

Heat-Caused & Heat-Related Deaths from Exposure to Excessive Natural Heat in Arizona (2012-2023)

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SUMMARY REPORT OF HEAT-RELATED DEATHS IN 2023

990 Heat-related deaths occurred in Arizona during 2023



Around **65%** of the heat-related deaths occurred in Maricopa



The rate of Heat-related deaths among Arizona residents per 100,000 population is highest among La Paz, Mohave and Pima counties



3 out of every **4** heat-related deaths are among males



63% of the heat-related deaths were age 50 years or older



A significant proportion of heat-related deaths occurred during the months of May, June, July, August and September and over **60%** of the annual heat-related deaths occurred in the month of July



Over **69%** of the Arizona residents who died of heat-related illness during 2023, lived in the state for 20+ years



52% of heat-related deaths involved substance use in 2023



Heat-Caused & Heat-Related Deaths from Exposure to Excessive Natural Heat in Arizona by Year

Year	Heat - Caused Deaths	Heat - Related Deaths
2012	97	156
2013	105	151
2014	50	91
2015	89	140
2016	152	233
2017	133	267
2018	128	251
2019	164	288
2020	314	523
2021	309	559
2022	359	671
2023	460	990

Heat-caused deaths are deaths where the primary cause of death is listed as exposure to excessive natural heat. Heat-related deaths are deaths where exposure to excessive natural heat is listed anywhere on the death record and include those that were heat-caused.

Heat-Caused Deaths by State of Residence and Geographic Region

State or County of Residence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Arizona Resident	53	56	35	46	102	106	91	118	207	190	241	351	1,596
Non-Arizona Resident	44	49	15	43	50	27	37	46	107	119	118	109	764

Geographic Region of Occurrence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Central Counties	55	47	29	43	71	66	74	102	161	128	156	259	1,191
Northern Counties	*	13	*	6	12	33	19	24	54	68	74	50	356[†]
Southern Counties	41	45	17	39	64	33	35	36	96	110	121	138	775
Western Counties	*	0	*	*	*	*	0	*	*	*	8	13	38[†]

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

*Number of deaths related to exposure to excessive natural heat were suppressed due to non-zero count less than 6.

Classification of geographic regions: Central = Gila, Graham, Maricopa, Pinal, and Yavapai; Eastern = Greenlee; Northern = Apache, Coconino, Mohave, and Navajo; Southern = Cochise, Pima, Santa Cruz, and Yuma; Western = La Paz.



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Heat-Related Deaths by State of Residence and Geographic Region

State or County of Residence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Arizona Resident	108	96	76	95	177	230	187	221	378	418	525	824	3,335
Non-Arizona Resident	48	55	15	45	56	37	64	67	145	141	146	166	985

Geographic Region of Occurrence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Central Counties	106	88	66	91	145	195	193	216	357	366	460	686	2,969
Northern Counties	*	16	7	7	17	34	20	26	58	70	77	54	388[†]
Southern Counties	47	47	17	41	66	37	38	43	103	119	126	232	916
Western Counties	*	0	*	*	*	*	0	*	*	*	8	18	47[†]

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

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Classification of geographic regions: Central = Gila, Graham, Maricopa, Pinal, and Yavapai; Eastern = Greenlee; Northern = Apache, Coconino, Mohave, and Navajo; Southern = Cochise, Pima, Santa Cruz, and Yuma; Western = La Paz.

Heat-Caused Deaths by Gender and Race/Ethnicity

Race/Ethnicity	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
American Indian/Alaskan Native	N/A	N/A	N/A	N/A	N/A	10	6	6	11	14	23	28	98
Asian or Pacific Islander	N/A	N/A	N/A	N/A	N/A	*	*	*	*	*	*	*	21 [†]
African American/Black	N/A	N/A	N/A	N/A	N/A	*	7	9	20	21	26	35	120 [†]
Hispanic/Latino	N/A	N/A	N/A	N/A	N/A	31	34	43	91	113	119	123	554
White Non-Hispanic	N/A	N/A	N/A	N/A	N/A	78	71	76	152	151	180	252	960
Unknown	97	105	50	89	152	10	9	26	37	7	8	17	607

GENDER	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Female	23	20	17	17	45	40	25	39	74	77	94	125	596
Male	74	85	33	72	107	93	103	125	240	232	265	335	1,764

Notes: Due to data quality issues, Race/Ethnicity data for the years 2012-2016 is being withheld. The table is expected to be updated in late 2024.

