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

HEAT-ASSOCIATED DEATHS IN MARICOPA COUNTY, AZ FINAL REPORT* FOR 2012

February 2014

*Two cases pending

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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 9 consecutive days. Temperatures reached 116° F and three excessive heat warnings were issued during this month. To track these deaths, the Maricopa County Department of Public Health (MCDPH) created a novel and effective approach for surveillance of heat-associated deaths and has continued to use this system annually. The enhanced heat surveillance season usually begins in May and ends in October. During 2012, a few outlying cases expired in November, however the original exposure occurred during the summer months, which led to the decline of their health status.

Method

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 Arizona Department of Health Services has a vital records database containing death certificates. MCDPH 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 2012 totaling 904 cases over the seven-year period. Of these cases, 62% were confirmed as being heat-associated deaths.

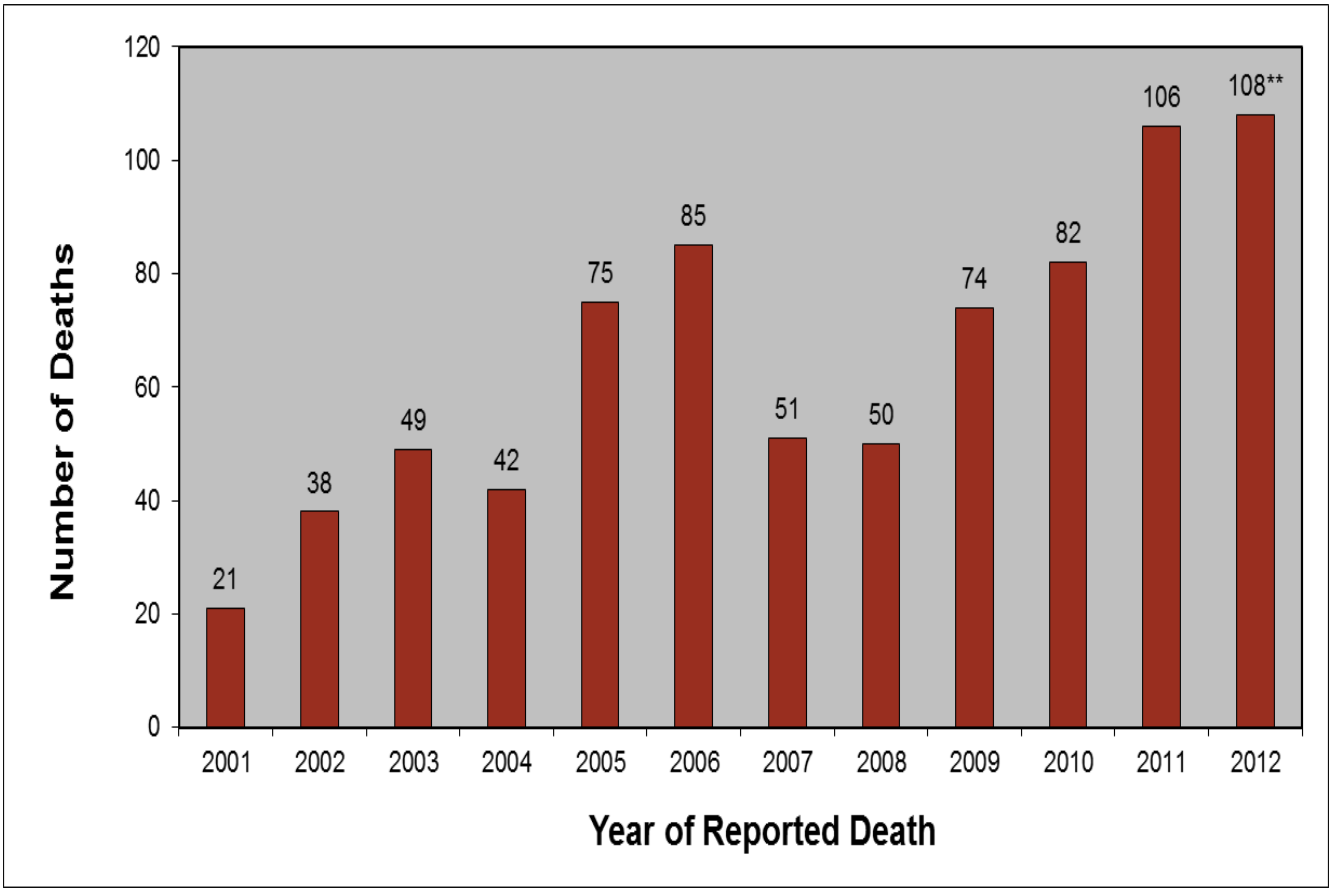
Table 1. Heat-Associated Deaths Reported by Investigation Status, Maricopa County, 2006-2012

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	172	108 (63%)	62 (36%)	2* (1%)
Total	904	556 (62%)	346 (38%)	2* (0.2%)

*As of 12/10/2013, 2 cases are still pending a final cause of death. The numbers in this report are provisional and an addendum will be added to the report once these cases have been classified.

In 2012, there were 108 heat-associated deaths reported, which is the highest number of heat-associated deaths in Maricopa County in more than ten years. The graph shows that after a decline in 2007 and 2008, heat mortality increased in 2009 and continued to increase through 2012.

Graph 1. Heat-Associated Deaths by Year, Maricopa County, 2001-2012*



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

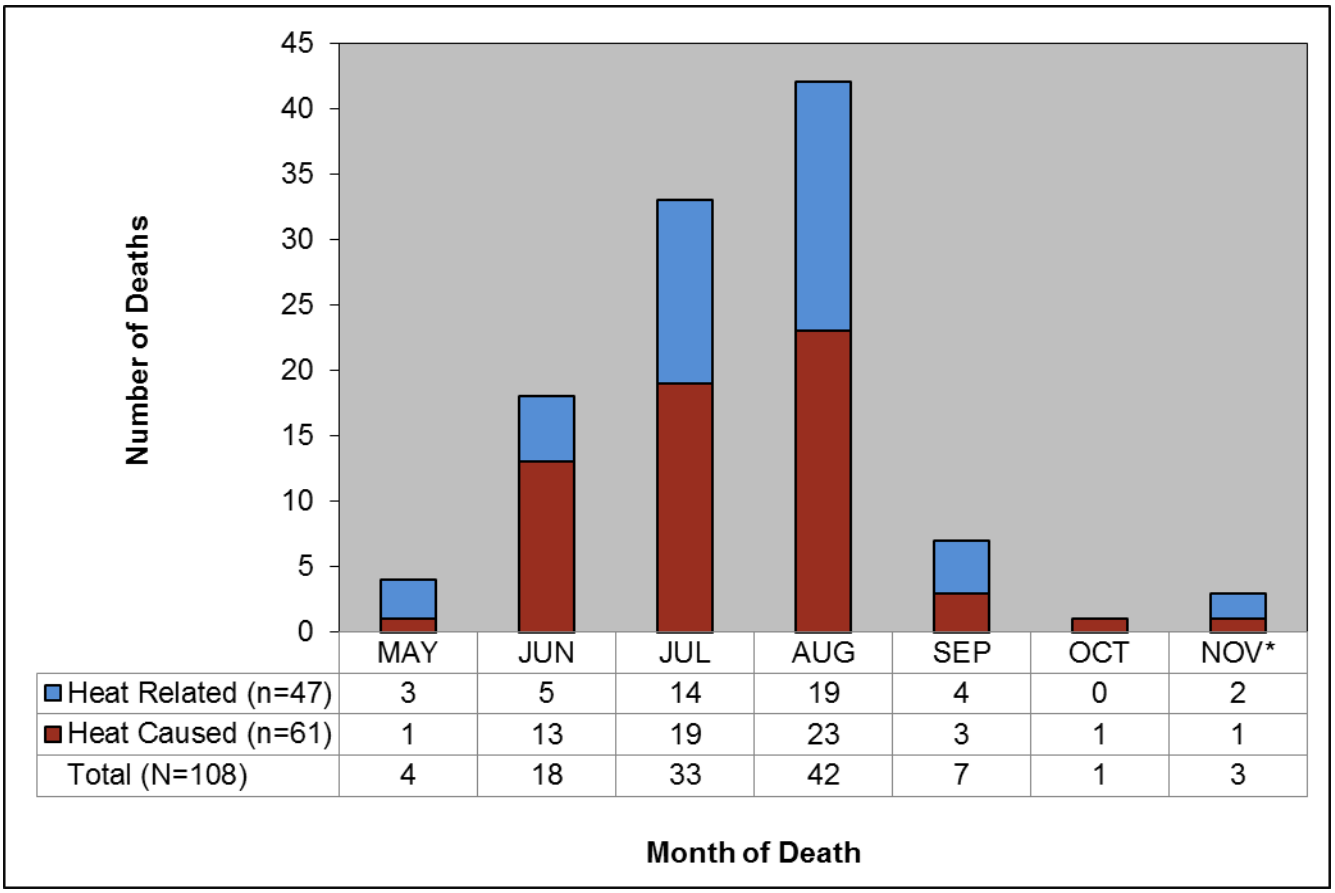
*The numbers reported here are for heat-associated deaths reported to MCDPH as of 12/10/2013.

