MARICOPA COUNTY DEPARTMENT OF PUBLIC HEALTH
DIVISION OF DISEASE CONTROL
OFFICE OF EPIDEMIOLOGY

HEAT-ASSOCIATED DEATHS IN MARICOPA COUNTY, AZ FINAL REPORT* FOR 2013

May 7, 2014

*Three cases pending

Table of Contents

Acknowledgements

The Maricopa County Department of Public Health (MCDPH), Office of Epidemiology would like to thank the following agencies for their contributions to this report's findings:

- Maricopa County Office of the Medical Examiner (OME)
- Maricopa County Office of Vital Registration (OVR)
- Arizona Department of Health Services (ADHS), Office of Vital Registration
- National Weather Service (NWS)
- Maricopa Association of Governments (MAG)
- Local hospitals (infection preventionists, emergency departments, social worker staff)

Background

In July 2005, Maricopa County (MC) experienced exceptionally high temperatures that contributed to 45 deaths, 35 occurring over nine consecutive days. Temperatures reached 116° F and three excessive heat warnings were issued during this month. After this event, the Maricopa County Department of Public Health (MCDPH) created a novel and effective approach for surveillance of heat-associated deaths in 2006 and has continued to use this system annually. The enhanced heat surveillance season usually begins in May and ends in October.

Methods

Surveillance data is obtained from the following sources:

1. The Maricopa County Office of the Medical Examiner (OME) forwards suspected heat-related deaths to MCDPH and provides data including demographics, preliminary information regarding how the death occurred, and the circumstances of death. In the past, this information came solely as a weekly line list with limited information for each case. However, in February of 2012, MCDPH started receiving all preliminary reports of death (PRODs) from the OME. These reports provide expanded information on a daily basis and have changed the screening methods used by MCDPH staff to ensure that all potential heat-related deaths are documented.

2. The MCDPH Office of Vital Registration registers all Maricopa County death certificates in the Arizona Department of Health Services vital records database. The MCDPH Office of Epidemiology searches this database looking for causes of death associated with environmental heat. A Statistical Analysis Software (SAS) program looks for the key phrases and International Classification of Disease-10 (ICD-10) codes listed below.

Key Phrases
HEAT EXPOSURE
ENVIRON
EXHAUSTION
SUN
HEAT STRESS
HEAT STROKE
HYPERTHERMIA

ICD 10 Code	**Corresponding Definition**
X30	Exposure to excessive natural heat
T67.X	Effects of heat and light
P810	Environmental hyperthermia of newborn

3. Hospital and media reports can sometimes initiate a heat death investigation, for example, if a child is reportedly left in a hot car.

Once data are received, analysis of the information is required to identify only those deaths caused as a result of environmental heat. Environmental heat is heat generated by the climate (sun, humidity, etc.) rather than heat from man-made sources such as ovens or manufacturing equipment. Heat-associated deaths are categorized based on the classification criteria listed below:

> **Heat-caused (HC) deaths** are those in which environmental heat was directly involved in the sequence of conditions causing deaths. These are deaths where environmental heat terms were indicated in ***Part I***[1] of the death certificate causes of death (diseases or conditions in the direct sequence causing death), for cause of death variables (*cod_a, cod_b, cod_c, or cod_d).* County of death: Maricopa.
>
> **Heat-related (HR) deaths** are those in which environmental heat contributed to the deaths but was not in the sequence of conditions causing these deaths. These are cases where environmental heat terms were mentioned in ***Part II***[2] of the death certificate causes of death (diseases and conditions contributing but not directly resulting in the death sequence), but not in any of the Part I death variables (*cod_a, cod_b, cod_c, or cod_d*). County of death: Maricopa.

For the purposes of this report, heat-caused and heat-related deaths are combined and referred to as "heat-associated deaths." Please note that most jurisdictions report only heat-caused deaths. This should be considered when comparing Maricopa County data with data from other locations.

Death certificate data, in combination with the OME notes, are used to produce the information that is contained in this report. Total case count, demographics, residency, drug/alcohol use, and years lived in Arizona are directly retrieved from death certificate data. Place of death location, indoor/outdoor occurrence, air conditioning use, and homelessness are retrieved based on explicit notations made in the death certificate and/or OME notes.

Homelessness is defined as having an address on the death certificate that matches a homeless shelter, government agency, business, or an intersection. Cases are also classified as homeless if there is an indication on the death certificate. If the address is listed as unknown on the death certificate then an examination of the medical examiner's notes is made to determine if there is a reference to an address - if none, then the person is classified as homeless. If the address is listed as out of jurisdiction then time spent in Arizona, as provided by the death certificate, is taken into consideration.

Once classification is completed, the data are summarized for the production and dissemination of reports. Reports are generated weekly during the season and posted to the MCDPH website which can be found at:

> http://www.maricopa.gov/publichealth/Services/EPI/Reports/heat.aspx

[1] **Part I of the death certificate:** cod a – is the immediate cause (final disease or condition resulting in death) cod b, cod c, cod d – are sequentially listed conditions leading to the cause listed on cod a.
[2] **Part II of the death certificate:** Other significant conditions contributing to death but not resulting in the underlying cause given in Part I.

Results

Heat-Associated Deaths by Year

On average, over 100 suspected heat-associated deaths have been investigated each year from 2006 through 2013 totaling 1,050 cases over the eight-year period. Of these cases, 60% were confirmed as being heat-associated deaths.

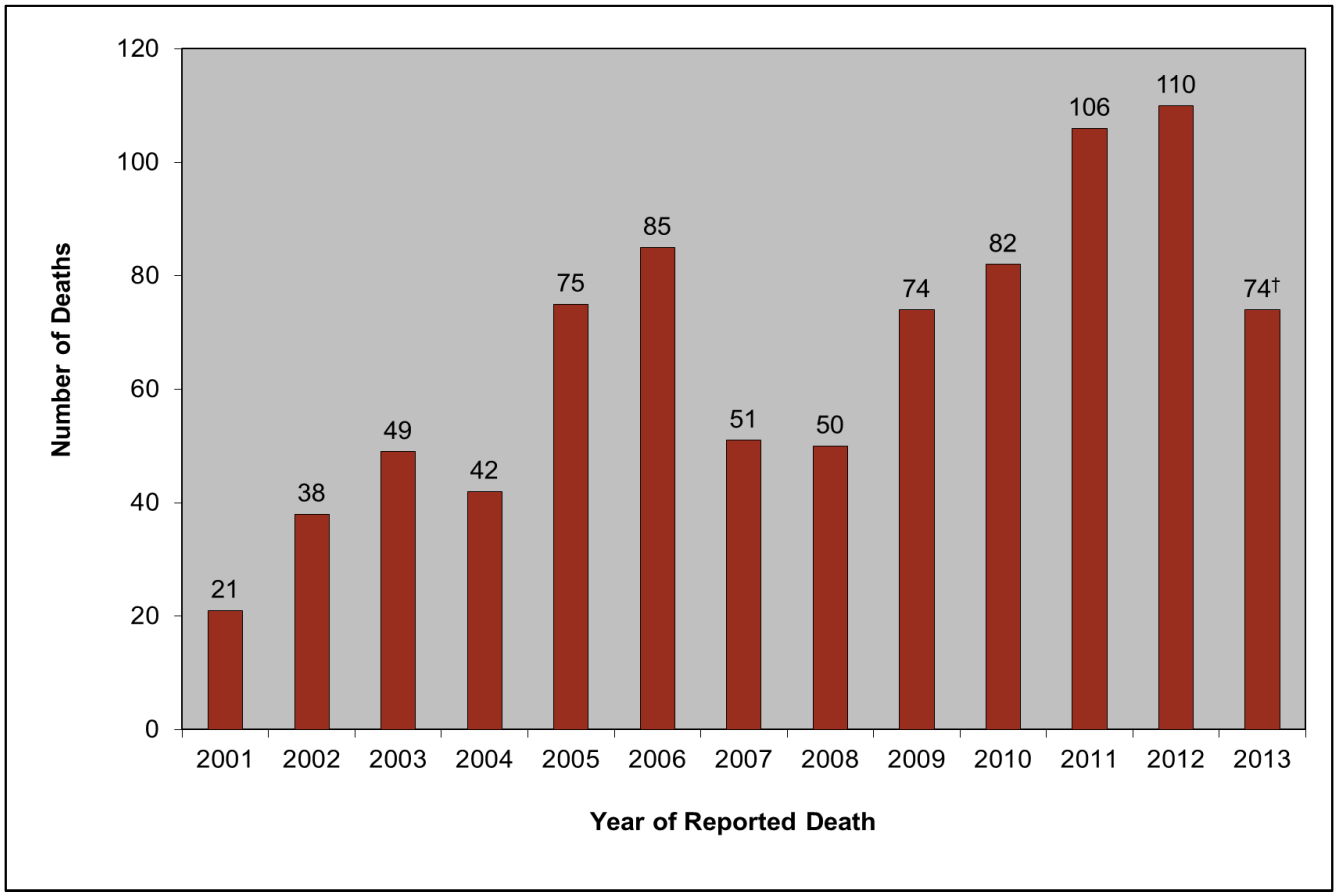
Table 1. Heat-Associated Deaths Reported by Investigation Status, Maricopa County, 2006-2013

Year	Total Reported N	Confirmed N (%)	Ruled-Out N (%)	Pending N (%)
2006	104	85 (82%)	19 (18%)	0 (0%)
2007	131	51 (39%)	80 (61%)	0 (0%)
2008	97	50 (52%)	47 (48%)	0 (0%)
2009	114	74 (65%)	40 (35%)	0 (0%)
2010	142	82 (58%)	60 (42%)	0 (0%)
2011	144	106 (74%)	38 (26%)	0 (0%)
2012	173	110 (64%)	63 (36%)	0 (0%)
2013	145	74 (51%)	68 (47%)	3* (2%)
Total	1,050	632 (60%)	415 (40%)	3* (0%)

* As of 03/21/2014, 3 cases were still pending a final cause of death.

