Trends in Morbidity and Mortality from Exposure to Excessive Natural Heat in Arizona, 2012 report

Bureau of Epidemiology & Disease Control
Office of Environmental Health
Bureau of Public Health Statistics
Health Status and Vital Statistics Section

Arizona Department of Health Services

HEALTH AND WELLNESS FOR ALL ARIZONANS

Janice K. Brewer, Governor

State of Arizona

Will Humble, Director
Arizona Department of Health Services

MISSION

To promote, protect, and improve the health and wellness of individuals and communities in Arizona.

Prepared by:
THE BUREAU OF EPIDEMIOLOGY & DISEASE CONTROL
THE BUREAU OF PUBLIC HEALTH STATISTICS
ARIZONA DEPARTMENT OF HEALTH SERVICES
150 N. 18th Avenue
Phoenix, Arizona 85007-3248
[www.azhealth.gov]

THIS PUBLICATION CAN BE MADE AVAILABLE IN ALTERNATIVE FORMAT.
Please contact the Bureau of Epidemiology & Disease Control at 602-364-3118 (voice) or call 1-800-367-8939 (TDD).

Trends in Morbidity and Mortality from Exposure to Excessive Natural Heat in Arizona, 2012 report

This report is supported by funds from Cooperative Agreement #1UE1EH001119-01 from The Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.

February 4, 2014

Trends in Morbidity and Mortality from Exposure to Excessive Natural Heat in Arizona, 2012 report

TABLE OF CONTENTS

Methods and Sources....1
Limitations of the Data....2

Section 1: Heat-Related Mortality, 2000-2012

Figure 1 Deaths From Exposure to Excessive Natural Heat Occurring in Arizona by Year, 2000-2012....3
Figure 2 Deaths From Exposure to Excessive Natural Heat Occurring in Arizona by State or Country of Residence, 2000-2012....4
Figure 3 Deaths From Exposure to Excessive Natural Heat Occurring in Arizona by Month, 2000-2012....5
Figure 4 Percent Distribution of Deaths From Exposure to Excessive Natural Heat Occurring in AZ by Month and Residence Status, 2000-2012....6
Figure 5 Percent Distribution of Deaths From Exposure to Excessive Natural Heat Occurring in AZ by Age Group and Residence Status, 2000-2012....7
Figure 6 Median Age at Death From Exposure to Excessive Natural Heat by Residence Status, 2000-2012....8
Figure 7 Median Age at Death From Exposure to Excessive Natural Heat by Gender and Race/Ethnic Group, 2000-2012....9
Figure 8 Percent Distribution of Deaths from Exposure to Excessive Natural Heat by Residence Status and Area of Occurrence in AZ, 2000-2012....10
Table 1 Characteristics of Death from Exposure to Excessive Natural Heat Occurring in AZ by Year, 2000-2012....11
Table 2 Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Residence Status, 2000-2012....13
Table 3 Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Region, 2000-2012....16
Table 4 Deaths from Exposure to Excessive Natural Heat by Geographic Region of Occurrence in AZ and Residence Status, 2000-2012....19
Table 5 Median Age at Death from Exposure to Excessive Natural Heat by Geographic Region of Occurrence in AZ and Residence Status, 2000-2012....19
Table 6 Median Age at Death from Exposure to Excessive Natural Heat by Race/Ethnicity and Gender, 2000-2012....20

Section 2: Heat-Related Morbidity, 2012

Figure 9 Illness From Exposure to Excessive Natural Heat Occurring in AZ by State or Country of Residence, 2012....21
Figure 10 Hospitalizations From Exposure to Excessive Natural Heat Occurring in AZ by Month, 2012....22
Figure 11 Percent Distribution of Illness From Exposure to Excessive Natural Heat Occurring in AZ by Age Group and Residence Status, 2012....23
Figure 12 Median Age at Hospitalization From Exposure to Excessive Natural Heat By Residence Status, 2012....24
Figure 13 Median Age at Illness From Exposure to Excessive Natural Heat by Race/Ethnic Group, 2012....25
Figure 14 Percent Distribution of Illness From Exposure to Excessive Natural Heat by Residence Status and Area of Occurrence in AZ, 2012....26
Table 7 Characteristics of Illness from Exposure to Excessive Natural Heat Occurring in AZ, 2012....27
Table 8 Characteristics of Arizona Illness from Exposure to Excessive Natural Heat by Residence Status, 2012....30
Table 9 Characteristics of Arizona Illness from Exposure to Excessive Natural Heat by Region, 2012....33
Table 10 Illness from Exposure to Excessive Natural Heat by Geographic Region of Occurrence in AZ and Residence Status, 2012....36
Table 11 Median Age at Illness from Exposure to Excessive Natural Heat by Geographic Region of Occurrence in AZ and Residence Status, 2012....36
Table 12 Median Age at Illness from Exposure to Excessive Natural Heat by Race/Ethnicity and Gender, 2012....37

Purpose

The previous special report, *Deaths from Exposure to Excessive Natural Heat Occurring in Arizona, 1992 - 2009*, was published in March 2010. It presented a broad range of information concerning natural/environmental heat-related deaths occurring in Arizona and among various groups. Similarly, the purpose of *Trends in Morbidity and Mortality from Exposure to Excessive Natural Heat in Arizona, 2012 report* is to update and expand information concerning natural/environmental heat-related mortality occurrences within Arizona, and for the first time provide information on heat-related morbidity occurring in Arizona.

Methods and Sources

Data collected regarding the number and characteristics of deaths from exposure to excessive natural heat was obtained from the mortality database containing information from death certificates filed with the Arizona Department of Health Services (ADHS), Office of Vital Records. Data collected regarding the number and characteristics of inpatient admissions or patients treated in an emergency department were obtained from hospital discharge and emergency department data collected by the Arizona Department of Health Services, Cost Reporting and Discharge Data Review Section.

The *International Classification of Diseases* (ICD) permits the classification of environmental events and circumstances as the external cause of injury [and/or] death. Beginning with the 2000 data year in Arizona (1999 nationally) the Tenth Revision of the International Classification of Diseases (ICD-10) replaced the Ninth Revision (ICD-9), which was in effect since 1979. Exposure to excessive natural heat as the underlying cause of death is identified by X30, a three-character category in the Tenth Revision and E900.0 in the Ninth Revision. In this report, deaths from exposure to excessive natural heat are classified using ICD-10 classifications. In addition to death certificates where exposure to excessive natural heat was indicated as the underlying cause of death, heatstroke or sunstroke may be reported on death certificates as contributing factors that had a bearing on the death, but were not its underlying cause. Unless the underlying cause of death was identified as X30, these deaths were not included in this report.

Hospitalizations (inpatient admissions and emergency department visits) for heat illness (hyperthermia) due to exposure to excessive natural heat are classified using ICD-9 codes. Heat illness cases are restricted to patients having an ICD-9-CM 992.x diagnosis listed as the principal diagnosis code. The principal diagnosis code is the ICD code describing the principal diagnosis (i.e. the condition established after study to be chiefly responsible for occasioning the admission of the patient for care). E codes are not reported in this field and have separate fields designated for the purpose of reporting. Patients were removed for having an ICD-9 code E900.1 (man-made source of heat) as a cause of injury or other diagnosis. Hospitalization dates were classified by time using admission date. Cases were counted once per hospitalization.

Limitations of the Data

In this report we distinguish three groups at risk of death from exposure to excessive natural heat: *Arizona residents*, *visitors to Arizona from other states and migrants from Canada*, and *migrants from Mexico, Central America, or South America.*

These groups differ in size and sociodemographic characteristics such as age composition, gender, occupation, and race/ethnicity. One of the primary objectives in the comparative analysis of mortality is to measure the likelihood (risk or probability of occurrence) of death in the specified population during a particular time. Mortality rates express the likelihood of death – the frequency of a vital event (such as death) in the numerator occurring to individuals in the denominator – and they are generally expressed as units of population in the denominator (per 1,000, 10,000, 100,000, and so forth). It is important to note that the risk of death expressed as a mortality rate can only be computed for the residents of Arizona. Neither the number of visitors to Arizona during a calendar year nor those from other states or countries can be estimated with any precision.

While comparisons are made among these groups, correlations between the increased number of deaths from exposure to excessive natural heat among migrants from Mexico, Central America, and South America and undocumented persons is beyond the scope of this report.

The value of comparing the absolute number of deaths, rather than group-specific relative frequencies, ought not to be overestimated. On the other hand, from an epidemiological or public health viewpoint, the number of deaths from a rare cause may be of great importance even if the statistically reliable mortality rate cannot be computed.

The total burden of illness related to exposure to excessive natural heat may be larger than is indicated in this report. ADHS collects hospital discharge records for inpatient and emergency department visits from all Arizona licensed hospitals. Records do not capture illness cases that recover without medical intervention or were treated at an urgent care facility. The collection of data from hospitals is required by Arizona Revised Statute (A.R.S.) § 36-125-05 and Arizona Administrative Code Title 9, Chapter 11, Articles 4 and 5. All Arizona licensed hospitals (i.e. regulated by the Arizona Department of Health Services) are required to report. Therefore, hospitals such as Veteran's Administration Department of Defense, and those located on tribal land, are not included in reporting.

When examining heat-related morbidity in this report, we examined patients whose primary reason for hospitalization was caused by exposure to excessive natural heat. A case where a heat diagnosis (992.x) is listed as one of the up to 24 secondary diagnoses is beyond the scope of this report. When including both primary diagnoses, secondary diagnoses, and injury codes (E900.0/E900.9) for exposure to excessive natural heat, the number of inpatient admissions recorded in this report are increased from 212 to 548 and the number of emergency department visits from 1573 to 2415 in 2012. This number may better reflect comparable reports using the term heat-related illness.

Alterations can be made to these methods to improve subsequent heat morbidity surveillance efforts in future report updates. Determining the methods used will ensure that the data collected from year to year is comparable.

Section 1: Heat-Related Mortality, 2000 - 2012

Between 2000 and 2012, 1,535 deaths from exposure to excessive natural heat occurred in Arizona.

The number of deaths from exposure to excessive natural heat has shown a wide variation from year to year (low = 62 deaths in 2000; high = 226 deaths in 2005). On average, 118 people died every year from a heat-related condition (**Figure 1, Table 1**).

Approximately seven out of every ten deaths from exposure to excessive natural heat between 2000 and 2012 were males (1,142/1,535 or 74.4 percent, **Table 1**), and 58.5 percent (898/1,535, **Table 1**) were Hispanic or Latino.

