

# Heat-Related Illness Emergency Department & Inpatient Admissions (Hospitalizations) 2017-2021, Arizona Residents and Non-Residents

Heat-Related Illness by Year		
Year	Emergency Department Visit	Inpatient Admission (Hospitalization)
2017	3131	760
	<i>Of those, 2007 were heat-caused<sup>†</sup> (64.1%)</i>	<i>Of those, 283 were heat-caused<sup>†</sup> (37.2%)</i>
2018	3026	753
	<i>Of those, 1928 were heat-caused<sup>†</sup> (63.7%)</i>	<i>Of those, 250 were heat-caused<sup>†</sup> (33.2%)</i>
2019	2944	761
	<i>Of those, 1903 were heat caused<sup>†</sup> (64.6%)</i>	<i>Of those, 299 were heat-caused<sup>†</sup> (39.3%)</i>
2020	2414	894
	<i>Of those, 1401 were heat caused<sup>†</sup> (58.0%)</i>	<i>Of those, 360 were heat-caused<sup>†</sup> (40.3%)</i>
2021	2873	920
	<i>Of those, 1813 were heat caused<sup>†</sup> (63.1%)</i>	<i>Of those, 412 were heat-caused<sup>†</sup> (44.8%)</i>

<sup>†</sup>Heat-caused emergency department and inpatient visits (hospitalizations) are visits where the primary diagnosis is listed as exposure to excessive natural heat. Heat-related visits are where exposure to excessive natural heat is listed anywhere in the diagnoses and include those that were heat-caused.



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# 2017-2021, Arizona Residents and Non-Residents

Heat-Related Emergency Department Visits and Inpatient Admissions (Hospitalizations) by Resident Status					
Resident Status	2017	2018	2019	2020	2021
AZ Resident Emergency Department Visit	2745	2672	2649	2086	2514
Non-Resident Emergency Department Visit	386	354	295	328	359
AZ Resident Inpatient Admission (Hospitalization)	662	668	648	751	772
Non-Resident Inpatient Admission (Hospitalization)	98	85	113	143	148



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# Emergency Department Visits 2017-2021, Arizona Residents and Non-Residents

## Heat-Related Illness by Sex and Age Group

Sex	2017	2018	2019	2020	2021
Female	1026	971	931	714	879
Male	2105	2055	2013	1700	1994

Age Group	2017	2018	2019	2020	2021
Infants <1	6	11	8	6	9
Children 1 - 14	157	137	140	53	114
Adolescents 15-19	171	198	167	121	145
Young Adults 20-44	1447	1358	1354	1088	1298
Middle-Aged Adults 45 - 64	859	870	846	715	805
Elderly 65+	491	452	429	431	502



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# Inpatient Admissions (Hospitalizations) 2017-2021, Arizona Residents and Non-Residents

## Heat-Related Illness by Sex and Age Group

Sex	2017	2018	2019	2020	2021
Female	169	168	195	178	208
Male	591	585	566	716	712

Age Group	2017	2018	2019	2020	2021
Infants <1	0	0	<6*	6	6
Children 1 - 14	<6*	<6*	<6*	6	7
Adolescents 15-19	12	15	8	10	16
Young Adults 20-44	230	218	227	255	291
Middle-Aged Adults 45 - 64	290	281	289	360	318
Elderly 65+	226	234	233	257	282

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



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# Emergency Department Visits 2017-2021, Arizona Residents and Non-Residents

Heat-Related Illness by Race/Ethnicity					
Race/Ethnicity	2017	2018	2019	2020	2021
American Indian/Alaskan Native	124	99	108	94	116
Asian or Pacific Islander	39	34	40	24	32
Black or African American	232	215	213	165	215
Hispanic	773	817	765	575	721
White	1932	1828	1788	1526	1738
Other	31	33	30	30	51



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# Inpatient Admissions (Hospitalizations) 2017-2021, Arizona Residents and Non-Residents

Heat-Related Illness by Race/Ethnicity					
Race/Ethnicity	2017	2018	2019	2020	2021
American Indian/Alaskan Native	21	28	19	32	40
Asian or Pacific Islander	6	10	12	10	7
Black or African American	64	67	70	85	76
Hispanic	172	161	159	165	213
White	481	466	485	585	574
Other	16	21	16	17	10

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# Emergency Department Visits 2017-2021, Arizona Residents and Non-Residents

Heat-Related Illness by Month					
Month	2017	2018	2019	2020	2021
January	<6*	6	<6*	<6*	<6*
February	7	10	<6*	10	<6*
March	101	30	32	12	20
April	95	115	105	61	102
May	231	238	96	283	194
June	1080	603	518	377	890
July	809	941	968	620	789
August	508	710	859	722	540
September	227	325	306	248	285
October	52	37	40	62	29
November	13	6	15	15	16
December	<6*	<6*	<6*	<6*	<6*