† Sum rounded to nearest tens unit due to non-zero addend less than 6;

*Number of deaths related to exposure to excessive natural heat were suppressed due to non-zero count less than 6.



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Heat-Related Deaths by Gender and Race/Ethnicity

Race/Ethnicity	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
American Indian/Alaskan Native	N/A	N/A	N/A	N/A	N/A	16	11	11	28	33	51	60	210
Asian or Pacific Islander	N/A	N/A	N/A	N/A	N/A	6	*	*	*	*	8	11	41[†]
African American/Black	N/A	N/A	N/A	N/A	N/A	11	16	20	39	55	60	93	294
Hispanic/Latino	N/A	N/A	N/A	N/A	N/A	47	56	65	127	156	180	239	870
White Non-Hispanic	N/A	N/A	N/A	N/A	N/A	161	142	146	251	298	359	561	1,918
Unknown	156	151	91	140	233	26	25	41	73	12	13	26	987

GENDER	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Female	46	27	22	35	60	77	53	68	116	122	139	230	995
Male	110	124	69	105	173	190	198	220	407	437	532	760	3,325

Notes: Due to data quality issues, Race/Ethnicity data for the years 2012-2016 is being withheld. The table is expected to be updated in late 2024.

† Sum rounded to nearest tens unit due to non-zero addend less than 6;

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Heat-Caused & Heat-Related Deaths from Exposure to Excessive Natural Heat

Year	Heat Related Deaths	Rate per 100,000(HRD)	Heat Caused Deaths	Rate per 100,000 (HCD)
2013	151	2.29	105	1.60
2014	91	1.36	50	0.75
2015	140	2.07	89	1.32
2016	233	3.41	152	2.22
2017	267	3.83	133	1.91
2018	251	3.55	128	1.81
2019	288	4.01	164	2.28
2020	523	7.29	314	4.38
2021	559	7.67	309	4.24
2022	671	9.06	359	4.85
2023	990	13.16	460	6.11

Note: Crude rates are calculated per 100,000 population. For the years 2013-2023, their respective year estimates were used. Rate calculations utilize the official population estimates from Arizona Department of Health Services: vital statistics-<https://pub.azdhs.gov/health-stats/menu/info/pop/index.php>

Heat-Caused Deaths by Age Group

Age_Group	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Less than 1	*	*	*	*	*	*	0	*	*	*	0	0	9 †
1 - 4	*	*	*	*	0	*	0	*	*	*	0	0	7 †
5 - 14	0	0	0	*	*	0	*	*	*	*	0	*	12 †
15 - 24	*	17	*	15	12	6	7	10	25	27	30	26	184 †
25 - 34	15	13	*	11	26	18	19	17	31	47	35	50	287 †
35 - 44	18	15	8	15	18	10	16	17	39	41	48	43	288
45 - 54	16	19	*	10	16	23	15	18	48	38	47	55	308 †
55 - 64	14	10	7	15	31	20	19	30	61	43	60	97	407 †
65 - 74	12	6	9	14	17	24	32	25	47	53	58	89	386 †
75 - 84	10	11	*	*	15	23	16	24	44	42	68	71	334 †
85+	*	6	*	*	13	7	*	15	14	16	13	26	122
Missing Ages	*	6	*	*	*	0	0	*	0	*	*	*	16

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

*Number of deaths related to exposure to excessive natural heat were suppressed due to non-zero count less than 6.

Heat-Related Deaths by Age Group

Age_Group	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Less than 1	*	*	*	*	*	*	0	*	*	*	0	0	9 †
1 - 4	*	*	*	*	0	*	0	*	*	*	0	0	11 †
5 - 14	0	0	0	*	*	0	*	*	*	*	0	*	12 †
15 - 24	*	17	6	16	12	8	8	13	29	33	39	34	219 †
25 - 34	19	13	8	16	29	31	26	26	50	83	73	115	489
35 - 44	20	23	12	19	27	24	31	32	80	77	120	148	613
45 - 54	24	25	15	16	30	47	40	51	88	84	109	144	673
55 - 64	27	23	15	30	56	49	53	60	118	105	113	215	864
65 - 74	23	17	14	24	32	42	57	43	67	90	106	179	694
75 - 84	21	14	8	10	27	46	28	36	64	63	92	114	523
85+	13	10	9	*	16	17	7	19	22	20	18	38	194 †
Missing Ages	*	7	*	*	*	0	0	*	0	*	*	*	19 †

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

*Number of deaths related to exposure to excessive natural heat were suppressed due to non-zero count less than 6.

