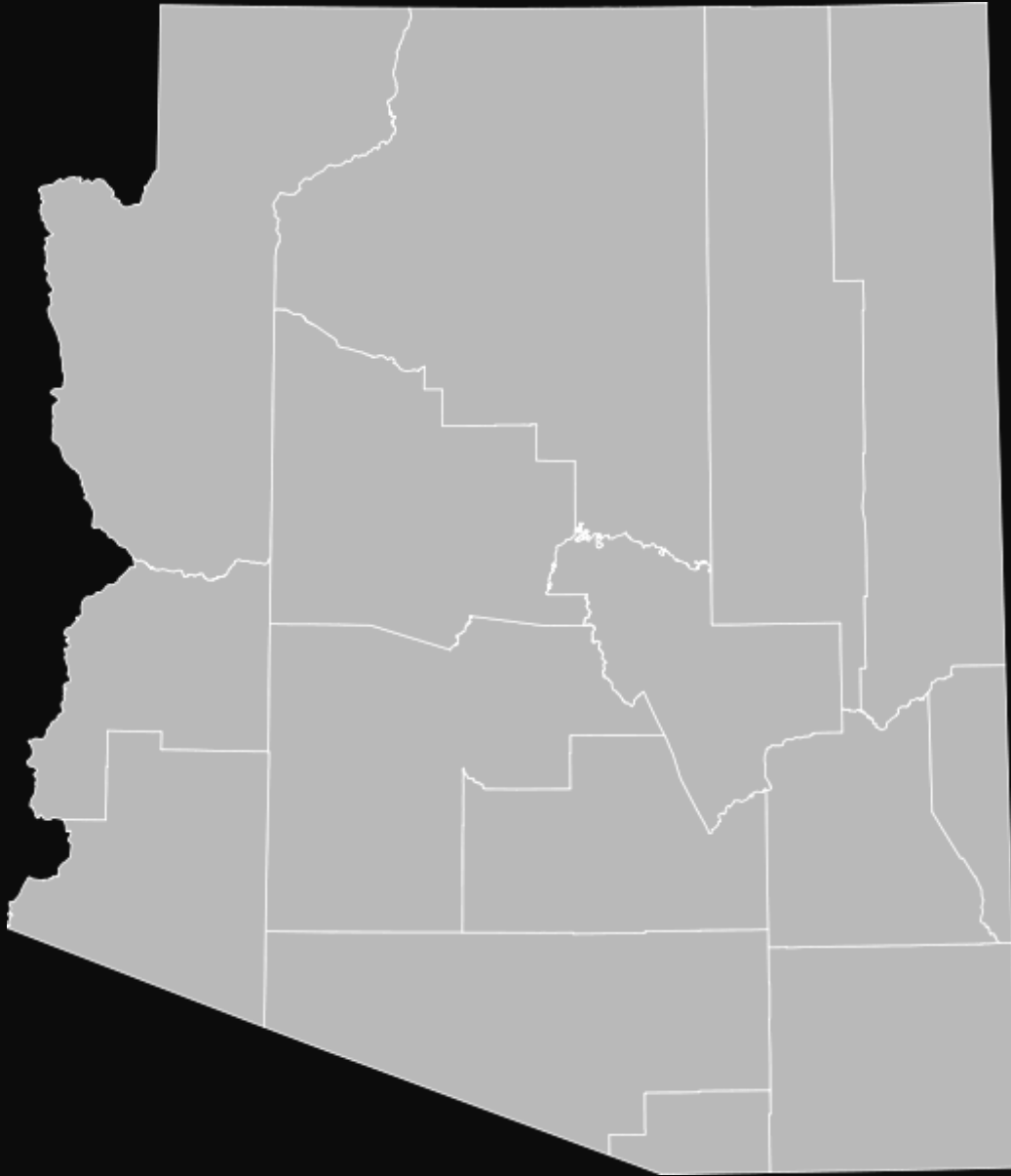


County Trauma Report

Arizona, 2016



Bureau of EMS and Trauma System

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Purpose & Methods

Purpose:

The purpose of this report is to describe traumatic injury in each of Arizona’s 15 counties using the Arizona State Trauma Registry (ASTR). The intent is to identify county-specific areas of need in order to develop and strengthen local injury prevention programs.

Methods:

In 2015, the ASTR captured 42,351 cases of traumatic injury from forty-two healthcare facilities including ten Level I trauma centers, seven Level III trauma centers, twenty-three Level IV trauma centers, and two non-designated hospitals (Appendix A.). The ASTR captures a subset of injuries that meet the trauma inclusion criteria*. For the purpose of this report trauma patients were stratified by county based on the injury location. The table below depicts the distribution of reporting healthcare facilities in each of Arizona’s 15 counties based on their level of designation:

Table 1: Distribution of reporting healthcare facilities by designation

County	Level I	Level III	Level IV	Non-Designated	Total
Apache			2		2
Cochise		1	3		4
Coconino	1	1	1		3
Gila			2		2
Graham			1		1
Greenlee					0
La Paz			1		1
Maricopa	8	4	4	1	17
Mohave		1	1		2
Navajo			2		2
Pima	1		2		3
Pinal			1		1
Santa Cruz					0
Yavapai			3		3
Yuma				1	1
Total	10	7	23	2	42

The county of injury was either missing or located outside of Arizona in 2.8% (n = 1,189) of trauma cases which were excluded from this analysis. Trauma rates were calculated per 100,000 Arizona residents using the 2015 population denominators from the Arizona Health Status and Vital Statistics database. Non-zero trauma counts less than 10 were suppressed along with their corresponding rates.