Figure 1
Deaths from Exposure to Excessive Natural Heat Occurring in Arizona by Year, 2000 – 2012

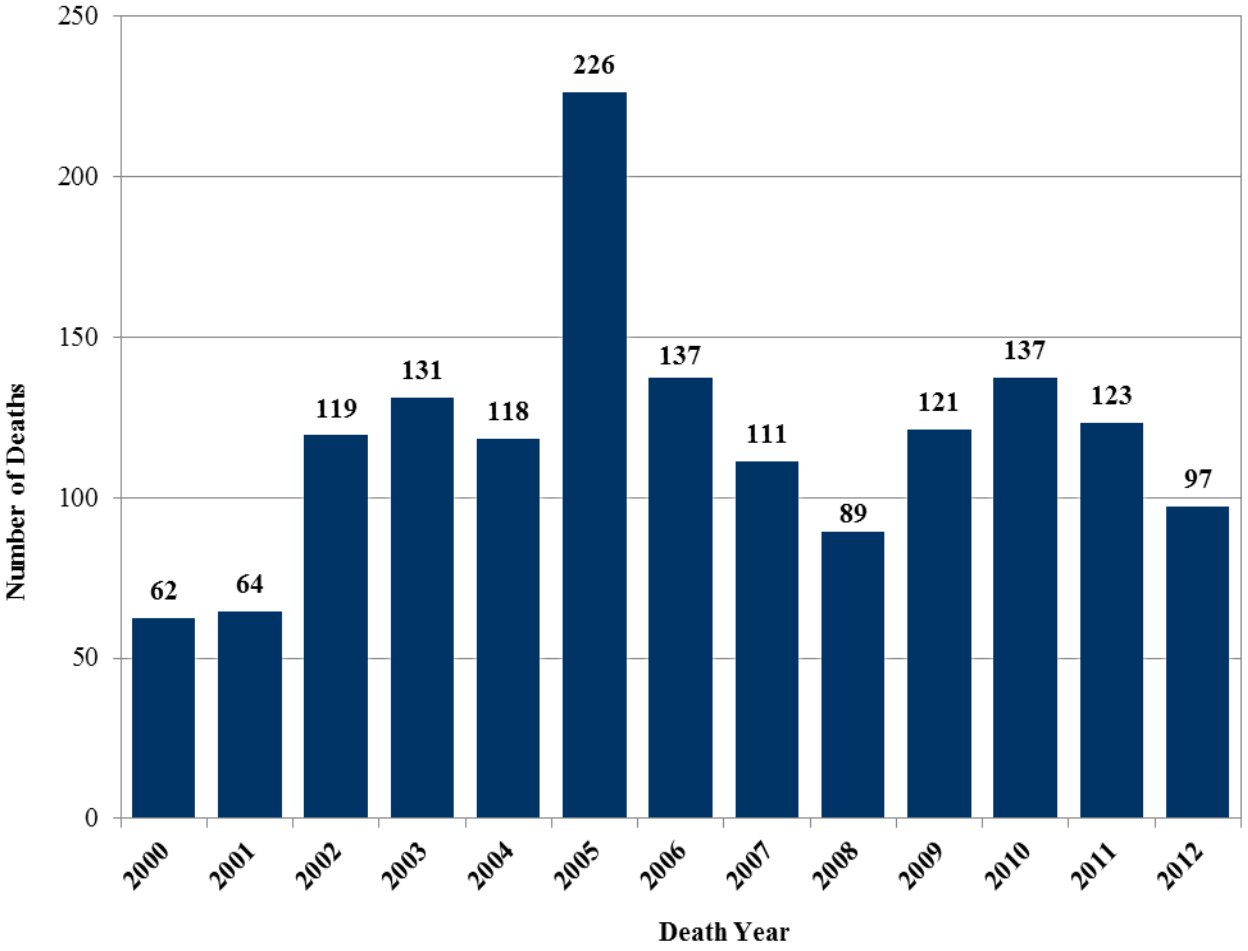
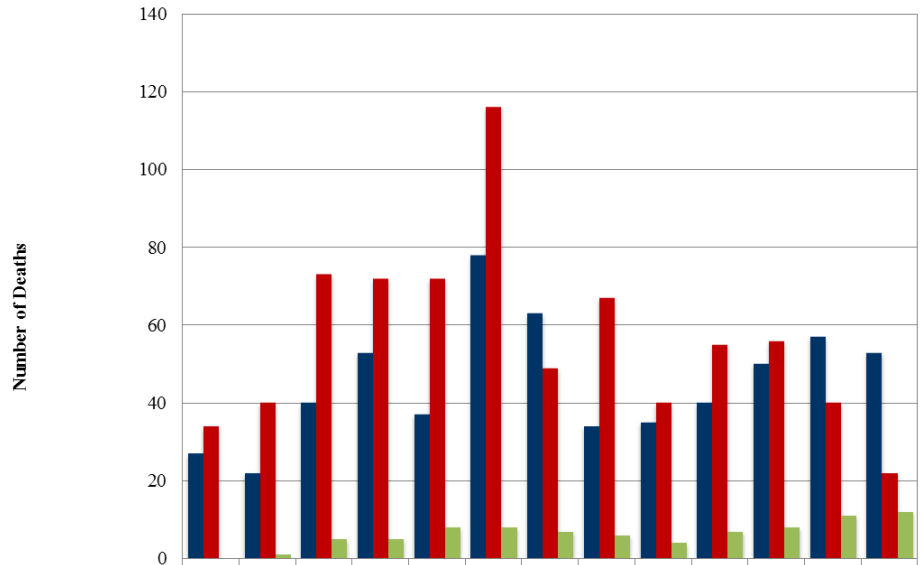


Figure 2
Deaths From Exposure to Excessive Natural Heat Occurring in Arizona by State or Country of Residence, 2000 - 2012



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Arizona Resident	27	22	40	53	37	78	63	34	35	40	50	57	53
Mexico/Central-/South American Resident	34	40	73	72	72	116	49	67	40	55	56	40	22
Other U.S. State or Canada Resident	0	1	5	5	8	8	7	6	4	7	8	11	12

From 2000 to 2012, migrants from Mexico, Central America, or South America accounted for half of all deaths (736 or 47.9 percent, **Table 2**) from exposure to excessive natural heat. The vast majority (404 or 54.9 percent, **Table 2**) of these deaths occurred in the five years from 2002 to 2007.

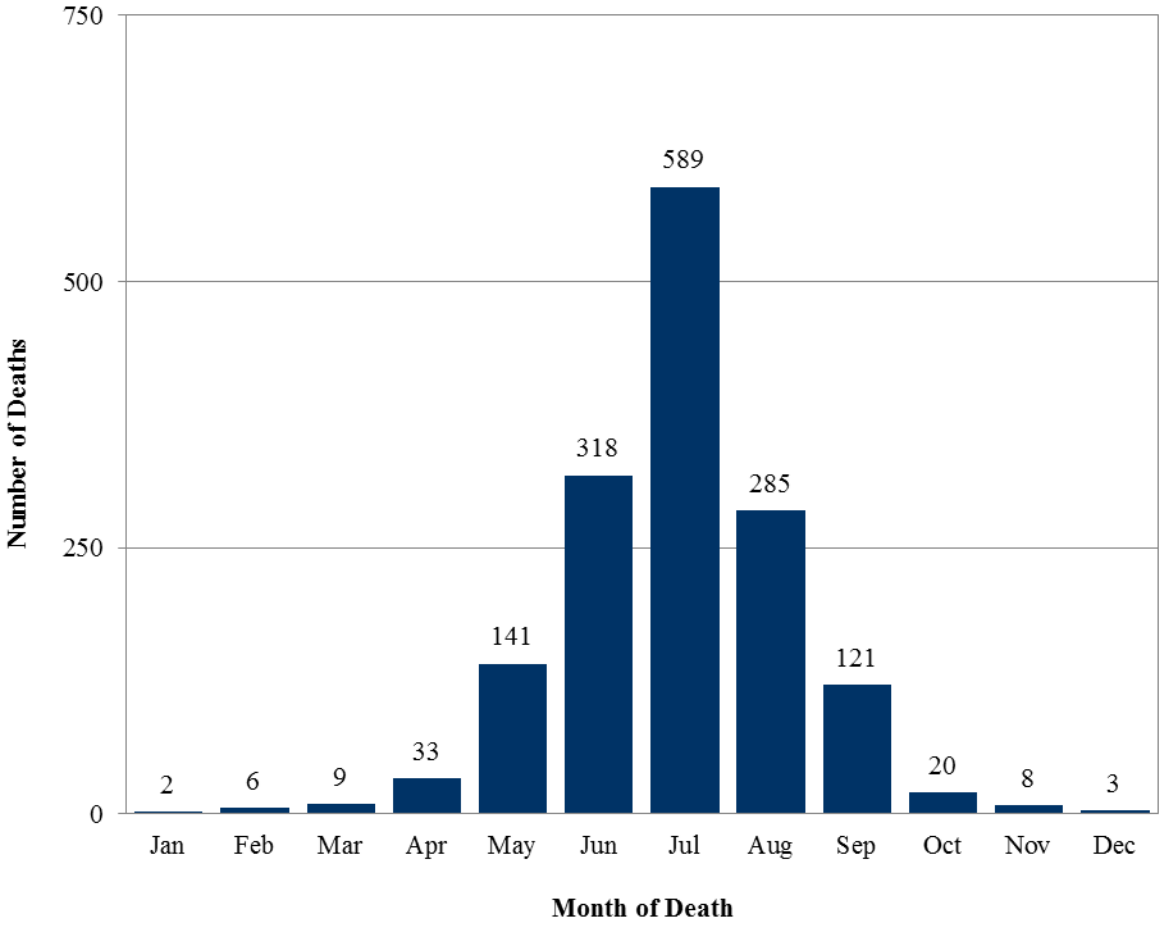
There were 589 deaths from exposure to excessive natural heat among the residents of Arizona (38.4 percent of the total), or 45 deaths on average per year in 2000 - 2012.

Visitors to Arizona from other U.S. states or migrants from Canada experienced 82 deaths from exposure to excessive natural heat during the 2000 to 2012 period.

Arizona's Sonoran Desert is where the Greater Phoenix metropolitan area is located and where temperatures oftentimes reach triple digits during the summer months. The number of deaths from exposure to excessive natural heat were highest for both Arizona residents and migrants from Mexico, Central American, and South American countries during 2005, however, the highest reported temperatures for the Greater Phoenix area during this period were in 2006 and 2010, both reporting temperatures of 118 degrees Fahrenheit[1]. No significant climate changes were reported which might explain the number of deaths in Arizona from natural heat.

[1] See http://phoenix.about.com/cs/weather/a/weathertrivia_2.htm

Figure 3
Deaths From Exposure to Excessive Natural Heat Occurring in Arizona by Month, 2000 - 2012

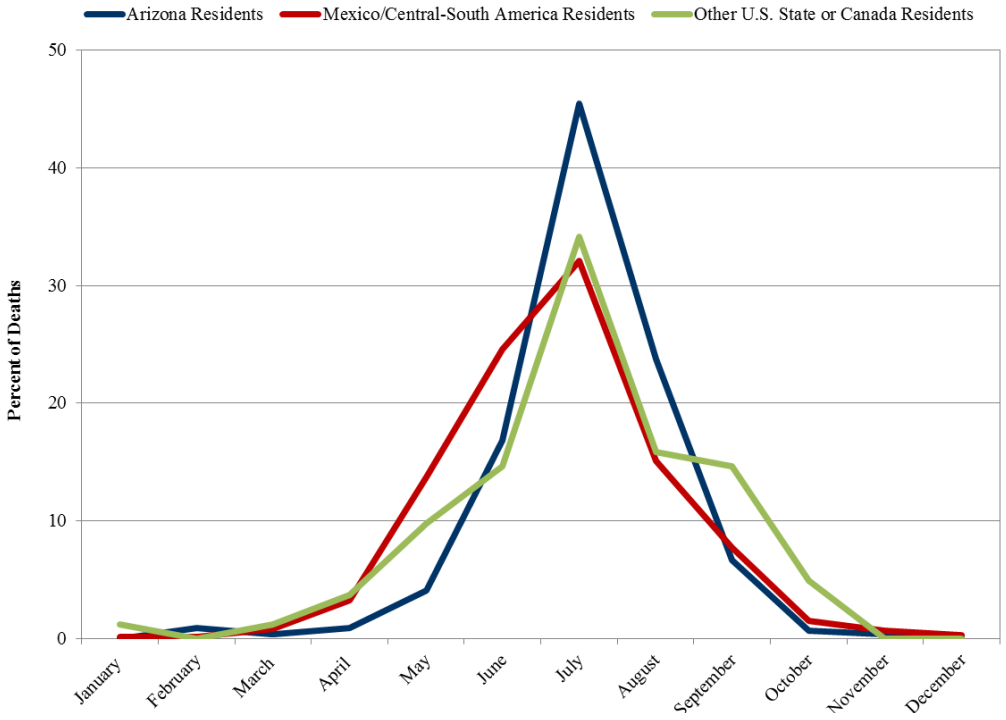


In Phoenix daily maximum temperatures reach ≥100° F in early June and can remain at that level until mid-September or October. The historical data collected by the Western Regional Climate Center demonstrate that the temperature of 100° F can be reached as early as March and continue through October[2]. Temperatures exceeding 125° F have been observed in the desert area.

Not surprisingly, most deaths from excessive natural heat occurred during late spring and summer (**Figure 3**, **Table 2**), with the highest number of deaths occurring during the month of July (589 in 2000 - 2012), followed by June (318), then August (285), May (141) and September (121). Ninety-five percent of all deaths from exposure to excessive heat occurred during this five month period.

