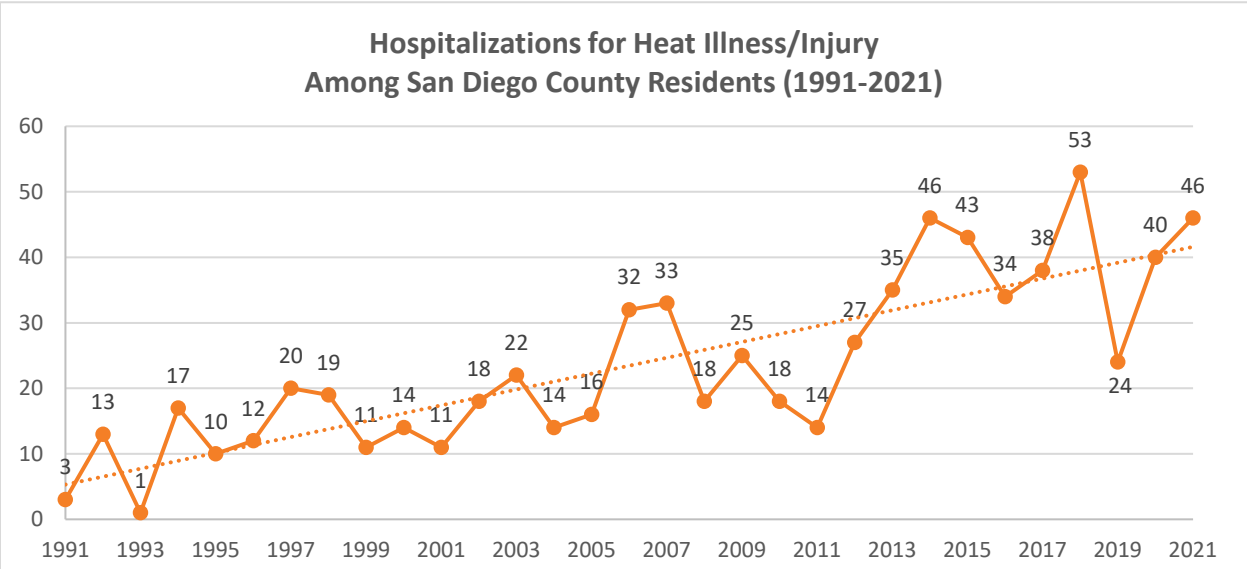
Appendix: Historical Trends Through 2021

HEAT ILLNESS/INJURY DEATHS AMONG SAN DIEGO COUNTY RESIDENTS (1991-2021).



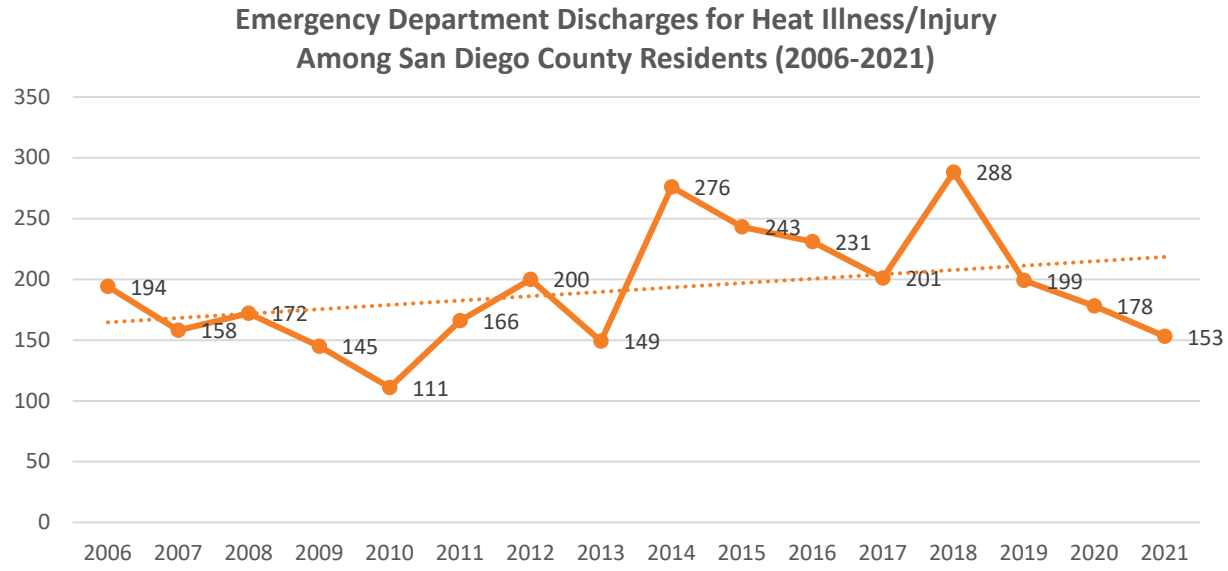
*Total = 85. CDC definition, any mention of heat illness or injury during May-Sept., excluding mention of non-natural heat exposure. The COVID-19 pandemic was associated with increases in all-cause mortality. COVID-19 deaths have affected the patterns of mortality including deaths from heat illness/injury.
Sources: California Department of Public Health (CDPH), Vital Statistics Death Statistical Master Files for California Department of Public Health, Injury and Violence Prevention Branch. 1991-2020. CDPH, Center for Health Statistics, Office of Health Information and Research, Vital Records Business Intelligence System, 2021. Prepared by County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit, 2/2023. Contact 619.692.6667.

HOSPITALIZATIONS FOR HEAT ILLNESS/INJURY AMONG SAN DIEGO COUNTY RESIDENTS (1991-2021).



*Total = 727. CDC definition, any mention of heat illness or injury during May-Sept., excluding mention of non-natural heat exposure.
Data sources: California Office of Statewide Health Planning and Development, Patient Discharge Data. 1991-2010 prepared by California Department of Public Health, Safe and Active Communities Branch (http://epicenter.cdph.ca.gov). 2011-2021 prepared by County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit, 2/2023. Contact 619.692.6667.

EMERGENCY DEPARTMENT DISCHARGES FOR HEAT ILLNESS/INJURY AMONG SAN DIEGO COUNTY RESIDENTS (2006-2021).



*Total = 3,064. CDC definition, any mention of heat illness or injury during May-Sept., excluding mention of non-natural heat exposure. Data sources: California Office of Statewide Health Planning and Development, Emergency Department Discharge Data. 2006-2010 prepared by California Department of Public Health, Safe and Active Communities Branch, http://epicenter.cdph.ca.gov. 2011-2021 prepared by County of San Diego, Health and Human Services Agency, Public Health Services, Community Health Statistics Unit, 2/2023. Contact 619.692.6667.