

Opioid Death Rate during 2010-2016 in **States and District of Columbia (DC) that Legalized Marijuana** during Those Years and **States that, as of September 2016, Had Not.**

Data Source: CDC WONDER

Green data, pages 1-2: Legalizing States + DC
Black data, pages 3-4: Non-Legalizing States

LEGALIZING JURISDICTIONS

19 States + DC that Legalized Marijuana between January 2010 and September 2016

Alaska, Arizona, Colorado, Connecticut, Delaware, District of Columbia (DC), Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Washington

Year	Annual Death Rate Age-Adjusted	95% Confidence Interval
2010	8.351	8.201-8.500
2011	8.976	8.822-9.131
2012	9.314	9.156-9.473
2013	9.936	9.773-10.099
2014	11.237	11.064- 11.411
2015	13.405	13.215-13.593
2016	18.215	17.994-18.436

Month Year	State or DC ^	Type of Legalization^	Population ^^	Opioid Deaths ***	Death Rate Non-Age-Adjusted	Death Rate Months Equalized†	Death Rate Joinpoint Regression~	Joinpoint, AAPC*, and p-Value	Change from January 2010^^^		
Jan., 2010	NJ	Medicinal	144,384,393	1,060	0.734	0.720	0.702	↑ AAPC = 4.54 p < 0.0001	0		
Feb., 2010			144,468,709	978	0.677	0.735	0.705		0.003		
Mar., 2010			144,552,946	1,118	0.773	0.759	0.707		0.005		
Apr., 2010			144,637,104	1,003	0.693	0.703	0.710		0.008		
May, 2010			144,721,186	1,082	0.748	0.734	0.713		0.011		
Jun., 2010			144,805,193	988	0.682	0.692	0.715		0.013		
Jul., 2010			144,889,127	980	0.676	0.664	0.718		0.016		
Aug., 2010			144,972,989	973	0.671	0.659	0.721		0.019		
Sep., 2010			145,056,781	938	0.647	0.656	0.724		0.022		
Oct., 2010			145,140,504	1,028	0.708	0.695	0.726		0.024		
Nov., 2010			AZ	Medicinal	145,224,160	1,062	0.731		0.741	0.729	0.027
Dec., 2010					145,307,751	1,082	0.745		0.731	0.732	0.030
Jan., 2011	DC	Medicinal	145,391,278	1,102	0.758	0.744	0.735	0.033			
Feb., 2011			145,474,742	1,140	0.784	0.851	0.737	0.035			
Mar., 2011			145,558,146	1,156	0.794	0.779	0.740	0.038			
Apr., 2011			145,641,491	1,123	0.771	0.782	0.743	0.041			
May, 2011			145,724,778	1,089	0.747	0.733	0.746	0.044			
Jun., 2011			145,808,009	1,040	0.713	0.723	0.749	0.047			
Jul., 2011			145,891,185	1,215	0.833	0.817	0.751	0.049			
Aug., 2011			145,974,309	1,109	0.760	0.745	0.754	0.052			
Sep., 2011			146,057,381	1,065	0.729	0.739	0.757	0.055			
Oct., 2011			146,140,403	1,099	0.752	0.738	0.760	0.058			
Nov., 2011			146,223,378	1,114	0.762	0.772	0.763	0.061			
Dec., 2011			146,306,306	1,039	0.710	0.697	0.766	0.064			
Jan., 2012	146,389,188	1,179	0.805	0.792	0.769	0.067					
Feb., 2012	146,472,027	1,176	0.803	0.844	0.772	0.070					
Mar., 2012	146,554,825	1,137	0.776	0.763	0.775	0.073					
Apr., 2012	146,637,582	1,043	0.711	0.723	0.777	0.075					
May, 2012	146,720,300	1,140	0.777	0.764	0.780	0.078					
Jun., 2012	CT	Medicinal	146,802,981	1,144	0.779	0.792	0.783	0.081			
Jul., 2012			MA	Medicinal	146,885,627	1,136	0.773	0.761	0.786	0.084	
Aug., 2012	146,968,238	1,173			0.798	0.785	0.789	0.087			
Sep., 2012	147,050,817	1,089	0.741	0.753	0.792	0.090					
Oct., 2012	147,133,365	1,145	0.778	0.766	0.795	0.093					
Nov., 2012	CO	Recreational	147,215,884	1,153	0.783	0.796	0.798	0.096			
Dec., 2012			WA	Med & Rec**	147,298,375	1,197	0.813	0.800	0.801	0.099	
Jan., 2013	147,380,840	1,200			0.814	0.799	0.804	0.102			
Feb., 2013	147,463,281	1,206	0.818	0.888	0.807	0.105					