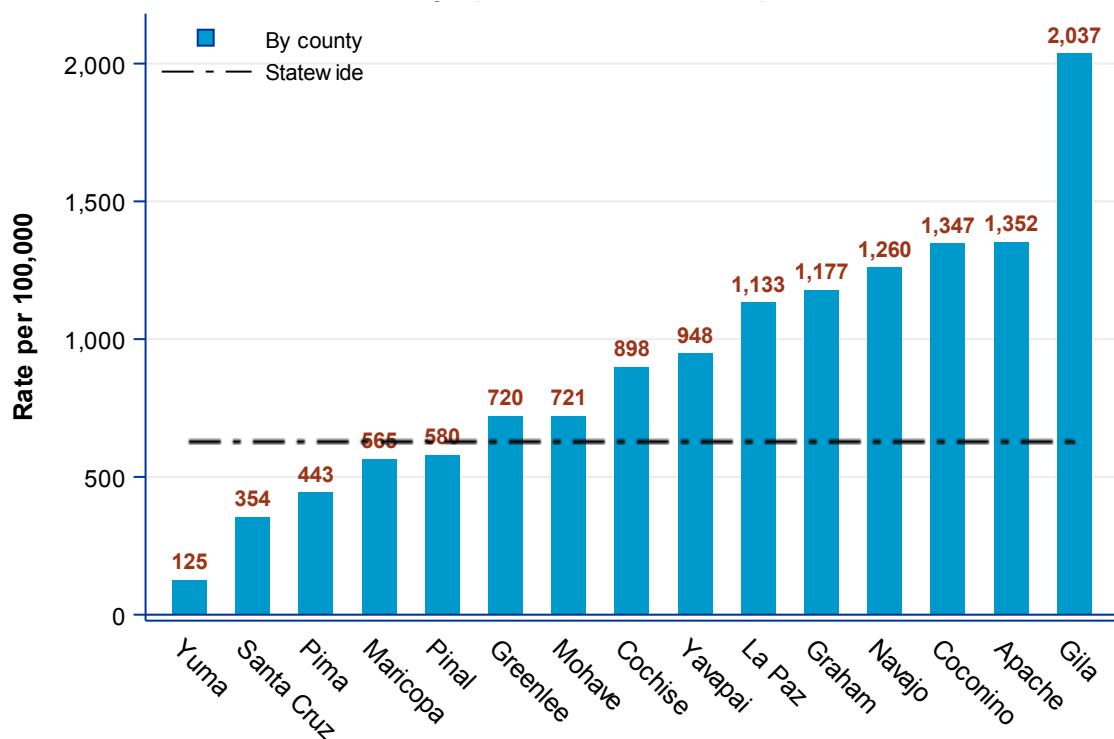
Limitations:

The data are limited to hospitals participating in the ASTR; therefore, information on patients treated at non-participating hospitals is not included. Additionally, Yuma Regional Medical Center submitted only a fraction of their trauma cases in 2015. Therefore their rate/proportion is underestimated and unreliable.

*<http://azdhs.gov/documents/preparedness/emergency-medical-services-trauma-system/data/ASTR/ast-2015-inclusion-criteria.pdf>

Trauma Rate

Figure 1: County-specific trauma rate per 100,000 Arizona residents



Data source: Arizona State Trauma Registry 2015

County-specific trauma rates were calculated based on the county of injury. In 2015, the rate of traumatic injury in Arizona was 627 per 100,000 Arizona residents. Urban counties like Maricopa, Pima and Pinal had lower trauma rates than most of the rural counties.

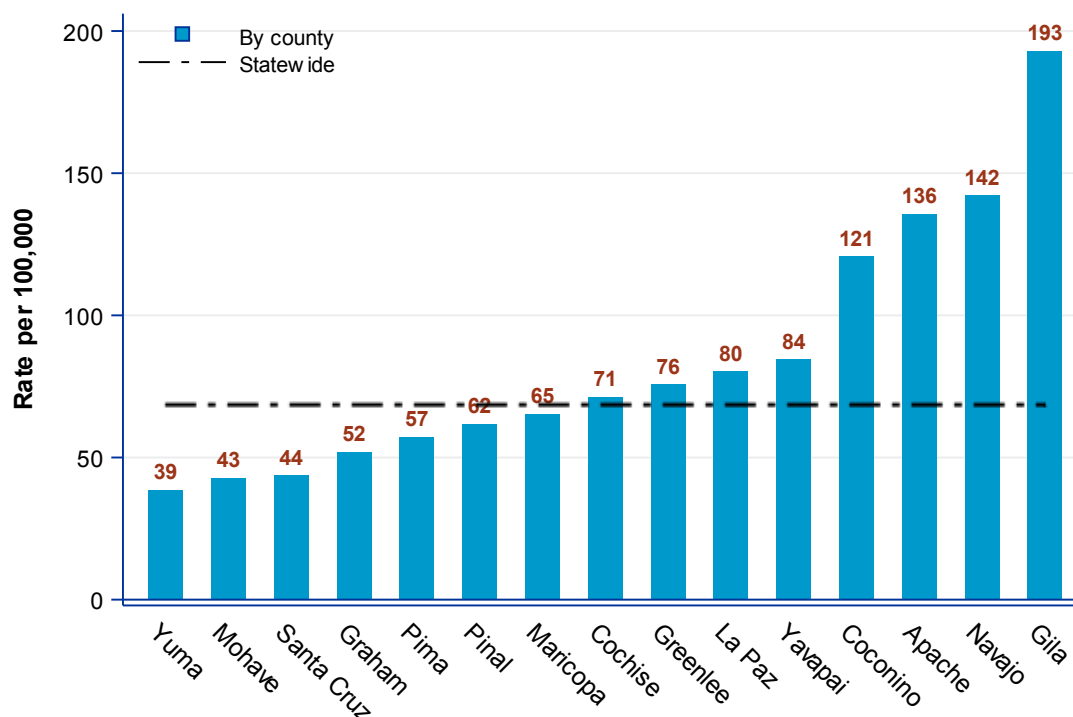
Table 2: County-specific trauma rate per 100,000 Arizona residents

Injury County	Total Trauma Cases	Rate per 100,000 (95%CI)
Yuma	268	125 [110, 140]
Santa Cruz	178	354 [302, 406]
Pima	4,470	443 [430, 456]
Maricopa	23,037	565 [558, 572]
Pinal	2,359	580 [557, 604]
Greenlee	76	720 [558, 882]
Mohave	1,484	721 [685, 758]
Cochise	1,160	898 [847, 950]
Yavapai	2,064	948 [907, 989]
La Paz	240	1,133 [990, 1,276]
Graham	453	1,177 [1,069, 1,286]
Navajo	1,382	1,260 [1,194, 1,327]
Coconino	1,907	1,347 [1,286, 1,407]
Apache	976	1,352 [1,267, 1,436]
Gila	1,108	2,037 [1,917, 2,156]

