



Heat Associated Death Surveillance In Maricopa County

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Presentation Outline

- } Key Points related to findings of death heat surveillance

- } Background information on heat effects

- } Office of Epidemiology, Maricopa County Department of Public Health actions before and during heat season
 - Surveillance for heat related deaths/illnesses
 - Education campaign
 - Collaboration with other agencies

- } Data on heat caused/related deaths in Maricopa County



Key Points

- } Excessive heat events were present in 2009
- } Number of Heat caused/related deaths in 2009 were higher than in 2008
- } Month of July - higher number of heat deaths
- } Excessive heat events impacted older individuals as well as younger individuals
- } Individuals outdoors were affected more than those indoors
- } Individuals affected indoors were older and some of them did not have air conditioning in use
- } Most heat deaths occurred at private residence
- } Excessive heat events affected homeless population
- } **Heat deaths are preventable**



Background Information – U.S.

- }] Exposure to extreme environmental heat can cause illness, injury and death
 - More deaths annually than hurricanes, lightning, tornadoes, floods and earthquakes combined
 - 8,015 individuals died from excessive heat exposure from 1979-2003
 - ~400 deaths annually
 - Findings indicate that during 1993-2002, the incidence of deaths related to heat was three to seven times greater in Arizona than in US overall.
 - Number of heat events predicted to double in the next 20 years



Silent Killer

- } **Lack of public recognition**
 - No damage to infrastructure (silent killer)
 - Many deaths go unreported, unrecognized
- } **Every death is preventable**



4/21/2010



Risk Factors

} Individual:

- Age (young and old)
- Underlying medical conditions/mental illness (obese, CVD, alcohol, drugs, disabled...)
- People that overexert during work or exercise
- Income and poverty status
- Homelessness
- Social isolation
- Access to health care and cooling facilities

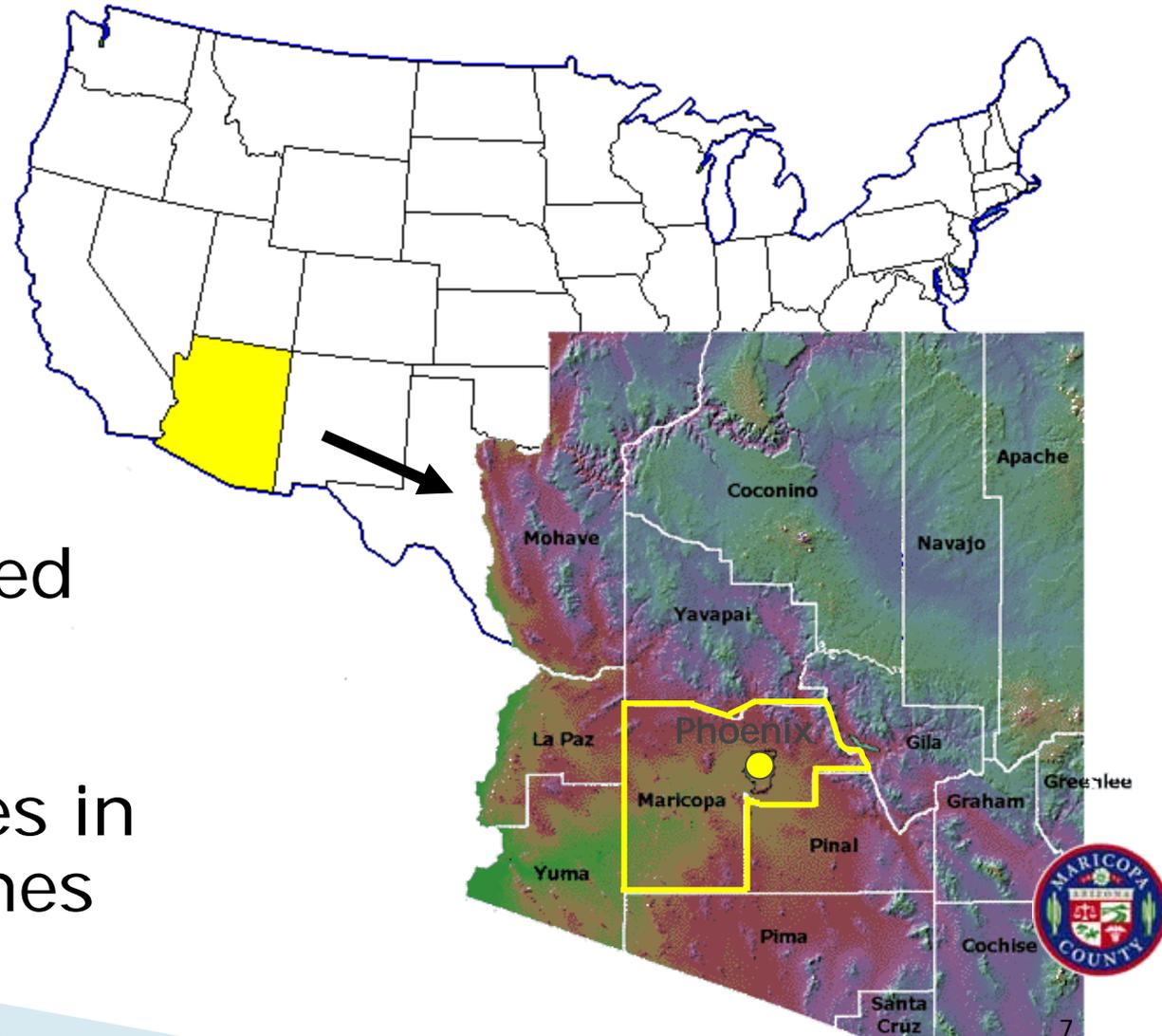
} Community characteristics

- Neighborhood characteristics: land use/land cover, crime rate, housing type, urban heat island