Legalizing Data Table continued from prior page

Mar., 2013			147,545,698	1,316	0.892	0.875	0.810		
Apr., 2013			147,628,094	1,215	0.823	0.834	0.814		0.112
May, 2013			147,710,470	1,211	0.820	0.804	0.817		0.115
Jun., 2013			147,792,827	1,212	0.820	0.831	0.820		0.118
Jul., 2013	NH	Medicinal	147,875,168	1,175	0.795	0.780	0.823		0.121
Aug., 2013			147,957,494	1,222	0.826	0.810	0.826		0.124
Sep., 2013			148,039,806	1,197	0.809	0.820	0.829	Joinpoint 1	0.127
Oct., 2013			148,122,106	1,220	0.824	0.808	0.840		0.138
Nov., 2013			148,204,396	1,243	0.839	0.850	0.852		0.150
Dec., 2013			148,286,676	1,332	0.898	0.881	0.863		0.161
Jan., 2014	IL	Medicinal	148,368,950	1,444	0.973	0.955	0.875		0.173
Feb., 2014			148,451,217	1,370	0.923	1.003	0.887		0.185
Mar., 2014			148,533,481	1,467	0.988	0.969	0.899		0.197
Apr., 2014			148,615,742	1,203	0.809	0.821	0.911		0.209
May, 2014			148,698,002	1,357	0.913	0.895	0.924		0.222
Jun., 2014			148,780,262	1,371	0.921	0.934	0.936		0.234
Jul., 2014	MN, NY	Medicinal	148,862,525	1,384	0.930	0.912	0.949		0.247
Aug., 2014			148,944,791	1,369	0.919	0.902	0.962		0.260
Sep., 2014			149,027,063	1,319	0.885	0.897	0.975		0.273
Oct., 2014	MD	Medicinal	149,109,341	1,481	0.993	0.975	0.988	AAPC = 16.32 p < 0.0001	0.286
Nov., 2014			149,191,628	1,405	0.942	0.955	1.002		0.300
Dec., 2014			149,273,924	1,527	1.023	1.004	1.015		0.313
Jan., 2015			149,356,233	1,636	1.095	1.075	1.029		0.327
Feb., 2015	AI	Med & Rec**	149,438,554	1,526	1.021	1.109	1.043		0.341
Mar., 2015	DC	Recreational	149,520,890	1,677	1.122	1.100	1.057		0.355
Apr., 2015	GA	Medicinal	149,603,242	1,670	1.116	1.132	1.072		0.370
May, 2015			149,685,613	1,668	1.114	1.093	1.086		0.384
Jun., 2015			149,768,002	1,552	1.036	1.051	1.101		0.399
Jul., 2015			149,850,413	1,701	1.135	1.114	1.116		0.414
Aug., 2015			149,932,846	1,702	1.135	1.114	1.131		0.429
Sep., 2015			150,015,303	1,716	1.144	1.160	1.146		0.444
Oct., 2015	OR	Recreational	150,097,786	1,790	1.193	1.170	1.162	Joinpoint 2	0.460
Nov., 2015			150,180,296	1,664	1.108	1.123	1.194		0.492
Dec., 2015			150,262,835	1,623	1.080	1.060	1.228		0.526
Jan., 2016			150,345,405	1,840	1.224	1.204	1.262		0.560
Feb., 2016			150,428,006	2,096	1.393	1.465	1.297		0.595
Mar., 2016			150,510,641	2,281	1.516	1.491	1.333		0.631
Apr., 2016	PA	Medicinal	150,593,311	2,301	1.528	1.553	1.370		0.668
May, 2016			150,676,018	2,171	1.441	1.418	1.409	AAPC = 33.45 p < 0.0001	0.707
Jun., 2016	OH, OK	Medicinal	150,758,763	2,071	1.374	1.397	1.448		0.746
Jul., 2016			150,841,548	2,431	1.612	1.586	1.488		0.786
Aug., 2016	DL, FL	Medicinal	150,924,374	2,232	1.479	1.455	1.530		0.828
Sep., 2016			151,007,243	2,288	1.515	1.540	1.572		0.870
Oct., 2016			151,090,157	2,436	1.612	1.586	1.616		0.914
Nov., 2016			151,173,117	2,415	1.598	1.624	1.661		0.959
Dec., 2016			151,256,125	2,553	1.688	1.661	1.708		1.006