[2] See http://www.wrcc.dri.edu/

Figure 4
Percent Distribution of Deaths From Exposure to Excessive Natural Heat Occurring in Arizona by Month and Residence Status, 2000 - 2012



Regardless of the residence status, most deaths from excessive natural heat occurred during the month of July (**Figure 4, Table 2**). Compared to residents of Arizona, proportionately there were more deaths among residents of Mexico, Central America, and South America from March–June. However, between September-October the proportions are similar.
In contrast, the number of deaths from exposure to excessive natural heat among Arizona residents substantially exceeded the number of deaths from either of the two remaining groups in both July and August.

The difference in the seasonal pattern of mortality may mean that fewer migrants entered Arizona in July and August, the two summer months with the highest temperatures (**Table 2**).

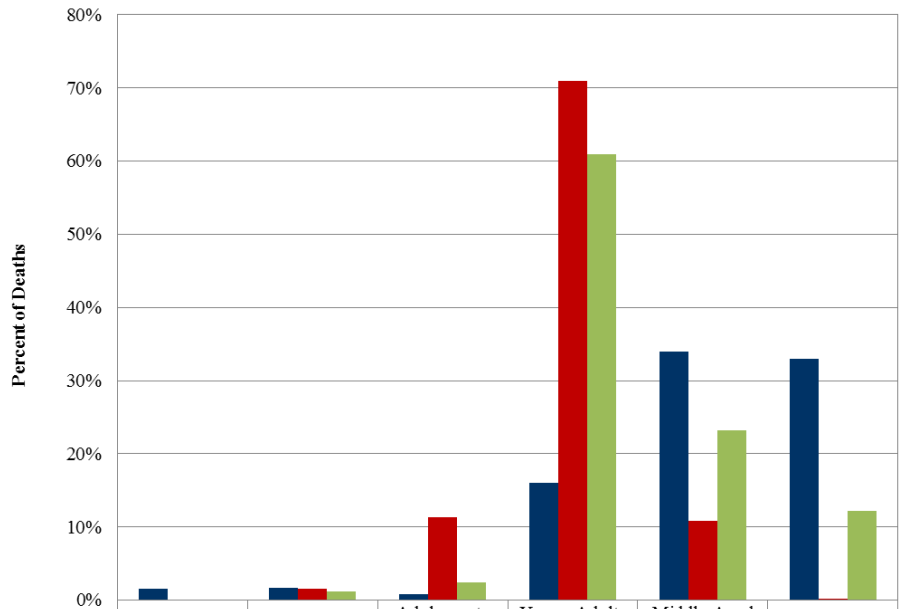
From 2000-2012, deaths from exposure to excessive natural heat among migrants to Arizona occurred at younger ages compared to deaths from natural heat among the State's residents (**Figure 5**). In fact, young adults 20-44 years old accounted for 71 percent of deaths from exposure to excessive natural heat among the migrants from Mexico and other Central or South American countries.

In contrast, adults 65 years or older had the highest risk of heatstroke or sunstroke among the age groups of Arizona residents. Less than one percent of all deaths from natural heat among migrants were 65 years and older, while 32.9 percent of fatalities due to exposure to excessive heat among Arizona residents were this age.

Out of 646 death certificates of Arizona residents who died from exposure to excessive natural heat in 1992-2009, 554 provided injury location (e.g. home, parking lot, or desert).

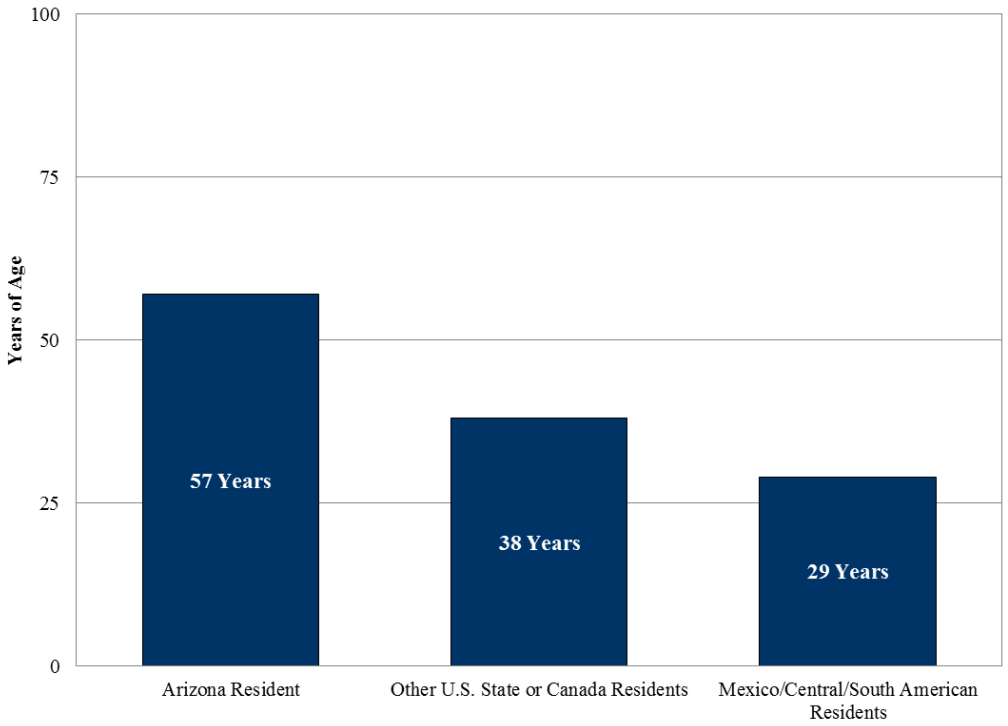
The number of deaths that occurred outdoors was 2.2 times greater than number of deaths indoors (381 vs. 173). The majority (75.1 percent) of individuals who died outdoors were <65 years of age. In contrast, 66.5 percent of at home deaths were among decedents 65 years or older.

Figure 5
Percent Distribution of Deaths From Exposure to Excessive Natural Heat Occurring in Arizona by Age Group and Residence Status, 2000 - 2012



	Infants < 1	Children 1 - 14	Adolescents 15 - 19	Young Adults 20 - 44	Middle-Aged Adults 45 - 64	Elderly 65 +
Arizona Residents	1.5	1.7	0.9	16.0	34.0	32.9
Mexico/Central/South American Residents	0.0	1.5	11.3	70.9	10.9	0.1
Other U.S. State or Canada Residents	0.0	1.2	2.4	61.0	23.2	12.2

Figure 6
Median Age at Death From Exposure to Excessive Natural Heat By Residence Status, 2000 – 2012



One out of two Arizonans who died from exposure to excessive natural heat between 2000 - 2012 was older than 57 years of age (**Figure 6**, **Table 5**).

In contrast, one out of two visitors from other U.S. states or Canada who died from exposure to excessive natural heat was older than 38 years of age. The median age of people from Mexico, Central American, or South American countries that died from exposure to excessive natural heat was 29 years of age, which was 28 years younger than the median age of deaths from residents of Arizona.

Figure 7
Median Age at Death From Exposure to Excessive Natural Heat by Gender and Race/Ethnic Group, 2000 - 2012

Between 2000 and 2012, Asian or Pacific Islander females had the highest median age at death from exposure to excessive natural heat at 74 years, exceeding by 44 years the median age at death for Hispanic or Latino females (Figure 7, Table 6). African American males had the highest (54 years), and Hispanic males had the lowest (31 years), median age at death from exposure to excessive natural heat, respectively.

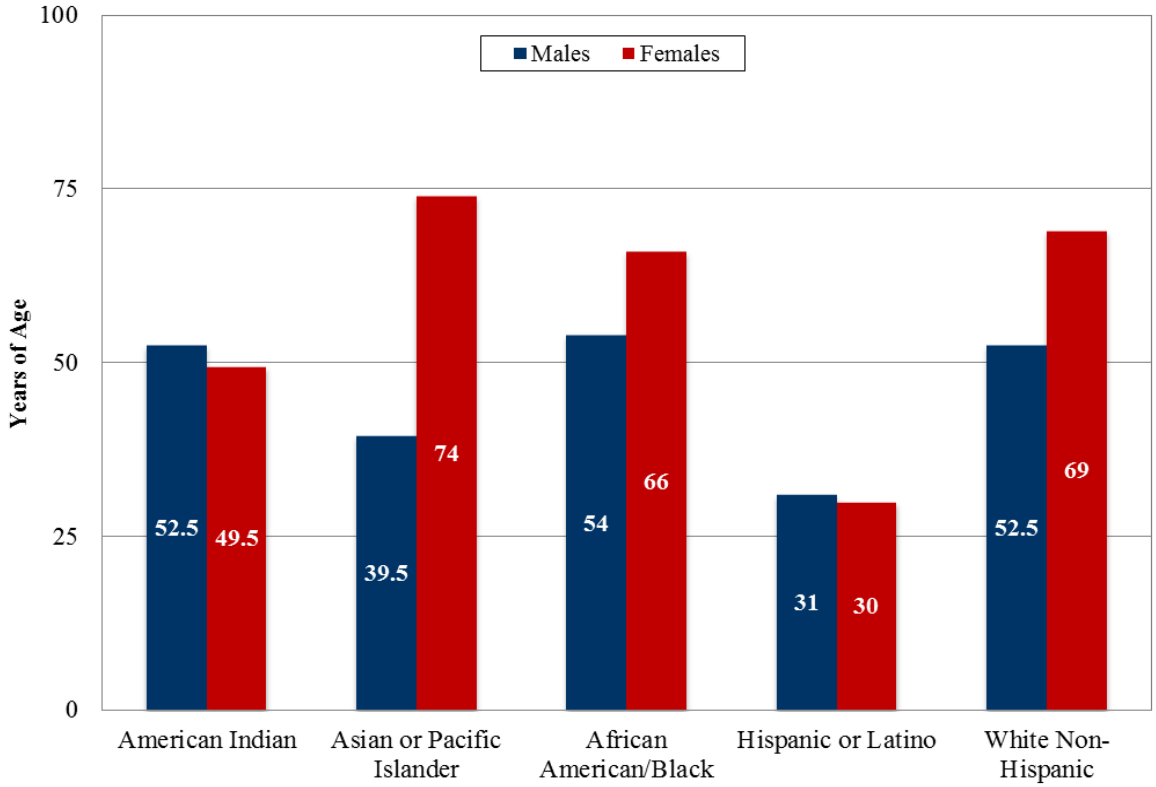
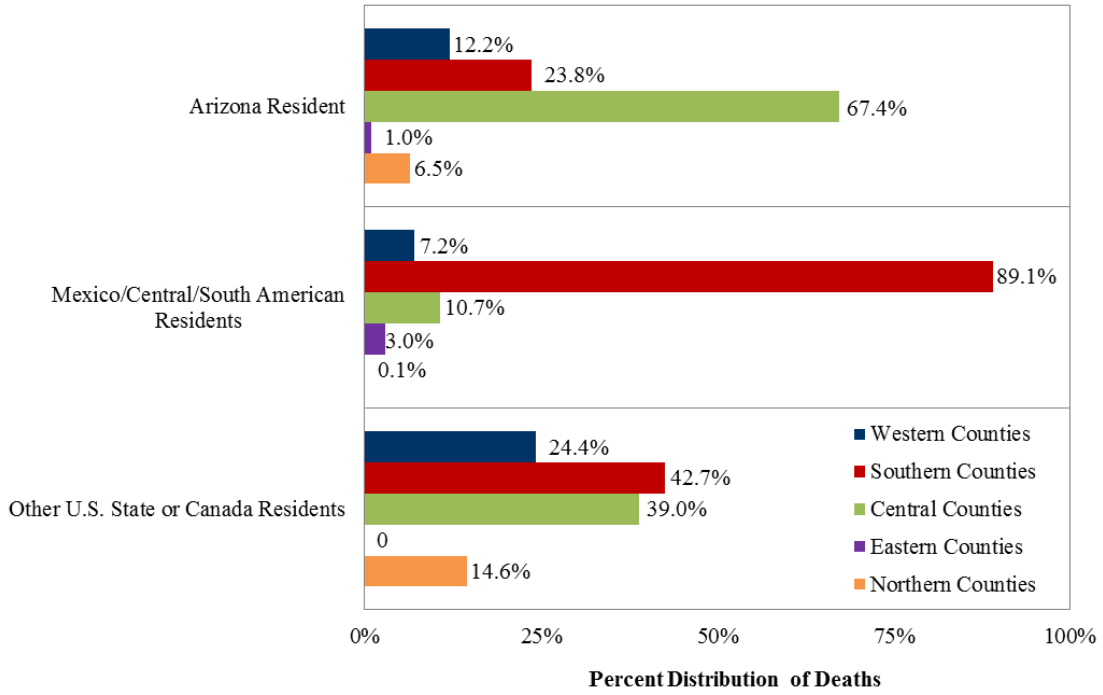


Figure 8
Percent Distribution of Deaths From Exposure to Excessive Natural Heat By Residence Status and Area of Occurrence in Arizona, 2000 - 2012



From 2000 to 2012, the four counties along Arizona's southern border (Cochise, Pima, Santa Cruz, and Yuma) reported 89.1 percent of deaths from exposure to excessive heat among migrants from Mexico, Central America, or South America (**Figure 8, Table 3**). Centrally located counties (Gila, Graham, Maricopa, Pinal, and Yavapai) reported the majority of deaths from exposure to excessive heat for both residents of Arizona (67.4 percent) and visitors from other U.S. states and migrants from Canada (39 percent). The highest concentrations of heat-related deaths were in Maricopa and Pima counties.