**Two cases still pending a final cause of death.

Heat-Associated Deaths by Month

In 2012, more than one third of the year's 108 heat-associated deaths occurred in August. August had nine days with excessive heat warnings, all of which were consecutive (8/6/2012 – 8/14/2012). For comparison, July had only two days of consecutive excessive heat warnings.The majority of 2012 deaths were classified as heat-caused (56%), with the remainder classified as heat-related (44%). [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, 2012



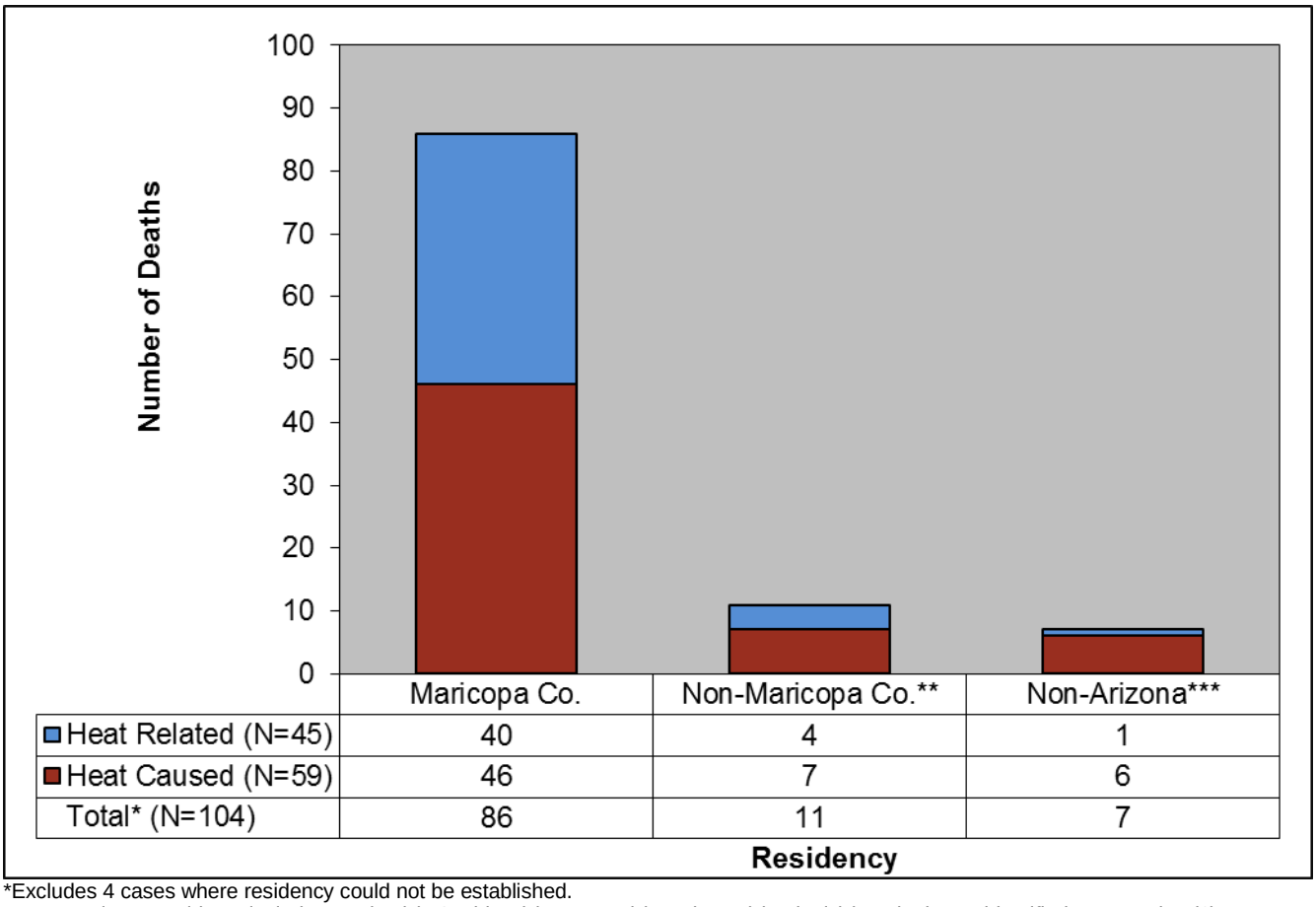
	MAY	JUN	JUL	AUG	SEP	OCT	NOV*
Heat Related (n=47)	3	5	14	19	4	0	2
Heat Caused (n=61)	1	13	19	23	3	1	1
Total (N=108)	4	18	33	42	7	1	3

*The three deaths that occurred in November were results of heat-associated injuries that occurred over the summer.

Heat-Associated Deaths by Residency

Residency was identified for 104 of the 108 heat-associated deaths in 2012. The cases for which residency could not be established were excluded from this graph. Most cases (83%) were Maricopa County residents.

Graph 3. Heat-Associated Deaths by Residency (n=104)* and Classification, Maricopa County, 2012



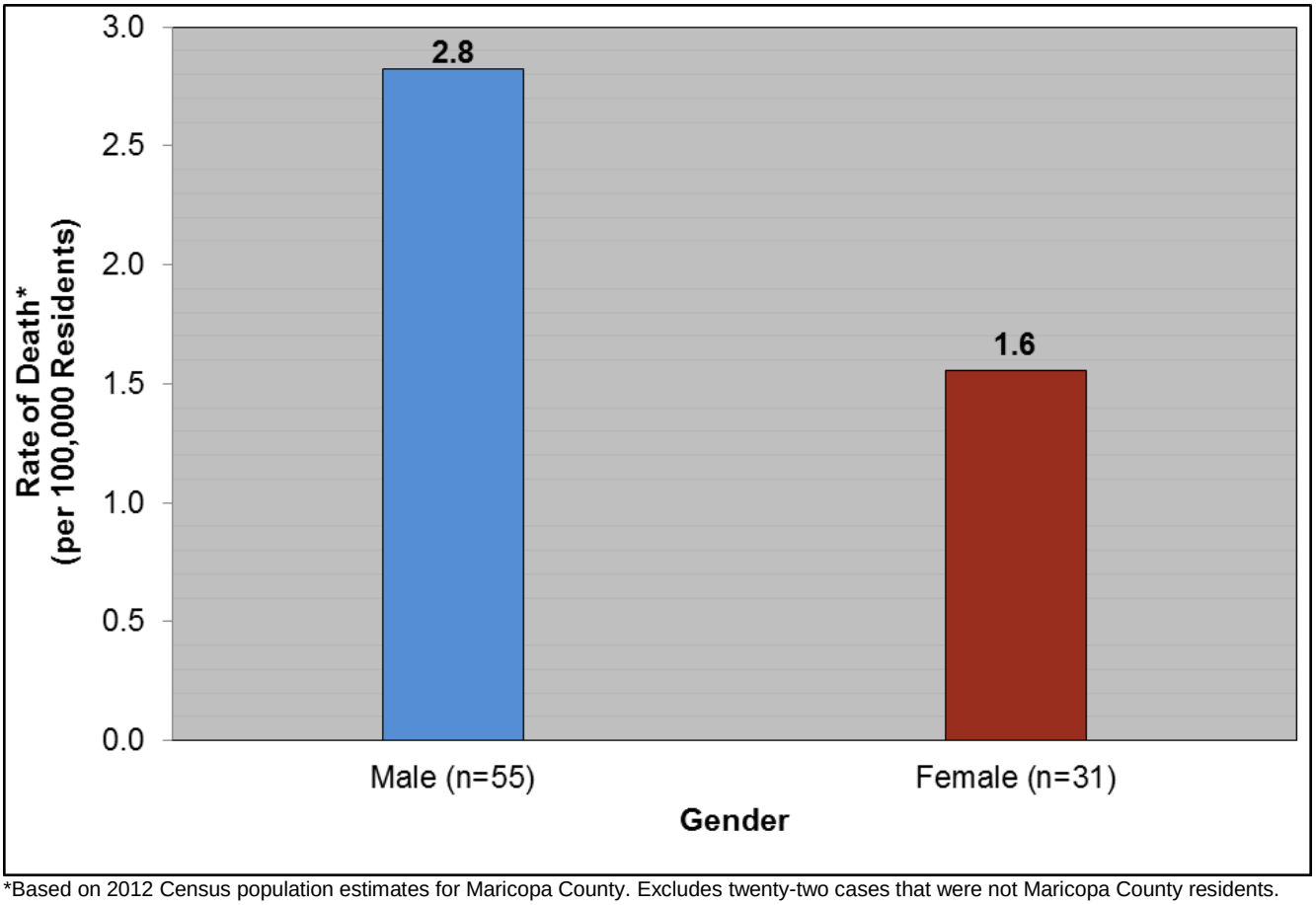
	Maricopa Co.	Non-Maricopa Co.**	Non-Arizona***
Heat Related (N=45)	40	4	1
Heat Caused (N=59)	46	7	6
Total* (N=104)	86	11	7

*Excludes 4 cases where residency could not be established.
**Non-Maricopa residents include Apache (1), Cochise (1), La Paz (1), Mohave (1), Pinal (1) and other unidentified AZ counties (6).
***Non-Arizona residents include seven US residents (AR, CA (3), IA, MN) and one non-US resident (Mexico).