In 2013, there were 74 heat-associated deaths reported, which is the lowest number of heat-associated deaths reported in Maricopa County since 2010. The graph shows that after a steady increase since 2008, heat mortality suddenly decreased in 2013.

Graph 1. Heat-Associated Deaths by Year, Maricopa County, 2001-2013*



Data Sources: Maricopa County, Office of Vital Registration and Office of Medical Examiner; Arizona Department of Health Services, Office of Vital Registration

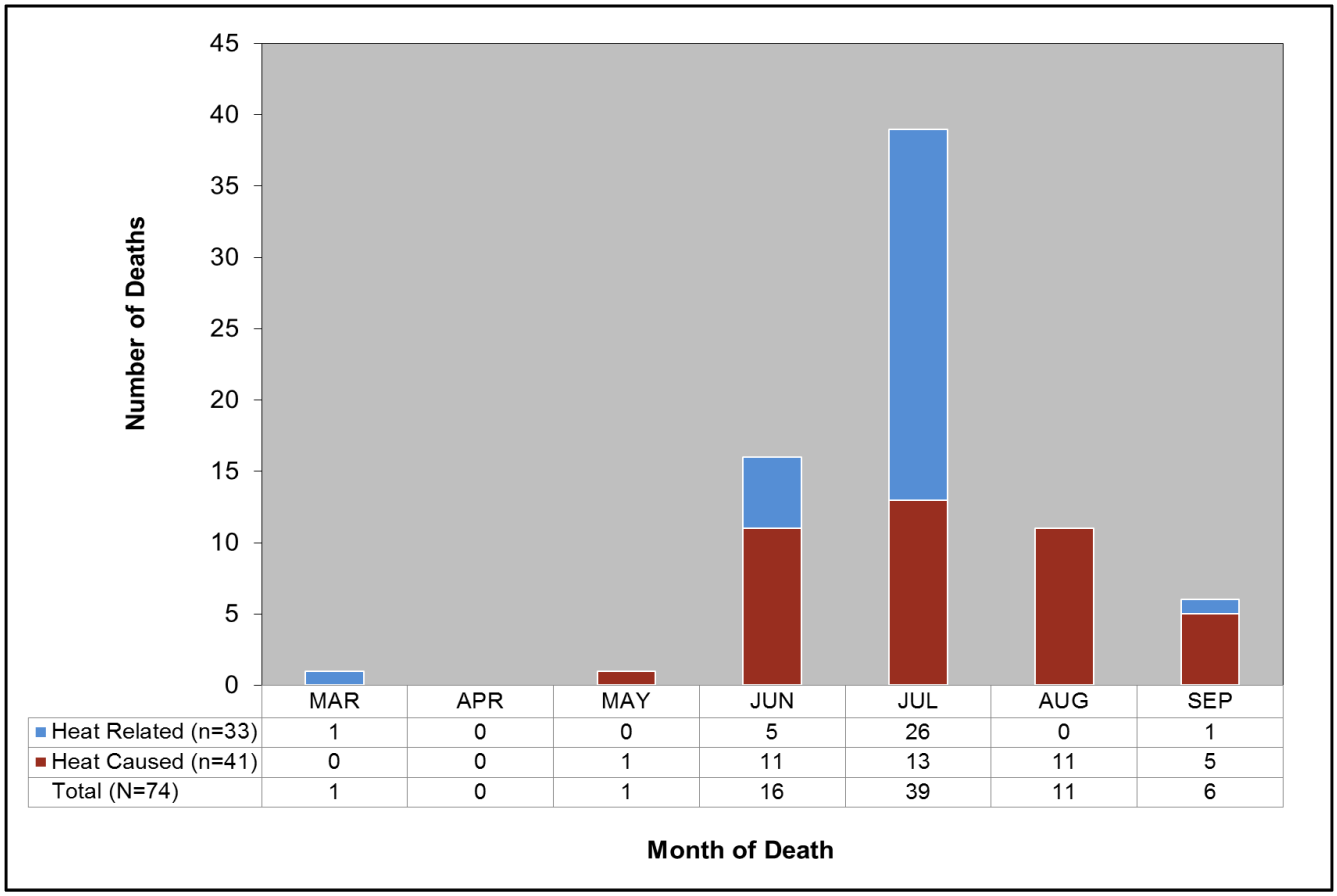
* The numbers reported here are for heat-associated deaths reported to MCDPH as of 03/21/2014.

† Three cases still pending a final cause of death

Heat-Associated Deaths by Month

In 2013, more than half of the year's 74 heat-associated deaths occurred in July. This summer there were 15 days where excessive heat warnings were issued. The longest period of excessive heat occurred in late June to early July (6/28/2013-7/3/2013) with six consecutive days of excessive heat. The majority of 2013 deaths were classified as heat-caused (55%), with the remainder classified as heat-related (45%). [For more detailed information on temperatures and excessive heat warnings, See Appendix, Graph A]

Graph 2. Heat-Associated Deaths by Month and Classification, Maricopa County, 2013

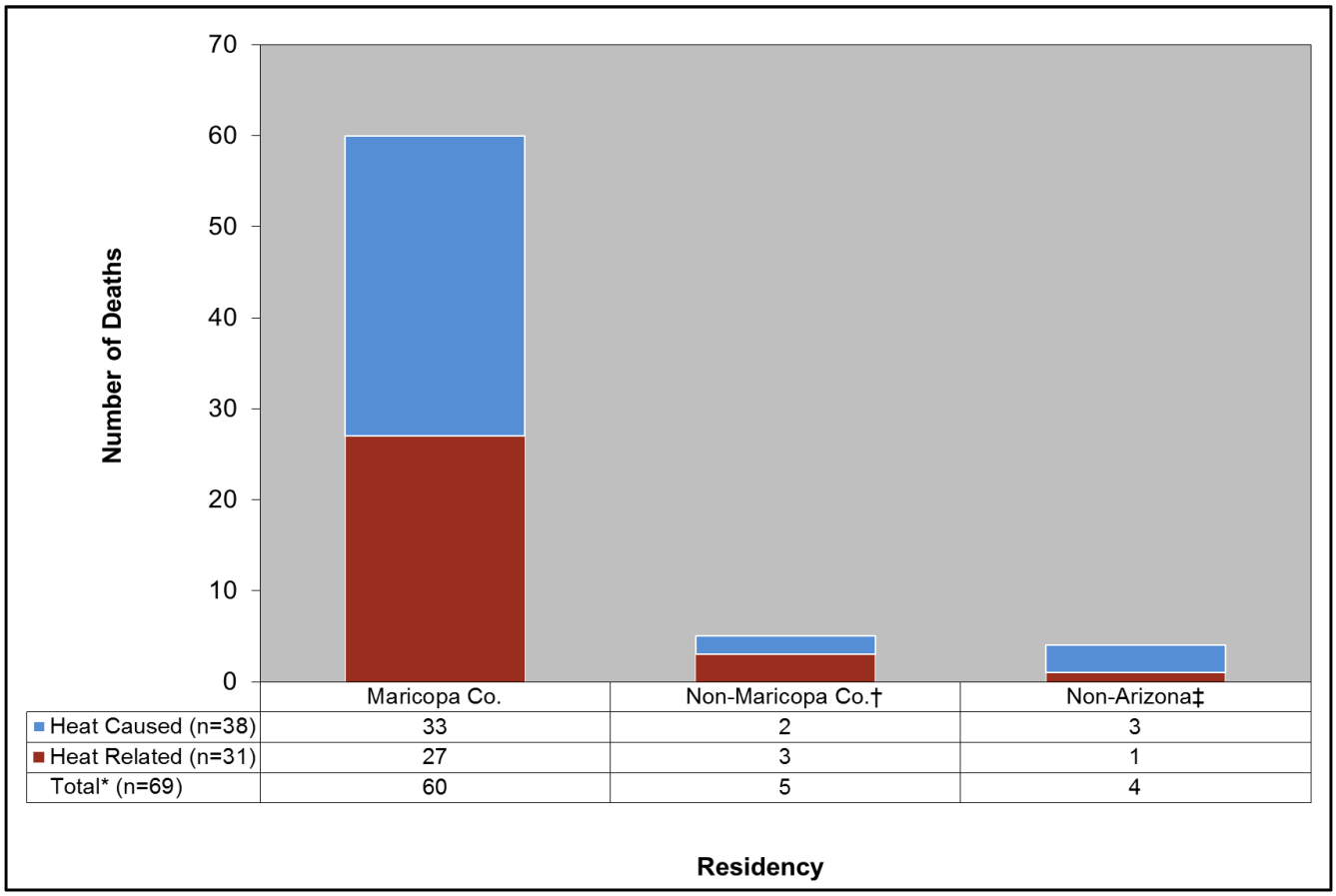


	MAR	APR	MAY	JUN	JUL	AUG	SEP
Heat Related (n=33)	1	0	0	5	26	0	1
Heat Caused (n=41)	0	0	1	11	13	11	5
Total (N=74)	1	0	1	16	39	11	6

Heat-Associated Deaths by Residency

Residency was identified for 69 of the 74 heat-associated deaths in 2013. The cases for which residency could not be established were excluded from this graph. Most cases (87%) were Maricopa County residents.