Among visitors from other U.S. states or migrants from other countries (excluding those from Mexico, Central American, or South American countries), deaths from exposure to excessive natural heat occurred in similar proportions in both southern and central Arizona counties.

Table 1

Characteristics of Deaths from Exposure to Excessive Natural Heat Occurring in Arizona by Year, 2000 - 2012

		Total	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total		1535	62	64	119	131	118	226	137	111	89	121	137	123	97
State or Country of Residence	Arizona	589	27	22	40	53	37	78	63	34	35	40	50	57	53
	Other U.S. State or Canada	80†	0	*	*	*	8	8	7	6	*	7	8	11	12
	Mexico, Central America, or South America	736	34	40	73	72	72	116	49	67	40	55	56	40	22
	Other	10†	0	0	0	0	0	0	0	*	*	0	*	*	*
	Unknown	120†	*	*	*	*	*	24	18	*	6	19	20	14	8
Geographic Region of Occurrence	Central Arizona Counties	543	17	13	30	35	38	65	58	39	33	51	48	61	55
	Northern Arizona Counties	50†	6	*	*	*	*	6	*	*	*	*	6	7	0
	Southern Arizona Counties	921	38	48	86	89	77	153	72	67	50	64	81	55	41
	Western Arizona Counties	10†	0	0	0	0	0	*	*	*	*	*	*	0	*
Gender	Female	392	21	23	35	40	33	55	33	35	20	22	26	26	23
	Male	1142	41	41	84	91	85	171	104	76	69	98	111	97	74
	Unknown	0†	0	0	0	0	0	0	0	0	0	*	0	0	0
Race/Ethnicity	American Indian or Alaska Native	50†	*	*	*	*	*	7	*	*	*	*	*	*	*
	Asian or Pacific Islander	10†	0	0	*	*	0	*	0	0	0	*	0	0	*
	African American/Black	40†	*	*	0	*	0	7	6	*	*	*	6	6	*
	Hispanic/Latino	898	38	44	80	85	83	136	70	72	50	69	69	59	43
	White Non-Hispanic	444	21	14	33	27	28	61	52	30	27	30	41	42	38
	Unknown	100†	0	*	*	8	6	14	6	6	6	13	19	11	8
Age Group (years)	0 - 4	20†	0	0	0	*	*	*	*	*	*	*	*	0	*
	5 - 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10 - 14	20†	0	0	*	*	0	*	*	*	0	*	*	0	0
	15 - 19	90†	0	*	9	8	8	17	8	9	9	7	7	*	*
	20 - 24	140†	0	10	13	16	21	21	10	7	9	10	15	8	*
	25 - 29	159	0	8	16	17	18	20	9	16	8	14	14	12	7
	30 - 34	138	0	6	18	9	7	22	12	15	9	11	8	14	7
	35 - 39	120†	0	*	9	14	6	21	12	9	*	13	12	12	10
	40 - 44	125	0	6	11	11	14	14	11	14	8	8	10	10	8
	45 - 49	110†	0	*	11	6	10	16	13	*	7	8	10	9	12
	50 - 54	100†	0	*	*	*	*	17	12	10	9	10	11	8	*
	55 - 59	60†	0	0	*	9	*	7	10	*	*	*	*	6	7
	60 - 64	50†	0	*	0	*	*	6	10	*	*	*	*	10	7
	65 - 69	40†	0	*	*	*	*	*	*	*	*	6	*	*	*
	70 - 74	30†	0	*	*	*	*	8	*	0	*	0	*	*	7
	75 - 79	50†	0	0	*	*	*	*	*	*	*	6	6	6	7
	80 - 84	40†	0	*	*	*	*	8	*	*	*	*	*	*	*
	85+	50†	0	*	*	*	*	7	*	*	*	*	*	10	*
	Unknown	190†	62	13	6	13	10	27	7	*	*	14	20	7	*

Table 1 (continued)

		Total	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
County of Occurrence	Apache	10†	0	0	*	*	0	0	*	0	*	0	0	*	0
	Cochise	20†	*	*	*	9	0	0	*	0	0	*	*	0	0
	Coconino	10†	*	0	0	*	*	*	0	*	0	*	*	*	0
	Gila	0†	0	0	0	0	*	0	0	0	0	0	0	*	0
	Graham	0†	0	0	0	0	0	*	0	*	0	0	0	0	*
	La Paz	10†	0	0	0	0	0	*	*	*	*	*	*	0	*
	Maricopa	460	14	10	27	25	32	56	53	30	26	43	40	54	50
	Mohave	30†	*	*	*	*	*	*	*	*	*	0	*	*	0
	Navajo	0†	0	0	0	0	0	*	*	*	*	0	0	0	0
	Pima	729	26	37	75	65	57	116	50	54	41	50	74	49	35
	Pinal	70†	*	*	*	9	*	8	*	8	7	6	6	6	*
	Santa Cruz	60†	*	*	*	*	*	8	7	10	6	9	*	*	0
	Yavapai	10†	*	0	0	*	0	0	*	0	0	*	*	0	*
	Yuma	110†	7	6	8	10	16	29	14	*	*	*	*	*	6
Month of Death	January	0†	0	0	0	0	0	0	0	0	0	0	0	*	0
	February	10†	0	0	*	0	0	*	0	0	*	*	0	0	0
	March	10†	*	0	0	0	*	*	*	0	*	*	0	*	0
	April	30†	*	0	*	*	*	7	*	*	*	*	*	*	*
	May	140†	11	14	6	22	9	23	10	9	*	12	8	*	9
	June	318	18	17	37	18	20	20	35	31	38	10	23	27	24
	July	589	18	16	30	48	38	120	77	35	25	53	71	30	28
	August	285	8	8	22	31	30	30	11	23	10	29	18	39	26
	September	120†	*	8	17	8	15	16	*	7	*	9	12	15	6
	October	20†	*	0	0	*	0	*	0	*	*	*	*	*	*
	November	10†	*	*	0	0	0	*	0	0	0	0	*	*	*
	December	0†	0	0	0	0	*	*	0	0	0	*	0	0	0
Autopsy Performed	No	452	18	13	27	33	29	131	51	20	17	24	19	36	34
	Yes	1082	44	51	92	98	89	95	86	90	72	97	118	87	63

Notes: * Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 2

Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Residence Status, 2000 - 2012

		Total	State or Country of Residence				
			Arizona	Other U.S. States or Canada	Mexico, Central America, or South America	Other	Unknown
Total		1535	589	80†	736	10†	120†
Year of Death	2000	62	27	0	34	0	*
	2001	60†	22	*	40	0	*
	2002	120†	40	*	73	0	*
	2003	130†	53	*	72	0	*
	2004	118	37	8	72	0	*
	2005	226	78	8	116	0	24
	2006	137	63	7	49	0	18
	2007	111	34	6	67	*	*
	2008	90†	35	*	40	*	6
	2009	121	40	7	55	0	19
	2010	137	50	8	56	*	20
	2011	123	57	11	40	*	14
	2012	97	53	12	22	*	8
Geographic Region of Occurrence	Central Arizona Counties	543	397	32	79	*	33
	Northern Arizona Counties	50†	38	12	*	*	*
	Southern Arizona Counties	921	140	35	656	7	83
	Western Arizona Counties	10†	8	*	0	0	0
Gender	Female	392	154	21	194	*	20
	Male	1142	435	61	542	8	96
	Unknown	1	0	0	0	0	*
Race/Ethnicity	American Indian or Alaska Native	50†	42	*	0	0	0
	Asian or Pacific Islander	10†	*	*	0	0	0
	African American/Black	40†	31	*	0	*	*
	Hispanic/Latino	898	121	29	724	*	19
	White Non-Hispanic	104	40	0	0	0	64
	Unknown	444	351	46	12	*	30

Table 2 (continued)

Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Residence Status, 2000 - 2012

		Total	State or Country of Residence				
			Arizona	Other U.S. States or Canada	Mexico, Central America, or South America	Other	Unknown
Age Group (years)	0 - 4	20†	19	0	*	0	0
	5 - 9	0	0	0	0	0	0
	10 - 14	20†	*	*	11	0	0
	15 - 19	90†	*	*	83	0	*
	20 - 24	140†	6	*	129	*	*
	25 - 29	159	13	7	129	*	8
	30 - 34	138	15	17	104	0	*
	35 - 39	124	23	10	84	*	*
	40 - 44	125	34	12	75	*	*
	45 - 49	106	55	7	36	0	8
	50 - 54	100†	63	*	27	0	6
	55 - 59	62	41	6	11	0	*
	60 - 64	50†	41	*	6	0	*
	65 - 69	40†	40	*	0	0	*
	70 - 74	30†	31	*	0	*	0
	75 - 79	50†	42	*	0	0	0
	80 - 84	40†	35	*	0	*	0
	85+	50†	46	0	*	0	0
	Unknown	192	77	0	39	0	76
County of Occurrence	Apache	10†	*	0	0	0	0
	Cochise	20†	*	0	22	0	0
	Coconino	14	6	6	0	*	0
	Gila	0†	*	0	0	0	0
	Graham	0†	*	0	0	0	0
	La Paz	10†	8	*	0	0	0
	Maricopa	460	370	27	35	*	26
	Mohave	30†	23	6	*	0	*
	Navajo	0†	*	0	0	0	0
	Pima	729	92	24	531	6	76
	Pinal	70†	18	*	44	0	7
	Santa Cruz	59	6	0	51	0	*
	Yavapai	10†	*	*	0	0	0
	Yuma	110	41	11	52	*	*

Table 2 (continued)

Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Residence Status, 2000 - 2012

		Total	State or Country of Residence				
			Arizona	Other U.S. States or Canada	Mexico, Central America, or South America	Other	Unknown
Month of Death	January	0†	0	*	*	0	0
	February	10†	*	0	*	0	0
	March	10†	*	*	6	0	0
	April	30†	*	*	24	0	*
	May	141	24	8	101	*	*
	June	318	99	12	181	*	24
	July	589	268	28	236	*	54
	August	285	140	13	111	*	20
	September	121	39	12	57	*	11
	October	20†	*	*	11	0	*
	November	10†	*	0	*	0	*
	December	0†	*	0	*	0	0
Autopsy Performed	No	452	285	21	121	*	22
	Yes	1082	304	61	614	8	95

Notes: *Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 3

Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Region, 2000 - 2012

		Total	Geographic Region of Occurrence			
			Central Arizona Counties	Northern Arizona Counties	Southern Arizona Counties	Western Arizona Counties
Total		1535	543	50†	921	10†
Year of Death	2000	62	17	6	38	0
	2001	60†	13	*	48	0
	2002	120†	30	*	86	0
	2003	130†	35	*	89	0
	2004	120†	38	*	77	0
	2005	230†	65	6	153	*
	2006	140†	58	*	72	*
	2007	110†	39	*	67	*
	2008	90†	33	*	50	*
	2009	120†	51	*	64	*
	2010	140†	48	6	81	*
	2011	123	61	7	55	0
	2012	100†	55	0	41	*
State or Country of Residence	Arizona	589	397	38	140	8
	Other U.S. State or Canada	80†	32	12	35	*
	Mexico, Central America, or South America	740†	79	*	656	0
	Other	10†	*	*	7	0
	Unknown	120†	33	*	83	0
Gender	Female	390†	135	19	235	*
	Male	1142	408	35	685	9
	Unknown	0†	0	0	*	0