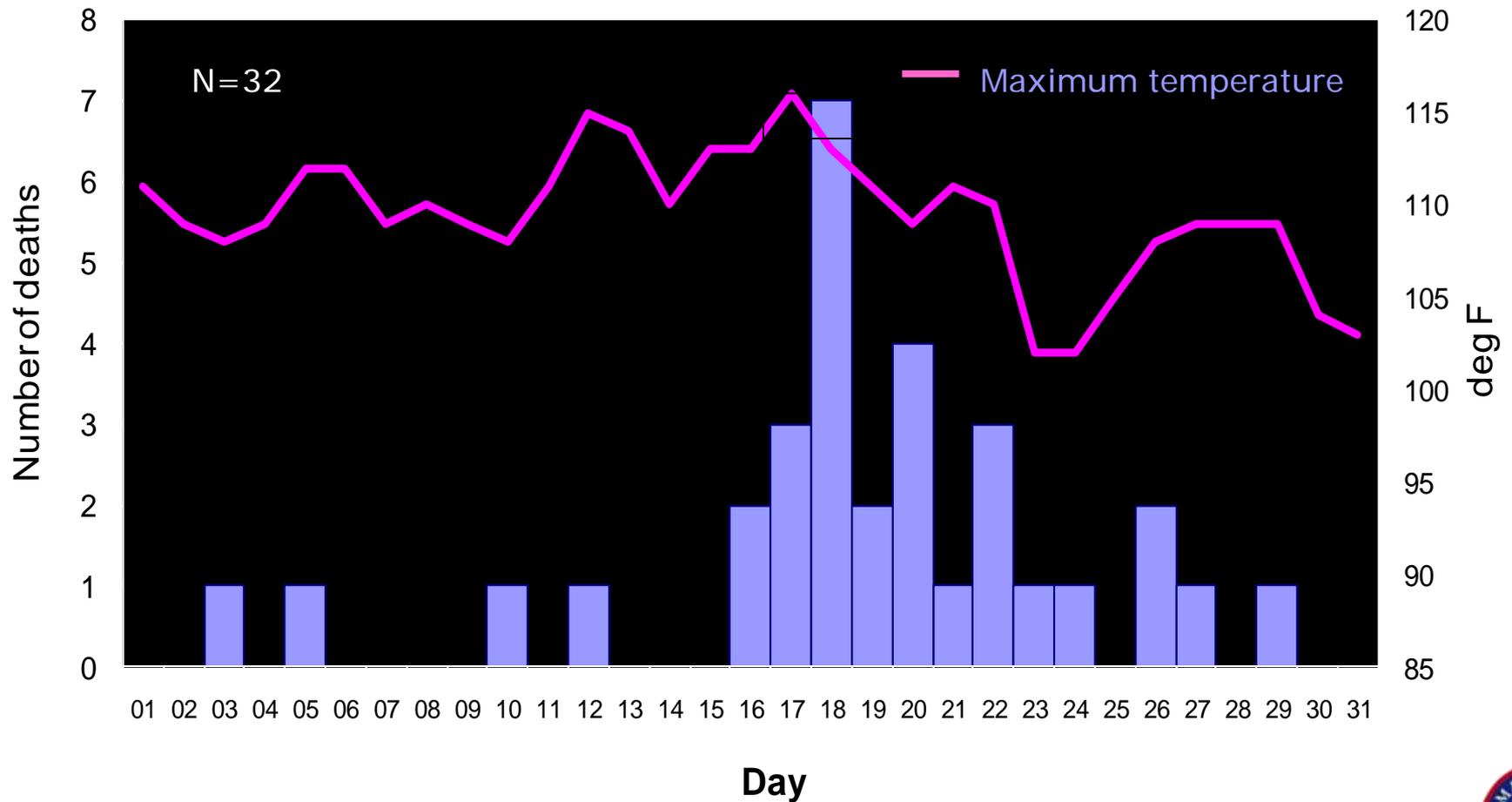


Maricopa County, Arizona

- } High summer temperatures average from 98°F–107°F
- } Low humidity
- } Heat-acclimated population
- } Cooling devices in almost all homes



Maricopa County: July 2005



Heat Season

- } **Heat Season** – Beginning of May through the end of September
- } **Office of Medical Examiner** – receive data weekly from their office
- } **Close attention to National Weather Service (NWS) messages:**
 - **Heat advisory** – issued when the temperature is forecast to be unusually hot but not life threatening
 - **Excessive heat watch** – issued when conditions are likely to result in life threatening heat emergency within the next 24-48hours
 - **Excessive heat warning** – issued when a life threatening heat emergency exists or is imminent.
- } **Begin enhanced heat surveillance**
 - Active surveillance for heat related deaths
 - Active notification of hospitals
 - Request to take heat warning in consideration when discharging patients with info on cooling centers
 - Outreach by healthcare for the homeless



Public Health Response

} Initiate education campaign

- Press release with information on dangers of excessive heat, signs and symptoms of heat related illnesses
- Emphasis on Spanish speaking community
- Where to call for help
- Risks with medications
- Pets
- Look for neighbors



Collaboration

- } **Maricopa County Department of Emergency Management coordinates response and planning with**
 - National Weather Service
 - American Red Cross
 - Sheriff's Office
 - Salvation Army
 - Animal Care and Control
 - Arizona Public Service
 - Facilities Management
 - Salt River Project
 - Cities and Towns



Enhanced Heat Surveillance

- } Data collected from Medical Examiner and death certificates – looking for deaths that *might* be due to heat
- } Data investigation and analysis – looking at data to see if heat indicated (codes or words)
- } Produce Weekly Heat caused/related death reports and make them available to internal and external partners
 - o Reports are posted on Public Health website at:
 - http://www.maricopa.gov/Public_Health/epi/heat.aspx



Definitions

- } **Heat caused:** a death due directly to exposure to heat
- } **Heat related:** a death due to some other health condition or disease, to which heat exposure was a contributor (for example, a person who died of a cardiac condition that was exacerbated by dehydration due to heat exposure)
- } **Pending:** a death still being investigated
- } **Not heat related** (“rule out”)