Graph 3. Heat-Associated Deaths by Residency (n=69)* and Classification, Maricopa County, 2013



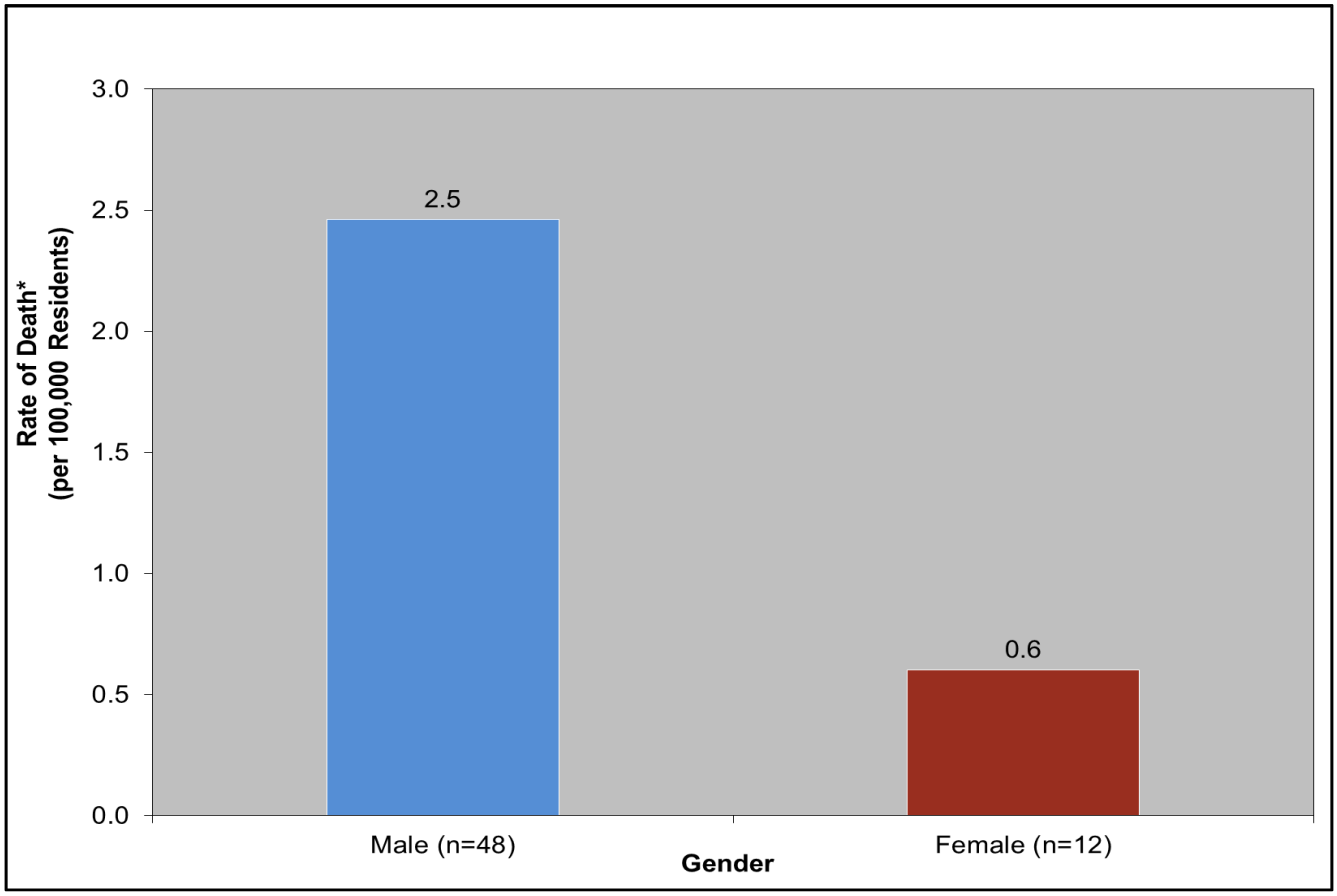
	Maricopa Co.	Non-Maricopa Co.†	Non-Arizona‡
Heat Caused (n=38)	33	2	3
Heat Related (n=31)	27	3	1
Total* (n=69)	60	5	4

* Excludesfive cases where residency could not be established.
† Non-Maricopa residents include five cases from unidentified AZ counties.
‡ Non-Arizona residents include three US residents (CA, OR, WV) and one non-US resident (Mexico).

Heat-Associated Deaths by Gender

The majority of deaths among Maricopa residents occurred among males (81%). Additionally, the mortality rate for males was 4.2 times greater than the rate for females (2.5 and 0.6 deaths per 100,000 residents, respectively). [For more detailed results on gender, See Appendix, Table A]

Graph 4. Heat-Associated Crude Death Rate per 100,000 Maricopa County Residents* by Gender (n=60), Maricopa County, 2013

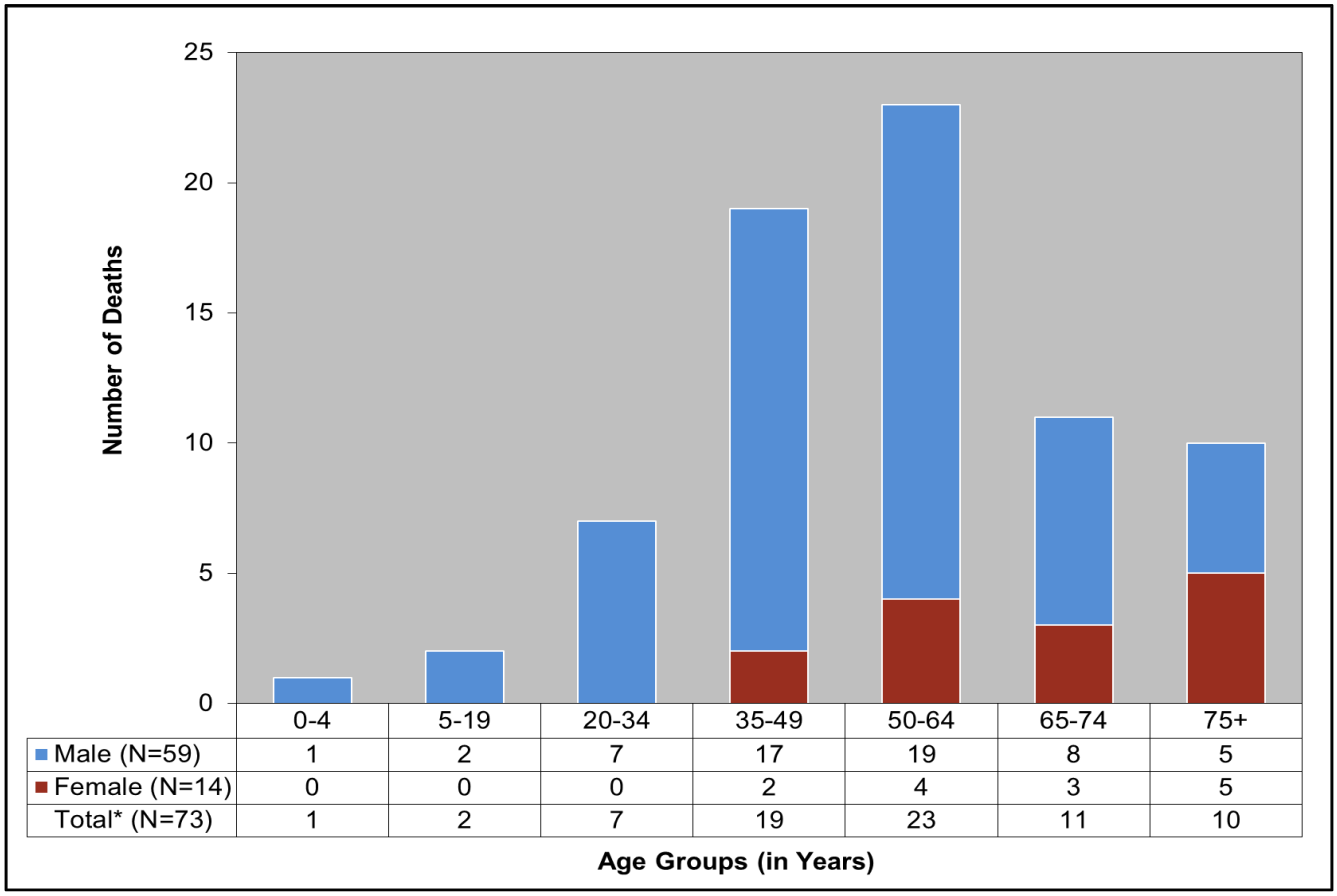


* Based on 2012 Census population estimates for Maricopa County. Excludes fourteen cases that were not Maricopa County residents.