Heat-Associated Deaths by Gender

The pattern for heat-associated deaths is different for males and females. The majority of deaths occurred among males (66%). Additionally, the mortality rate for males was 1.75 times greater than the rate for females (2.8 and 1.6 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=86), Maricopa County, 2012

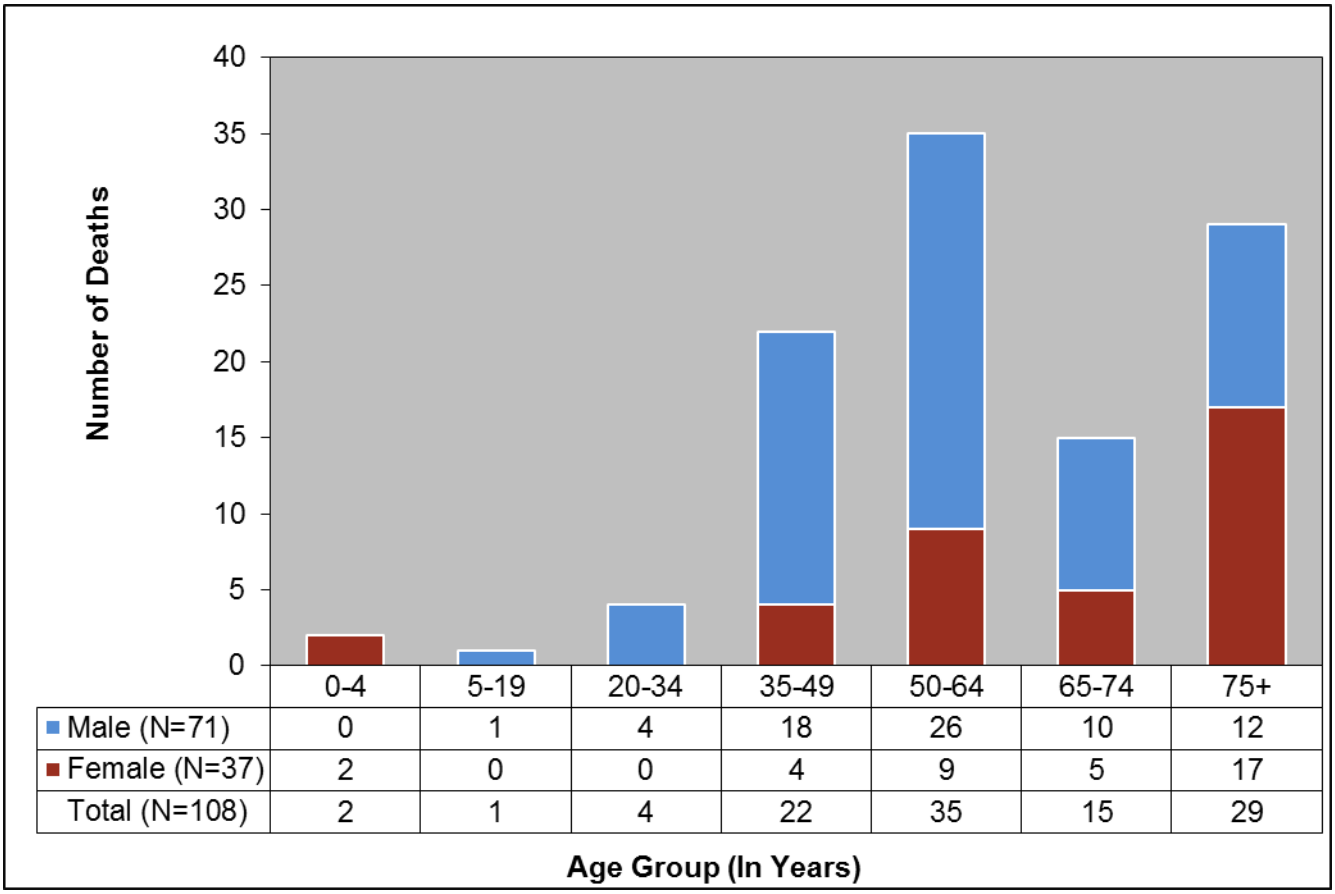


*Based on 2012 Census population estimates for Maricopa County. Excludes twenty-two cases that were not Maricopa County residents.

Heat-Associated Deaths by Age

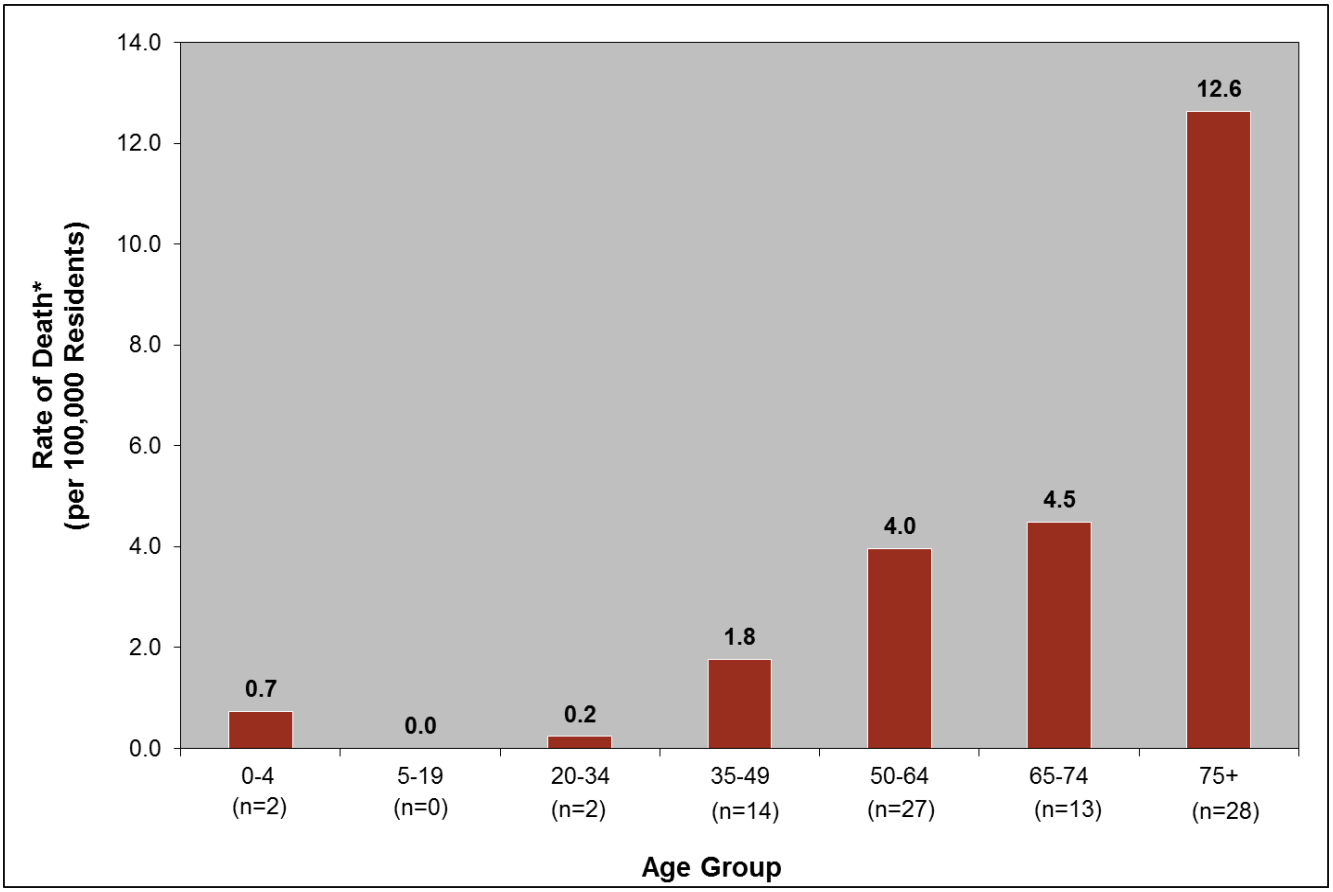
The highest incidence of heat-associated death occurred among individuals 50-64 years of age (32%) followed by those 75 and older (27%). The data show that the heat-associated mortality rate begins to increase in the 35-49 year old age group, with a substantial increase among the 75+ age group (Graph 6). Two pediatric deaths occurred in 2012, both among children under the age of five. [For more detailed results on age, See Appendix, Tables A-B]

Graph 5. Heat-Associated Deaths by Age Group and Gender, Maricopa County, 2012



	0-4	5-19	20-34	35-49	50-64	65-74	75+
Male (N=71)	0	1	4	18	26	10	12
Female (N=37)	2	0	0	4	9	5	17
Total (N=108)	2	1	4	22	35	15	29

Graph 6. Heat-Associated Crude Death Rate per 100,000 Maricopa County Residents* by Age Group (n=86), Maricopa County, 2012