Heat-Caused Deaths by Substance Abuse and Years in Arizona

Substance Use	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Alcohol Use	10	8	*	6	16	12	14	13	22	20	31	41	196[†]
Drug Use	*	*	6	*	8	8	10	30	54	33	33	75	265[†]
Combined Alcohol and Drug Use	*	*	*	*	*	*	*	*	*	*	*	7	23
No substance Use	83	94	41	78	128	111	101	121	235	254	293	337	1,876

Years in Arizona	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
<3 years	32	41	13	40	50	26	35	32	71	77	78	80	575
3-9 years	6	8	6	*	12	8	19	14	25	19	19	34	173[†]
10-19 years	9	8	*	7	15	20	7	18	23	23	39	40	214[†]
+20 years	27	24	20	23	52	51	45	53	98	91	129	188	801
Unknown/None	23	24	6	16	23	28	22	47	97	99	94	118	597

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

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Heat-Related Deaths by Substance Abuse and Years in Arizona

Substance Use	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Alcohol Use	17	18	11	14	28	30	25	30	38	50	53	72	386
Drug Use	14	12	17	14	37	57	65	92	176	165	235	400	1,284
Combined Alcohol and Drug Use	*	*	*	10	*	*	9	*	9	19	16	43	128[†]
No substance Use	122	119	59	102	164	176	152	161	300	325	367	475	2,522

Years in Arizona	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
<3 years	36	47	15	43	57	41	46	42	82	93	100	116	718
3-9 years	10	12	10	11	25	19	25	27	46	37	52	81	355
10-19 years	20	13	12	8	20	37	23	32	44	42	66	84	401
+20 years	65	49	45	53	92	118	101	117	188	239	290	464	1,821
Unknown/None	25	30	9	25	39	52	56	70	163	148	163	245	1,025

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

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Heat-Caused Deaths by County

County of Occurrence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Apache	0	*	0	0	0	0	*	0	0	*	*	*	8 [†]
Cochise	0	*	0	*	*	*	*	*	8	9	10	14	50 [†]
Coconino	*	*	*	*	0	8	*	*	*	*	*	*	33 [†]
Gila	0	*	0	*	*	*	*	*	*	*	*	*	13 [†]
Graham	*	0	0	0	0	*	0	0	*	*	*	*	6 [†]
La Paz	*	0	*	*	*	*	0	*	*	*	8	13	38 [†]
Maricopa	50	37	23	36	66	59	66	89	143	115	139	239	1,062
Mohave	0	7	*	*	11	25	15	22	49	60	66	48	307 [†]
Navajo	*	*	*	0	*	0	0	0	*	*	*	*	8 [†]
Pima	35	38	12	28	45	26	26	25	45	53	54	91	478 [†]
Pinal	*	*	*	*	*	*	*	12	11	8	12	13	83 [†]
Santa Cruz	0	*	*	*	*	0	*	0	7	12	8	7	44 [†]
Yavapai	*	*	*	*	*	*	*	*	*	*	*	*	27 [†]
Yuma	6	*	*	7	16	6	*	10	36	36	49	26	203 [†]

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Heat-Related Deaths by County

County of Occurrence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Apache	0	*	0	0	0	0	*	0	0	*	*	*	9 [†]
Cochise	0	*	0	*	*	*	*	*	8	9	10	20	56 [†]
Coconino	*	*	*	*	0	9	*	*	6	*	*	*	47 [†]
Gila	0	*	0	*	*	*	*	*	*	*	*	*	23 [†]
Graham	*	0	0	0	0	*	0	0	*	*	*	*	9 [†]
La Paz	*	0	*	*	*	*	0	*	*	*	8	18	47 [†]
Maricopa	100	77	60	82	137	173	175	192	322	337	418	644	2,717 [†]
Mohave	0	8	*	*	14	25	16	22	51	60	67	49	317 [†]
Navajo	*	*	*	0	*	0	0	0	*	*	*	*	15 [†]
Pima	37	39	12	29	46	28	28	32	51	59	58	173	592
Pinal	*	6	*	*	*	17	15	22	27	20	33	30	186 [†]
Santa Cruz	0	*	*	*	*	0	*	0	7	12	8	8	45 [†]
Yavapai	*	*	*	*	*	*	*	*	*	*	*	*	34 [†]
Yuma	10	*	*	8	17	8	*	10	37	39	50	31	223 [†]