Heat-Associated Deaths by Age

The highest incidence of heat-associated death occurred among individuals 50-64 years of age (32%) followed by those 35-49 (26%). The data show that the heat-associated mortality rate begins to increase in the 35-49 year old age group, with a substantial increase among the 75+ age group (Graph 6). Three pediatric deaths occurred in 2013. [For more detailed results on age, See Appendix, Tables A-B]

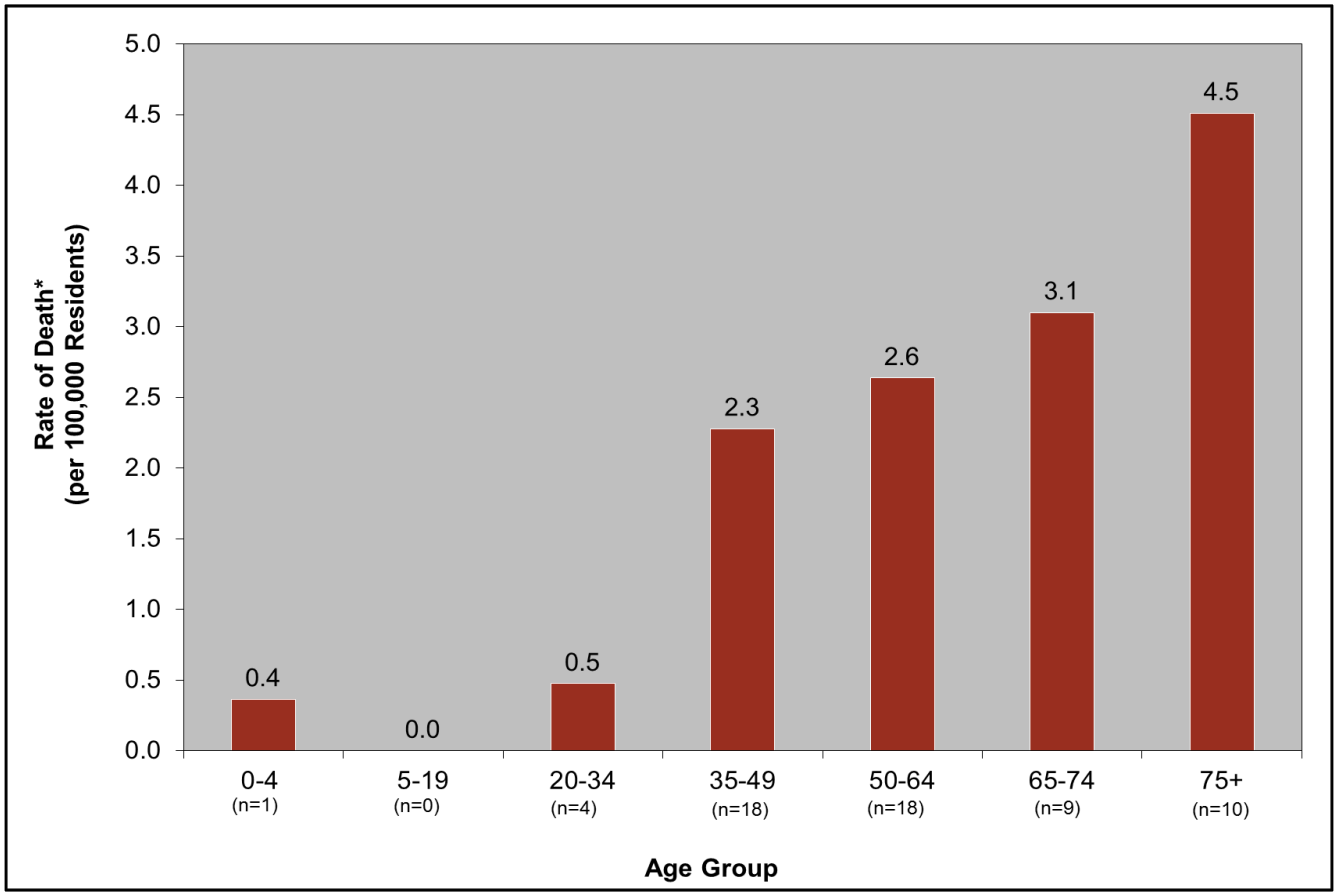
Graph 5. Heat-Associated Deaths by Age Group and Gender, Maricopa County, 2013



	0-4	5-19	20-34	35-49	50-64	65-74	75+
Male (N=59)	1	2	7	17	19	8	5
Female (N=14)	0	0	0	2	4	3	5
Total* (N=73)	1	2	7	19	23	11	10

***** One case was excluded due to unknown age.

Graph 6. Heat-Associated Crude Death Rate per 100,000 Maricopa County Residents* by Age Group (n=60), Maricopa County, 2013

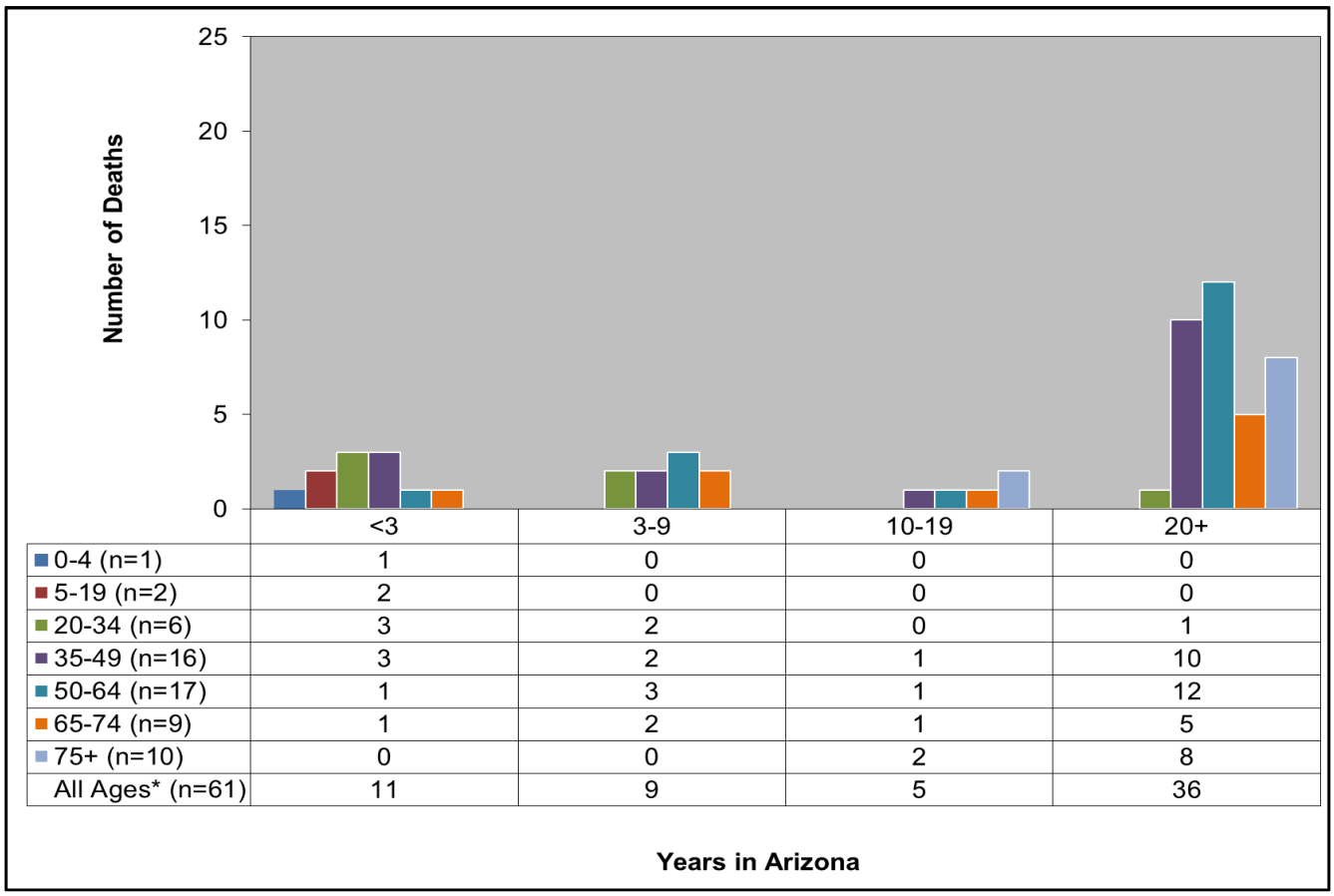


* Based on 2012 Census population estimates for Maricopa County. Excludes fourteen cases that were not Maricopa County residents; one of these decedent's age was also unknown.

Heat-Associated Deaths by Years of Life Spent in Arizona

Of the 61 decedents for whom time spent in Arizona was known, 59% resided in Arizona for 20 years or more. The graph illustrates that heat mortality in our community may not only affect those that are new to this climate, however the age of these decedents and other factors should also be considered.

Graph 7. Heat-Associated Deaths by Years of Life Spent in Arizona and Age Group (n=61)*, Maricopa County, 2013