Table 3 (continued)
Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Region, 2000 - 2012

		Total	Geographic Region of Occurrence			
			Central Arizona Counties	Northern Arizona Counties	Southern Arizona Counties	Western Arizona Counties
Race/Ethnicity	American Indian or Alaska Native	45	22	14	8	0
	Asian or Pacific Islander	10†	*	0	*	0
	African American/Black	40†	34	0	*	0
	Hispanic/Latino	900†	165	6	726	*
	White Non-Hispanic	444	293	34	103	10
	Unknown	104	25	0	79	0
Age Group (years)	0 - 4	20†	15	*	*	0
	5 - 9	0	0	0	0	0
	10 -14	20†	*	0	12	0
	15 - 19	90†	12	*	78	0
	20 - 24	140†	14	*	123	0
	25 - 29	160†	34	*	124	0
	30 - 34	140†	27	*	108	0
	35 - 39	120†	25	*	94	0
	40 - 44	130†	42	*	77	0
	45 - 49	110†	55	*	49	0
	50 - 54	100†	63	*	33	*
	55 - 59	60†	40	*	16	*
	60 - 64	50†	29	*	18	*
	65 - 69	40†	31	*	10	*
	70 - 74	30†	22	*	7	*
	75 - 79	50†	34	*	6	*
	80 - 84	40†	25	*	9	*
	85+	50†	34	*	7	*
	Unknown	192	38	6	147	0

Table 3 (continued)

Characteristics of Arizona Deaths from Exposure to Excessive Natural Heat by Region, 2000 - 2012

		Total	Geographic Region of Occurrence			
			Central Arizona Counties	Northern Arizona Counties	Southern Arizona Counties	Western Arizona Counties
County of Occurrence	Apache	10†	0	*	0	0
	Cochise	23	0	0	23	0
	Coconino	14	0	14	0	0
	Gila	0†	*	0	0	0
	Graham	0†	*	0	0	0
	La Paz	11	0	0	0	11
	Maricopa	460	460	0	0	0
	Mohave	31	0	31	0	0
	Navajo	0†	0	*	0	0
	Pima	729	0	0	729	0
	Pinal	70	70	0	0	0
	Santa Cruz	59	0	0	59	0
	Yavapai	8	8	0	0	0
	Yuma	110	0	0	110	0
Month of Death	January	0†	*	0	*	0
	February	10†	0	*	*	0
	March	10†	*	*	6	0
	April	30†	*	*	27	0
	May	140†	18	*	118	*
	June	320†	88	9	218	*
	July	589	248	16	317	6
	August	285	126	14	143	0
	September	120†	41	6	73	*
	October	20	11	0	9	0
	November	10†	*	0	*	0
	December	0†	*	0	*	0
Autopsy Performed	No	452	212	33	198	8
	Yes	1,080†	331	21	722	*

Notes: *Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 4

Deaths from Exposure to Excessive Natural Heat by Geographic Region of Occurrence in Arizona and Residence Status, 2000 -2012

		Total	Geographic Region of Occurrence			
			Central Arizona Counties	Northern Arizona Counties	Southern Arizona Counties	Western Arizona Counties
State or Country of Residence	Arizona	589	397	38	140	8
	Other U.S. States or Canada	80†	32	12	35	*
	Mexico, Central America, or South America	740†	79	*	656	0
	Other	10†	*	*	7	0
	Unknown	120†	33	*	83	0
Total		1,535	540†	50†	921	10†

Notes: * Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 5

Median Age at Death from Exposure to Excessive Natural Heat by Geographic Region of Occurrence in Arizona and Residence Status, 2000 - 2012

		Total	Geographic Region of Occurrence			
			Central Arizona Counties	Northern Arizona Counties	Southern Arizona Counties	Western Arizona Counties
State or Country of Residence	Arizona	57.0	56.0	194.5	147.5	69.0
	Other U.S. States or Canada	38.0	44.5	71.5	80.0	63.0
	Mexico, Central America, or South America	29.0	29.0	24.0	92.5	0.0
Total		51.5	52.0	57.5	35.2	65.0

Table 6
Median Age at Death from Exposure to Excessive Natural Heat by Race/Ethnicity and Gender, 2000 - 2012

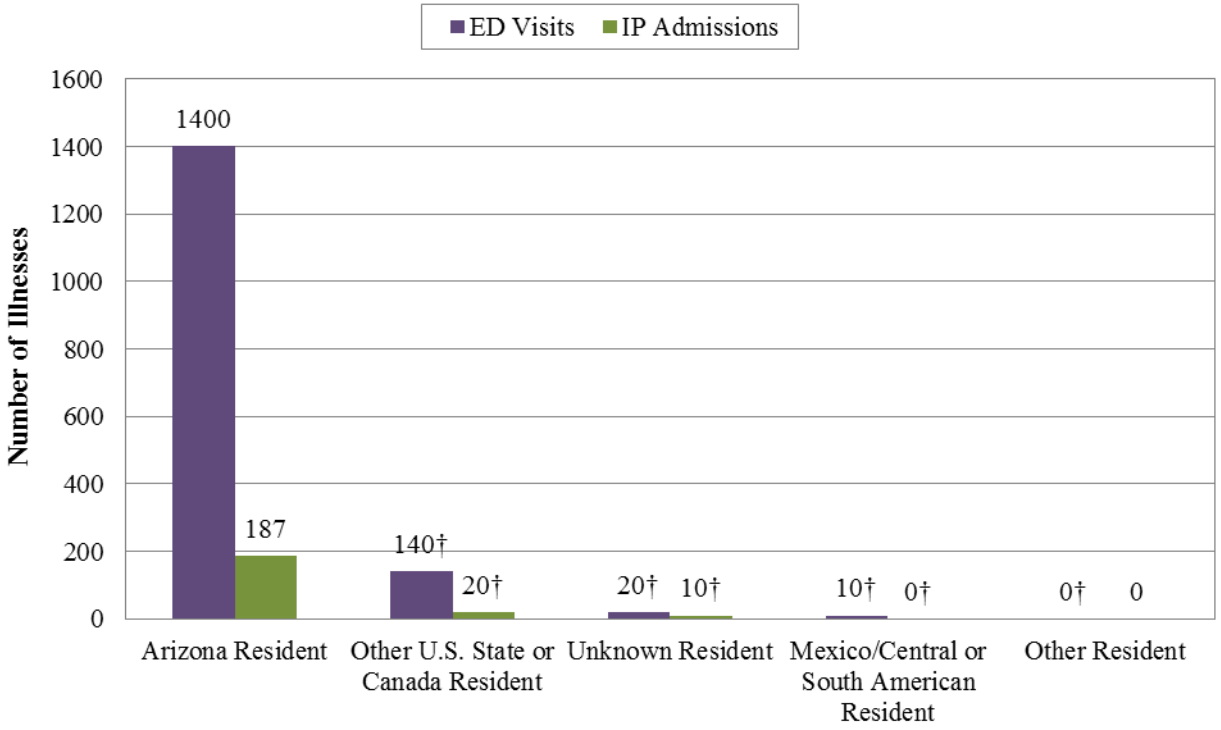
Race/Ethnicity	Gender	Median Age at Death
American Indian or Alaska Native	Male	52.5
	Female	49.5
	Total	49.5
Asian or Pacific Islander	Male	39.5
	Female	74.0
	Total	43.0
African American or Black	Male	54.0
	Female	66.0
	Total	58.5
Hispanic or Latino	Male	31.0
	Female	30.0
	Total	46.0
White Non-Hispanic	Male	52.5
	Female	69.0
	Total	54.0
Total	Male	50.5
	Female	53.0
	Total	51.5

Section 2: Heat-Related Morbidity, 2012

In 2012, there were a total of 1,572 emergency department (ED) visits and a total of 212 inpatient admissions (IP) from exposure to excessive natural heat. Based on these numbers, Arizona residents accounted for the majority of emergency department visits (1,400 cases, **Table 8, Figure 9**) and inpatient admissions (187 cases, **Table 8, Figure 9**) from exposure to excessive natural heat. The vast majority of these emergency department visits and inpatient admissions occurred between May and September. Arizona residents accounted for 88.2 percent of the total inpatient admissions due to exposure to excessive natural heat in Arizona and also accounted for 89.1 percent of the total ED visits due to exposure to excessive natural heat in Arizona.

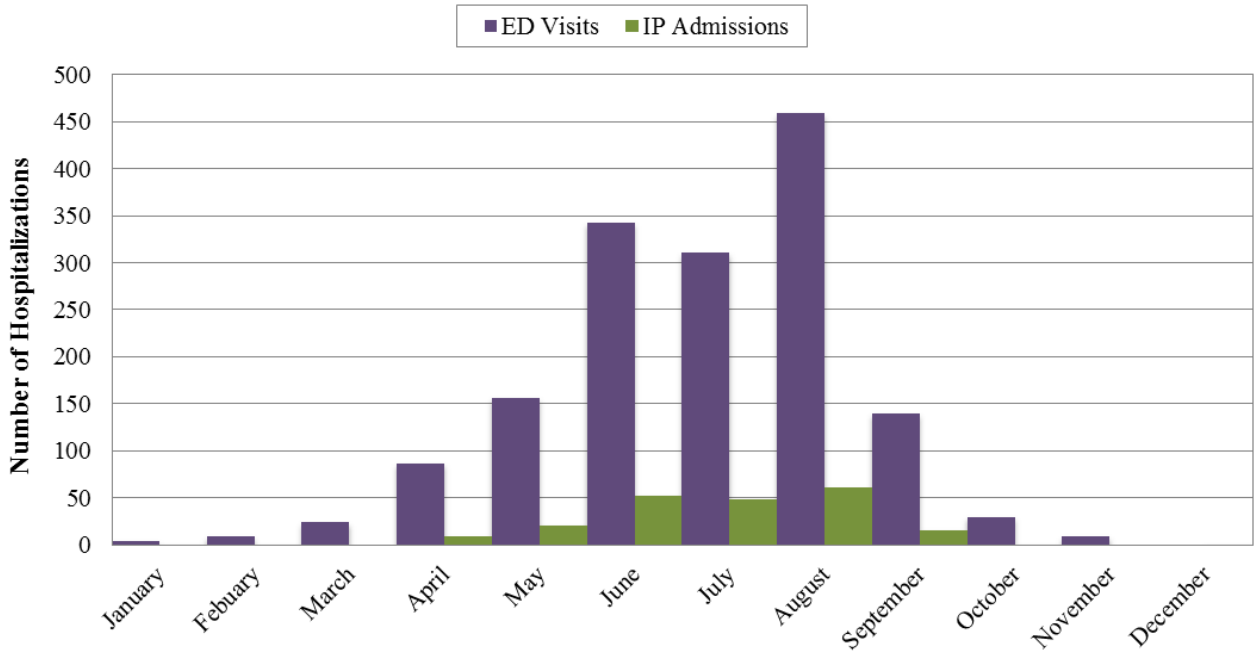
Visitors to Arizona from other U.S. states or Canada experienced 140 ED visits (8.9 percent, **Table 8, Figure 9**) and 20† IP admissions (9.4 percent, **Table 8, Figure 9**) from exposure to excessive natural heat in 2012.

Figure 9
Illnesses From Exposure to Excessive Natural Heat Occurring in Arizona By State or Country of Residence, 2012



† Sum rounded to nearest ten units due to non-zero addend less than 6.

Figure 10
Hospitalizations From Exposure to Excessive Natural Heat
Occurring in Arizona by Month, 2012



[3] See http://ral.ucar.edu/csap/events/climatehealth/2013/docs/s_harlan_heat_mortality.pdf

Arizona's Sonoran Desert covers a majority of the land in the southern half of Arizona. The Greater Phoenix metropolitan area is located in Central Arizona in the Sonoran Desert. Temperatures in Phoenix and elsewhere in the Sonoran Desert region oftentimes reach triple digits during the summer months (May-September). The mean high temperature in July is 107° F in the Central Arizona urbanized region.[3] The hot and arid climate during the summer months can increase the risk for getting a heat illness.