Heat Caused and Heat Related Death Occurrences in Maricopa County Numbers

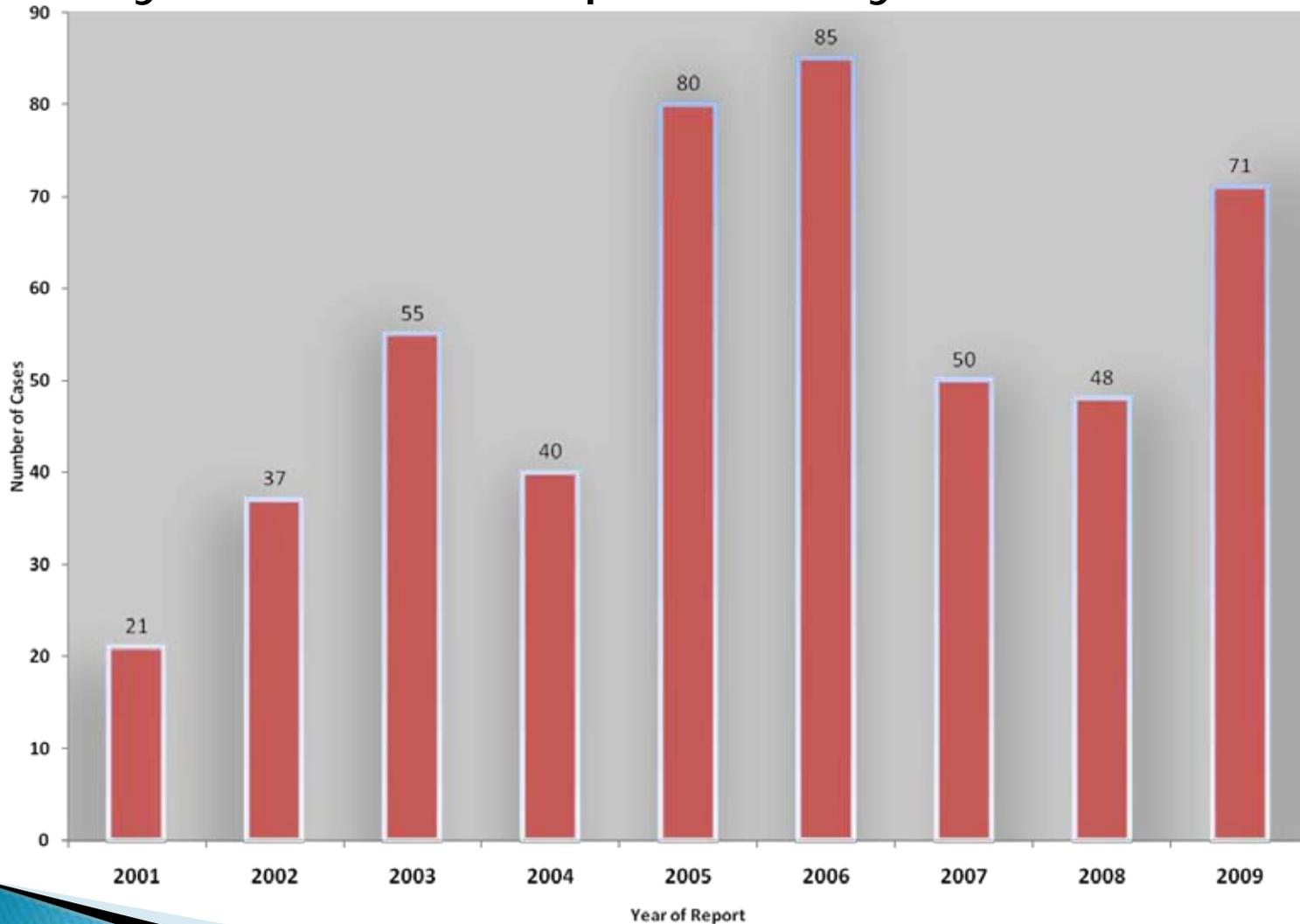


Heat Caused and Heat Related Deaths Reported in Maricopa County: 2006 -2009

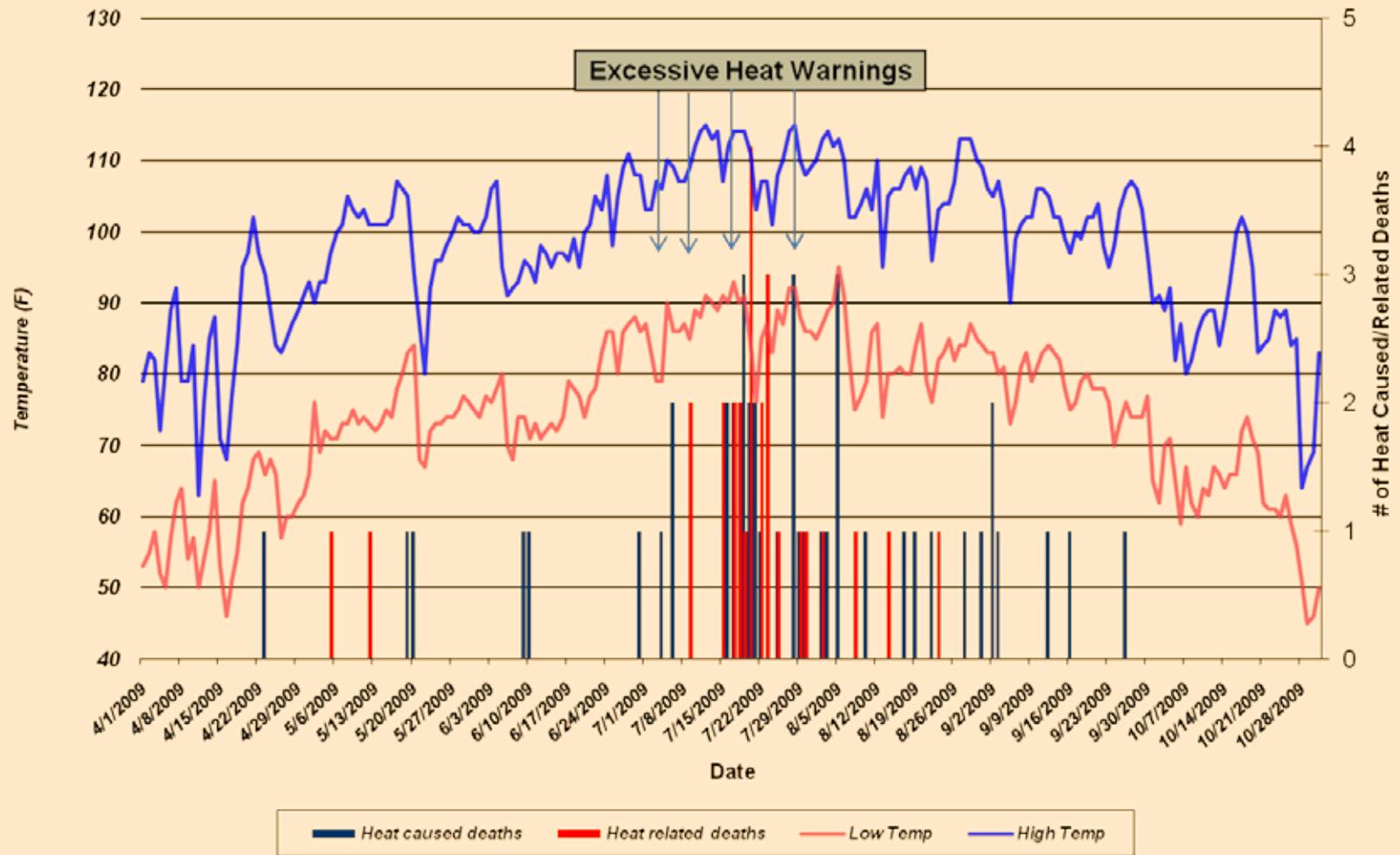
Cases	2006	%	2007	%	2008	%	2009	%	TOTAL
Total Reported	103	100	129	100	95	100	111	100	438
Confirmed	85	83	50	39	48	51	71	64	254
Ruled Out	18	17	79	61	47	49	39	35	183
Pending	0	0	0	0	0	0	1	1	1