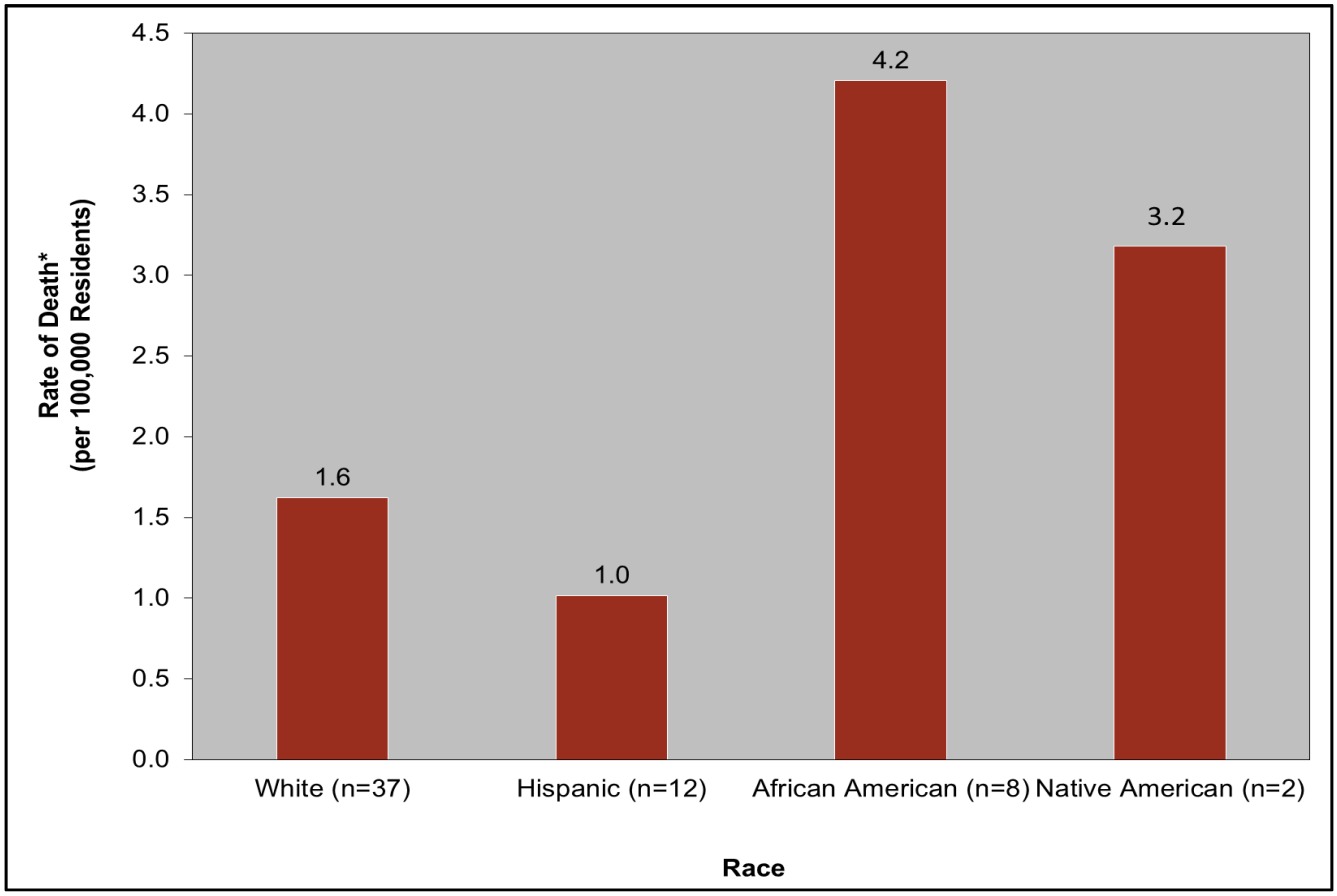
	<3	3-9	10-19	20+
0-4 (n=1)	1	0	0	0
5-19 (n=2)	2	0	0	0
20-34 (n=6)	3	2	0	1
35-49 (n=16)	3	2	1	10
50-64 (n=17)	1	3	1	12
65-74 (n=9)	1	2	1	5
75+ (n=10)	0	0	2	8
All Ages* (n=61)	11	9	5	36

* Excludes thirteen cases for which time spent in Arizona was unknown at the time of analysis.

Heat-Associated Deaths by Race

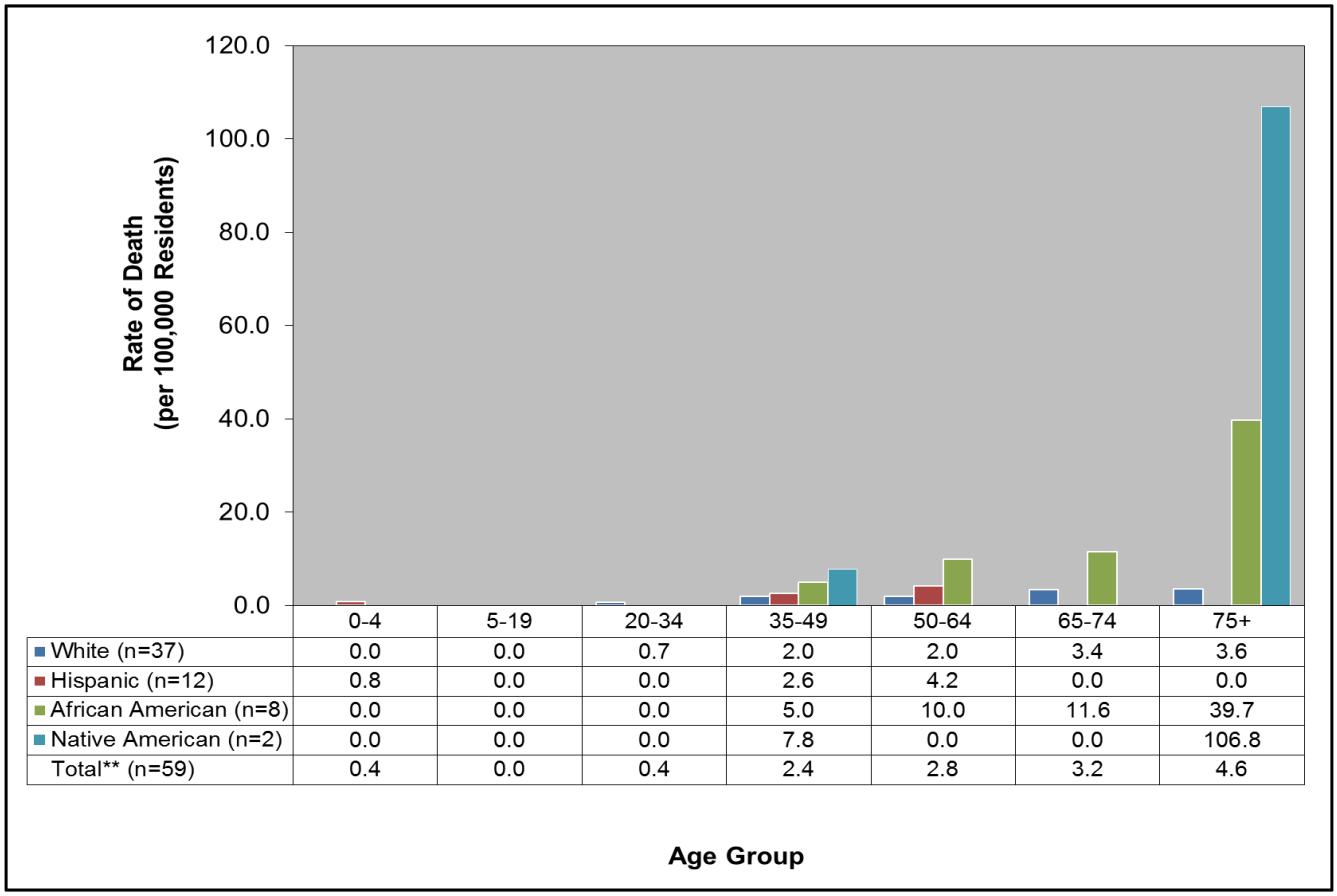
Although Whites and Hispanics reported the highest number of heat-associated deaths overall (58% and 23%, respectively), African Americans had the highest rate of death (4.2 per 100,000 residents) compared to all other races. When stratifying by age, as seen in Graph 9, the highest death rate of any age or race/ethnicity group is 106.8 per 100,000 residents among Native Americans aged 75+ years. Relatively high rates of death are also seen in African Americans 75+ years (39.7 per 100,000) and 65-74 years (11.6 per 100,000). However, due to the small number of heat-associated deaths, rates may vary significantly each year and therefore be considered unstable. [For more detailed results on race/ethnicity, See Appendix, Tables C-D]

Graph 8. Heat-Associated Crude Death Rate per 100,000 Residents* by Race/Ethnicity (n=59), Maricopa County, 2013



* Based on 2012 Census population estimates for Maricopa County. Excludes fourteen cases that were not Maricopa County residents (one with unknown race) and one additional case with multiple race indicated.

Graph 9. Heat-Associated Crude Death Rate per 100,000 Residents* by Race/Ethnicity and Age Group (n=59), Maricopa County, 2013



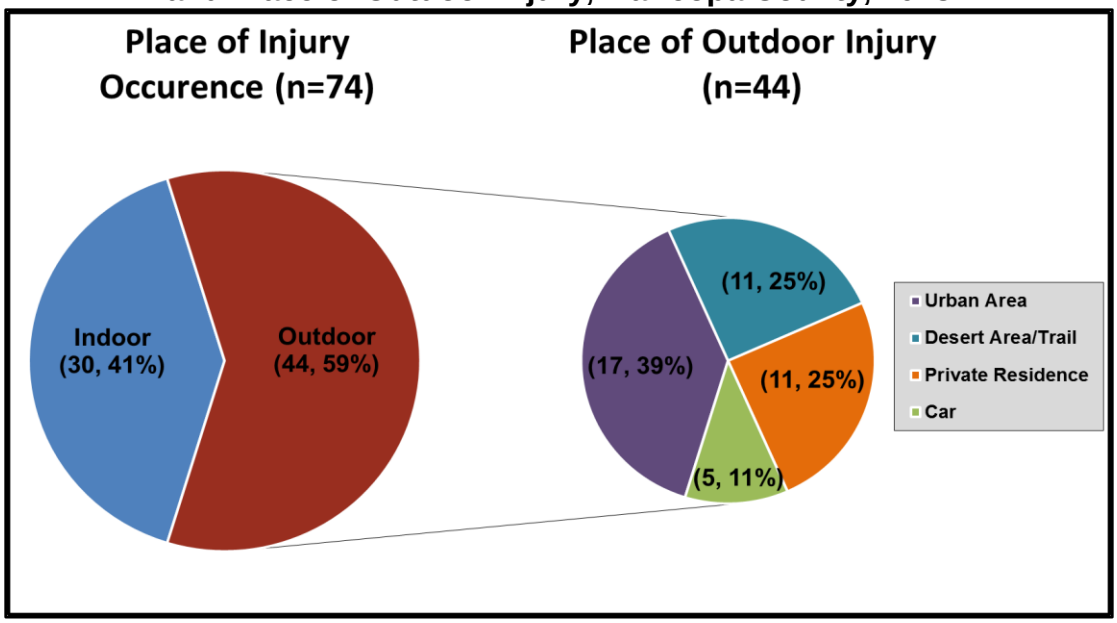
	0-4	5-19	20-34	35-49	50-64	65-74	75+
White (n=37)	0.0	0.0	0.7	2.0	2.0	3.4	3.6
Hispanic (n=12)	0.8	0.0	0.0	2.6	4.2	0.0	0.0
African American (n=8)	0.0	0.0	0.0	5.0	10.0	11.6	39.7
Native American (n=2)	0.0	0.0	0.0	7.8	0.0	0.0	106.8
Total** (n=59)	0.4	0.0	0.4	2.4	2.8	3.2	4.6

* Based on 2012 Census population estimates for Maricopa County. Excludes fourteen cases that were not Maricopa County residents and one additional case with multiple races indicated.