Not surprisingly, most illnesses from excessive natural heat occurred during late spring and summer (**Figure 10**, **Table 8**), with the highest number of heat illness emergency department visits and heat illness inpatient admissions occurring during the month of August (458 and 60† respectively), followed by June (342 ED visits, 50† IP admissions), then July (310† ED visits, 48 IP admissions), May (160† ED visits, 20† IP admissions), and September (140 ED visits, 20† IP admissions).

The warm season between May and September accounts for 89.9 percent of the total ED visits and 95.2 percent of the total IP admissions from exposure to excessive natural heat.

In 2012, illnesses (ED visits and IP admissions) from exposure to excessive natural heat occurred among all age groups except the infant group (<1 years old). Young adult residents of Arizona 20-44 years old accounted for 44.6 percent of heat illness emergency department visits and 24.8 percent of IP admissions. On the other hand, middle aged and elderly Arizona residents accounted for only 35.4 percent of heat illness emergency department visits for exposure to excessive natural heat, but represent 61.4 percent of IP admissions (**Figure 11**).

Less than one percent of heat illness emergency department visits were from Arizona resident children ages 1-14 years old, but Arizona resident adolescents 15-19 years old accounted for 7.8 percent of the total.

Figure 11
Percent Distribution of Illness From Exposure to Excessive Natural Heat Occurring in Arizona by Age Group and Residence Status, 2012

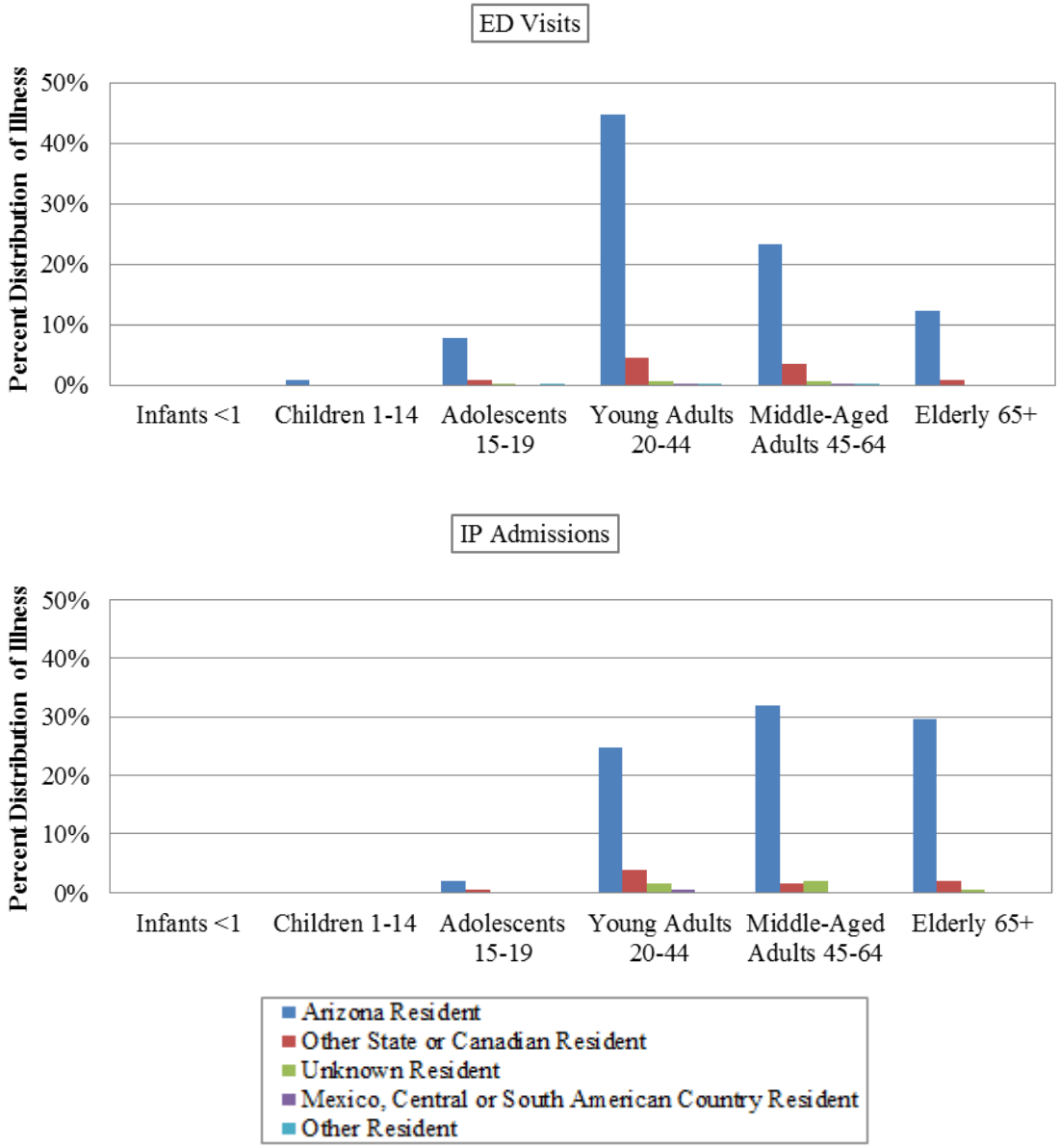
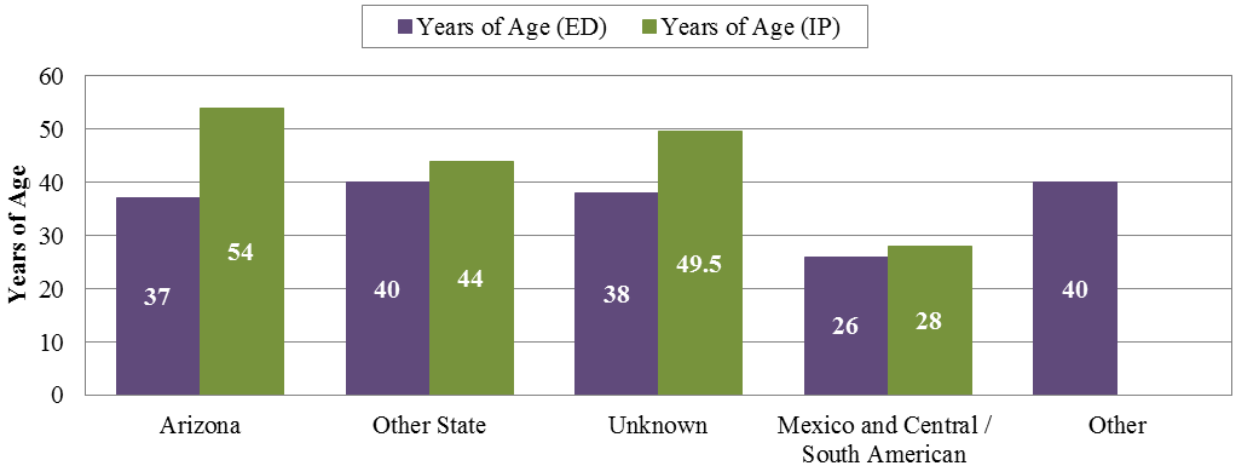


Figure 12
Median Age at Hospitalization From Exposure to Excessive Natural Heat
By Residence Status, 2012

Figure 12
Median Age at Illness From Exposure to Excessive Natural Heat* by Gender and Race/Ethnic Group, 2012



Visitors from Mexico, Central American, or South American countries had the youngest median age for a heat illness (ED visits or IP admission; **Figure 12**). In contrast, Arizona residents who were admitted to inpatient care were the oldest group. Regarding inpatient admissions, the median age of Arizona residents at time of admission was 26 years older than visitors from Mexico, Central American, or South American countries.

One out of two Arizonians who were admitted to the hospital for heat illness in 2012 was older than 54 years of age (**Figure 12**).

Figure 13
Median Age at Illness From Exposure to Excessive Natural Heat by Race/Ethnic Group, 2012

Nearly four out of five (80.2 percent) inpatient admissions and two-thirds (66.4 percent) of emergency department visits due to exposure to excessive natural heat occurred among men (**Table 7**). The median age of people visiting the emergency department for a heat illness was 37 years of age, while the median age for an inpatient admission was 53 (**Figure 13**).

The median age of males visiting the emergency department for a heat illness was 37 years of age. The median age of females was similar at 39 years of age. In contrast, the median age of males and females admitted to the hospital was older, 50 and 69 respectively (**Table 12**).

*There were no multi-racial inpatient admissions for heat illness.

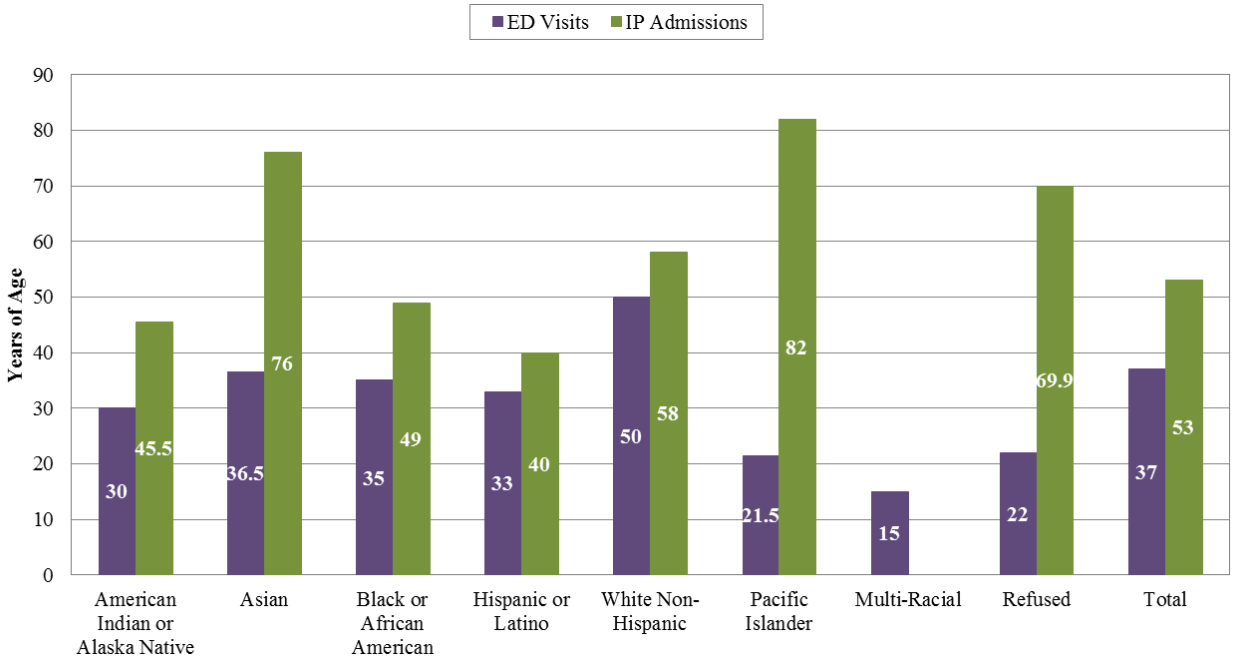
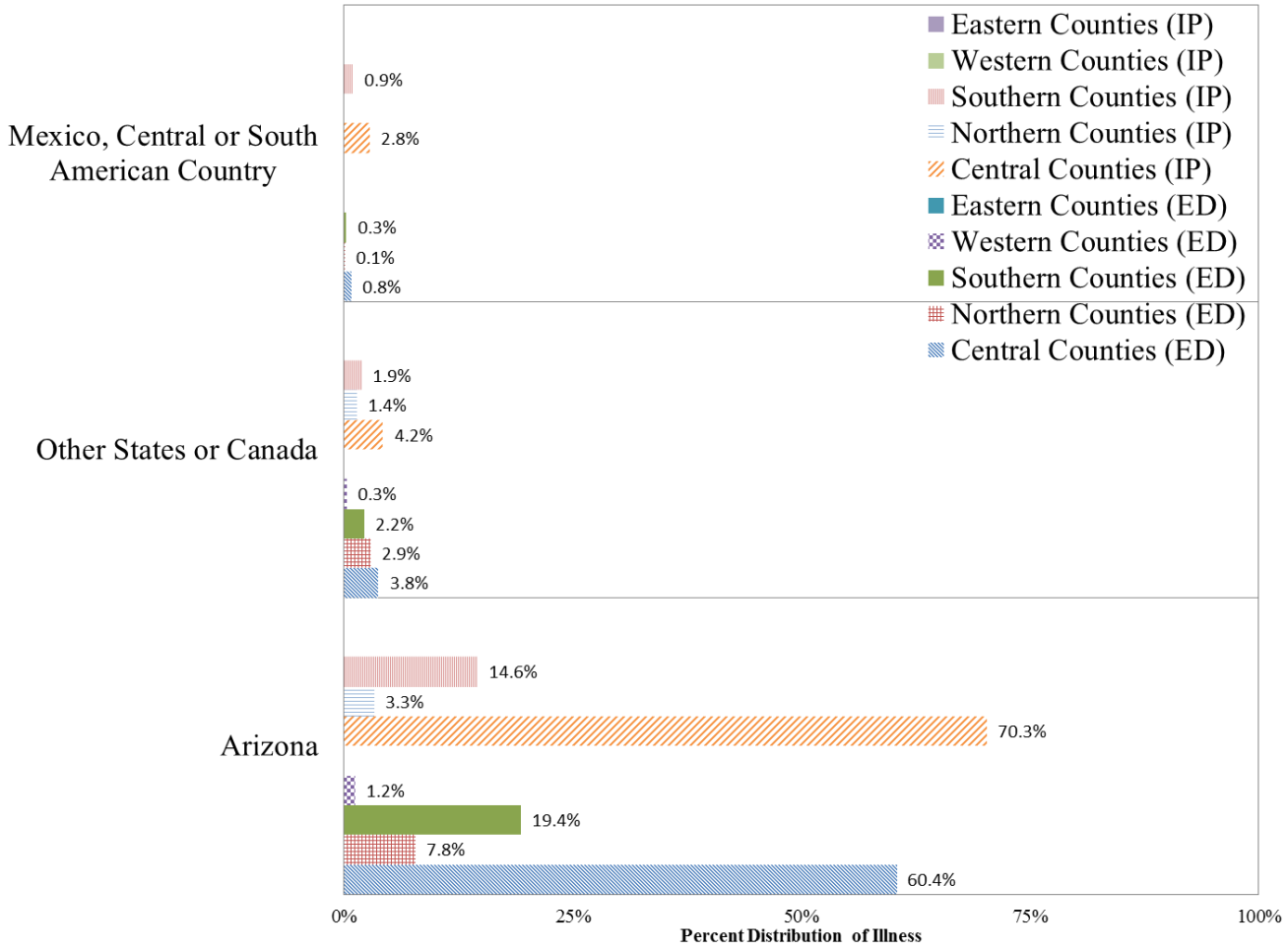


