

Last Updated 3/20/2020

Goal: Estimate AZ's inpatient and ICU daily bed demand impact due to SARS-CoV-2

Findings:
 1) AZ and county-level average daily inpatient and ICU bed estimates
 2) AZ and county-level PEAK daily inpatient and ICU bed estimates
 *findings us both the **Wuhan** and the **Guangzhou** rates to create the AZ and county-level estimates

Sources:
 1) **Article:** https://dash.harvard.edu/bitstream/handle/1/42599304/JAMA20-3221_Merged_PDF.pdf?sequence=1&isAllowed=y
 2) **AZ pop data:** https://pub.azdhs.gov/health-stats/menu/info/pop/2018/110d2_18.xlsx

Points:
 1) 2018 AZ population data used, estimates are likely higher
 2) AZ and county-level estimates are based on population 15 yo and older [matches article's methods]
 2a) AZ's 15+ yo pop of 80.7% is closer to Guangzhou (82.8%) compared to Wuhan (88.2%)

Sheet Guide:
Overview- General information of the data file
Snap- Quick table glance of estimates
Slim- Greater level of supportive data, compared to **Snap** [contains rates from article used to create estimates]
Brut- Greater level of supportive data, compared to **Slim**

Reading the Table: Column K-N Number of estimated patients hospitalized due to SARS-CoV-2 [K & L hospital; M & N ICU]
 Column P-S Single PEAK estimate of patients hospitalized due to SARS-CoV-2 [P & Q hospital; R & S ICU]

Example: **cell K8** Estimates a daily average of ~ 13 patients are actively hospitalized in Graham Co related to SARS-CoV-2 [Wuhan average hospital rate estimate used] (4.35/10,000)
cell M14 Estimates a daily average of ~68 patients active in ICU in Pima Co related to SARS-CoV-2 [Wuhan average ICU rate estimate used] (0.80/10,000)
cell P8 Estimates the one-time PEAK of ~72 patients actively hospitalized in Graham Co related to SARS-CoV-2 [Wuhan PEAK hospital rate estimate used] (24.48/10,000)
cell S14 Estimates a daily average of ~1 patient active in ICU in Pima Co related to SARS-CoV-2 [Guangzhou average ICU rate estimate used] (0.01/10,000)

Last Updated 4/22/2020
 Created: 3/20/2020

*contents have not been dual-reviewed and may contain subjective or inaccurate information. Viewers are encouraged to review the available resources and provided in sheet **Brut**.

		Daily Average of Hospital & ICU Inpatient Estimate				PEAK of Hospital & ICU Inpatient Estimate			
		AZ_daily_HOSP_Ave_15+yo		AZ_daily_ICU_Ave_15+yo		AZ_PEAK_HOSP_15+yo		AZ_PEAK_ICU_15+yo	
		[Wuhan ave]	[Guangzhou ave]	[Wuhan ave]	[Guangzhou ave]	[Wuhan PEAK]	[Guangzhou PEAK]	[Wuhan PEAK]	[Guangzhou PEAK]
	Region	4.35/10,000	0.02/10,000	0.80/10,000	0.01/10,000	24.48/10,000	0.03/10,000	2.63/10,000	0.01/10,000
4	Apache	24.66	0.09	4.55	0.04	138.71	0.17	14.90	0.07
5	Cochise	46.40	0.17	8.56	0.08	260.94	0.33	28.04	0.13
6	Coconino	52.36	0.19	9.66	0.09	294.46	0.37	31.64	0.15
7	Gila	19.84	0.07	3.66	0.03	111.60	0.14	11.99	0.06
8	Graham	12.84	0.05	2.37	0.02	72.23	0.09	7.76	0.04
9	Greenlee	3.51	0.01	0.65	0.01	19.73	0.02	2.12	0.01
10	La Paz	8.17	0.03	1.51	0.01	45.96	0.06	4.94	0.02
11	Maricopa	1,493.22	5.56	275.39	2.50	8,397.74	10.56	902.24	4.17
12	Mohave	79.41	0.30	14.65	0.13	446.60	0.56	47.98	0.22
13	Navajo	38.05	0.14	7.02	0.06	213.97	0.27	22.99	0.11
14	Pima	371.27	1.38	68.47	0.62	2,087.97	2.63	224.33	1.04
15	Pinal	155.05	0.58	28.59	0.26	871.99	1.10	93.69	0.43
16	Santa Cruz	17.72	0.07	3.27	0.03	99.65	0.13	10.71	0.05
17	Yavapai	86.15	0.32	15.89	0.14	484.50	0.81	52.05	0.24
18	Yuma	77.21	0.29	14.24	0.13	434.25	0.55	46.66	0.22
19	AZ	2,485.87	9.26	458.45	4.16	13,980.30	17.58	1,502.03	6.94
20		Wuhan estimate	Guangzhou estimate	Wuhan estimate	Guangzhou estimate	Wuhan estimate	Guangzhou estimate	Wuhan estimate	Guangzhou estimate