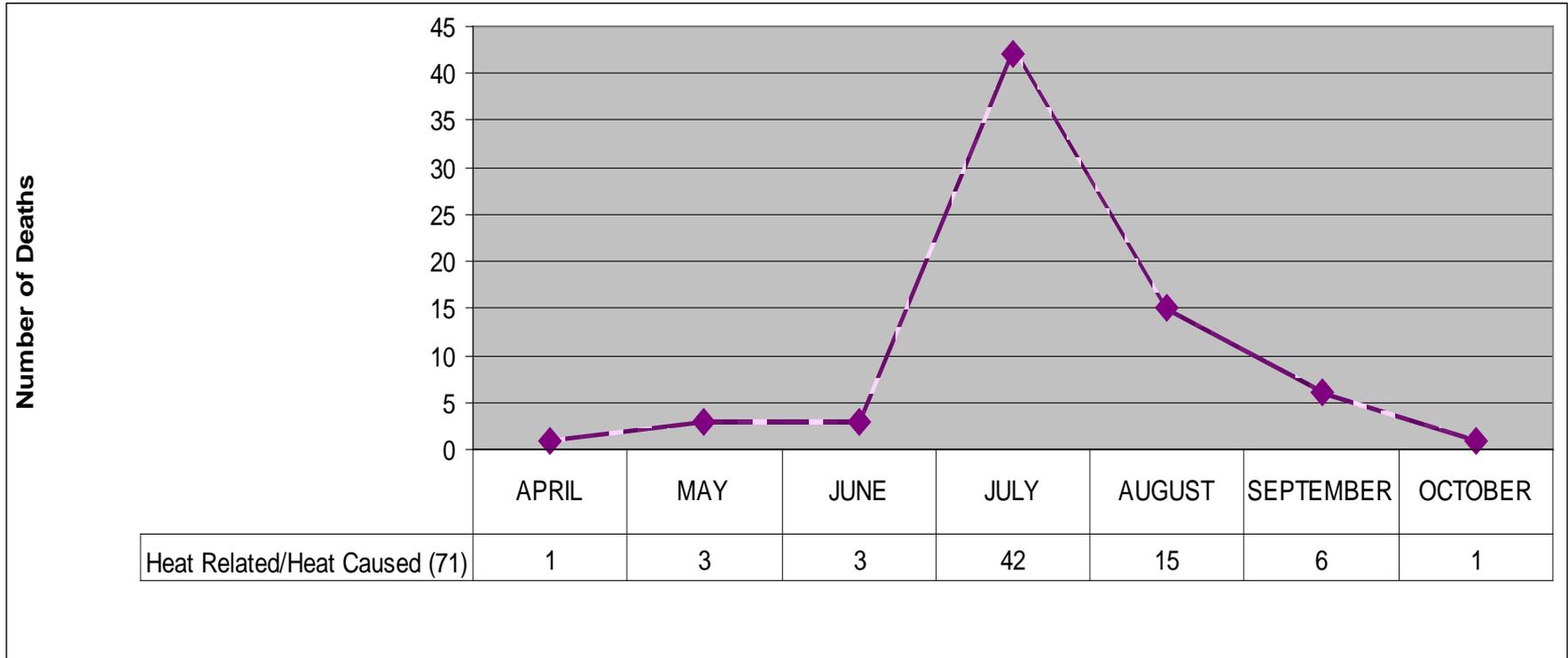
Heat Caused and Heat related Deaths by Year, Maricopa County: 2001-2009



Maricopa County Heat Caused/Related Deaths by Maximum and Minimum Temperatures and Date 4/1/09-10/31/09 (n=72)



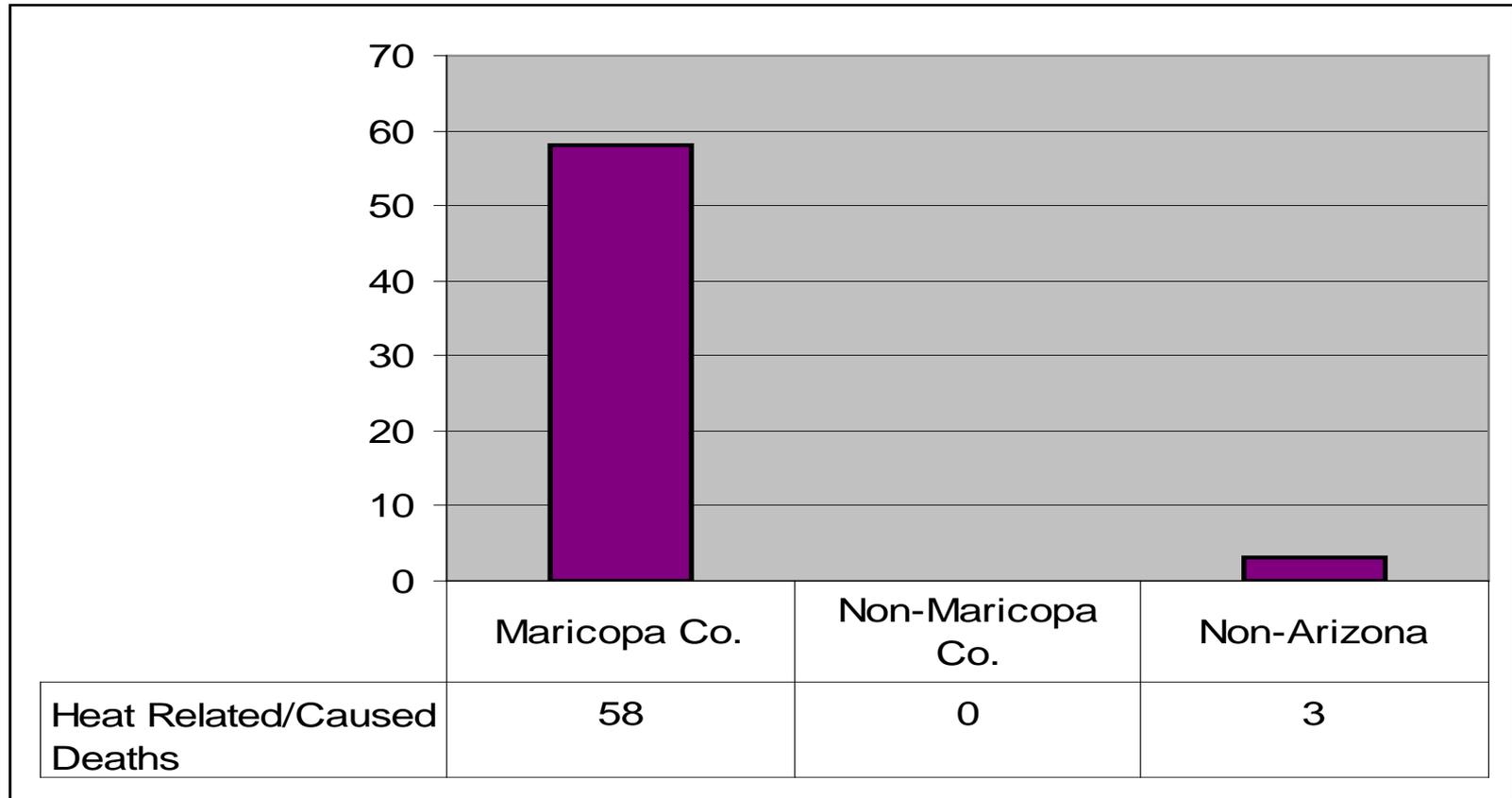
Heat Caused and Related Deaths* by Case Classification and Month Maricopa County: 2009