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Heat-Caused Deaths by Month

Month of Occurrence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
January	0	0	0	0	0	0	0	*	0	0	*	0	* [†]
February	0	0	0	0	0	0	0	*	0	0	*	0	* [†]
March	0	*	*	*	*	*	0	0	0	*	*	*	12 [†]
April	*	*	*	*	*	*	*	*	*	*	7	*	31 [†]
May	9	9	0	*	*	*	11	*	9	15	25	8	101 [†]
June	24	30	13	34	54	50	16	22	30	101	88	21	483
July	28	39	18	13	52	36	49	54	116	81	139	271	896
August	26	14	8	36	28	22	28	54	122	56	41	110	545
September	6	7	*	*	9	8	20	19	26	41	47	32	222 [†]
October	*	*	*	*	*	*	*	*	9	8	*	10	47 [†]
November	*	*	*	*	*	*	*	*	0	*	*	*	15 [†]
December	*	0	0	0	0	*	0	0	*	*	0	0	* [†]

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

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Health and Wellness for all Arizonans

Heat-Related Deaths by Month

Month of Occurrence	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
January	0	0	0	0	0	0	0	*	0	0	*	0	* [†]
February	0	0	0	0	0	0	0	*	0	0	*	0	* [†]
March	0	*	*	*	*	*	0	0	0	*	*	*	15 [†]
April	*	*	*	*	*	*	*	*	*	*	10	7	43 [†]
May	13	10	0	*	*	9	17	7	21	26	35	23	169 [†]
June	33	41	22	43	84	85	28	37	46	174	139	51	783
July	43	67	36	31	81	93	97	112	226	155	316	597	1,854
August	51	18	15	51	46	45	68	86	178	119	87	230	994
September	10	9	10	7	11	17	35	32	36	67	68	66	368
October	*	*	*	*	*	*	*	6	12	9	*	12	62 [†]
November	*	*	*	*	*	*	*	*	0	*	*	*	19 [†]
December	*	0	0	0	0	*	0	0	*	*	0	0	6 [†]

Notes: † Sum rounded to nearest tens unit due to non-zero addend less than 6;

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Health and Wellness for all Arizonans

Heat-Caused Deaths by Place of Injury

Place of Injury	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Home	21	20	9	11	39	45	39	45	91	92	124	185	721 [†]
Other Specified	63	80	31	70	100	76	75	103	194	189	204	225	1,410 [†]
Residential Institution	0	0	0	0	*	*	*	*	0	*	*	*	10 [†]
Street/Highway	*	*	*	*	*	*	*	8	10	9	19	17	80 [†]
Trade & Service Area	0	0	0	0	0	*	*	0	*	*	*	*	6 [†]
Unknown	10	*	7	6	8	9	7	7	16	15	11	31	131 [†]

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Heat-Related Deaths by Place of Injury

Place of Injury	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Home	42	35	17	23	75	89	71	84	144	173	207	331	1,291
Other Specified	87	98	63	94	138	133	142	178	314	328	388	547	2,510[†]
Residential Institution	0	0	0	0	*	*	*	*	0	*	*	*	12[†]
Street/Highway	*	*	*	*	*	6	13	13	32	26	48	47	202[†]
Trade & Service Area	0	0	0	0	0	*	*	0	*	*	*	*	14[†]
Unknown	24	14	8	19	13	36	22	12	28	24	26	61	287

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Methods

ICD-10 Codes	Description
T67.0	Heat stroke and sunstroke
T67.1	Heat syncope
T67.2	Heat cramps
T67.3	Heat exhaustion from water depletion
T67.4	Heat exhaustion from salt depletion
T67.5	Heat exhaustion, unspecified
T67.6	Heat fatigue, transient
T67.7	Heat edema
T67.8	Other specified heat effects
T67.9	Unspecified effects of heat and light
X30	Exposure to excessive natural heat

- For this report, we are exclusively using ICD-10 codes for analyses. This approach enhances standardization and comparability of our findings with other outcomes.
- Criteria adapted from Council of State & Territorial Epidemiologists (CSTE)
- Methods search entire death record for ICD-10 codes
- ICD codes related to man-made sources of heat were excluded
- Substance use codes (ICD-10) for alcohol-and drug-related deaths are defined by [ADHS Population Health and Vital Statistics Diagnostics Categories](#)