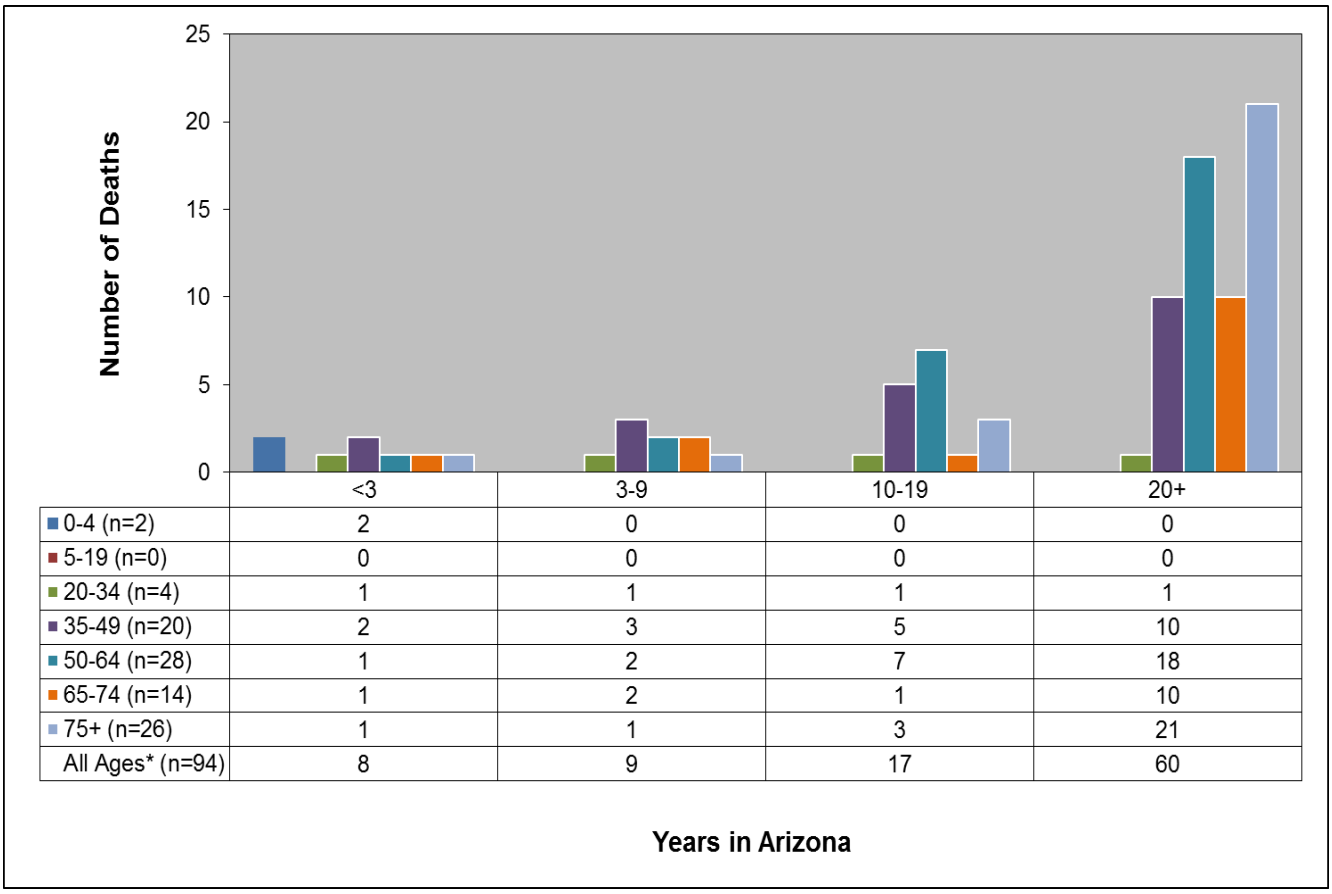


*Based on 2012 Census population estimates for Maricopa County. Excludes twenty-two cases that were not Maricopa County residents.

Heat-Associated Deaths by Years of Life Spent in Arizona

Of the 94 decedents for whom time spent in Arizona was known, 64% resided in Arizona for 20 years or more. Additionally, the majority of decedents (82%) had lived in Arizona for at least 10 years. The graph illustrates that heat mortality in our community may not necessarily be the result of non-acclimatization since the majority of decedents have resided in Arizona for more than 10 years, although the age distribution of decedents falling into the larger "Years in Arizona" categories should be considered.

Graph 7. Heat-Associated Deaths by Years of Life Spent in Arizona and Age Group (n=94)*, Maricopa County, 2012



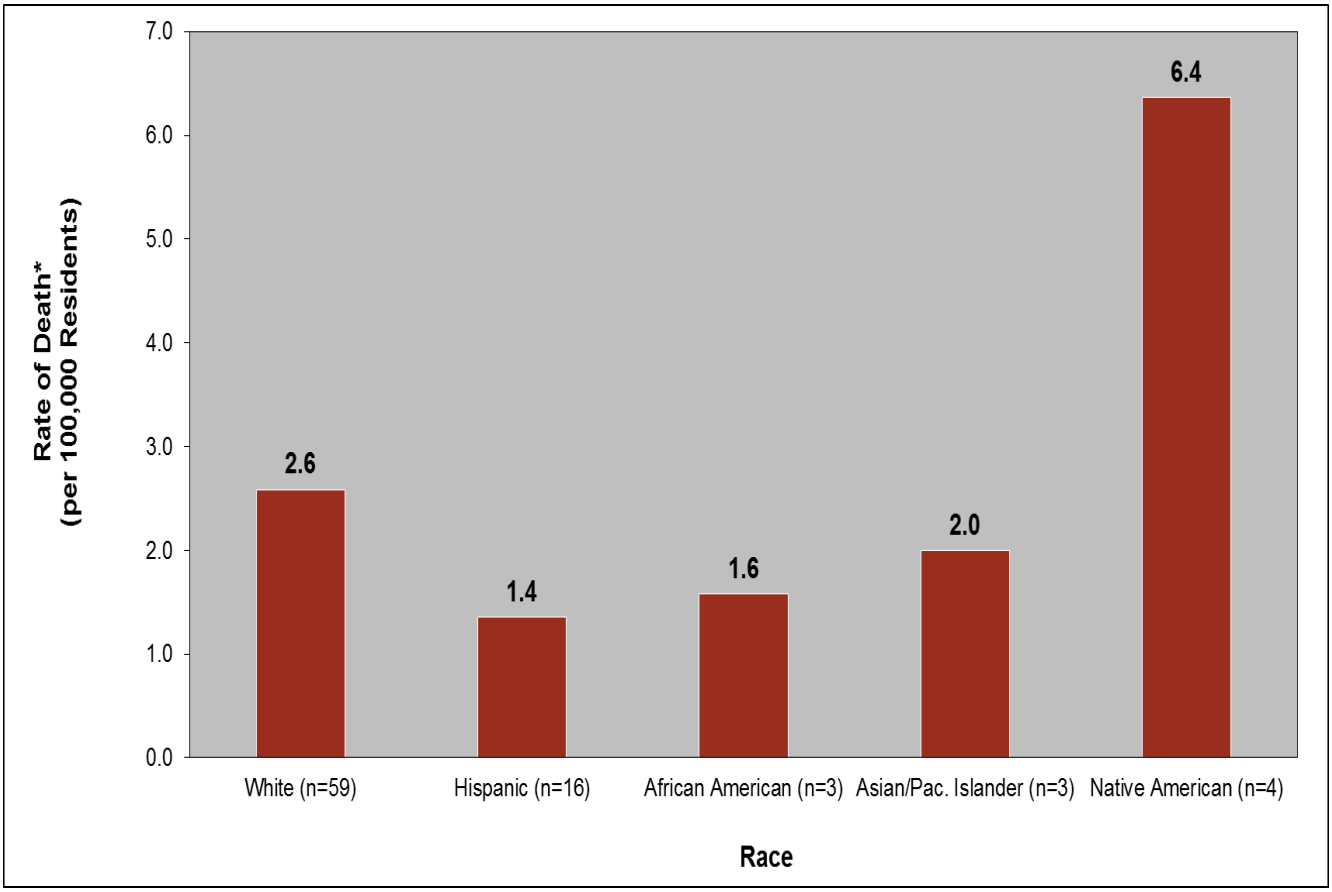
	<3	3-9	10-19	20+
0-4 (n=2)	2	0	0	0
5-19 (n=0)	0	0	0	0
20-34 (n=4)	1	1	1	1
35-49 (n=20)	2	3	5	10
50-64 (n=28)	1	2	7	18
65-74 (n=14)	1	2	1	10
75+ (n=26)	1	1	3	21
All Ages* (n=94)	8	9	17	60