Figure 14
Percent Distribution of Illness From Exposure to Excessive Natural Heat
By Residence Status and Area of Occurrence, 2012



*Due to low cell counts, Figure 14 does not represent cases listed as "Other" or "Unknown". See Table 10 for more information.

In 2012, the majority of heat illnesses were in Central Arizona Counties (ED = 1,020†, IP = 164), followed by Southern Arizona Counties (ED = 350†, IP = 40†), then Northern Counties (ED = 170†, IP = 10†), and Western Counties (ED = 20†, IP = 0; (**Table 10**).

Arizona residents experienced the majority of illnesses from exposure to excessive natural heat in the centrally located counties of Gila, Graham, Maricopa, Pinal, and Yavapai (ED = 60.4 percent, IP = 70.3 percent), while visitors from other states and residents of Canada accounted for less than (ED = 3.8 percent, IP = 4.2 percent; (**Figure 14**). Eastern Counties (Greenlee) did not have any cases reported in 2012.

Table 7

Characteristics of Illness from Exposure to Excessive Natural Heat Occurring in Arizona, 2012

		2012		
		Total	**ED Visits**	**IP Admissions**
State or Country of Residence	Arizona	1587	1400	187
	Out of State or Canada	160	144	16
	Unknown	28	20	8
	Mexico / Central or South America	10†	*	*
	Other	0†	*	0
Geographic Region of Occurrence	Central Arizona Counties	1188	1024	164
	Northern Arizona Counties	182	172	10
	Southern Arizona Counties	386	348	38
	Western Arizona Counties	24	24	0
Gender	Female	570	528	42
	Male	1215	1045	170
Race / Ethnicity	American Indian /Alaska Native	68	60	8
	Asian	10†	12	*
	Black / African American	110	96	14
	Hispanic / Latino	454	406	48
	White	1122	984	138
	Native Hawaiian / Pacific Islander	10†	*	*
	Multi-Racial	0†	*	0
	Refused	10†	10	*

Table 7 (continued)

Characteristics of Illness from Exposure to Excessive Natural Heat Occurring in Arizona, 2012

		2012		
		Total	**ED Visits**	**IP Admissions**
Age Groups	0-4	19	19	0
	5-9	26	26	0
	10-14	80†	79	*
	15-19	30†	28	*
	20-24	173	161	12
	25-29	163	154	9
	30-34	158	144	14
	35-39	142	132	10
	40-44	158	139	19
	45-49	142	122	20
	50-54	140	120	20
	55-59	106	90	16
	60-64	86	68	18
	65-69	72	57	15
	70-74	69	52	17
	75-79	46	34	12
	80-84	36	26	10
	85+	35	22	13

Table 7 (continued)

Characteristics of Illness from Exposure to Excessive Natural Heat Occurring in Arizona, 2012

		2012		
		Total	**ED Visits**	**IP Admissions**
County of Occurrence	Apache	0†	*	0
	Cochise	20†	18	*
	Coconino	19	19	0
	Gila	10†	9	*
	Graham	9	9	0
	La Paz	24	24	0
	Maricopa	1079	919	160
	Mohave	152	142	10
	Navajo	10	10	0
	Pima	190	164	26
	Pinal	60†	57	*
	Santa Cruz	0†	*	0
	Yavapai	30	30	0
	Yuma	173	163	10
Month of Occurrence	January	10†	*	*
	Febuary	10†	9	*
	March	24	24	0
	April	96	87	9
	May	178	157	21
	June	396	343	53
	July	359	311	48
	August	520	459	61
	September	156	140	16
	October	30†	30	*
	November	9	9	0
	December	0†	0	*

Notes: *Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 8

Characteristics of Arizona Illness from Exposure to Excessive Natural Heat By Residence Status, 2012

		2012											
		ED Visits						IP Admissions					
		Total	**Arizona**	**Other States or Canada**	**Mexico, Central or South American Country**	**Unknown**	**Other**	**Total**	**Arizona**	**Other States or Canada**	**Mexico, Central or South American Country**	**Unknown**	**Other**
Year	2012	1572	1400	140†	20†	10†	0†	212	187	20†	10†	0†	0
Geographic Region of Occurrence	Central Arizona Counties	1,020†	950	59	12	*	*	164	149	9	6	0	0
	Northern Arizona Counties	170†	123	45	*	0	*	10†	7	*	0	0	0
	Southern Arizona Counties	350†	305	35	*	*	0	40†	31	*	*	*	0
	Western Arizona Counties	20†	19	*	0	0	0	0	0	0	0	0	0
Gender	Female	530†	460	63	*	*	*	40†	35	*	*	0	0
	Male	1,040†	940	81	19	*	*	170†	152	11	6	*	0
Race / Ethnicity	American Indian /Alaska Native	60†	57	*	*	0	0	10†	7	*	0	0	0
	Asian	10†	11	*	0	0	0	0†	*	0	0	0	0
	Black / African American	100†	86	9	*	0	0	10†	13	*	0	0	0
	Hispanic / Latino	410†	381	19	*	*	0	50†	38	7	*	*	0
	White	980†	854	109	15	*	*	138	125	7	6	0	0
	Native Hawaiian / Pacific Islander	0†	*	0	0	0	0	0†	*	0	0	0	0
	Multi-Racial	0†	0	*	0	0	0	0	0	0	0	0	0
	Refused	10†	18	*	0	0	0	0†	*	0	0	0	0

Table 8 (continued)

Characteristics of Arizona Illness from Exposure to Excessive Natural Heat By Residence Status, 2012

		2012											
		ED Visits						IP Admissions					
		Total	**Arizona**	**Other States or Canada**	**Mexico, Central or South American Country**	**Unknown**	**Other**	**Total**	**Arizona**	**Other States or Canada**	**Mexico, Central or South American Country**	**Unknown**	**Other**
Age Group (years)	0-4	20†	18	*	0	0	0	0	0	0	0	0	0
	5-9	30†	24	*	0	0	0	0	0	0	0	0	0
	10-14	80†	74	*	0	*	0	0†	*	0	0	0	0
	15-19	130†	114	12	*	0	*	10†	*	*	0	0	0
	20-24	160†	148	11	*	0	0	10†	9	*	*	0	0
	25-29	150†	135	14	*	*	0	10†	6	*	*	*	0
	30-34	140†	123	18	*	0	0	10†	12	*	*	0	0
	35-39	130†	119	11	*	0	0	10†	9	*	0	0	0
	40-44	140†	127	11	0	0	*	20†	16	*	0	0	0
	45-49	120†	107	12	*	0	0	20†	19	0	*	0	0
	50-54	120†	104	12	*	0	*	20†	19	0	*	0	0
	55-59	90†	74	12	*	*	0	20†	12	*	*	0	0
	60-64	70†	54	14	0	0	0	20†	17	*	0	0	0
	64-69	60†	53	*	0	0	0	20†	13	*	0	0	0
	70-74	50†	48	*	0	0	0	20†	15	*	*	0	0
	75-79	30†	33	*	0	0	0	10†	12	0	0	0	0
	80-84	30†	23	*	0	0	0	10†	10	0	0	0	0
	85+	22	22	0	0	0	0	10†	12	*	0	0	0

Table 8 (continued)

Characteristics of Arizona Illness from Exposure to Excessive Natural Heat By Residence Status, 2012

		2012											
		ED Visits						IP Admissions					
		Total	**Arizona**	**Other States or Canada**	**Mexico, Central or South American Country**	**Unknown**	**Other**	**Total**	**Arizona**	**Other States or Canada**	**Mexico, Central or South American Country**	**Unknown**	**Other**
County of Occurrence	Apache	0†	*	0	0	0	0	0	0	0	0	0	0
	Cochise	20†	17	*	0	0	0	0†	*	0	0	0	0
	Coconino	20†	15	*	0	0	0	0	0	0	0	0	0
	Gila	9	9	0	0	0	0	0†	*	0	0	0	0
	Graham	9	9	0	0	0	0	0	0	0	0	0	0
	La Paz	20†	19	*	0	0	0	0	0	0	0	0	0
	Maricopa	920†	852	52	12	*	*	160†	145	9	6	0	0
	Mohave	140†	99	39	*	0	*	10†	7	*	0	0	0
	Navajo	10†	8	*	0	0	0	0	0	0	0	0	0
	Pima	160†	147	12	*	*	0	30†	22	*	*	*	0
	Pinal	60†	55	*	0	0	0	0†	*	0	0	0	0
	Santa Cruz	0†	*	0	0	0	0	0	0	0	0	0	0
	Yavapai	30†	25	*	0	0	0	0	0	0	0	0	0
	Yuma	310†	138	144	18	*	*	10†	7	*	*	0	0
Month of Illness	January	0†	*	0	0	0	0	0†	*	0	0	0	0
	Febuary	10†	6	*	0	*	0	0†	*	0	0	0	0
	March	20†	20	*	0	0	0	0	0	0	0	0	0
	April	90†	73	12	*	0	0	10†	8	*	0	0	0
	May	160†	139	13	*	*	0	20†	18	*	*	0	0
	June	340†	309	26	6	*	*	50†	45	6	*	0	0
	July	310†	282	23	*	0	*	50†	43	*	*	0	0
	August	460†	406	47	*	*	0	60†	56	*	*	*	0
	September	140	133	7	0	0	0	20†	14	*	0	0	0
	October	30†	21	8	0	0	*	0†	*	0	0	0	0
	November	10†	7	*	0	0	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0†	0	0	0	*	0