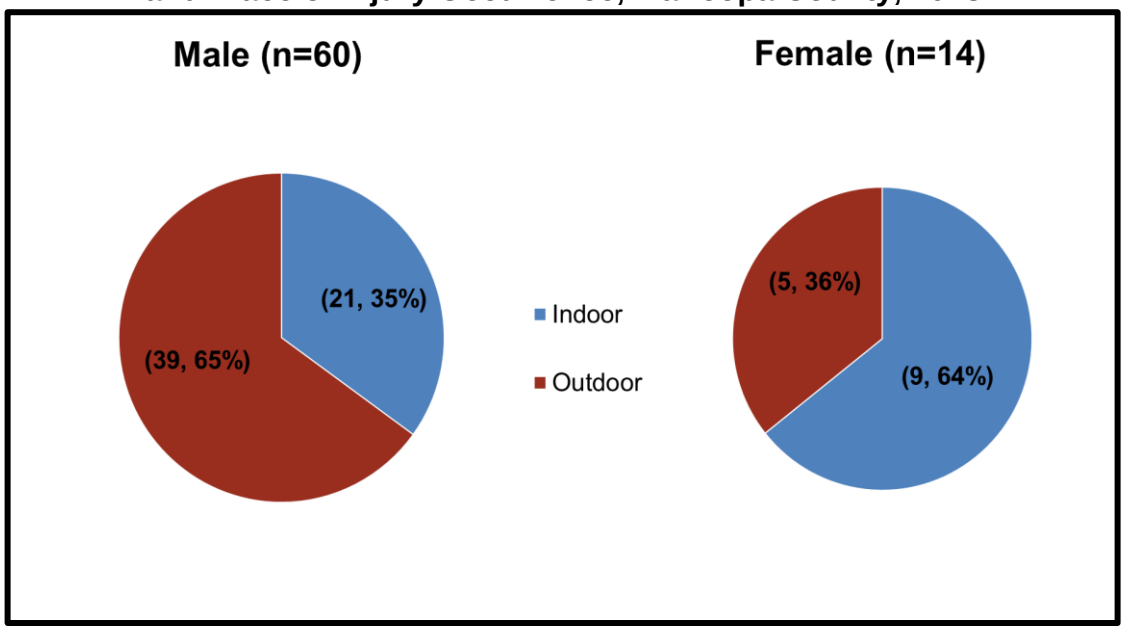
Heat-Associated Deaths by Place of Occurrence and Air Conditioning (AC) Status

Graph 10 illustrates that 59% of heat-associated deaths in 2013 occurred outdoors. These deaths most often occurred in urban areas (39%). The majority of all 74 deaths occurred at a private residence which includes 29 indoor deaths and 11 outdoor deaths. Graph 11 shows that more men died outdoors (65%), while more women (64%) died indoors. [For more detailed results on place of injury, See Appendix, Tables E-F]

Graph 10. Heat-Associated Deaths by Place of Occurrence and Place of Outdoor Injury, Maricopa County, 2013

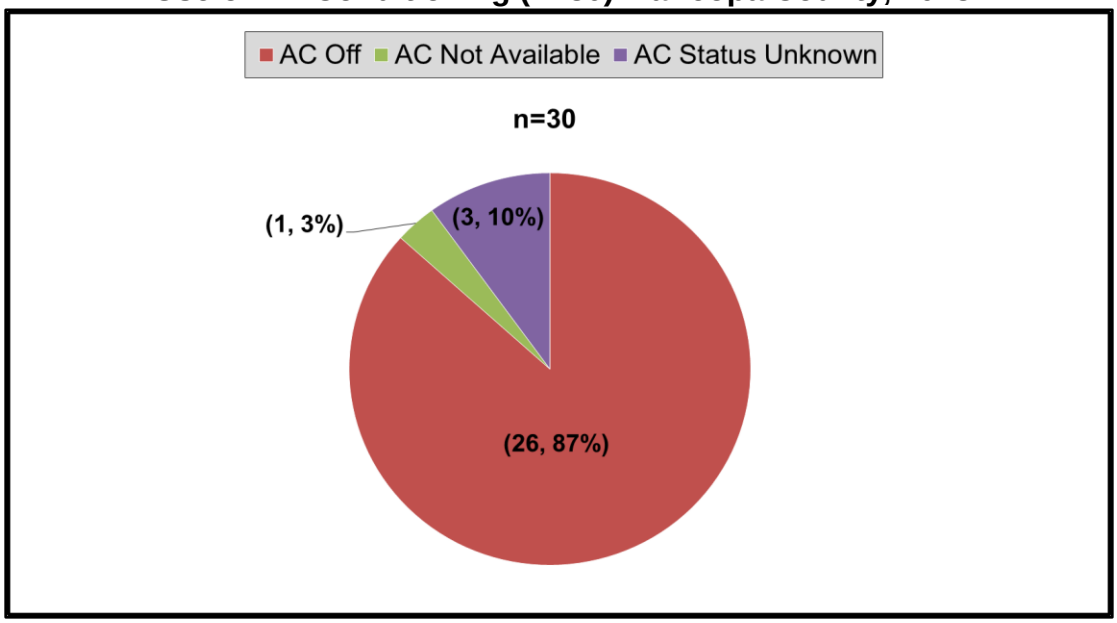


Graph 11. Heat-Associated Deaths by Gender and Place of Injury Occurrence, Maricopa County, 2013

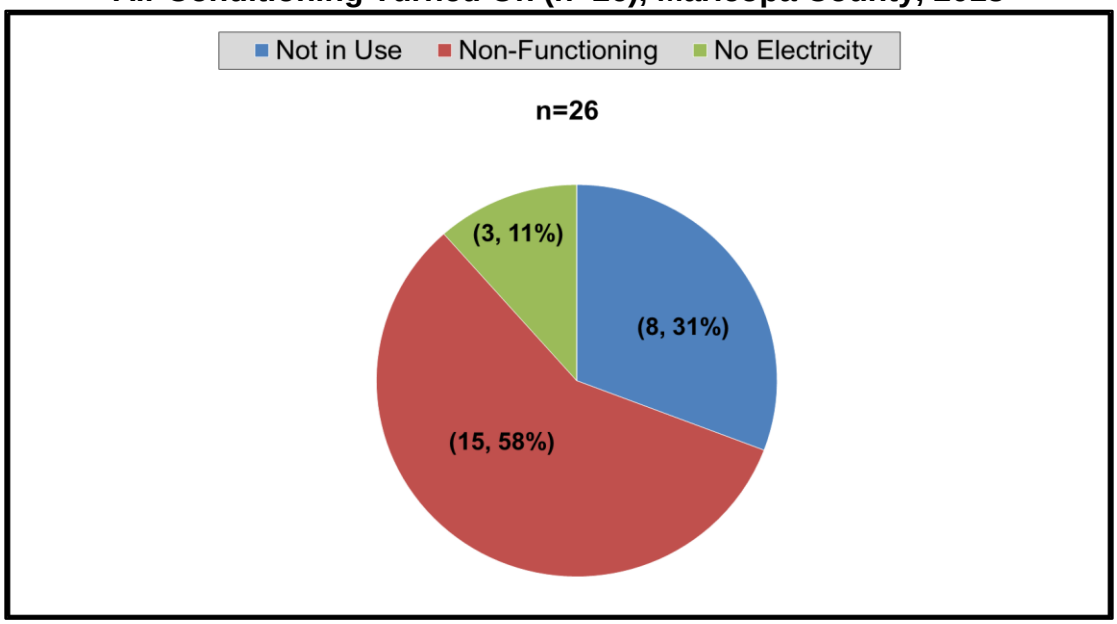


Among deaths occurring indoors, 87% did not have air conditioning (AC) in use or it was not present (Graph 12). For the one death where air conditioning was turned on, the AC was blowing hot air because the thermostat was set high or other unknown reasons. Of the 87% who did not have air conditioning turned on, the majority of AC units (69%) were either non-functioning or the dwelling did not have electricity (Graph 13). [For more detailed results on AC status, See Appendix, Table G]

Graph 12. Indoor Occurring Heat-Associated Deaths by Use of Air Conditioning (n=30) Maricopa County, 2013