CI= Confidence interval

Severe Trauma Rate

Figure 2: County-specific severe trauma rate per 100,000 Arizona residents



Data source: Arizona State Trauma Registry 2015

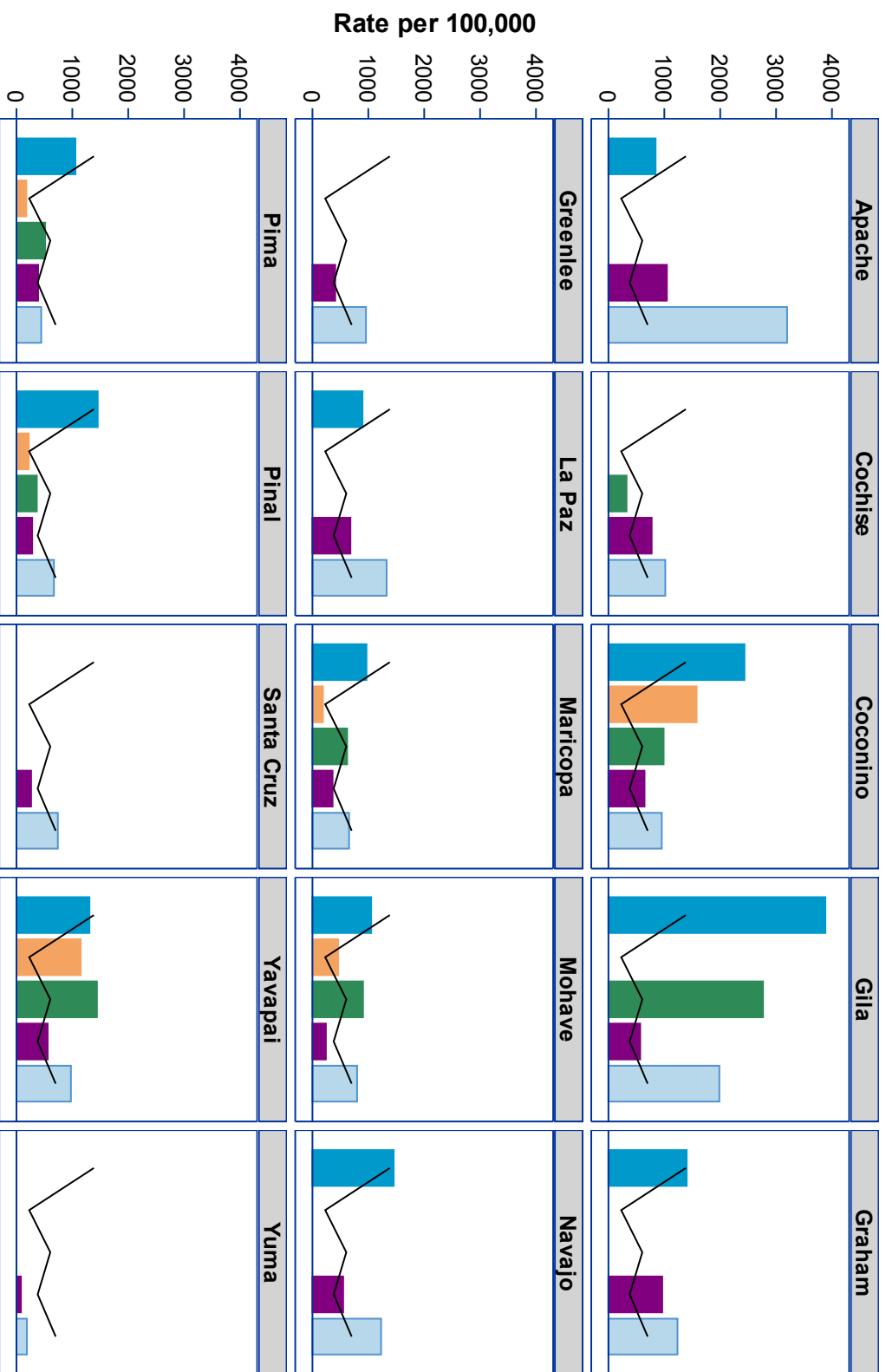
The severe trauma rate was calculated in order to remove patients with minor injuries who may have been transported to a trauma center for convenience. Severe trauma patients are defined as having an Injury Severity Score (ISS) greater than 15.

Table 3: County-specific severe trauma rate per 100,000 Arizona residents

Injury County	Total Trauma Cases with ISS>15	Rate per 100,000 (95%CI)
Yuma	83	39 [30, 47]
Mohave	88	43 [34, 52]
Santa Cruz	22	44 [25, 62]
Graham	20	52 [29, 75]
Pima	577	57 [52, 62]
Pinal	251	62 [54, 69]
Maricopa	2,664	65 [63, 68]
Cochise	92	71 [57, 86]
Greenlee	8	76 [23, 128]
La Paz	17	80 [42, 118]
Yavapai	184	84 [72, 97]
Coconino	171	121 [103, 139]
Apache	98	136 [109, 163]
Navajo	156	142 [120, 165]
Gila	105	193 [156, 230]
Statewide	4,634	69 [67, 71]

Race/Ethnicity

Figure 3: County-specific trauma rate per 100,000 Arizona residents by race/ethnicity



Data source: Arizona State Trauma Registry 2015 Trauma rates were not calculated when trauma volume was <10

Table 4: County-specific trauma rate per 100,000 Arizona residents by race/ethnicity