*Excludes one case that is still pending



Heat Caused and Related Deaths by Residency and Classification Maricopa County: 2009

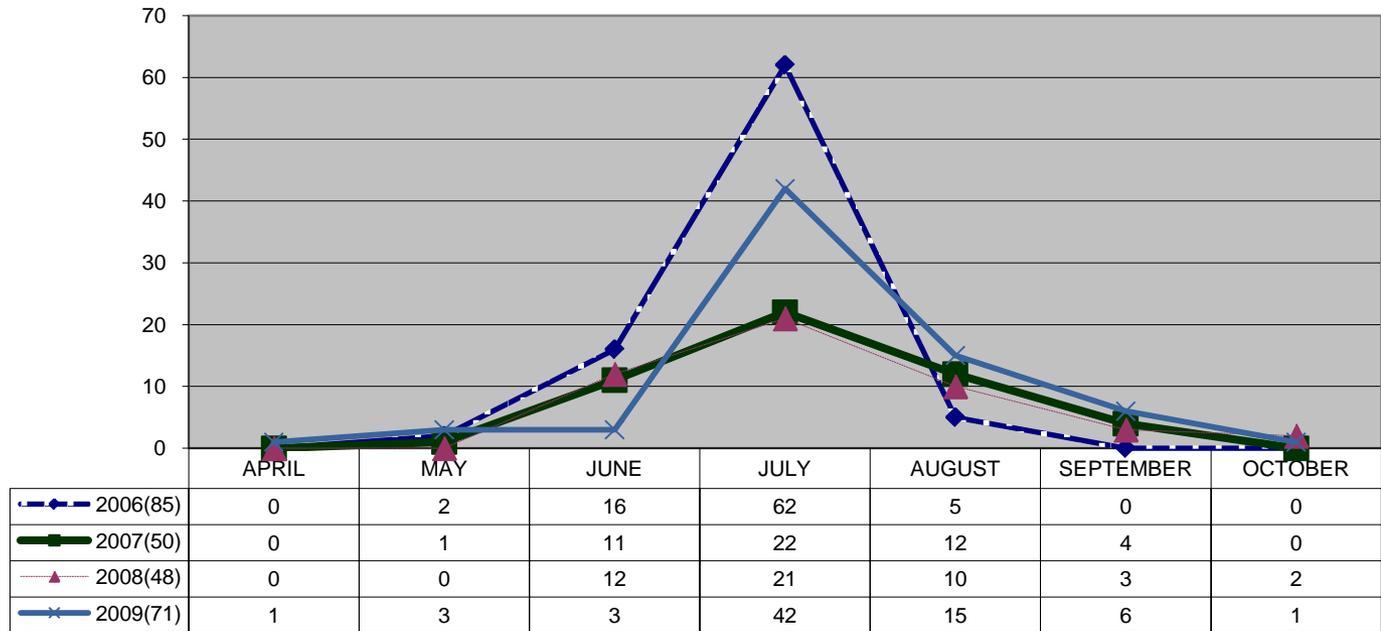


Non-Arizona residents include Alaska and New Mexico residents
 Non-Maricopa residents include an Arizona resident but non Maricopa
 Excludes eleven cases with unknown state and county residence