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# Inpatient Admissions (Hospitalizations) 2017-2021, Arizona Residents and Non-Residents

Heat-Related Illness by Month					
Month	2017	2018	2019	2020	2021
January	<6*	<6*	0	<6*	<6*
February	<6*	<6*	0	<6*	<6*
March	15	<6*	6	<6*	<6*
April	10	23	17	20	20
May	45	47	16	56	42
June	250	124	128	101	290
July	225	271	270	310	250
August	136	193	221	304	195
September	65	80	94	80	101
October	6	<6*	8	17	10
November	<6*	<6*	<6*	0	<6*
December	<6*	0	0	<6*	0

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# Emergency Department Visits 2017-2021, Arizona Residents

Heat-Related Illness by County					
County Residence	2017	2018	2019	2020	2021
Apache	9	7	10	6	8
Cochise	53	43	47	27	32
Coconino	23	27	20	25	22
Gila	15	20	31	23	18
Graham	14	14	14	18	9
Greenlee	<6*	<6*	<6*	<6*	<6*
La Paz	20	25	10	23	37
Maricopa	1602	1492	1545	1237	1504
Mohave	174	173	136	159	180
Navajo	18	13	12	17	23
Pima	332	340	307	214	242
Pinal	191	232	224	186	189
Santa Cruz	6	6	13	<6*	13
Yavapai	55	50	46	39	60
Yuma	229	227	231	105	176

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# Emergency Department Visits 2017-2021, Arizona Residents

## Heat-Related Illness Rates by County

County Residence	2017	2018	2019	2020	2021
Apache	12.6	9.7	13.9	9.1	12.2
Cochise	42.4	34.0	36.9	21.5	25.4
Coconino	16.3	18.9	13.9	17.2	15.2
Gila	28.0	37.2	57.3	43.1	33.6
Graham	37.3	36.8	36.0	46.6	23.0
Greenlee	*	*	*	*	*
La Paz	96.4	118.9	47.0	138.7	225.5
Maricopa	37.0	33.9	34.4	27.9	33.4
Mohave	83.8	82.2	63.6	74.3	82.7
Navajo	16.5	11.8	10.8	15.9	21.3
Pima	32.3	32.8	29.3	20.5	23.0
Pinal	44.3	52.0	48.5	43.3	42.0
Santa Cruz	12.9	12.9	27.8	*	27.1
Yavapai	24.1	21.5	19.5	16.5	24.8
Yuma	109.4	107.5	107.9	51.4	85.0
<b>Arizona</b>	<b>38.9</b>	<b>37.3</b>	<b>36.3</b>	<b>29.1</b>	<b>34.6</b>

Note: Crude rates are calculated per 100,000 population. For years 2016-2019, [Vintage 2020 estimates from US Census](#) were used and for 2020-2021, [Vintage 2021 estimates from US Census](#) were used to calculate rates.

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# Inpatient Admissions (Hospitalizations) 2017-2021, Arizona Residents

Heat-Related Illness by County					
County Residence	2017	2018	2019	2020	2021
Apache	<6*	<6*	<6*	<6*	<6*
Cochise	7	7	<6*	<6*	<6*
Coconino	<6*	<6*	<6*	<6*	<6*
Gila	<6*	<6*	<6*	0	<6*
Graham	<6*	<6*	<6*	<6*	0
Greenlee	0	0	<6*	0	0
La Paz	<6*	<6*	<6*	<6*	<6*
Maricopa	462	443	433	547	504
Mohave	36	27	28	37	52
Navajo	<6*	<6*	<6*	<6*	7
Pima	63	78	83	74	94
Pinal	43	54	51	50	50
Santa Cruz	<6*	<6*	<6*	<6*	0
Yavapai	11	<6*	9	<6*	9
Yuma	25	39	24	22	41

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# Inpatient Admissions (Hospitalizations) 2017-2021, Arizona Residents

Heat-Related Illness Rates by County					
County Residence	2017	2018	2019	2020	2021
Apache	*	*	*	*	*
Cochise	5.6	5.5	*	*	*
Coconino	*	*	*	*	*
Gila	*	*	*	0.0	*
Graham	*	*	*	*	0.0
Greenlee	0.0	0.0	*	0.0	0.0
La Paz	*	*	*	*	*
Maricopa	10.7	10.1	9.6	12.3	11.2
Mohave	17.3	12.8	13.1	17.3	23.9
Navajo	*	*	*	*	6.5
Pima	6.1	7.5	7.9	7.1	8.9
Pinal	10.0	12.1	11.0	11.6	11.1
Santa Cruz	*	*	*	*	0.0
Yavapai	4.8	*	3.8	*	3.7
Yuma	11.9	18.5	11.2	10.8	19.8
<b>Arizona</b>	9.4	9.3	8.9	10.5	10.6

Note: Crude rates are calculated per 100,000 population. For years 2016-2019, [Vintage 2020 estimates from US Census](#) were used and for 2020-2021, [Vintage 2021 estimates from US Census](#) were used to calculate rates.