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

Heat-Associated Deaths by Race

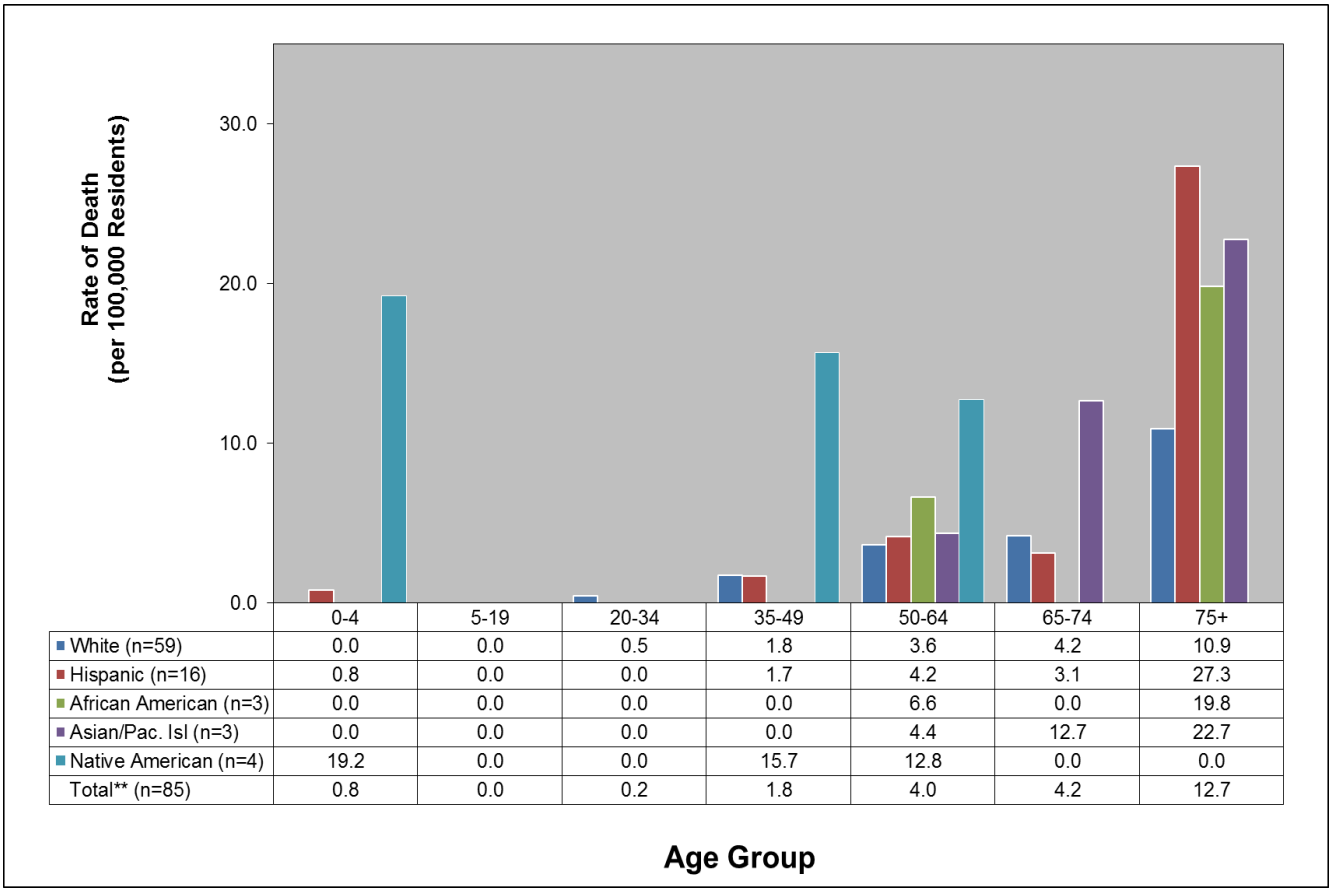
Although Whites and Hispanics reported the highest number of heat-associated deaths overall (65% and 17%, respectively), Native Americans had the highest rate of death (6.4 per 100,000 residents) compared to all other races. When stratifying by age, as seen in Graph 9, the highest death rate of any age or race/ethnicity group is 27.3 per 100,000 residents among Hispanics aged 75+ years. Relatively high rates of death are also seen in Asian/Pacific Islanders 75+ years (22.7 per 100,000), African Americans 75+ years (19.8 per 100,000), and Native Americans 0-4 years (19.2 per 100,000). However, due to the small number of heat-associated deaths, rates may vary significantly each year. [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=85), Maricopa County, 2012



*Based on 2012 Census population estimates for Maricopa County. Excludes twenty-three cases that were not Maricopa County residents and/or where race was unknown.

Graph 9. Heat-Associated Crude Death Rate per 100,000 Residents* by Race/Ethnicity and Age Group (n=85), Maricopa County, 2012



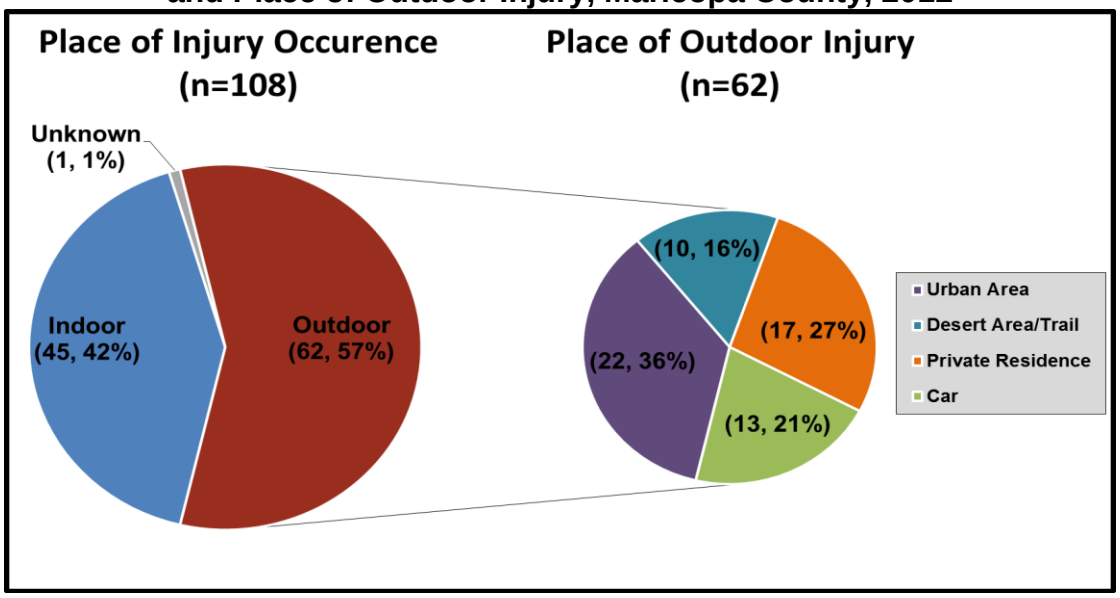
	0-4	5-19	20-34	35-49	50-64	65-74	75+
White (n=59)	0.0	0.0	0.5	1.8	3.6	4.2	10.9
Hispanic (n=16)	0.8	0.0	0.0	1.7	4.2	3.1	27.3
African American (n=3)	0.0	0.0	0.0	0.0	6.6	0.0	19.8
Asian/Pac. Isl (n=3)	0.0	0.0	0.0	0.0	4.4	12.7	22.7
Native American (n=4)	19.2	0.0	0.0	15.7	12.8	0.0	0.0
Total** (n=85)	0.8	0.0	0.2	1.8	4.0	4.2	12.7

*Based on 2012 Census population estimates for Maricopa County. Excludes twenty-three cases that were not Maricopa County residents and/or where race was unknown.

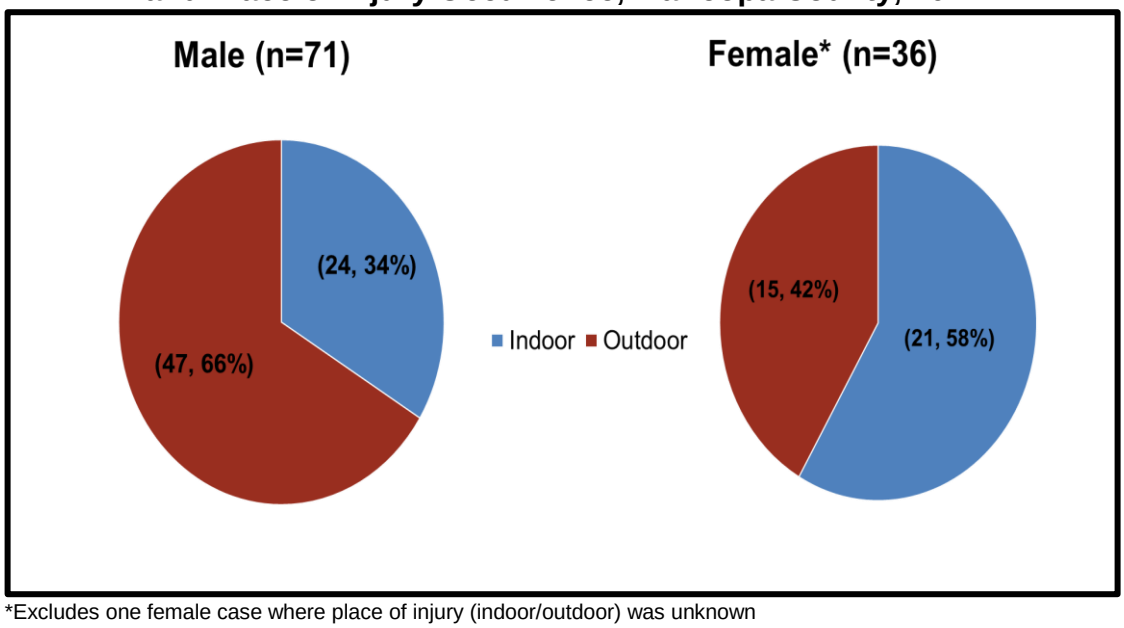
Heat-Associated Deaths by Place of Occurrence and Air Conditioning (AC) Status

The majority of all 108 deaths occurred at a private residence which includes all 45 indoor deaths and 17 outdoor deaths. Graph 10 illustrates that 57% of heat-associated deaths in 2012 occurred outdoors. These deaths most often occurred in urban areas (36%). Graph 11 shows that more men died outdoors (66%), while more women (58%) 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, 2012