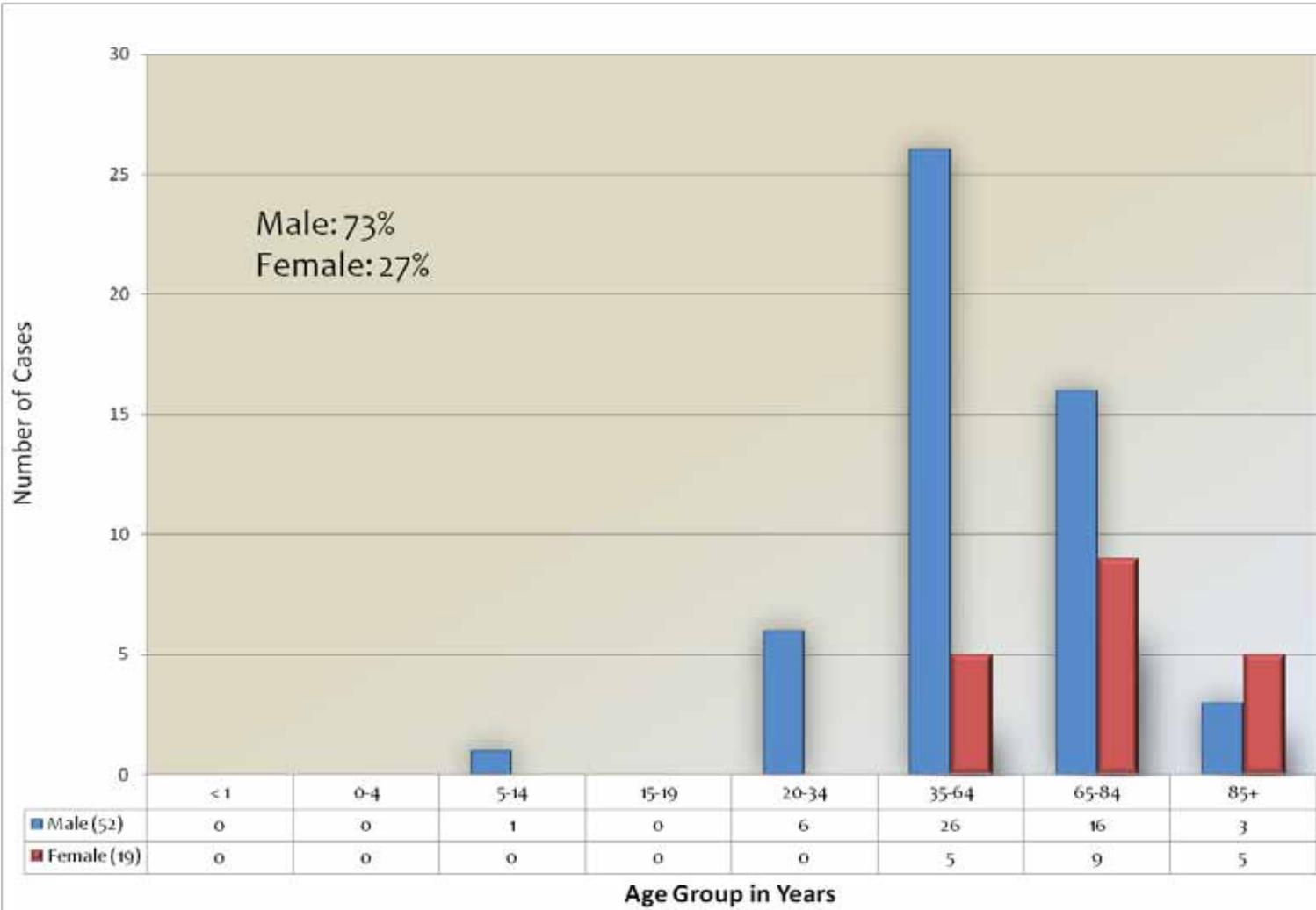


Heat Caused /Related Deaths by Month of Death, Maricopa County: 2006 - 2009

Number of Deaths



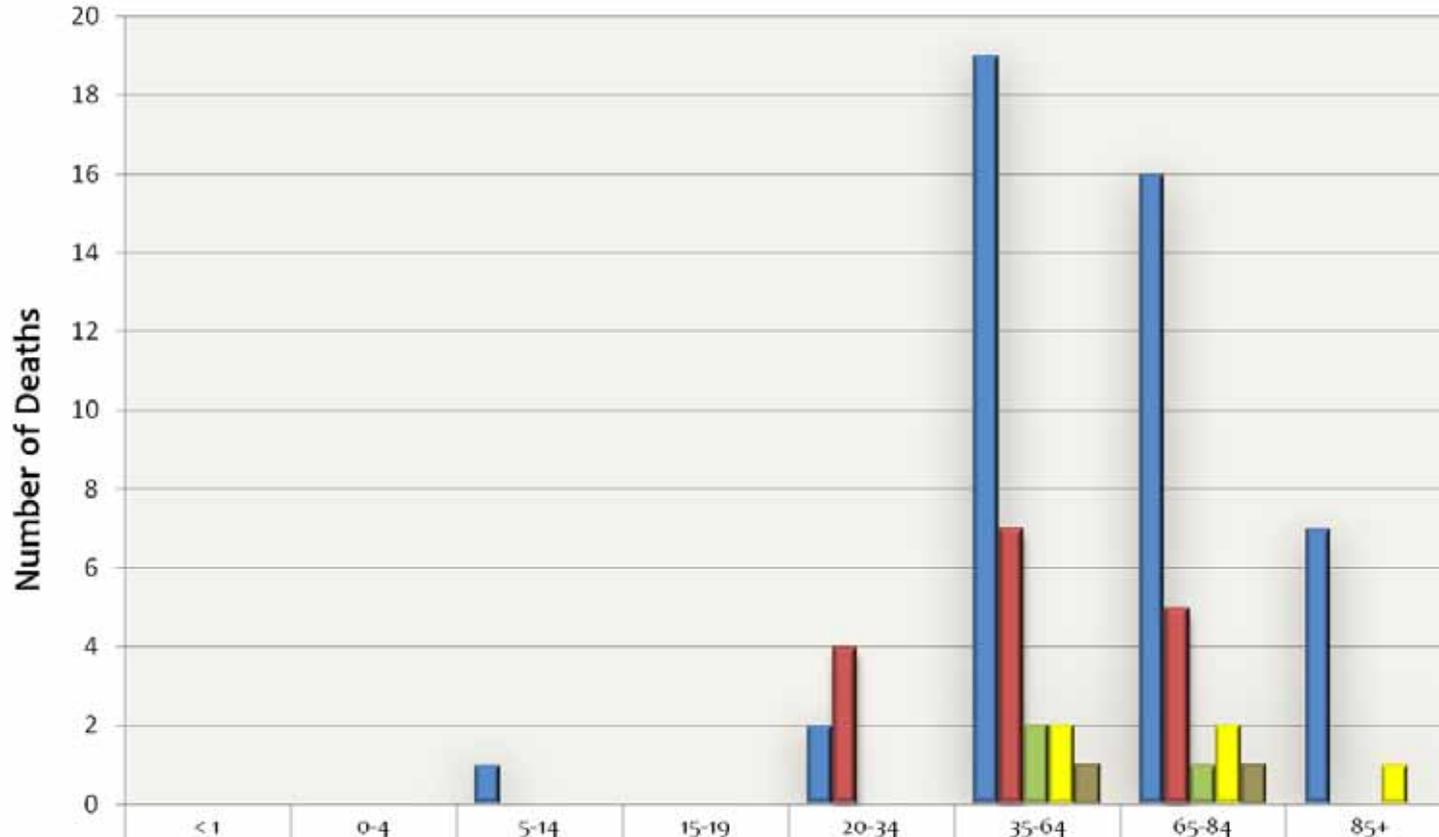
Heat Caused/Related Deaths by Age and Gender, Maricopa County: 2009



Includes one married couple; Female 85 yrs old, Male 88 yrs old
Excludes one male decedent with unknown age



Heat Caused/Related Deaths by Age and Race/Ethnicity Maricopa County: 2009



	<1	0-4	5-14	15-19	20-34	35-64	65-84	85+
■ White (45)	0	0	1	0	2	19	16	7
■ Hispanic (16)	0	0	0	0	4	7	5	0
■ Black (3)	0	0	0	0	0	2	1	0
■ Native American (5)	0	0	0	0	0	2	2	1
■ Unknown (2)	0	0	0	0	0	1	1	0