Notes: *Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 9

Characteristics of Arizona Illness from Exposure to Excessive Natural Heat By Region, 2012

		2012											
		ED Visits						IP Admissions					
		Total	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**	**Total**	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**
Year	2012	1568	1,020†	170†	350†	20†	0	212	164	10†	40†	0	0
State of Country of Residence	Arizona	1,400†	950	123	305	19	0	187	149	7	31	0	0
	Other States or Canada	140†	59	45	35	*	0	20†	9	*	*	0	0
	Unknown	20†	12	*	*	0	0	10†	6	0	*	0	0
	Mexico / Central or South America	10†	*	0	*	0	0	0†	0	0	*	0	0
	Other	0†	*	*	0	0	0	0	0	0	0	0	0
Gender	Female	530†	335	69	114	8	0	40†	29	*	10	0	0
	Male	1,040†	689	103	234	16	0	170†	135	7	28	0	0
Race / Ethnicity	American Indian /Alaska Native	60†	37	8	12	*	0	10†	8	0	0	0	0
	Asian	10†	9	0	*	*	0	0†	*	0	0	0	0
	Black / African American	100†	75	*	14	*	0	10†	12	0	*	0	0
	Hispanic / Latino	410†	251	17	135	*	0	50†	34	0	14	0	0
	White	980†	643	140	181	16	0	140†	106	10	22	0	0
	Native Hawaiian / Pacific Islander	0†	*	0	*	0	0	0†	*	0	0	0	0
	Multi-Racial	0†	*	0	0	0	0	0	0	0	0	0	0
	Refused	10†	*	*	*	0	0	0†	*	0	0	0	0

Table 9 (continued)

Characteristics of Arizona Illness from Exposure to Excessive Natural Heat By Region, 2012

		2012											
		ED Visits						IP Admissions					
		Total	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**	**Total**	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**
Age Group (years)	0-4	20†	14	*	*	0	0	0	0	0	0	0	0
	5-9	30†	21	*	*	0	0	0	0	0	0	0	0
	10-14	79	57	10	12	0	0	0†	*	0	0	0	0
	15-19	130†	76	17	31	*	0	10†	*	0	*	0	0
	20-24	160	117	12	31	0	0	10†	9	0	*	0	0
	25-29	154	102	13	39	0	0	10†	6	*	*	0	0
	30-34	140†	94	23	24	*	0	10†	13	0	*	0	0
	35-39	130†	89	13	27	*	0	10†	7	0	*	0	0
	40-44	140†	94	14	26	*	0	20†	16	0	*	0	0
	45-49	121	71	16	34	0	0	20†	17	0	*	0	0
	50-54	120†	76	9	34	*	0	20†	17	*	*	0	0
	55-59	90†	65	8	15	*	0	20†	13	*	0	0	0
	60-64	68	39	9	20	0	0	20†	13	*	*	0	0
	64-69	60†	32	8	16	*	0	20†	8	*	*	0	0
	70-74	55	33	9	7	6	0	20†	14	0	*	0	0
	75-79	30†	15	6	12	*	0	10†	8	*	*	0	0
	80-84	30†	16	0	9	*	0	10†	8	0	*	0	0
	85+	20†	13	*	6	*	0	10†	10	0	*	0	0

Table 9 (continued)

Characteristics of Arizona Illness from Exposure to Excessive Natural Heat By Region, 2012

		2012											
		ED Visits						IP Admissions					
		Total	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**	**Total**	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**
County of Occurrence	Apache	0†	0	*	0	0	0	0	0	0	0	0	0
	Cochise	18	0	0	18	0	0	0†	0	0	*	0	0
	Coconino	19	0	19	0	0	0	0	0	0	0	0	0
	Gila	9	9	0	0	0	0	0†	*	0	0	0	0
	Graham	9	9	0	0	0	0	0	0	0	0	0	0
	La Paz	24	0	0	0	24	0	0	0	0	0	0	0
	Maricopa	919	919	0	0	0	0	160	160	0	0	0	0
	Mohave	142	0	142	0	0	0	10	0	10	0	0	0
	Navajo	10	0	10	0	0	0	0	0	0	0	0	0
	Pima	164	0	0	164	0	0	26	0	0	26	0	0
	Pinal	114	57	0	0	57	0	10†	*	*	0	0	0
	Santa Cruz	0†	0	0	*	0	0	0	0	0	0	0	0
	Yavapai	30	30	0	0	0	0	0	0	0	0	0	0
	Yuma	0	0	0	0	0	0	10	0	0	10	0	0
Month of Illness	January	0†	*	0	*	0	0	0†	*	0	0	0	0
	Febuary	9	9	0	0	0	0	0†	*	0	0	0	0
	March	24	14	0	10	0	0	0	0	0	0	0	0
	April	87	61	12	14	0	0	10†	*	*	*	0	0
	May	160†	98	14	42	*	0	20†	17	0	*	0	0
	June	342	225	37	74	6	0	50†	37	*	13	0	0
	July	310†	210	34	59	*	0	48	40	0	8	0	0
	August	458	293	64	92	9	0	60†	48	*	8	0	0
	September	140	95	7	38	0	0	20†	14	*	*	0	0
	October	30†	14	*	12	*	0	0†	*	0	0	0	0
	November	10†	*	*	*	0	0	0	0	0	0	0	0
	December	0	0	0	0	0	0	0†	0	*	*	0	0

Notes: *Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 10

Illness from Exposure to Excessive Natural Heat by

Geographic Region of Occurrence in Arizona and Residence Status, 2012

		Geographic Region of Occurrence											
		2012											
		ED Visits						IP Admissions					
		Total	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**	**Total**	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**
State or Country of Residence	Arizona	1,400†	950	123	305	19	0	187	149	7	31	0	0
	Other States or Canada	140†	59	45	35	*	0	20†	9	*	*	0	0
	Unknown	10†	*	0	*	0	0	0†	0	0	*	0	0
	Mexico, Central or South America	20†	12	*	*	0	0	10†	6	0	*	0	0
	Other	0†	*	*	0	0	0	0	0	0	0	0	0
Total		1,570†	1,020†	170†	350†	20†	0	210†	164	10†	40†	0	0

Notes: *Cell suppressed due to non-zero count less than 6; † Sum rounded to nearest tens unit due to non-zero addend less than 6.

Table 11

Median Age at Illness from Exposure to Excessive Natural Heat by

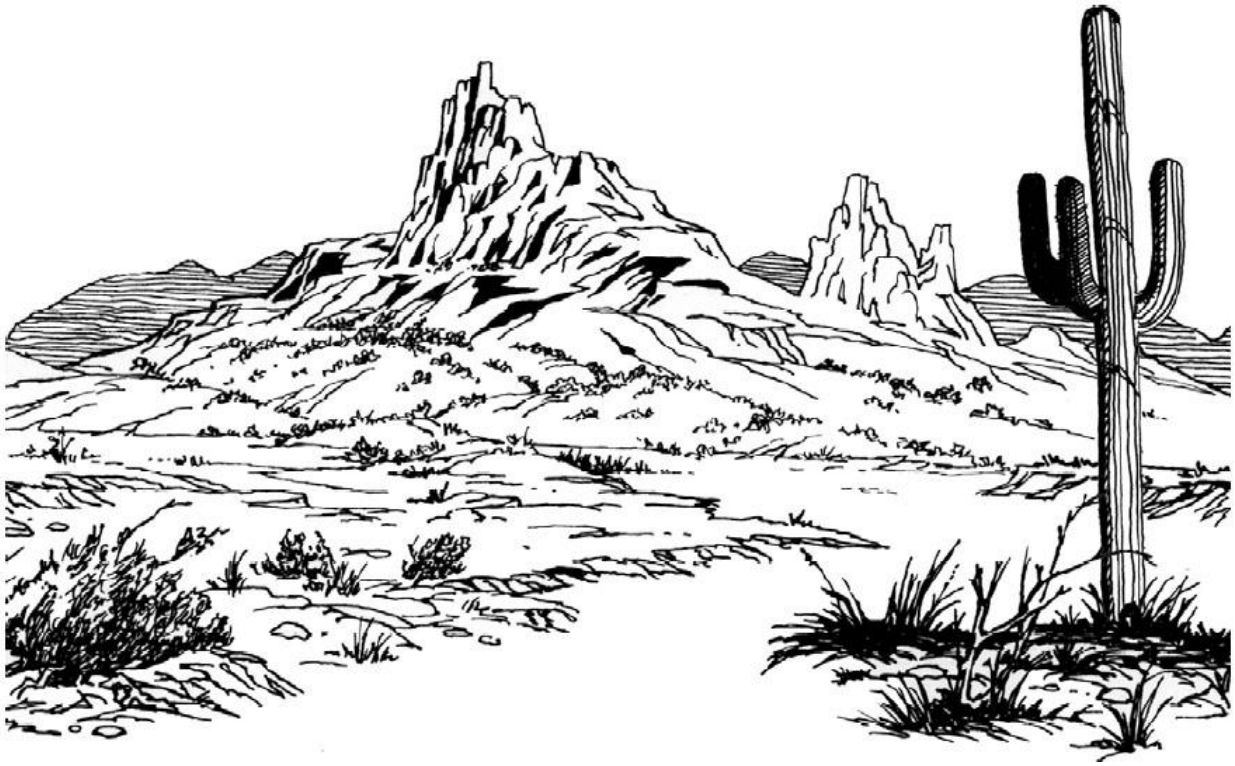
Geographic Region of Occurrence in Arizona and Residence Status, 2012

		Geographic Region of Occurrence											
		2012											
		ED Visits						IP Admissions					
		Total	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**	**Total**	**Central Arizona Counties**	**Northern Arizona Counties**	**Southern Arizona Counties**	**Western Arizona Counties**	**Eastern Arizona Counties**
State of Country of Residence	Arizona	37	36	38	40	43	0	54	51	61	64	0	0
	Other States or Canada	40	39	40	41	55	0	44	44	58	20.5	0	0
	Unknown	38	37.5	38	48	0	0	49.5	55.5	0	31.5	0	0
	Mexico / Central or South America	26	56	0	19.5	0	0	28	0	0	28	0	0
	Other	40	46	17	0	0	0	0	0	0	0	0	0
Total		37	36	38	40	43	0	53	51.5	59.5	56.5	0	0

Table 12
Median Age at Illness from Exposure to Excessive Natural Heat by Race/Ethnicity and Gender, 2012

Race / Ethnicity	Gender	Median Age	
		ED Visits	IP Admissions
American Indian or Alaska Native	Male	30	48
	Female	25	43
	Total	30	45.5
Asian	Male	30	0
	Female	44	76
	Total	36.5	76
Black or African American	Male	35	49
	Female	35	59.5
	Total	35	49
Hispanic or Latino	Male	33	40
	Female	32	18
	Total	33	40
White Non-Hispanic	Male	39	54
	Female	41	69.5
	Total	50	58
Pacific Islander	Male	29	0
	Female	21	82
	Total	21.5	82
Multi-Racial	Male	0	0
	Female	15	0
	Total	15	0
Refused	Male	20	99
	Female	32	39
	Total	22	69.9
Total	Male	37	50
	Female	39	69
	Total	37	53

Our website at http://www.azhealth.gov/plan provides instantaneous access to a wide range of statistical information about the health status of Arizonans. Additional reports and studies include Advance Vital Statistics by County of Residence (published in advance of our main yearly report), Community Vital Statistics, Deaths from Exposure to Excessive Natural Heat Occurring in Arizona, Differences in Health Status by Race/Ethnic Group, Health Status Profile of American Indians in Arizona, Heart Disease vs. Cancer: An Epidemiologic Transition in Mortality Risks, Injuries and Deaths of Arizona Residents in Motor Vehicle Accidents, Marital Status and Health, Obesity in Arizona: Prevalence, Hospital Care Utilization, Mortality, Teenage Pregnancy.



Office of Environmental Health
Bureau of Epidemiology & Disease Control
Health Status and Vital Statistics Section
Bureau of Public Health Statistics
PUBLIC HEALTH SERVICES
ARIZONA DEPARTMENT OF HEALTH SERVICES