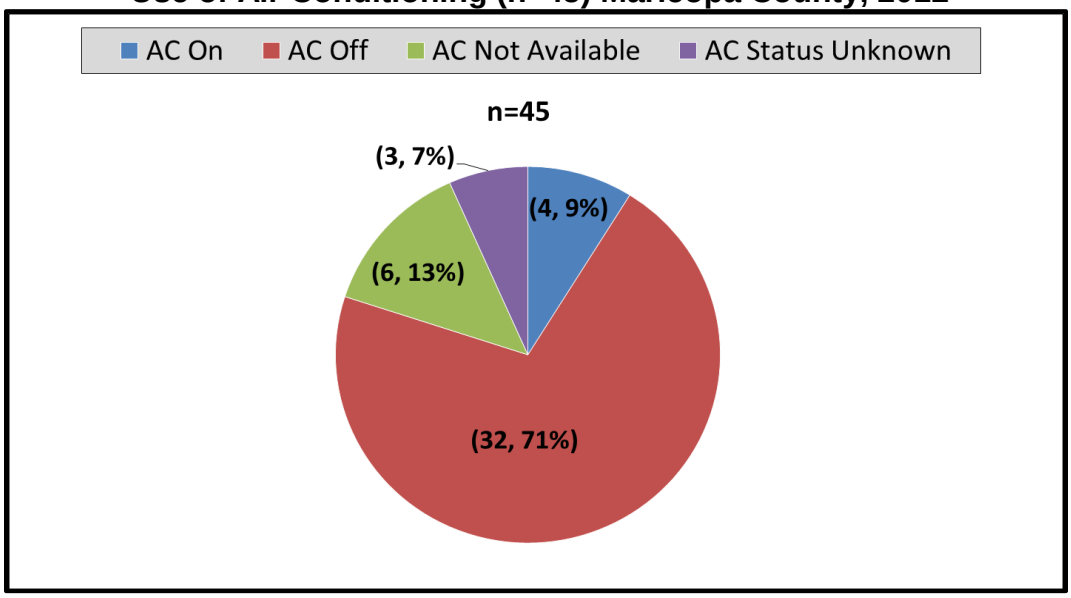
Graph 11. Heat-Associated Deaths by Gender and Place of Injury Occurrence, Maricopa County, 2012



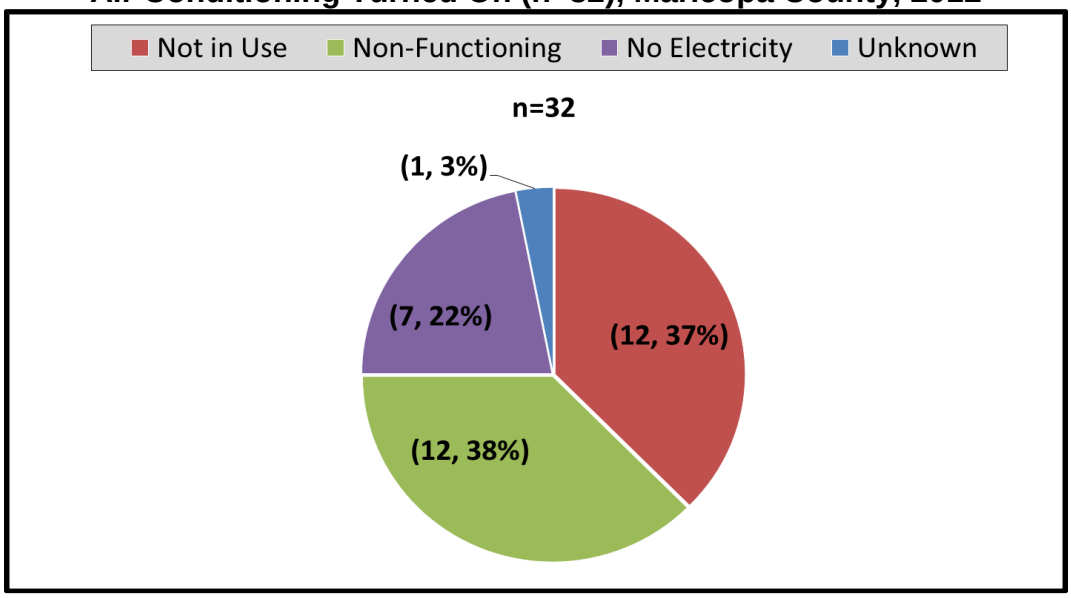
*Excludes one female case where place of injury (indoor/outdoor) was unknown

Among deaths occurring indoors, 84% did not have air conditioning (AC) in use or it was not present (Graph 12). For the 9% of deaths where air conditioning was turned on, the AC was blowing hot air because the thermostat was set high or other unknown reasons. Of the 71% who did not have air conditioning turned on, the majority of AC units (60%) 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=45) Maricopa County, 2012



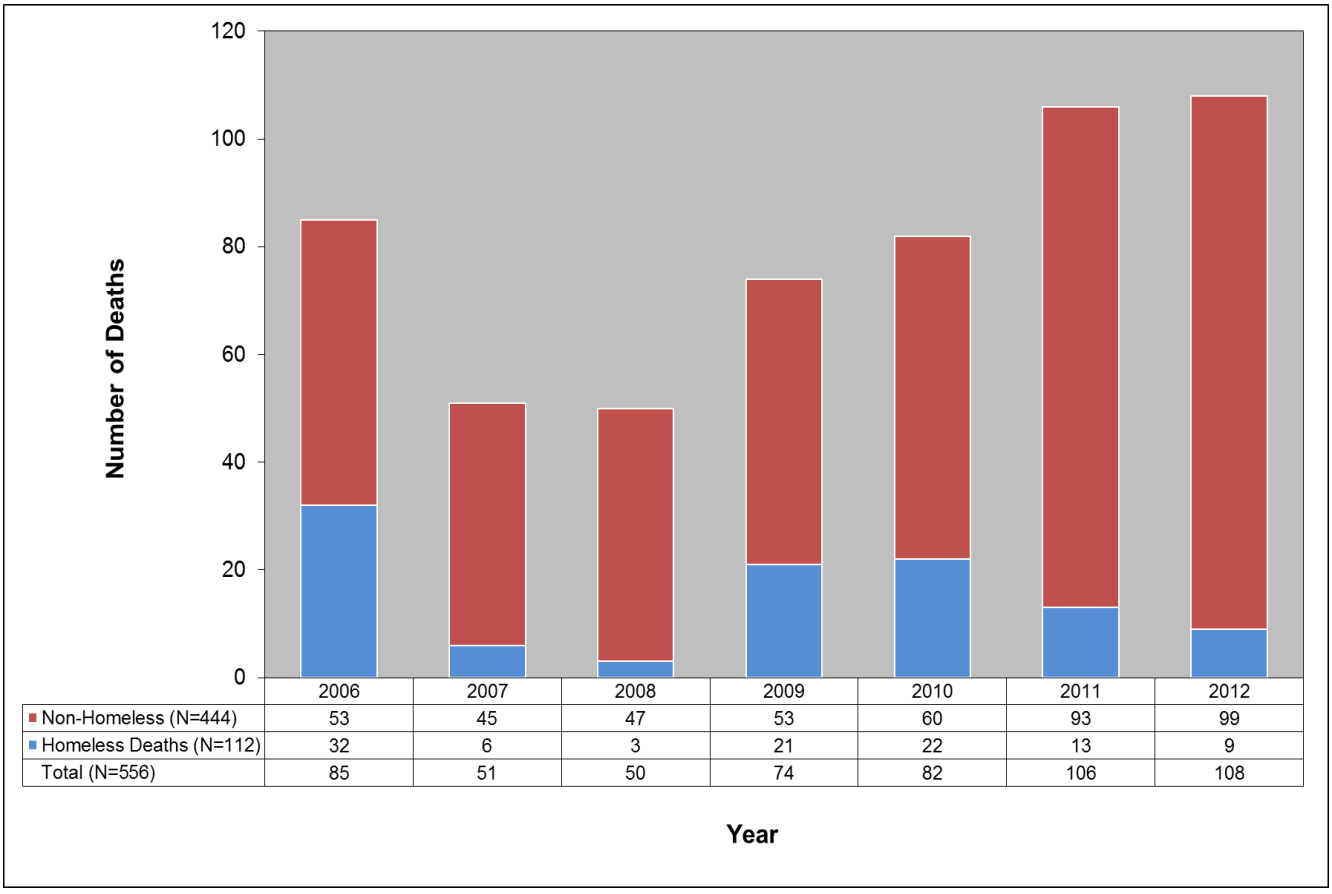
Graph 13. Air Conditioning Status for Cases who did not have Air Conditioning Turned On (n=32), Maricopa County, 2012