Age Group in Years



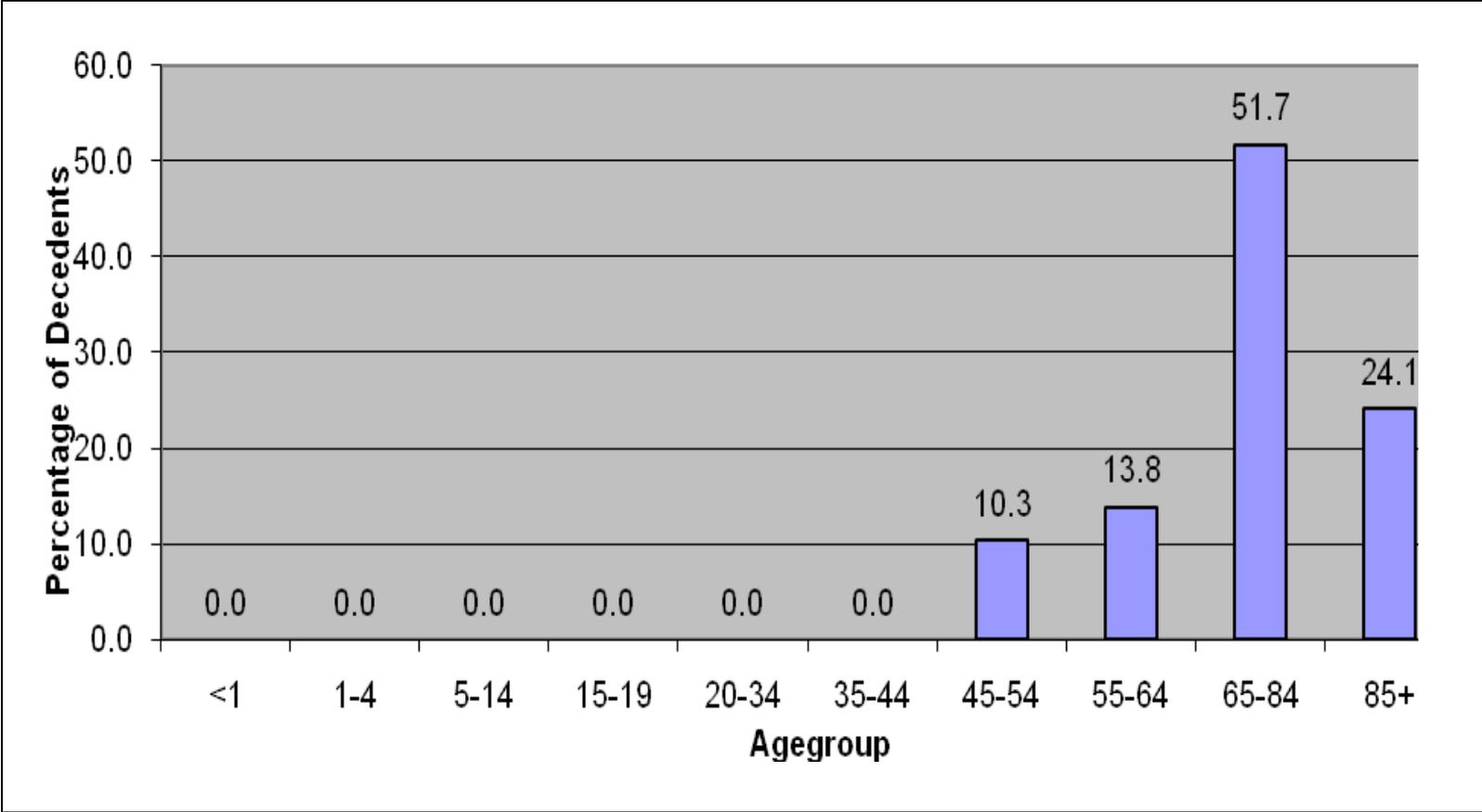
Heat Caused/Related Deaths by Environment and Location of Injury Maricopa County: 2009

Place of Injury (Indoor/Outdoor)				
Type of Place	Indoor	Outdoor	Unknown	Total
Private Residence	29	7	0	36
Business	0	6	1	7
Car	0	1	0	1
Desert Area	0	11	0	11
Unknown	0	0	0	0
Street	0	16	0	16
Total	29 (41%)	41 (58%)	1 (1%)	71 (100%)

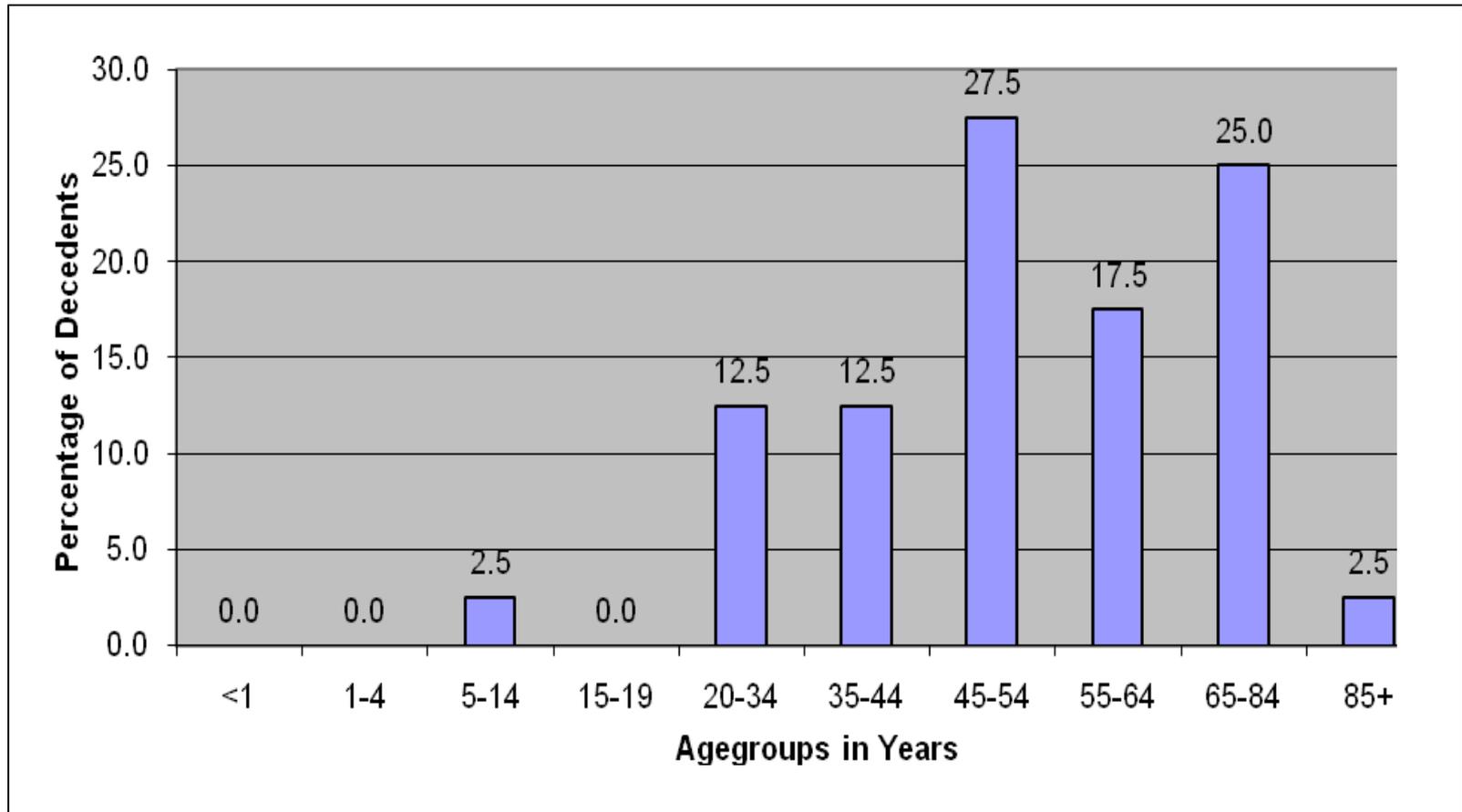
Note: 13 of the 16 individuals who died on the street were likely homeless.