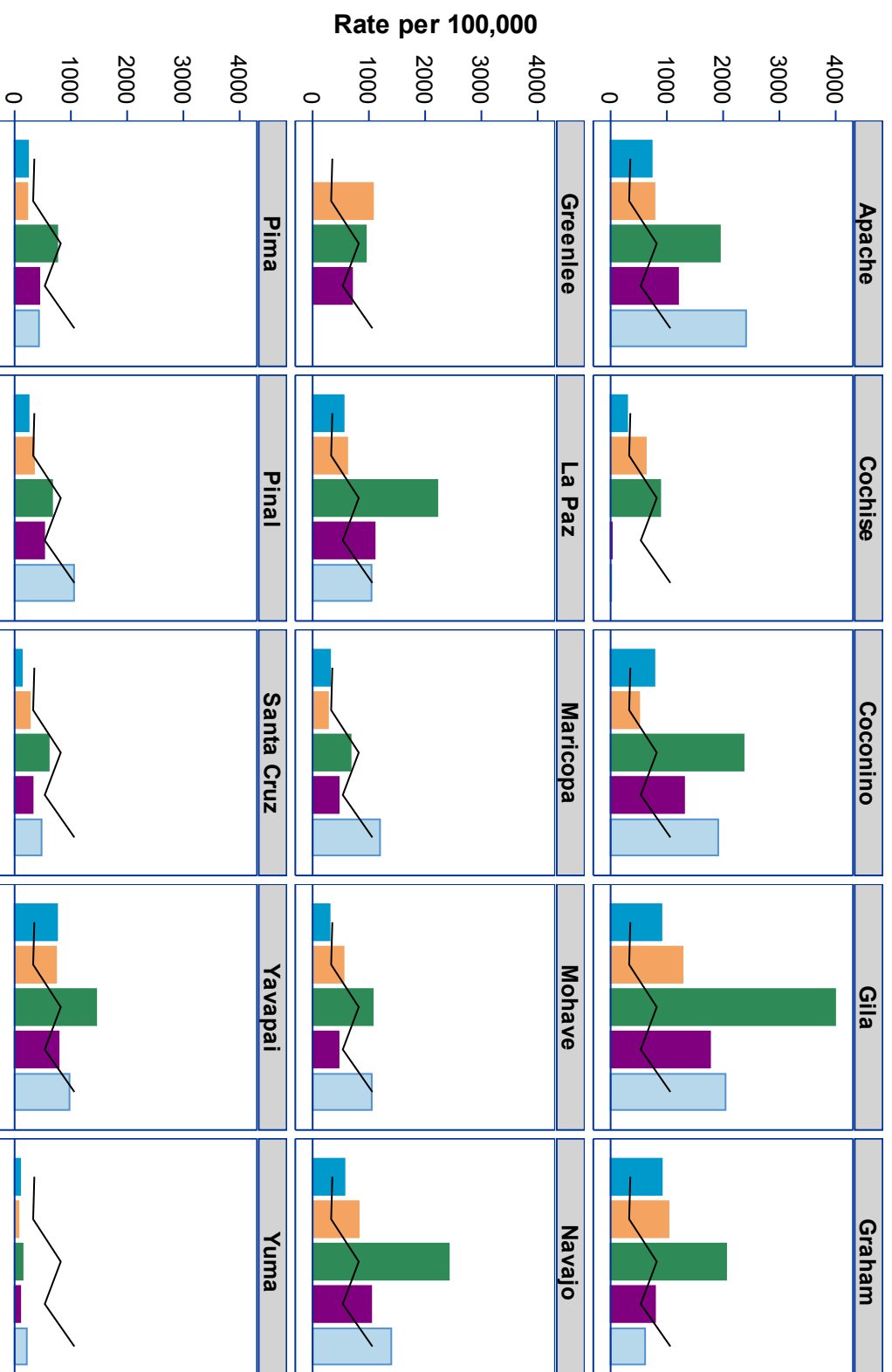
Injury county	AI/AN		Asian/PI		Black/AA		Hispanic		White	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Apache	442	844	U	U	U	U	48	1,046	449	3,197
Cochise	U	U	U	U	19	324	345	773	754	1,017
Coconino	912	2,434	44	1,578	25	987	127	646	755	954
Gila	334	3,881	U	U	13	2,766	58	568	688	1,985
Graham	70	1,399	U	U	U	U	119	962	247	1,236
Greenlee	U	U	U	U	U	U	20	407	49	957
La Paz	23	896	U	U	U	U	37	679	169	1,327
Maricopa	710	967	328	187	1,407	620	4,447	360	15,501	655
Mohave	49	1,051	14	460	27	905	78	240	1,299	799
Navajo	699	1,453	U	U	U	U	67	549	576	1,228
Pima	281	1,055	57	177	199	513	1,413	388	2,427	443
Pinal	296	1,454	20	220	71	365	335	282	1,601	671
Santa Cruz	U	U	U	U	U	U	109	262	59	741
Yavapai	48	1,306	29	1,149	32	1,440	173	559	1,739	975
Yuma	U	U	U	U	U	U	106	80	135	187
Statewide	3,976	1,385	533	228	1,866	606	7,857	380	27,093	702

U: Trauma rates are unstable and not calculated when trauma volume is <10 cases

The distribution of race/ethnicity-specific trauma rates varied by county. Statewide, American Indian/Alaska Natives had the highest rate of traumatic injury followed by White people and Black/African Americans.

Age-Specific

Figure 4: County-specific trauma rate per 100,000 Arizona residents by age



Data source: Arizona State Trauma Registry 2015. Trauma rates were not calculated when trauma volume was <10

Table 5: County-specific trauma rate per 100,000 Arizona residents by age

Injury county	<15		15-24		25-44		45-64		65+	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Apache	128	730	86	779	317	1,942	211	1,198	234	2,408
Cochise	89	293	69	625	299	881	285	21	418	10
Coconino	201	778	167	507	810	2,363	429	1,306	300	1,913
Gila	84	903	73	1,278	386	3,990	269	1,767	296	2,043
Graham	83	909	62	1,029	215	2,053	64	789	29	613
Greenlee	U	U	16	1,072	27	946	18	700	U	U
La Paz	17	551	12	615	74	2,217	57	1,102	80	1,047
Maricopa	2,640	310	1,536	272	7,562	675	4,536	464	6,763	1,198
Mohave	95	302	115	550	423	1,068	269	461	582	1,051
Navajo	144	566	127	818	586	2,421	283	1,041	242	1,398
Pima	437	238	362	226	1,810	757	1,085	439	776	433
Pinal	207	249	166	344	721	665	491	525	774	1,056
Santa Cruz	15	128	20	270	65	606	40	320	38	479
Yavapai	232	754	162	736	567	1,449	505	782	598	976
Yuma	46	98	24	69	73	141	44	99	81	217
Statewide	4,747	350	3,123	329	14,272	820	8,788	536	11,421	1,062

U: Trauma rates are unstable and not calculated when trauma volume is <10 cases

Older adults 65 and above had the highest rate of traumatic injury in Arizona followed by 25-44 year olds.

Mechanism of Injury

Figure 5: County-specific trauma rate per 100,000 Arizona residents by top six mechanisms of injury



Data source: Arizona State Trauma Registry 2015 Trauma rates were not calculated when trauma volume was <10

Table 6: County-specific trauma rate per 100,000 Arizona residents by injury mechanism