Heat-Associated Deaths among Individuals who are Homeless

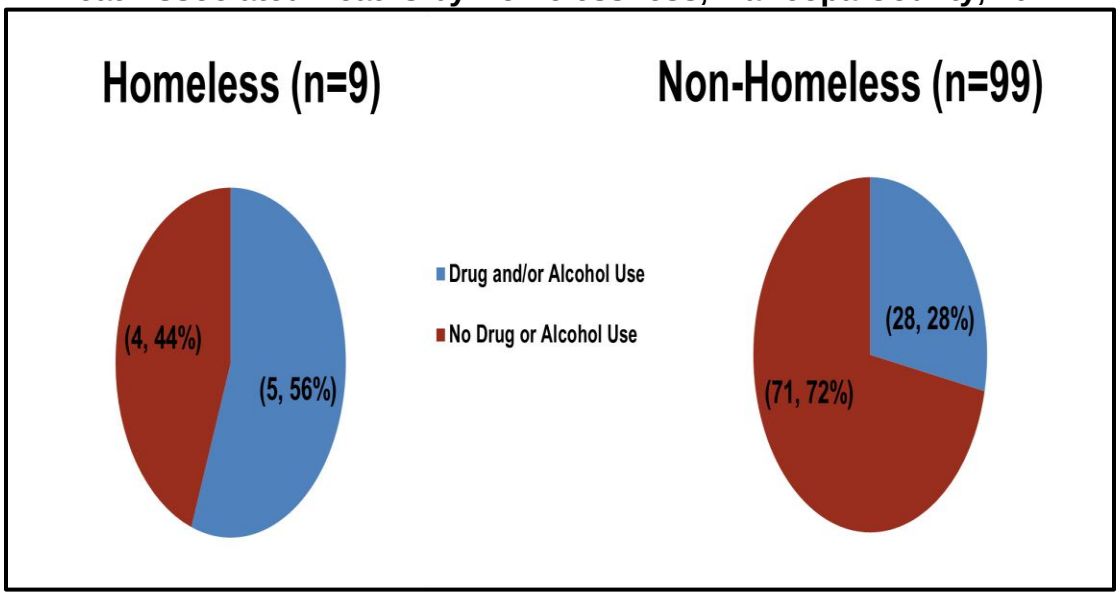
In 2006, 32 heat-associated deaths (38% of the 2006 total) occurred among homeless persons. In 2007 and 2008 heat-associated deaths among homeless persons decreased followed by an increase in 2009 and 2010. Heat-associated deaths in homeless persons then decreased again in 2011 and 2012 (Graph 14). Graph 15 shows that of the 9 individuals who are homeless, and died in 2012, 56% had drugs or alcohol listed among their causes of death compared to 28% of non-homeless persons. 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. Reports of drug and alcohol use were obtained both from the death certifcicate and the Medical Examiner's preliminary report of death, which does not indicate whether the drugs or alcohol contributed to the death (Graph 16). [For more detailed information on the homeless, See Appendix, Table H]

Graph 14. Homeless Heat-Associated Deaths, Maricopa County, 2006-2012

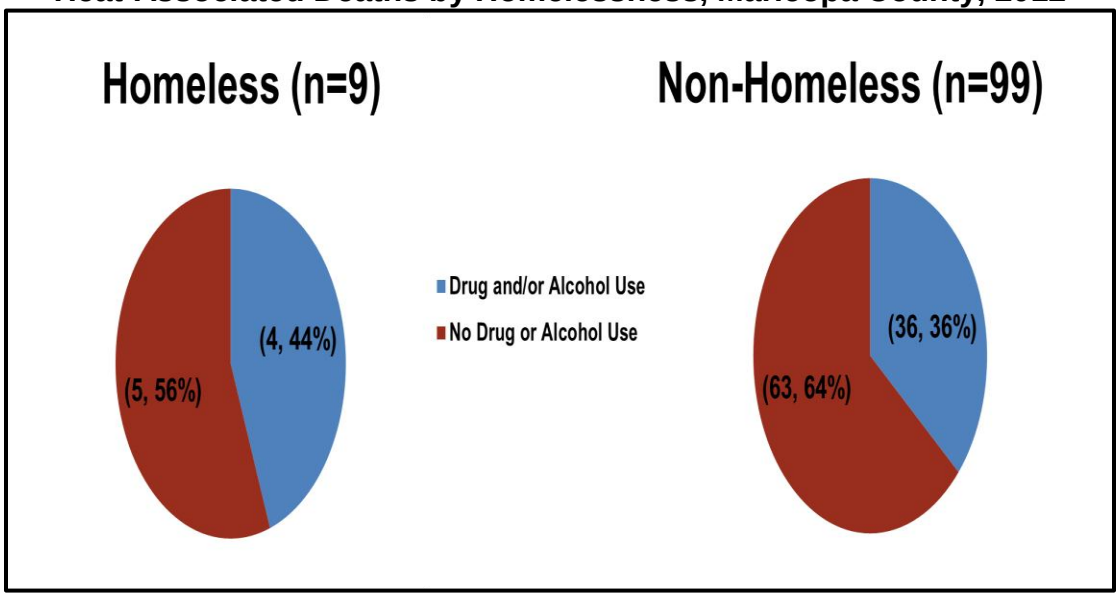


	2006	2007	2008	2009	2010	2011	2012
Non-Homeless (N=444)	53	45	47	53	60	93	99
Homeless Deaths (N=112)	32	6	3	21	22	13	9
Total (N=556)	85	51	50	74	82	106	108

Graph 15. Drug and Alcohol Use, as Mentioned on the Death Certificate for Heat-Associated Deaths by Homelessness, Maricopa County, 2012



Graph 16. Drug and Alcohol Use, as Mentioned by the Medical Examiner for Heat-Associated Deaths by Homelessness, Maricopa County, 2012



Conclusions – Heat-Associated Deaths 2012

1. The 108 confirmed heat-associated deaths in 2012 represents the highest number of deaths recorded since enhanced surveillance began in 2006. This number may increase once the remaining 2 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 August.

4. Most decedents, for whom residency was known, were residents of Maricopa County (83%) or Arizona (7%).

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

6. Nearly 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; two of which occurred in children less 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 more distributed above and below 65 years of age.

9. The majority of deaths (57%) occurred outdoors, about one third 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. All heat-associated deaths that occurred indoors, occurred at a private residence. For 84% of these indoor deaths, the air conditioning (AC) was not in use or it was not present.

12. Approximately one in twelve heat-associated deaths in 2012 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.

14. MCDPH staff identified seven heat-related deaths that were covered by a media report.

New Heat Surveillance Methods

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 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 in a timely manner increasing the sensitivity of MCDPH screening methods.

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 this 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 related 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 heat-related deaths and/or morbidity.

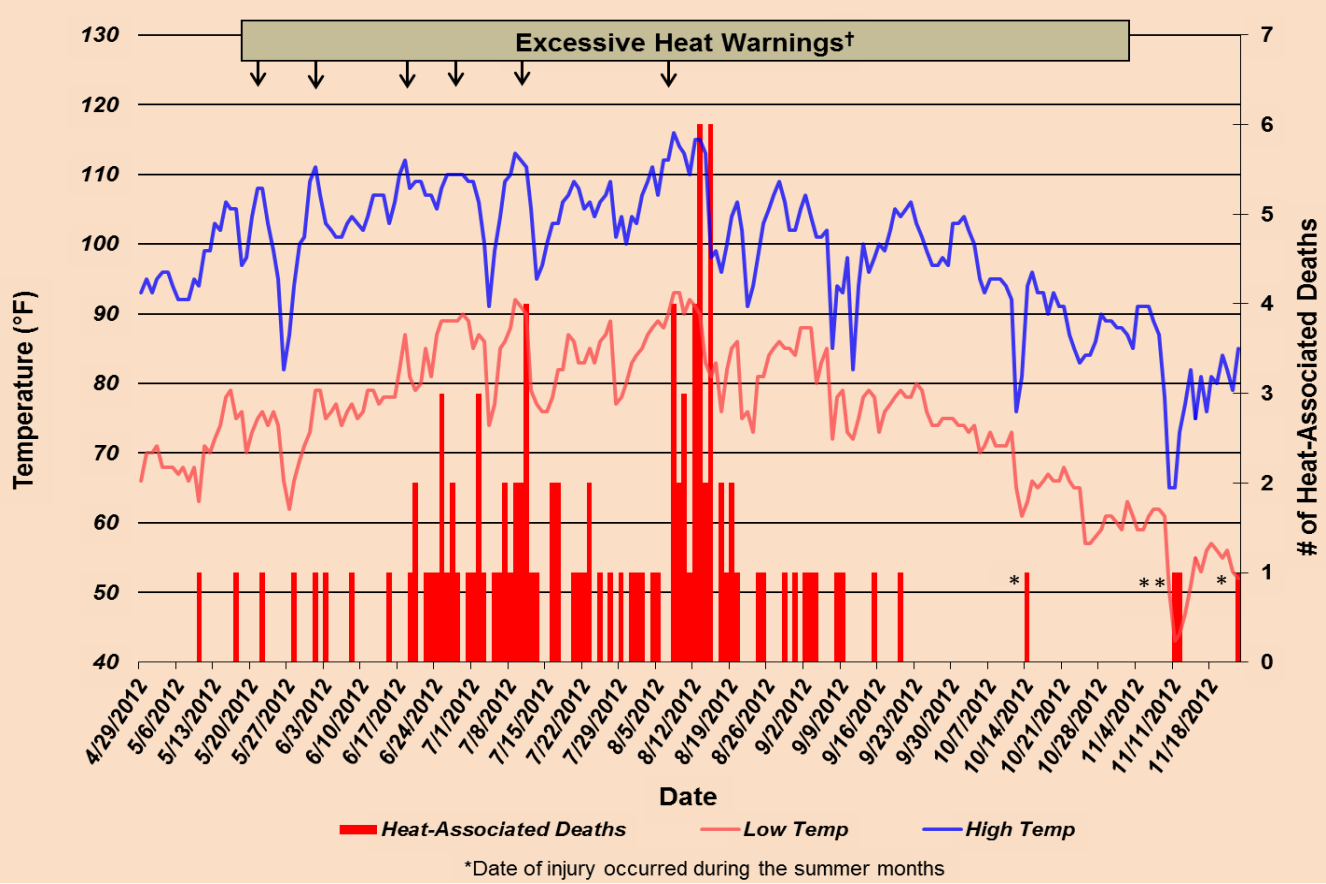
The primary goal of heat-associated death surveillance continues to be the reduction and eventually elimination of heat-associated deaths. The number of heat-associated deaths for 2012 compared to previous years is very concerning and highlights the need for community partners and public health to collaborate 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 [4/29/12-11/23/12 (N=108)]