Daily Average of Hospital & ICU Inpatient Estimate

PEAK of Hospital & ICU Inpatient Estimate

Region	AZ_daily_HOSP_Ave_15+ yo		AZ_daily_ICU_Ave_15+ yo		AZ_PEAK_HOSP_15+ yo		AZ_PEAK_ICU_15+ yo	
	[Wuhan ave]	[Guangzhou ave]	[Wuhan ave]	[Guangzhou ave]	[Wuhan PEAK]	[Guangzhou PEAK]	[Wuhan PEAK]	[Guangzhou PEAK]
Apache	24.66	0.09	4.55	0.04	138.71	0.17	14.90	0.07
Cochise	46.40	0.17	8.56	0.08	260.94	0.33	28.04	0.13
Coconino	52.36	0.19	9.66	0.09	294.46	0.37	31.64	0.15
Gila	19.84	0.07	3.66	0.03	111.60	0.14	11.99	0.06
Graham	12.84	0.05	2.37	0.02	72.23	0.09	7.76	0.04
Greenlee	3.51	0.01	0.65	0.01	19.73	0.02	2.12	0.01
La Paz	8.17	0.03	1.51	0.01	45.96	0.06	4.94	0.02
Maricopa	1,493.22	5.56	275.39	2.50	8,397.74	10.56	902.24	4.17
Mohave	79.41	0.30	14.65	0.13	446.60	0.56	47.98	0.22
Navajo	38.05	0.14	7.02	0.06	213.97	0.27	22.99	0.11
Pima	371.27	1.38	68.47	0.62	2,087.97	2.63	224.33	1.04
Pinal	155.05	0.58	28.59	0.26	871.99	1.10	93.69	0.43
Santa Cruz	17.72	0.07	3.27	0.03	99.65	0.13	10.71	0.05
Yavapai	86.15	0.32	15.89	0.14	484.50	0.61	52.05	0.24
Yuma	77.21	0.29	14.24	0.13	434.25	0.55	46.66	0.22
AZ	2,485.87	9.26	458.45	4.16	13,980.30	17.58	1,502.03	6.94

Wuhan estimate

Guangzhou estimate

Wuhan estimate

Guangzhou estimate

Wuhan estimate

Guangzhou estimate

Wuhan estimate

Guangzhou estimate

Number of estimated AZ persons **hospitalized** daily
[*includes ICU]
Using average from:

https://dash.harvard.edu/bitstream/handle/1/42599304/IAMA20-3221_Merged_PDF.pdf?sequence=1&isAllowed=y

Number of estimated AZ persons in **ICU** daily
Using average from:

https://dash.harvard.edu/bitstream/handle/1/42599304/IAMA20-3221_Merged_PDF.pdf?sequence=1&isAllowed=y

PEAK of estimated AZ persons **hospitalized** daily
[*includes ICU]
Using PEAK from:

https://dash.harvard.edu/bitstream/handle/1/42599304/IAMA20-3221_Merged_PDF.pdf?sequence=1&isAllowed=y

PEAK of estimated AZ persons in **ICU** daily
Using PEAK from:

https://dash.harvard.edu/bitstream/handle/1/42599304/IAMA20-3221_Merged_PDF.pdf?sequence=1&isAllowed=y