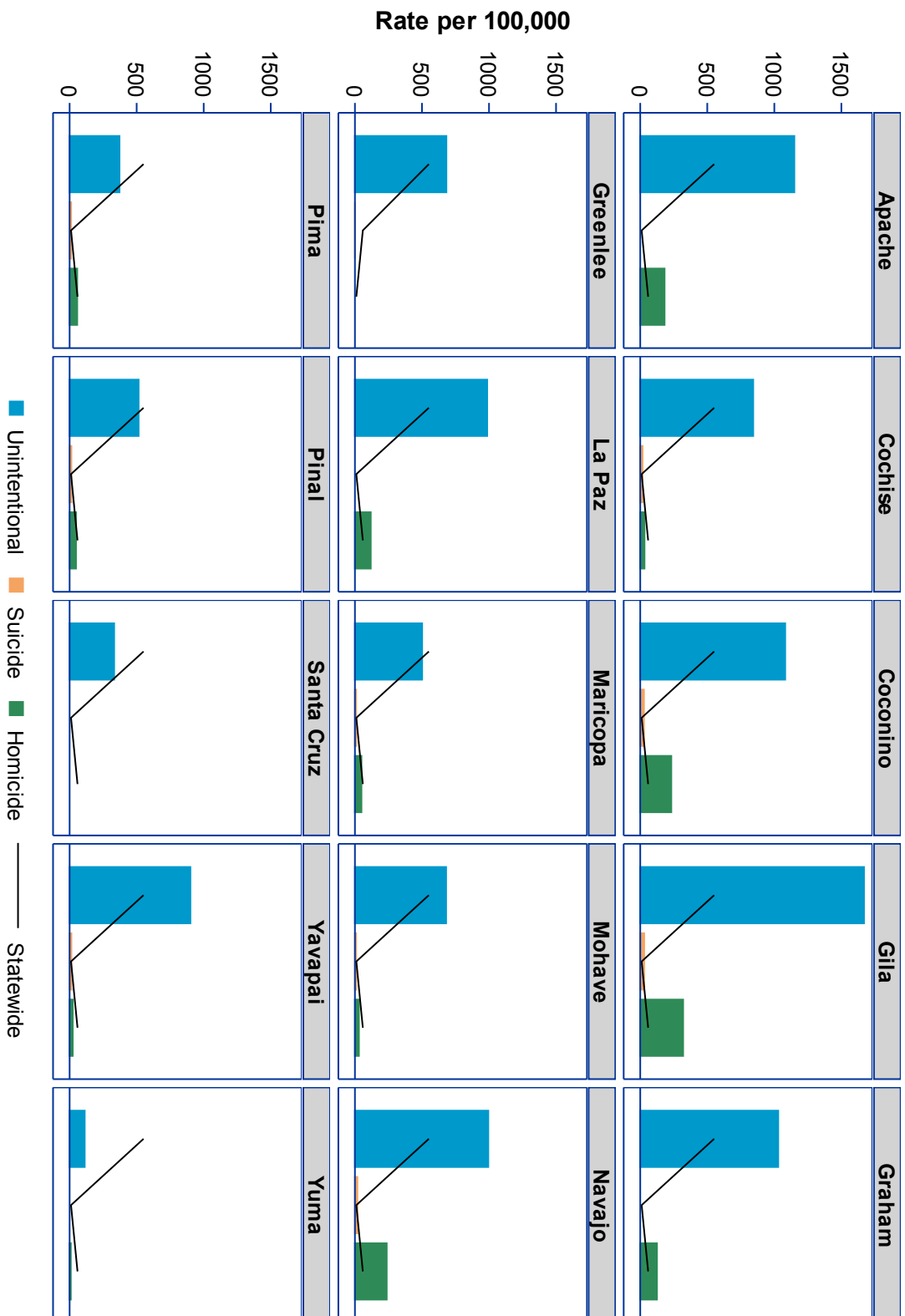
Injury county	Cut/Pierce		Fall		Firearm		MV Traffic		Other Land Transport		Struck By/Against	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Apache	46	64	409	566	22	30	208	288	84	116	116	161
Cochise	33	26	537	416	18	14	292	226	88	68	69	53
Coconino	79	56	472	333	31	22	645	456	149	105	293	207
Gila	58	107	418	768	U	U	241	443	93	171	142	261
Graham	17	44	66	172	U	U	186	483	75	195	43	112
Greenlee	U	U	13	123	U	U	26	246	23	218	U	U
La Paz	12	57	71	335	U	U	75	354	29	137	22	104
Maricopa	971	24	9,384	230	677	17	7,496	184	1,010	25	1,598	39
Mohave	20	10	614	298	22	11	507	246	147	71	56	27
Navajo	79	72	335	305	27	25	507	462	129	118	172	157
Pima	254	25	982	97	149	15	1,723	171	339	34	421	42
Pinal	85	21	1,001	246	37	9	657	162	177	44	194	48
Santa Cruz	U	U	72	143	U	U	43	86	16	32	20	40
Yavapai	45	21	721	331	35	16	747	343	235	108	105	48
Yuma	U	U	100	47	U	U	85	40	23	11	17	8
Statewide	1,733	26	15,580	231	1,053	16	13,758	204	2,787	41	3,377	50

U: Trauma rates are unstable and not calculated when trauma volume is <10 cases

Statewide, falls are the leading mechanism of trauma with 231 falls per 100,000 Arizona residents, followed by Motor Vehicle Traffic traumas. Falls and Motor Vehicle Traffic were also the top two mechanisms of trauma in most counties.

Intent of Injury

Figure 6: County-specific trauma rate per 100,000 Arizona residents by intent of injury



Data source: Arizona State Trauma Registry 2015 Trauma rates were not calculated when trauma volume was <10

Table 7: County-specific trauma rate per 100,000 Arizona residents by injury intent

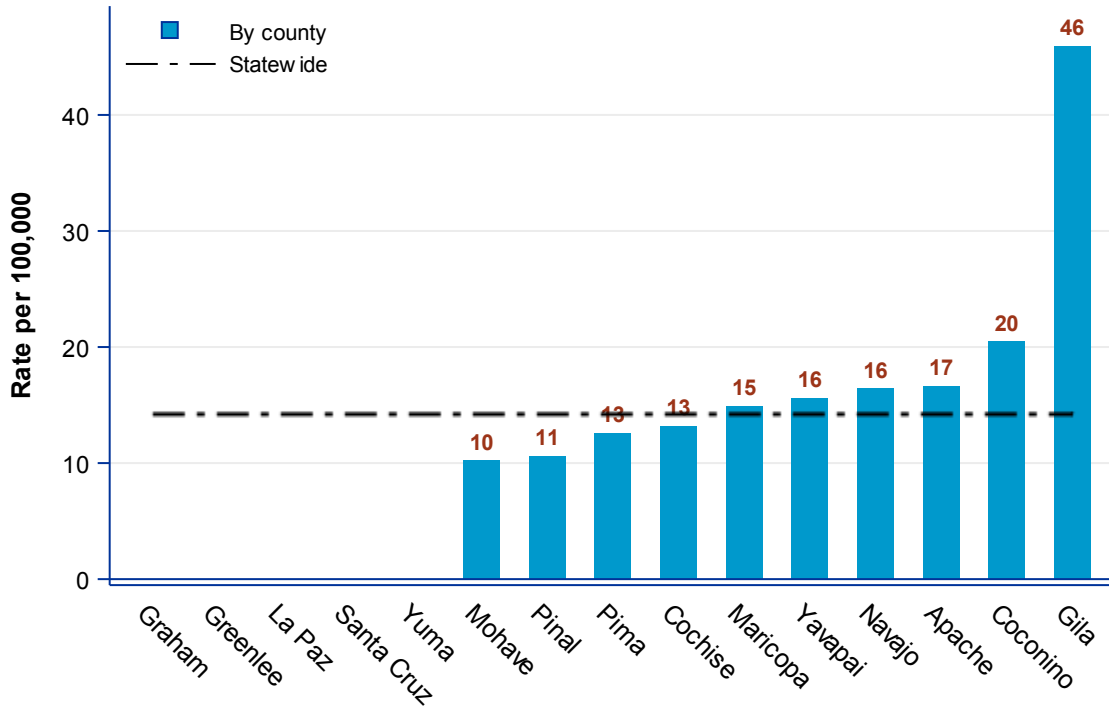
Injury county	Homicide		Suicide		Unintentional	
	N	Rate	N	Rate	N	Rate
Apache	131	181	U	U	830	1,149
Cochise	41	32	22	17	1,088	843
Coconino	328	232	39	28	1,531	1,081
Gila	174	320	16	29	908	1,669
Graham	48	125	U	U	396	1,029
Greenlee	U	U	0	0	72	682
La Paz	25	118	U	U	209	987
Maricopa	1,980	49	366	9	20,437	501
Mohave	61	30	18	9	1,399	680
Navajo	260	237	20	18	1,091	995
Pima	572	57	115	11	3,755	372
Pinal	194	48	54	13	2,092	515
Santa Cruz	U	U	U	U	167	332
Yavapai	51	23	29	13	1,962	901
Yuma	19	9	U	U	242	113
Statewide	3,976	59	702	10	37,260	551

U: Trauma rates are unstable and not calculated when trauma volume is <10 cases

In all 15 counties, the rate of Unintentional trauma was the highest followed by Homicide and Suicide.