†Exact Dates of Excessive Heat Warnings:

5/21/2012 – 5/22/2012
5/31/2012 – 6/1/2012
6/18/2012
6/27/2012 – 6/30/2012
7/9/2012 – 7/10/2012
8/6/2012 – 8/14/2012

Table A. Heat-Associated Deaths by Gender and Age Group, Maricopa County, 2012

Age Group	Deaths by Gender		
	Male N (%)	Female N (%)	Total N (%)
0-4	0 (0%)	2 (5%)	2 (2%)
5-19	1 (1%)	0 (0%)	1 (1%)
20-34	4 (6%)	0 (0%)	4 (4%)
35-49	17 (24%)	4 (11%)	21 (19%)
50-64	27 (38%)	9 (24%)	36 (33%)
65-74	10 (14%)	5 (14%)	15 (14%)
75+	12 (17%)	17 (46%)	29 (27%)
All Ages	**71 (66%)**	**37 (34%)**	**108 (100%)**

Table B. Heat-Associated Death Rates per 100,000 Residents* by Gender and Age Group, Maricopa County, 2012

Age Group	Gender Rate per 100,000 (N)		
	Male	Female	Total
0-4	0.0 (0)	1.5 (2)	0.7 (2)
5-19	0.0 (0)	0.0 (0)	0.0 (0)
20-34	0.5 (2)	0.0 (0)	0.2 (2)
35-49	3.3 (13)	0.3 (1)	1.8 (14)
50-64	5.8 (19)	2.3 (8)	4.0 (27)
65-74	6.6 (9)	2.6 (4)	4.5 (13)
75+	12.8 (12)	12.5 (16)	12.6 (28)
All Ages	**2.8 (55)**	**1.5 (31)**	**2.2 (86)**

*Based on 2012 Census population estimates for Maricopa County. Excludes twenty-two cases that were not Maricopa County residentsand/or where race was unknown.

Table C. Heat-Associated Death Rates per 100,000 Residents* by Age Group and Race/Ethnicity, Maricopa County, 2012

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)	0.5 (2)	2.0 (9)	3.4 (17)	4.2 (10)	10.9 (21)	2.5 (59)
Hispanic	0.8 (1)	0.0 (0)	0.0 (0)	1.7 (4)	4.2 (5)	3.1 (1)	27.3 (5)	1.4 (16)
Black	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.0 (3)	0.0 (0)	0.0 (0)	0.0 (3)
Asian/Pac. Islander	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.4 (1)	12.7 (1)	22.7 (1)	1.4 (3)
Native American	19.2 (1)	0.0 (0)	0.0 (0)	15.7 (2)	12.8 (1)	0.0 (0)	0.0 (0)	6.4 (4)
All Race/Ethnicities	**0.8 (2)**	**0.0 (0)**	**0.2 (2)**	**1.9 (15)**	**4.0 (27)**	**4.2 (12)**	**12.2 (27)**	**2.1 (85)**

*Based on 2012 Census population estimates for Maricopa County. Excludes twenty-three cases that were not Maricopa County residents and/or where race was unknown.

Table D. Heat-Associated Death Rates per 100,000 Residents* by Gender and Race/Ethnicity, Maricopa County, 2012

Race/Ethnicity	Gender Rate per 100,000 (N)		
	Male	Female	Total
White	3.6 (40)	1.6 (19)	2.6 (59)
Hispanic	1.3 (8)	1.4 (8)	1.4 (16)
Black	2.1 (2)	1.1 (1)	1.6 (3)
Asian/Pac. Islander	4.2 (3)	2.5 (2)	3.3 (5)
Native American	6.8 (2)	6.0 (2)	6.4 (4)
All Races	**2.9 (55)**	**1.6 (32)**	**2.3 (85)**

*Based on 2012 Census population estimates for Maricopa County. Excludes twenty-three cases that were not Maricopa County residents and/or where race was unknown.

Table E. Heat-Associated Deaths by Place Injury Occurred* and Age Group, Maricopa County, 2012

Age Group	Private Residence		Desert Area/Trail	Car	Urban Area				Total
	In	Out			Business	Street/ Alley	Field/ Park	Parking Lot	
0-4	1	0	0	1	0	0	0	0	2
5-19	0	0	1	0	0	0	0	0	1
20-34	0	0	1	2	0	0	0	1	4
35-49	4	1	2	2	3	5	5	0	22
50-64	11	7	4	6	2	3	0	1	34
65-74	10	0	1	2	0	2	0	0	15
75+	19	9	1	0	0	0	0	0	29
Total*	**45**	**17**	**10**	**13**	**5**	**10**	**5**	**2**	**107**

*Excludes one case where place of injury (indoor/outdoor) was unknown.

Table F. Heat-Associated Deaths by Indoor or Outdoor Occurrence*, Age Group, and Gender, Maricopa County, 2012

Age Group	Indoor			Outdoor		
	Male	Female	Total	Male	Female	Total
0-4	0	1	1	0	1	1
5-19	0	0	0	1	0	1
20-34	0	0	0	4	0	4
35-49	4	0	4	14	4	18
50-64	6	5	11	20	3	23
65-74	6	4	10	4	1	5
75+	8	11	19	4	6	10
Total	**24**	**21**	**45**	**47**	**15**	**62**

*Excludes one case where place of injury (indoor/outdoor) was unknown.

Table G. Heat-Associated Deaths by Use of Air Conditioning (AC) and Age Group, (Indoor Only) Maricopa County, 2012

Age Group	AC In Use	AC Not in Use	AC Not Available	AC Status Unknown	Total
0-4	0	1	0	0	1
5-19	0	0	0	0	0
20-34	0	0	0	0	0
35-49	0	2	1	1	4
50-64	0	9	1	1	11
65-74	2	6	2	0	10
75+	2	14	2	1	19
Total	**4**	**32**	**6**	**3**	**45**

Table H. Drug and Alcohol Use, as Mentioned on the Death Certificate for Heat-Associated Deaths, by Homelessness, Maricopa County, 2012

Homelessness	Total N (%)	Drug and/or Alcohol Use N (%)	No Drug or Alcohol Use N (%)
Homeless	9 (8%)	5 (56%)	4 (44%)
Non-Homeless	99 (92%)	28 (28%)	71 (72%)
Total	**108 (100%)**	**33 (31%)**	**75 (69%)**

Table I. Heat-Associated Deaths by Smoking/Tobacco Use, Maricopa County, 2012

Smoking/Tobacco Use	N (%)
Yes	26 (24%)
No	25 (23%)
Past	3 (3%)
Unknown	54 (50%)
Total	**108 (100%)**

Table J. Heat-Associated Deaths by Industry, Maricopa County, 2012

Industry*	N (%)
Installation, Maintenance, and Repair Occupations	17 (16%)
Constructions and Extraction Occupations	15 (14%)
Homemaker	13 (12%)
Healthcare Practitioners and Technical Occupations	7 (6%)
Transportation and Material Moving Occupations	7 (6%)
Business and Financial Operations Occupations	5 (5%)
Production Occupations	4 (4%)
Education, Training, and Library Occupations	3 (3%)
Farming, Fishing, and Forestry Occupations	3 (3%)
Food Preparation and Serving Related Occupations	3 (3%)
Office and Administrative Support Occupations	3 (3%)
Legal Occupations	2 (2%)
Management Occupations	2 (2%)
Architecture and Engineering Occupations	1 (1%)
Arts, Design Entertainment, Sports, and Media Occupations	1 (1%)
Community and Social Services Occupations	1 (1%)
Computer and Mathematical Occupations	1 (1%)
Life, Physical, and Social Science Occupations	1 (1%)
Sales and Related Occupations	1 (1%)
Unknown	18 (17%)
Total	**108 (100%)**

*Industry categories retrieved from the Bureau of Labor Statistics.

Table K. Heat-Associated Deaths by Education Category, Maricopa County, 2012

Education Category	N (%)
8th grade or less	10 (9%)
9th through 12th grade; no diploma	16 (15%)
High school graduate or GED completed	39 (36%)
Some college credit, but no degree	16 (15%)
Associate degree (e.g.AA,AS)	4 (4%)
Bachelor's degree (e.g.BA,BS)	8 (7%)
Master's degree (e.g.MA,MS,MEng,MEd,MSW,MBA)	2 (2%)
Doctorate (e.g.PhD,EdD) or Professional degree (e.g.MD,DDS,DVM,LLB,JD)	1 (1%)
Not Classifiable	2 (2%)
Unknown	10 (9%)
Total	**108 (100%)**