Region	Total	m_00_14	n_15-59	o_60_+	Prct_00_14	Prct_15_59	Prct_60_+
Apache	73330	16673	41363	15294	23%	56%	21%
Cochise	130319	23734	69074	37511	18%	53%	29%
Coconino	145564	25289	94345	25930	17%	65%	18%
Gila	54946	9362	25492	20092	17%	46%	37%
Graham	38126	8621	22291	7214	23%	58%	19%
Greenlee	10506	2446	6108	1952	23%	58%	19%
La Paz	21890	3115	8771	10004	14%	40%	46%
Maricopa	4294460	864293	2562178	867989	20%	60%	20%
Mohave	212948	30528	101317	81103	14%	48%	38%
Navajo	112746	25346	60205	27195	22%	53%	24%
Pima	1034201	181343	588931	263927	18%	57%	26%
Pinal	440591	84416	242233	113942	19%	55%	26%
Santa Cruz	52390	11688	28320	12382	22%	54%	24%
Yavapai	228970	31070	105694	92206	14%	46%	40%
Yuma	225212	47837	125460	51915	21%	56%	23%
AZ	7076199	1365761	4081782	1628656	19%	58%	23%

Reaion
 Apache
 Cochise
 Coconino
 Gila
 Graham
 Greenlee
 La Paz
 Maricopa
 Mohave
 Navajo
 Pima
 Pinal
 Santa Cruz
 Yavapai
 Yuma
 AZ

Daily Average of Hospital & ICU Estimate

AZ_daily_HOSP_Ave_15+		AZ_daily_ICU_Ave_15+	
[Wuhan ave]	[Guangzhou ave]	[Wuhan ave]	[Guangzhou ave]
24.66	0.09	4.55	0.04
46.40	0.17	8.56	0.08
52.36	0.19	9.66	0.09
19.84	0.07	3.66	0.03
12.84	0.05	2.37	0.02
3.51	0.01	0.65	0.01
8.17	0.03	1.51	0.01
1,493.22	5.56	275.39	2.50
79.41	0.30	14.65	0.13
38.05	0.14	7.02	0.06
371.27	1.38	68.47	0.62
155.05	0.58	28.59	0.26
17.72	0.07	3.27	0.03
86.15	0.32	15.89	0.14
77.21	0.29	14.24	0.13
2,485.87	9.26	458.45	4.16

PEAK of Hospital & ICU Estimate

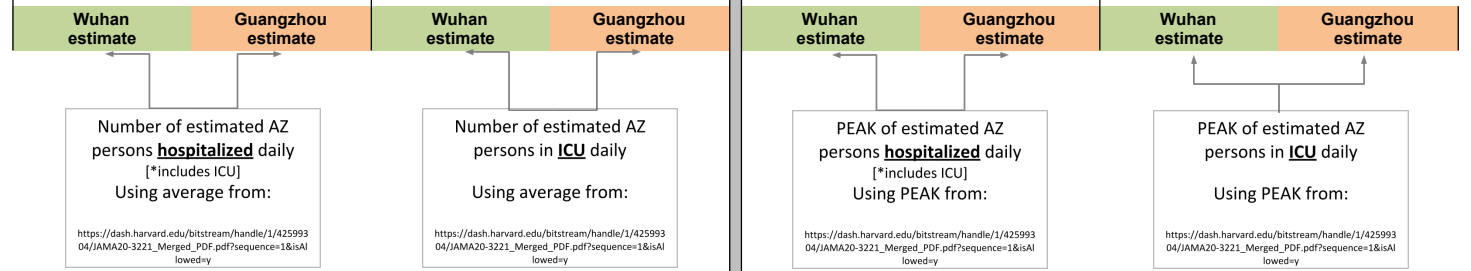
AZ_PEAK_HOSP_15+		AZ_PEAK_ICU_15+	
[Wuhan PEAK]	[Guangzhou PEAK]	[Wuhan PEAK]	[Guangzhou PEAK]
138.71	0.17	14.90	0.07
260.94	0.33	28.04	0.13
294.46	0.37	31.64	0.15
111.60	0.14	11.99	0.06
72.23	0.09	7.76	0.04
19.73	0.02	2.12	0.01
45.96	0.06	4.94	0.02
8,397.74	10.56	902.24	4.17
446.60	0.56	47.98	0.22
213.97	0.27	22.99	0.11
2,087.97	2.63	224.33	1.04
871.99	1.10	93.69	0.43
99.65	0.13	10.71	0.05
484.50	0.61	52.05	0.24
434.25	0.55	46.66	0.22
13,980.30	17.58	1,502.03	6.94