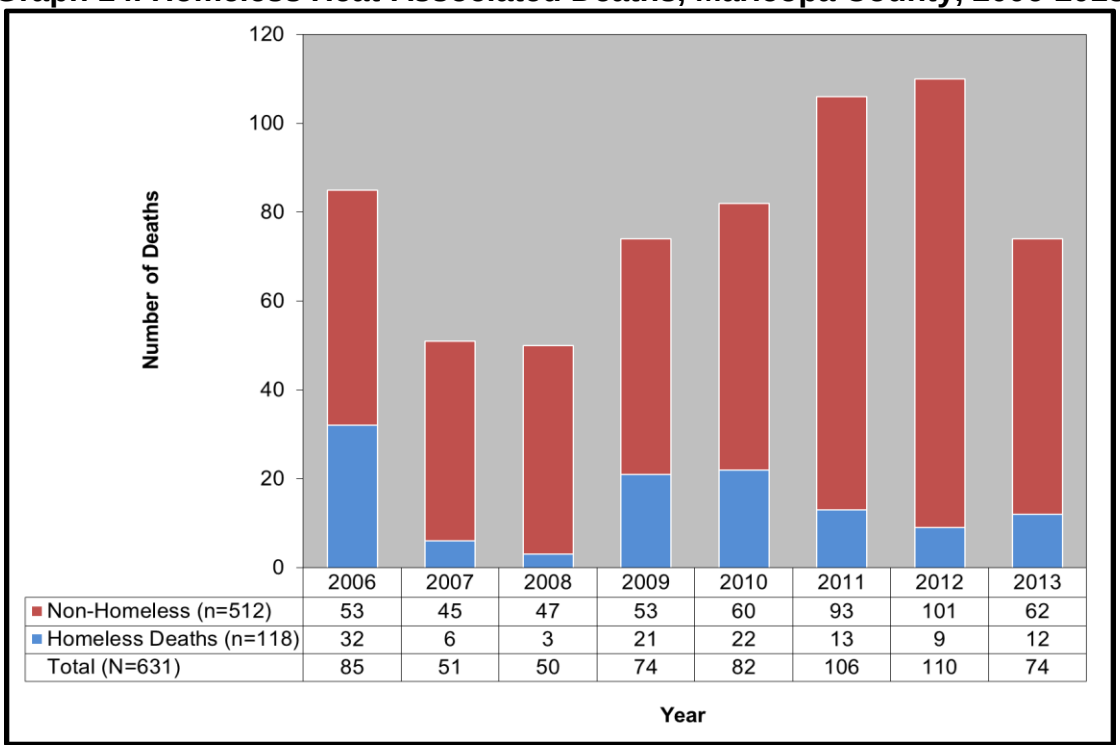
Graph 13. Air Conditioning Status for Cases who did not have Air Conditioning Turned On (n=26), Maricopa County, 2013



Heat-Associated Deaths among Individuals who are Homeless

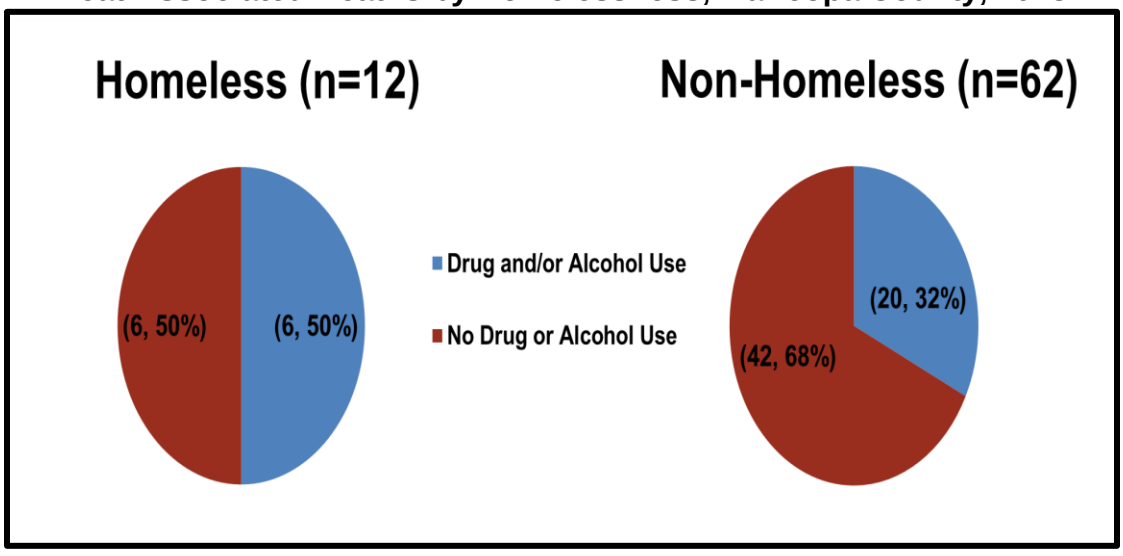
The highest number of deaths among the homeless was reported in 2006 with 32 heat-associated deaths (38% of the 2006 total). Graph 15 shows that drug and alcohol use was more commonly associatd with deaths among the homeless than deaths among those with a residence at the time of death. [For more detailed information on the homeless, See Appendix, Table H]

Graph 14. Homeless Heat-Associated Deaths, Maricopa County, 2006-2013



	2006	2007	2008	2009	2010	2011	2012	2013
Non-Homeless (n=512)	53	45	47	53	60	93	101	62
Homeless Deaths (n=118)	32	6	3	21	22	13	9	12
Total (N=631)	85	51	50	74	82	106	110	74

Graph 15. Drug and Alcohol Use, as Mentioned on the Death Certificate for Heat-Associated Deaths by Homelessness, Maricopa County, 2013



Conclusions – Heat-Associated Deaths 2013

1. The 74 confirmed heat-associated deaths in 2013 is the fewest number of deaths reported since 2009, however this number may increase once the remaining three cases are finalized.

2. The majority of heat-associated deaths were heat-caused (as opposed to heat-related). This means that the majority of deaths were cases in which environmental heat was directly involved in the sequence of conditions causing death.

3. The majority of heat-associated deaths occurred during the month of July.

4. Most decedents, for whom residency was known, were residents of Maricopa County (87%) or Arizona (7%).

5. The majority of decedents were not newcomers to Arizona. For decedents whose location and length of residency were known, about one in six lived in Arizona for less than three years.

6. One-quarter of heat-associated deaths occurred among males 50-64 years of age.

7. Three deaths occurred in people 19 years old or younger this year; one of which occurred in a child younger than 5 years of age.

8. Heat-associated deaths among men tended to occur among those under 65 years old, while deaths among women were distributed above 35 years of age.

9. The majority of deaths occurred outdoors, most of which occurred in urban areas.

10. Heat-associated deaths among men occurred more often outdoors; a larger proportion of deaths among women occurred indoors.

11. Nearly all deaths that occurred indoors, occurred at a private residence; one case died at a local store. For 90% of these indoor deaths, the air conditioning (AC) was not in use or it was not present.

12. Approximately one in six heat-associated deaths in 2013 occurred in an individual identified as homeless.

13. Drug or alcohol use is highly prevalent among individuals who die of heat related causes; the proportion of heat-associated deaths associated with drug or alcohol use is higher among those identified as homeless than those who are not.

Future Plans

One of the goals of the MCDPH heat surveillance program is to obtain more detailed information pertaining to the circumstances surrounding heat-associated mortality. More complete data on air conditioning status was obtained last year through the review of PRODs from the Medical Examiner. In the future, information about activities just prior to death (e.g. working, exercising, etc.) could provide insight into the implementation of future interventions and education. Analyses of additional risk factors, temperature variation, geographic distribution of deaths, and associated morbidities occurring during the heat season will also be conducted. Geographic location of heat-associated deaths and morbidity will be investigated using Geopgraphic Information Systems (GIS) mapping, which will enable the identification of areas in Maricopa County that have a higher burden of associated deaths and/or morbidity.

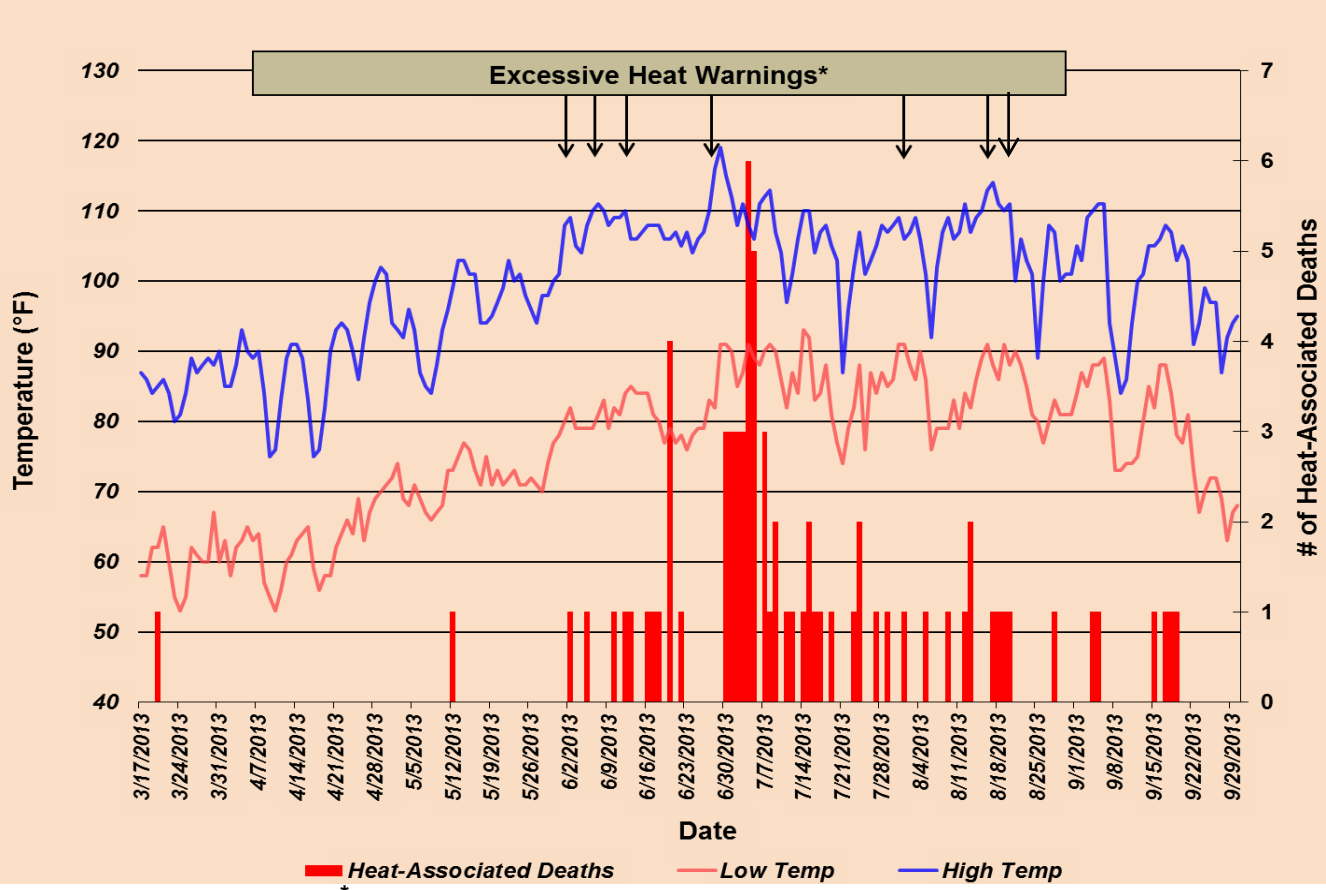
The primary goal of heat-associated death surveillance continues to be the reduction and eventually elimination of heat-associated deaths. The number of heat-associated deaths for 2013 is very concerning and highlights the need for community partners and public health to collaborate and respond to the needs of the community. Cooling and hydration stations were open to the public throughout the heat season, with additional stations opening during particularly long periods of excessive heat. With additional information about which populations and areas in Maricopa County are most affected by heat, we can continue to evaluate these services and augment them where they are most needed. Lastly, MCDPH will continue to use the information from enhanced heat surveillance to inform healthcare providers and community partners of the dangers of excessive heat and ways to avoid it.