Trauma Mortality

Figure 7: County-specific crude trauma mortality rate per 100,000 Arizona residents



Data source: Arizona State Trauma Registry 2015 Trauma fatality rates were not calculated when fatality count was <5

Statewide, the crude trauma mortality rate was 14 per 100,000 Arizona residents. The ASTR is limited to deaths that occurred within reporting healthcare facilities; therefore, these rates only show a portion of the true trauma mortality rate in Arizona.

Table 8: County-specific crude trauma mortality rate per 100,000 Arizona residents

Injury County	Total Trauma Deaths	Rate per 100,000 (95%CI)
Mohave	21	10 [6, 15]
Pinal	43	11 [7, 14]
Pima	127	13 [10, 15]
Cochise	17	13 [7, 19]
Maricopa	608	15 [14, 16]
Yavapai	34	16 [10, 21]
Navajo	18	16 [9, 24]
Apache	12	17 [7, 26]
Coconino	29	20 [13, 28]
Gila	25	46 [28, 64]
Graham	U	U
Greenlee	U	U
La Paz	U	U
Santa Cruz	U	U
Yuma	U	U
Statewide	962	14 [13, 15]

CI= Confidence interval Note: Deaths were not displayed when the count was <5 and rates were considered unstable

Trauma Charges

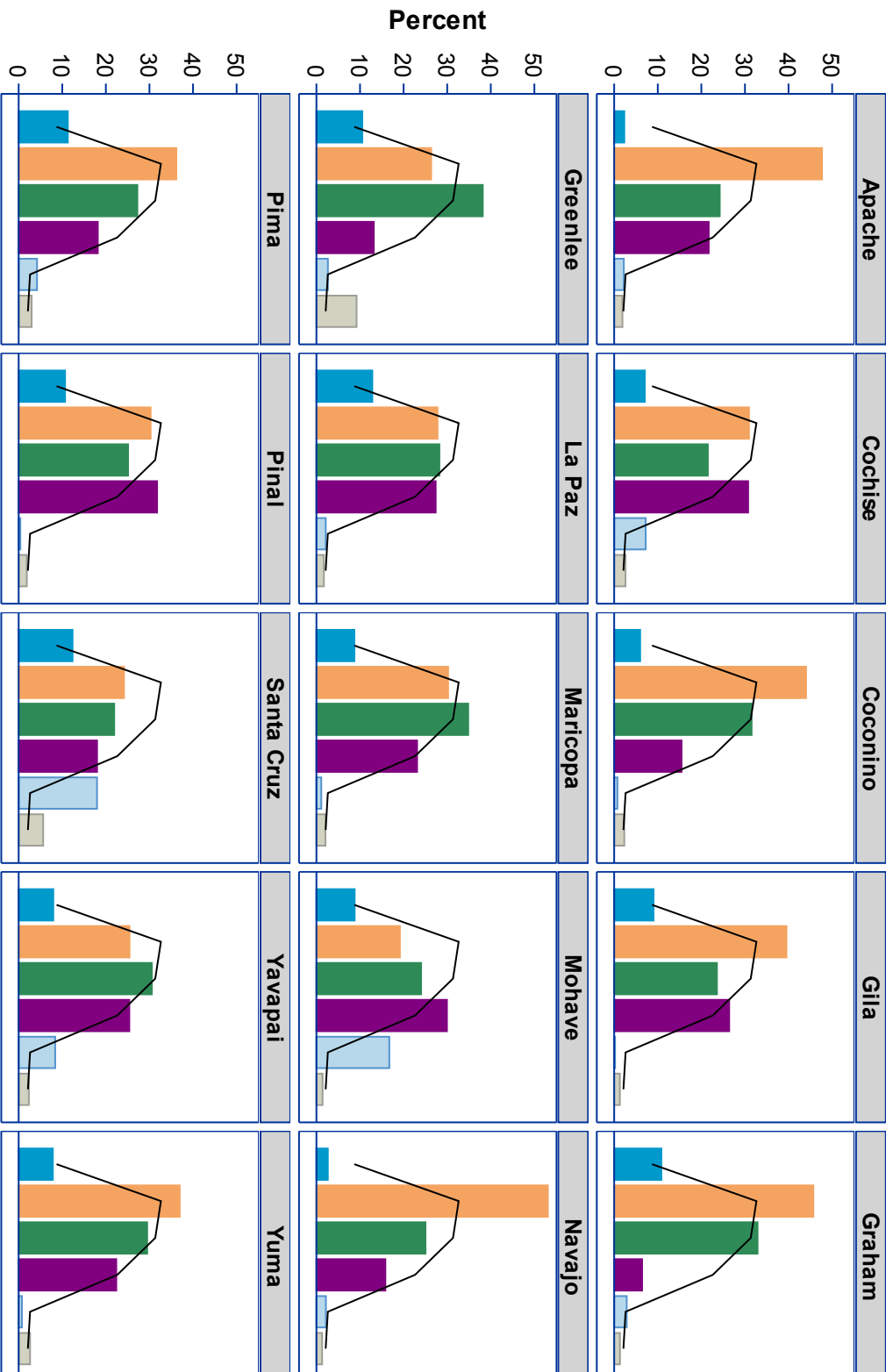
Table 9: Hospital trauma charges by county

Injury county	Total hospital charges	Median hospital charges
Apache	\$23,013,865	\$18,020
Cochise	\$28,997,164	\$14,771
Coconino	\$51,237,060	\$12,015
Gila	\$25,743,756	\$5,165
Graham	\$5,002,685	\$27,346
Greenlee	\$1,969,392	\$27,944
La Paz	\$9,930,745	\$31,173
Maricopa	\$1,029,553,546	\$26,713
Mohave	\$46,757,410	\$18,235
Navajo	\$45,202,120	\$17,204
Pima	\$173,939,591	\$19,099
Pinal	\$78,358,654	\$18,872
Santa Cruz	\$7,711,991	\$23,761
Yavapai	\$71,800,511	\$14,253
Yuma	\$18,432,141	\$32,820
Statewide	\$1,667,301,074	\$22,026

Trauma charges in Arizona totaled almost \$1.7 billion in 2015. The median hospital charge for a trauma patient was \$22,026.