*pop data: 2018 -- https://pub.azdhs.gov/health-stats/menu/info/pop/2018/t10d2_18.xlsx

Wuhan_Pop 9,000,000	
Prct_15_+	88.16%
Pop_15_+	7,934,400
rate / 10,000	
ave_HOSP_daily_visits	3454 4.35
ave_ICU_daily_visits	637 0.80
PEAK_HOSP_daily_visits	19425 24.48
PEAK_ICU_daily_visits	2087 2.63

Guangzhou_Pop 14,900,000	
Prct_15_+	82.82%
Pop_15_+	12,340,180
rate / 10,000	
ave_HOSP_daily_visits	20 0.02
ave_ICU_daily_visits	9 0.01
PEAK_HOSP_daily_visits	38 0.03
PEAK_ICU_daily_visits	15 0.01

*https://dash.harvard.edu/bitstream/handle/1/42599304/JAMA20-3221_Merged_PDF.pdf?sequence=1&isAllowed=y



Region	Total	c1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+	a_00-09	b_10-19	c_20-29	d_30-39	e_40-49	f_50-59	g_60-69	h_70-79	i_80+	m_00_14	n_15-59	o_80+	Prct_00_14	Prct_15_59	Prct_60+	AZ_daily_HOSP_Ave_15+		AZ_daily_ICU_Ave_15+		AZ_PEAK_HOSP_15+		AZ_PEAK_ICU_15+	
																																				[Wuhan ave]	[Guangzhou ave]	[Wuhan ave]	[Guangzhou ave]	[Wuhan PEAK]	[Guangzhou PEAK]	[Wuhan PEAK]	[Guangzhou PEAK]
Apache	73330	1084	4010	5638	5941	5770	4979	5036	4335	3936	3853	3982	4614	4858	4391	3635	2850	2029	1314	1075	10732	11711	10015	8271	7835	9472	8026	4879	2389	16673	41363	15294	23%	56%	21%	24.66	0.09	4.55	0.04	138.71	0.17	14.90	0.07
Cochise	130319	1541	6369	7858	7966	8154	7564	8328	7803	7713	6533	6740	7569	8670	8895	8895	7654	5544	3493	3030	15768	16120	15892	15516	13273	16239	17790	13198	6523	23734	69074	37511	19%	53%	29%	46.40	0.17	8.56	0.08	260.94	0.33	28.04	0.13
Cocconino	145564	1664	6581	8488	8556	14090	20025	11375	9108	8408	7481	7432	7737	8689	8351	6685	4610	2977	1764	1543	16733	22646	31400	17516	14913	16426	15036	7587	3307	25289	94345	25930	17%	65%	18%	52.36	0.19	9.96	0.09	294.46	0.37	31.64	0.15
Gila	54946	607	2575	3153	3027	2820	2622	2813	2578	2474	2165	2688	3236	4096	4615	4770	4247	3004	1859	1597	6335	5847	5435	5052	4853	7332	9385	7251	3456	9362	25402	20092	17%	46%	37%	19.84	0.07	3.66	0.03	111.60	0.14	11.99	0.06
Graham	38126	576	2237	2943	2865	3003	2718	2964	2621	2579	2298	2184	1945	1979	1953	1722	1311	955	660	613	5756	5868	5682	5200	4482	3924	3675	2266	1273	8621	22291	7214	23%	58%	19%	12.84	0.05	2.37	0.02	72.23	0.09	7.76	0.04
Greenlee	10506	167	637	824	818	736	666	750	764	764	613	594	620	601	594	457	309	218	164	210	1628	1554	1416	1528	1207	1221	1051	527	374	2446	6108	1952	23%	58%	19%	3.51	0.01	0.65	0.01	19.73	0.02	2.12	0.01
La Paz	21890	225	863	982	1065	947	933	1041	894	894	793	886	976	1407	1394	1831	2344	2130	1354	951	2050	2012	1974	1788	1679	2383	3225	4474	2305	3115	6771	10004	14%	40%	46%	8.17	0.03	1.51	0.01	45.96	0.06	4.94	0.02