Indoor Heat Caused/Related Deaths by Age Distribution, Maricopa County: 2009 (N=29)



Outdoor Heat Caused/Related Deaths by Age Distribution, Maricopa County: 2009 (N=41)



Heat Caused/Related Deaths Associated with Occupation/Recreation Maricopa County: 2009

Place of Injury	Type of Death					Total*
	Occupational	Recreational	Unknown Occupational	Unknown Recreational	Not Occupational or Recreational	
Indoor	0	0	0	0	29	29
Outdoor	1	1	0	0	39	41
Total	1	1	0	0	68	70

*Excludes one case where cause of death is known but circumstances are unknown



Homeless* Deaths by Mention of Alcohol and Drugs, Maricopa County: 2009

Homeless	Drug and/or Alcohol Use	No Drug or Alcohol Use
Yes (13, 19%)	3(23%)	10(77%)
No (57, 81%)	12(21%)	45(79%)
Total 70(100.0%)	15(21%)	55(79%)

*Excludes one case where homeless status is currently unknown

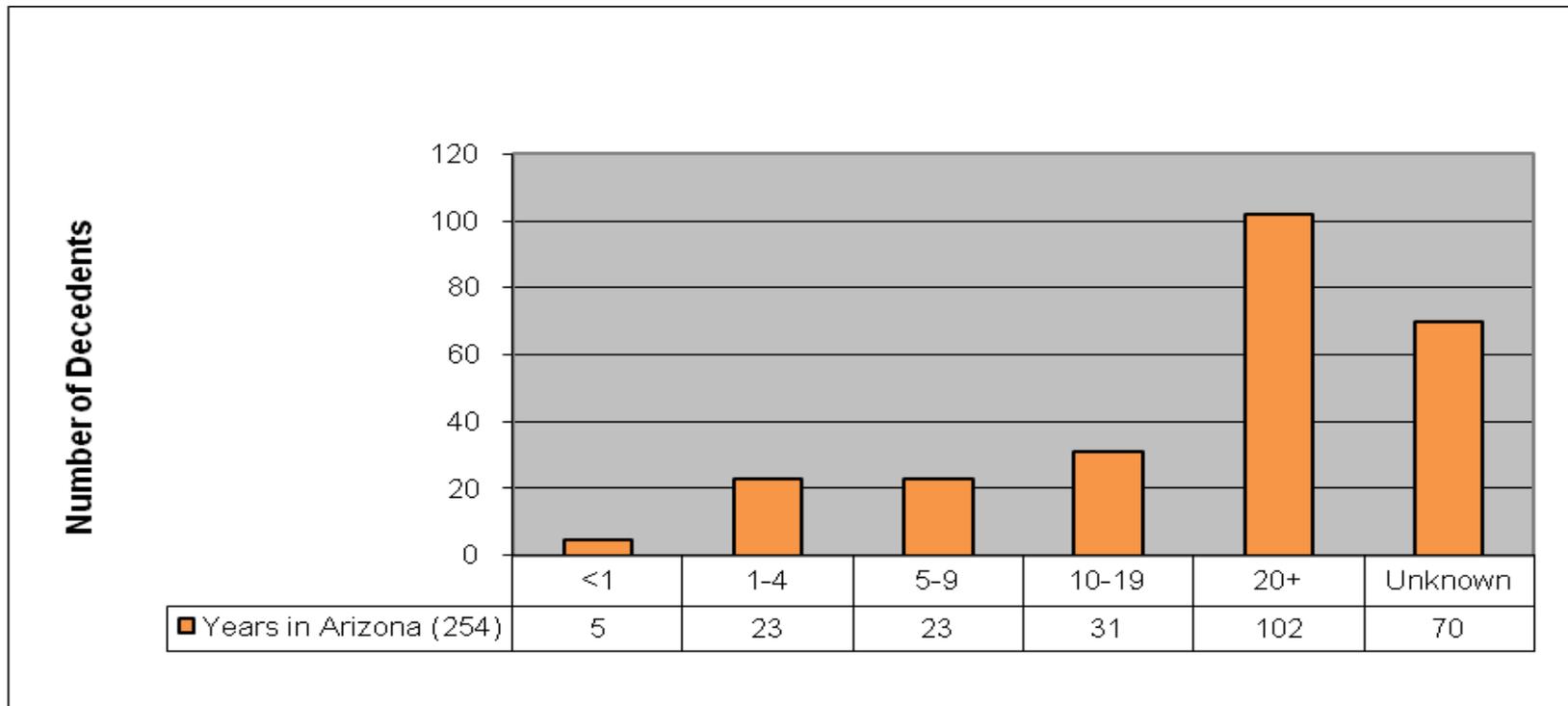


Heat Caused/Related Deaths by Use of Air Conditioning and Age Group*, Maricopa County: 2009 (Individuals who died indoors only, N=29)

Age group	Air conditioning not in use or broken	Unknown if working air conditioning Available	Not applicable	Total
<1	0	0	0	0
1-4	0	0	0	0
5-14	0	0	1	1
15-19	0	0	0	0
20-34	0	0	5	5
35-44	0	1	5	5
45-54	0	4	10	14
55-64	1	2	7	10
65-84	5	10	10	25
85+	0	6	2	8
Total*	6	23	40*	69

*Unknown age, however, unknown that died outdoor. 4/21/2010

Heat Related/Heat Caused Deaths by Years Lived in Arizona, Maricopa County, 2006-2009



72% of individuals lived in AZ more than 10 years
(excluded individuals with unknown time living in AZ)



Decedent Demographics, Maricopa County: 2009

N=71		
Characteristics		N (%)
	Male	52 (73)
	White	44(62)
	Hispanic	16(22)
	Homeless	13(19)
Place of Injury (indoor/outdoor)		
	Indoor	29(41)
	Outdoor	41(58)
Place of injury-Type		
	Private residence	36 (50)
	Desert area	11 (15)
	Street	16 (23)
	Car	1 (1)
	Business	5 (7)
	Parking Lot/Unknown	1/1(1/1)
Lived in Arizona		
	More than 10 years	72%
Age (years)		
	Mean(range)	61 (14-99)
	Median	59

Summary

- } In year 2009 noted higher number of heat caused/related deaths compared to year 2008 (48 to 71)
- } Excessive heat events affected homeless population
- } Excessive heat events impacted older individuals as well as younger individuals, but those over 64 made up 46%
- } July has consistently been most dangerous month
- } Individuals outdoors were affected more than those indoors.
 - Age range of those affected outdoor were: 14-85 years old
 - Most heat deaths occurred at private residence (although prior activity usually unknown)
 - Individuals affected indoors were older and some of them did not have air conditioning in use

Acknowledgements

- } Maricopa County Office of the Medical Examiner staff

- } Maricopa County Department of Public Health
 - Office of Epidemiology staff
 - Office of Vital Registration

- } National Weather Service staff

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QUESTIONS



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