Payer Source

Figure 8: Proportion of trauma cases by county and primary payer source



Data source: Arizona State Trauma Registry 2015

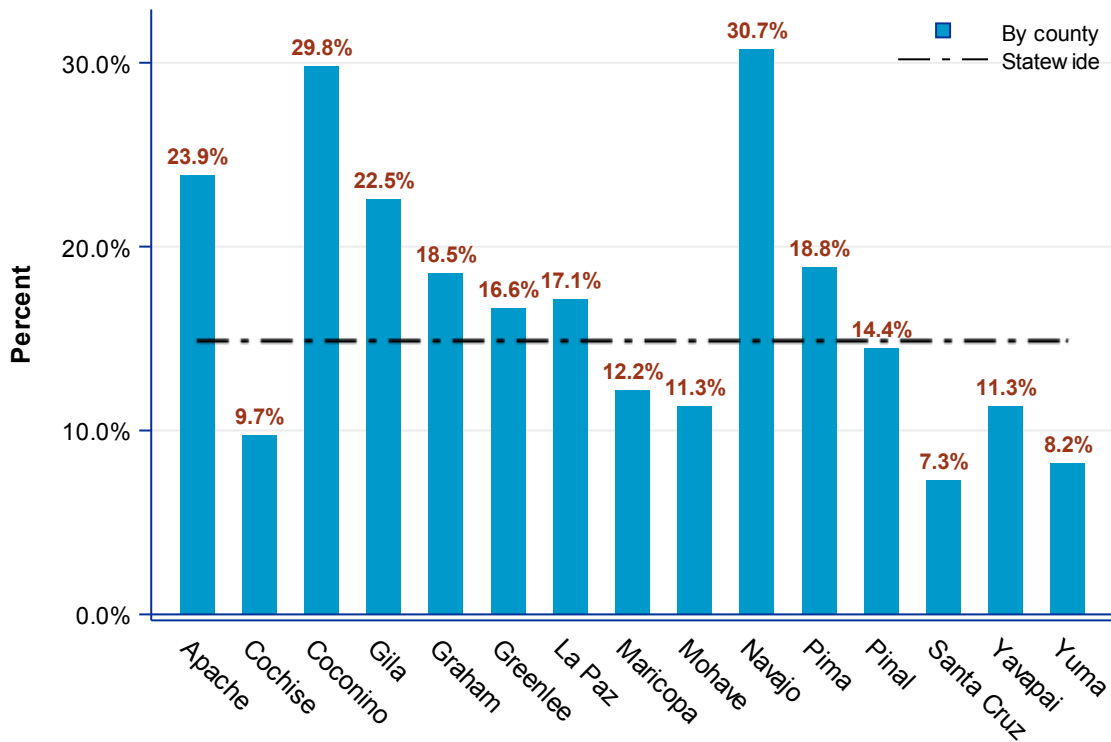
Table 10: Proportion of trauma cases by county and primary payer source

Injury county	AHCCCS/Other Government		Medicare		Other		Private		Self pay		Workers Comp	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Apache	453	47.6%	206	21.6%	21	2.2%	230	24.2%	22	2.3%	18	1.8%
Cochise	321	30.9%	319	30.7%	75	7.2%	223	21.4%	73	7.0%	27	2.6%
Coconino	835	44.0%	293	15.4%	14	0.7%	598	31.5%	113	5.9%	44	2.3%
Gila	394	39.5%	263	26.3%	2	0.2%	235	23.5%	90	9.0%	13	1.3%
Graham	207	45.6%	29	6.4%	13	2.8%	149	32.8%	49	10.8%	6	1.3%
Greenlee	20	26.3%	10	13.1%	2	2.6%	29	38.1%	8	10.5%	7	9.2%
La Paz	65	27.7%	64	27.3%	5	2.1%	66	28.2%	30	12.8%	4	1.7%
Maricopa	6,795	30.2%	5,193	23.0%	250	1.1%	7,832	34.8%	1,957	8.7%	466	2.0%
Mohave	284	19.1%	444	29.9%	248	16.7%	356	24.0%	130	8.7%	21	1.4%
Navajo	732	53.0%	218	15.8%	30	2.1%	345	25.0%	36	2.6%	18	1.3%
Pima	1,614	36.1%	810	18.1%	188	4.2%	1,215	27.2%	503	11.2%	133	2.9%
Pinal	714	30.2%	749	31.7%	9	0.3%	592	25.0%	251	10.6%	44	1.8%
Santa Cruz	43	24.1%	32	17.9%	32	17.9%	39	21.9%	22	12.3%	10	5.6%
Yavapai	522	25.4%	521	25.3%	172	8.3%	627	30.5%	163	7.9%	48	2.3%
Yuma	99	36.9%	60	22.3%	2	0.7%	79	29.4%	21	7.8%	7	2.6%
Statewide	13,544	32.6%	9,387	22.6%	1,085	2.6%	13,003	31.3%	3,607	8.6%	880	2.1%

The highest proportion of trauma charges were billed to the Arizona Health Care Cost Containment System (AHCCCS)/Other Government followed by Private insurance and Medicare.