Maricopa	4294460	54993	224741	287092	297467	289379	284123	324219	297723	288409	270378	280414	265983	261550	231536	205838	166968	113447	74672	75528	566826	586846	608342	586132	550792	527533	437374	280415	150200	864293	2562178	867989	20%	60%	20%	1,493.22	5.56	275.39	2.50	8,397.74	10.56	902.24	4.17
Mohave	122948	1836	7467	10252	10973	10470	9665	11351	10218	9773	9322	10988	13142	16388	17951	19034	17380	12822	7844	6072	19555	21443	21016	19991	20310	29530	36985	30202	13916	30528	101317	81103	14%	48%	38%	79.41	0.30	14.65	0.13	446.60	0.56	47.98	0.22
Navajo	112746	1558	6423	8619	8746	7970	6699	7931	6258	6070	5788	6025	6678	7386	7343	6779	5312	3735	2168	1858	16600	16716	14030	12128	11813	14064	14122	9047	4026	25346	69205	27195	22%	53%	24%	38.05	0.14	7.02	0.06	213.97	0.27	22.99	0.11
Pima	1034029	11600	47964	60336	61443	69656	91121	69528	60398	61100	56955	57170	58652	65241	65095	61841	51920	36056	23985	25030	119900	113099	100449	121498	113225	123903	126396	87976	49015	181343	589931	263927	18%	57%	29%	371.27	1.38	68.47	0.62	2,087.97	2.63	224.33	1.04
Pinal	440591	4638	20991	28892	28995	26837	24704	28572	29503	30148	27460	25533	23876	25600	26526	28386	25444	17003	9503	7080	54521	56732	53276	59651	52993	49476	54912	42447	16583	84416	242233	113942	19%	55%	26%	155.05	0.58	28.59	0.26	871.99	1.10	93.69	0.43
Santa Cruz	52390	709	2914	3924	4141	4134	3533	2992	2654	2853	2768	3043	3111	3232	3282	2898	2442	1725	1055	980	7547	8275	6525	5507	5811	6343	6180	4167	2035	11688	28320	12382	22%	54%	24%	17.72	0.07	3.27	0.03	99.65	0.13	10.71	0.05
Yavapai	228970	1889	7780	10253	11148	11523	10346	10825	10115	10161	9837	11300	13591	17986	21793	23019	19201	12967	7996	7230	39022	22671	21171	20286	21337	31577	44812	32168	15226	31070	105694	92206	14%	46%	40%	86.15	0.32	15.89	0.14	484.50	0.61	52.05	0.24
Yuma	225212	3224	13119	15731	15763	15869	18138	16658	14414	12829	11456	11787	11698	11582	10076	10208	10484	8059	6221	5267	32984	31652	35786	27343	23042	23180	20884	18543	11488	47637	125460	51915	21%	56%	23%	77.21	0.29	14.24	0.13	434.25	0.55	46.66	0.22
AZ																														1365761	4081782	1628656	19%	58%	23%	2,485.87	9.26	458.45	4.16	13,980.30	17.58	1,602.03	6.94

Wuhan_Pop	9,000,000
Prct_15_+	88.16%
Pop_15_+	7,934,400
	rate / 10,000
ave_HOSP_daily_visits	3454 4.35
ave_ICU_daily_visits	637 0.80
PEAK_HOSP_daily_visits	18425 24.48
PEAK_ICU_daily_visits	2087 2.63

Guangzhou_Pop	14,900,000
Prct_15_+	82.82%
Pop_15_+	12,340,180
	rate / 10,000
ave_HOSP_daily_visits	20 0.02
ave_ICU_daily_visits	9 0.01
PEAK_HOSP_daily_visits	38 0.03
PEAK_ICU_daily_visits	15 0.01