To learn more about services provided for cooling and hydration during the summer months, or how you can help, please visit:

http://www.maricopa.gov/publichealth/Programs/Heat/default.aspx
http://www.cir.org/

APPENDIX

Graph A. Maricopa County Heat-Associated Deaths by Date of Death, Maximum and Minimum Temperatures and Excessive Heat Warnings [3/17/2013-9/30/2013 (N=74)]



*** Exact Dates of Excessive Heat Warnings:**

6/2/2013 (1 day)
6/7/2013 (1 day)
6/12/2013 (1 day)
6/28/2013 – 7/3/2013 (6 days)
8/1/2013 (1 day)
8/16/2013 – 8/18/2013 (3 days)
8/20/2013 - 8/21/2013 (2 days)

Table A. Heat-Associated Deaths by Gender and Age Group, Maricopa County, 2013

Age Group	Deaths by Gender		
	Male n (%)	Female n (%)	Total n (%)
0-4	1 (2%)	0 (0%)	1 (1%)
5-19	2 (3%)	0 (0%)	2 (3%)
20-34	7 (12%)	0 (0%)	7 (10%)
35-49	17 (28%)	2 (14%)	19 (26%)
50-64	19 (32%)	4 (29%)	23 (32%)
65-74	8 (13%)	3 (21%)	11 (15%)
75+	5 (8%)	5 (36%)	10 (14%)
Unknown	1 (2%)	0 (0%)	0 (0%)
All Ages	**60 (81%)**	**14 (19%)**	**74 (100%)**

Table B. Heat-Associated Death Rates per 100,000 Residents* by Gender and Age Group, Maricopa County, 2013

Age Group	Gender Rate per 100,000 (n)		
	Male	Female	Total
0-4	0.7 (1)	0.0 (0)	0.4 (1)
5-19	0.0 (0)	0.0 (0)	0.0 (0)
20-34	0.9 (4)	0.0 (0)	0.5 (4)
35-49	4.3 (17)	0.3 (1)	2.3 (18)
50-64	4.3 (14)	1.1 (4)	2.6 (18)
65-74	5.2 (7)	1.3 (2)	3.1 (9)
75+	5.4 (5)	3.9 (5)	4.5 (10)
All Ages	**2.5 (48)**	**0.6 (12)**	**1.5 (60)**

* Based on 2012 Census population estimates for Maricopa County. Excludes fourteen cases that were not Maricopa County residents; one of these decedent's age was also unknown.

Table C. Heat-Associated Death Rates per 100,000 Residents* by Age Group and Race/Ethnicity, Maricopa County, 2013

Race/Ethnicity	Age Group Rate per 100,000 (n)							
	0-4	5-19	20-34	35-49	50-64	65-74	75+	Total
White	0.0 (0)	0.0 (0)	0.7 (3)	2.0 (9)	2.0 (10)	3.4 (8)	3.6 (7)	1.6 (37)
Hispanic	0.8 (1)	0.0 (0)	0.0 (0)	2.6 (6)	4.2 (5)	0.0 (0)	0.0 (0)	1.0 (12)
Black	0.0 (0)	0.0 (0)	0.0 (0)	5.0 (2)	10.0 (3)	11.0 (1)	39.7 (2)	4.2 (8)
Asian/Pac. Islander	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Native American	0.0 (0)	0.0 (0)	0.0 (0)	7.8 (1)	0.0 (0)	0.0 (0)	106.8 (1)	3.2 (2)
All Race/Ethnicities	**0.0 (1)**	**0.0 (0)**	**0.4 (3)**	**2.3 (18)**	**2.7 (18)**	**3.1 (9)**	**4.5 (10)**	**1.5 (59*)**

* Based on 2012 Census population estimates for Maricopa County. Excludes fourteen cases that were not Maricopa County residents (one with unknown age and race) and one additional case with multiple race indicated.

Table D. Heat-Associated Death Rates per 100,000 Residents* by Gender and Race/Ethnicity, Maricopa County, 2013

Race/Ethnicity	Gender Rate per 100,000 (n)		
	Male	Female	Total
White	2.4 (27)	0.7 (10)	1.6 (37)
Hispanic	1.8 (11)	0.2 (1)	1.0 (12)
Black	8.3 (8)	0.0 (0)	4.2 (8)
Asian/Pac. Islander	0.0 (0)	0.0 (0)	0.0 (0)
Native American	3.1 (1)	3.0 (1)	3.2 (2)
All Races	**2.5 (47)**	**0.6 (12)**	**1.5 (59*)**

* Based on 2012 Census population estimates for Maricopa County. Excludes fourteen cases that were not Maricopa County residents (one with unknown race) and one additional case with multiple race indicated.

Table E. Heat-Associated Deaths by Place Injury Occurred and Age Group, Maricopa County, 2013

Age Group	Indoor (n=30)		Outdoor (n=43)							
	Private Residence	Business	Private Residence	Desert Area/ Trail	Car	Urban Area				Total
						Business	Street/ Alley	Field/ Park	Parking Lot	
0-4	0	0	0	0	1	0	0	0	0	1
5-19	0	0	0	2	0	0	0	0	0	2
20-34	0	0	0	5	0	1	0	1	0	7
35-49	6	0	2	1	1	3	5	0	1	19
50-64	11	1	4	2	2	0	1	0	2	23
65-74	6	0	1	0	1	1	1	0	1	11
75+	6	0	3	1	0	0	0	0	0	10
Unknown	0	0	1	0	0	0	0	0	0	1
Total	**29**	**1**	**11**	**11**	**5**	**5**	**7**	**1**	**4**	**74**

Table F. Heat-Associated Deaths by Indoor or Outdoor Occurrence, Age Group, and Gender, Maricopa County, 2013

Age Group	Indoor			Outdoor		
	Male	Female	Total	Male	Female	Total
0-4	0	0	0	1	0	1
5-19	0	0	0	2	0	2
20-34	0	0	0	7	0	7
35-49	5	1	6	12	1	13
50-64	9	3	12	10	1	11
65-74	5	1	6	3	2	5
75+	2	4	6	3	1	4
Unknown	0	0	0	1	0	1
Total	**21**	**9**	**30**	**39**	**5**	**44**

Table G. Heat-Associated Deaths by Use of Air Conditioning (AC) and Age Group, (Indoor Only) Maricopa County, 2013

Age Group	AC Off	AC Not Available	AC Status Unknown	Total
0-4	0	0	0	0
5-19	0	0	0	0
20-34	0	0	0	0
35-49	4	0	2	6
50-64	10	1	1	12
65-74	6	0	0	6
75+	6	0	0	6
Unknown	0	0	0	0
Total	**26**	**1**	**3**	**30**

Table H. Drug and Alcohol Use, as Mentioned on the Death Certificate for Heat-Associated Deaths, by Homelessness, Maricopa County, 2013

Homelessness	Total n (%)	Drug and/or Alcohol Use n (%)	No Drug or Alcohol Use n (%)
Homeless	12 (11%)	6 (50%)	6 (50%)
Non-Homeless	62 (57%)	20 (32%)	42 (68%)
Total	**74 (100%)**	**26 (35%)**	**48 (65%)**

Table I. Heat-Associated Deaths by Smoking/Tobacco Use, Maricopa County, 2013

Smoking/Tobacco Use	n (%)
Yes	21 (28%)
No	3 (4%)
Past	0 (0%)
Unknown	50 (68%)
Total	**74 (100%)**

Table J. Heat-Associated Deaths by Education Category, Maricopa County, 2013

Education Category	n (%)
8th grade or less	10 (14%)
9th through 12th grade; no diploma	7 (10%)
High school graduate or GED completed	26 (35%)
Some college credit, but no degree	15 (20%)
Associate degree (e.g.AA,AS)	1 (1%)
Bachelor's degree (e.g.BA,BS)	0 (0%)
Master's degree (e.g.MA,MS,MEng,MEd,MSW,MBA)	2 (3%)
Doctorate (e.g.PhD,EdD) or Professional degree (e.g.MD,DDS,DVM,LLB,JD)	0 (0%)
Not Classifiable	1 (1%)
Unknown	12 (16%)
Total	**74 (100%)**