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# Emergency Department Visits 2017-2021, Arizona Residents and Non-Residents

## Heat-Related Illness by Comorbidity and Substance Use

Comorbidity <sup>†</sup>	2017	2018	2019	2020	2021
Obese/Overweight	44	53	53	43	51
Mental Disorders	938	893	956	780	830
Circulatory Disease	782	733	719	647	669
Respiratory Disease	253	243	239	189	213
No Comorbidity	1607	1580	1472	1172	1556
Substance Use	2017	2018	2019	2020	2021
Alcohol Use	67	64	56	63	57
Drug Use	592	546	610	509	589
Combined Alcohol and Drug Use	38	44	49	57	30
No Substance Use	2434	2372	2229	1785	2197

<sup>†</sup> More than 1 comorbidity may be listed in the visit record. All comorbidities identified in a record are represented in these yearly totals.



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# Inpatient Admissions (Hospitalizations) 2017-2021, Arizona Residents and Non-Residents

## Heat-Related Illness by Comorbidity and Substance Use

Comorbidity†	2017	2018	2019	2020	2021
Obese/Overweight	60	65	64	72	94
Mental Disorders	494	474	496	591	590
Circulatory Disease	470	467	468	567	602
Respiratory Disease	290	266	284	382	383
No Comorbidity	60	74	69	64	71
Substance Use	2017	2018	2019	2020	2021
Alcohol Use	37	38	53	49	46
Drug Use	293	280	293	377	366
Combined Alcohol and Drug Use	78	62	78	104	84
No Substance Use	352	373	337	364	424

† More than 1 comorbidity may be listed in the visit record. All comorbidities identified in a record are represented in these yearly totals.



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# Emergency Department Visits 2017-2021, Arizona Residents and Non-Residents

## Heat-Related Illness by Place of Injury and Preceding Activity

Place of Injury	2017	2018	2019	2020	2021
Industrial Site	439	408	442	380	442
Private Residence	923	1056	1005	750	950
Public Building	91	82	94	41	74
Recreational Site	120	129	88	65	92
Residential Institution	31	30	21	26	19
Street/Highway	580	516	518	481	507
Not Listed	947	805	776	671	789
Preceding Activity	2017	2018	2019	2020	2021
Exercise	7	12	<6*	12	8
Household Activities	24	28	27	13	29
Occupational	163	150	129	114	128
Recreational	359	318	323	272	275
Sports/Athletics	119	127	100	76	95
Not Listed	2459	2391	2360	1927	2338

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# Inpatient Admissions (Hospitalizations)

## 2017-2021, Arizona Residents and Non-Residents

### Heat-Related Illness by Place of Injury and Preceding Activity

Place of Injury	2017	2018	2019	2020	2021
Industrial Site	67	81	79	90	80
Private Residence	256	249	238	283	293
Public Building	22	27	25	19	18
Recreational Site	10	18	7	13	8
Residential Institution	9	8	<6*	<6*	<6*
Street/Highway	200	208	226	287	299
Not Listed	196	162	182	197	219
Preceding Activity	2017	2018	2019	2020	2021
Exercise	<6*	<6*	0	<6*	<6*
Household Activities	<6*	<6*	<6*	<6*	<6*
Occupational	44	32	22	9	14
Recreational	39	31	28	26	24
Sports/Athletics	11	12	6	7	11
Not Listed	659	673	702	846	868

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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

- Criteria adapted from Council of State & Territorial Epidemiologists (CSTE)
- Methods search entire record for ICD-10 codes
- ICD codes related to man-made sources of heat were excluded



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# Methods

ICD-10 Codes	Description
E66	Overweight and obesity
FXX	Mental, behavioral, and neurodevelopmental disorders
IXX	Diseases of the circulatory system
JXX	Diseases of the respiratory system

- ICD codes related to selected comorbidities are listed here
- Methods search entire record for ICD-10 codes
- Substance use codes (ICD-10) for alcohol-and drug-related comorbidities are defined by [ADHS Population Health and Vital Statistics Diagnostics Categories](#)



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