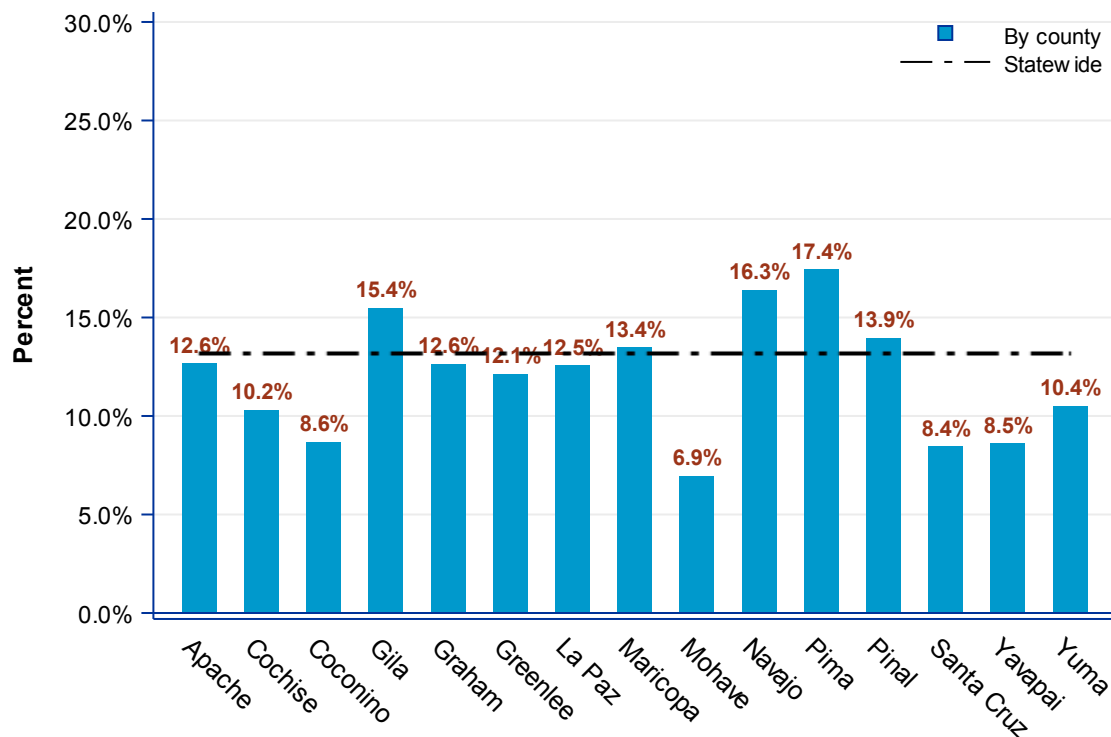
Alcohol & Drug Use

Figure 9: Confirmed/Suspected alcohol related trauma proportion by county



Data source: Arizona State Trauma Registry 2015

Figure 10: Confirmed/suspected drug related trauma proportion by county



Data source: Arizona State Trauma Registry 2015

Table 11: Proportion of confirmed/suspected drug and alcohol use by county

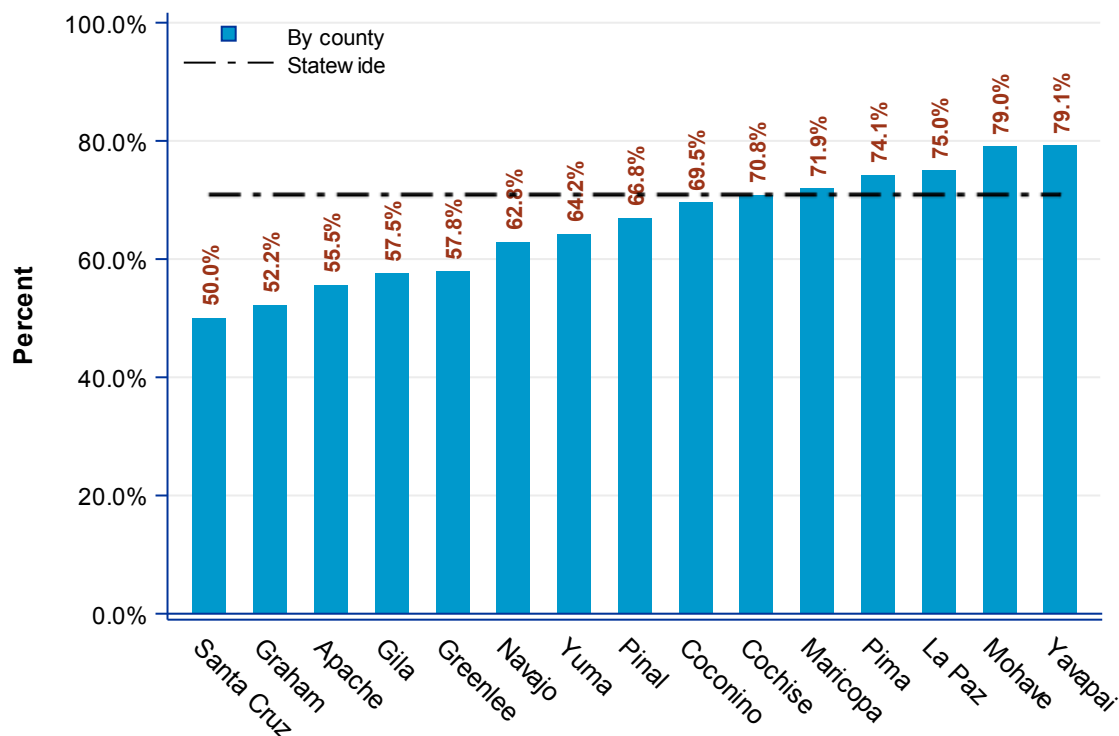
Injury county	Total trauma	Suspected/Confirmed Alcohol Use		Suspected/Confirmed Drug Use	
		N	%	N	%
Apache	976	225	23.9%	119	12.6%
Cochise	1,160	109	9.7%	115	10.2%
Coconino	1,907	567	29.8%	165	8.6%
Gila	1,108	222	22.5%	152	15.4%
Graham	453	67	18.5%	46	12.6%
Greenlee	76	11	16.6%	8	12.1%
La Paz	240	41	17.1%	30	12.5%
Maricopa	23,037	2,809	12.2%	3,102	13.4%
Mohave	1,484	168	11.3%	103	6.9%
Navajo	1,382	414	30.7%	221	16.3%
Pima	4,470	817	18.8%	755	17.4%
Pinal	2,359	339	14.4%	327	13.9%
Santa Cruz	178	13	7.3%	15	8.4%
Yavapai	2,064	234	11.3%	177	8.5%
Yuma	268	22	8.2%	28	10.4%
Statewide	42,351	6,107	14.8%	5,419	13.1%

Statewide, 14.8% of traumas involved the suspected or confirmed use of Alcohol and 13.1% of trauma involved the suspected or confirmed use of drugs.

Navajo county had the highest proportion of alcohol related trauma and Pima county had the highest proportion of drug related trauma.

Restraint Use

Figure 11: Safety restraint use among motor vehicle occupants by county



Data source: Arizona State Trauma Registry 2015

Statewide, 70.9% of trauma patients were wearing some form of safety restraint (lap belt, shoulder belt or car seat) when involved in a motor vehicle traffic accident.

Table 12: Seat belt use among motor vehicle occupants by county

Injury county	Total MV traffic occupants	Car restraint use	
		N	%
Santa Cruz	30	15	50.0%
Graham	134	70	52.2%
Apache	171	95	55.5%
Gila	179	103	57.5%
Greenlee	19	11	57.8%
Navajo	420	264	62.8%
Yuma	56	36	64.2%
Pinal	477	319	66.8%
Coconino	552	384	69.5%
Cochise	230	163	70.8%
Maricopa	5,001	3,598	71.9%
Pima	1,158	859	74.1%
La Paz	60	45	75.0%
Mohave	396	313	79.0%
Yavapai	567	449	79.1%
Statewide	9,533	6,760	70.9%

Appendix A.