Increase in December 2016 of Joinpoint Regression relative to Non-Legalizing States **52%**
 ^^^Area Under Regression Curve above January 2010 Death Rate 20.855
 % of Total Area Under Regression Curve † **73%**

^ According to Wikipedia **Medicinal and recreational *AAPC-average annual percent change

^^ Monthly values determined from annual rates via 3^o polynomial regression, with annual rate assumed to be July

*** IDC-10 Codes X40-44,X60-64,Y10-14 + T40.0-40.4,40.6; excludes non-opioid T40.4 cocaine, T40.7 cannabis, T40.8 LSD and T40.8 other non-narcotic psychodysleptics/hallucinogens

† Month days were converted from 28, 29 (leap year), 30 and 31 days, depending on the month, to 30.4167-day intervals for non-leap years and 30.5-day intervals for leap years

~ Weighted least-squares method, logarithmic transformation, and constant variance

NON-LEGALIZING JURISDICTIONS

**24 Control States that, as of September 2016,
had Not Legalized Marijuana**

Alabama, Arkansas, Delaware, Florida, Idaho, Indiana,
Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri,
Nebraska, North Carolina, North Dakota, South Carolina,
South Dakota, Tennessee, Texas, Utah, Virginia,
West Virginia, Wisconsin, Wyoming

Green data, pages 1-2: Legalizing States + DC
Black data, pages 3-4: Non-Legalizing States

Year	Annual Death Rate Age-Adjusted	95% Confidence Interval
2010	8.169	8.008-8.329
2011	8.454	8.209-8.616
2012	8.079	7.921-8.236
2013	8.336	8.176-8.496
2014	9.336	9.167-9.505
2015	10.590	10.41-10.770
2016	13.241	13.041-13.441

Month Year	Population ^^	Opioid Deaths ***	Death Rate Non-Age-Adjusted	Death Rate Months Equalized†	Death Rate Joinpoint Regression~	Joinpoint, AAPC*, and p-Value	Change from January 2010^^
Jan., 2010	127,172,311	902	0.709	0.696	0.676		0
Feb., 2010	127,289,267	900	0.707	0.768	0.676		0.000
Mar., 2010	127,405,967	928	0.728	0.715	0.676		0.000
Apr., 2010	127,522,407	843	0.661	0.670	0.676		0.000
May, 2010	127,638,582	823	0.645	0.633	0.675		0.000
Jun., 2010	127,754,487	811	0.635	0.644	0.675		0.000
Jul., 2010	127,870,118	826	0.646	0.634	0.675		0.000
Aug., 2010	127,985,470	804	0.628	0.616	0.675		-0.001
Sep., 2010	128,100,538	798	0.623	0.632	0.675		-0.001
Oct., 2010	128,215,317	837	0.653	0.641	0.675		-0.001
Nov., 2010	128,329,803	813	0.634	0.642	0.675		-0.001
Dec., 2010	128,443,991	878	0.684	0.671	0.675		-0.001
Jan., 2011	128,557,876	904	0.703	0.690	0.675		-0.001
Feb., 2011	128,671,453	906	0.704	0.765	0.675		-0.001
Mar., 2011	128,784,719	922	0.716	0.702	0.675		-0.001
Apr., 2011	128,897,667	954	0.740	0.750	0.674		-0.001
May, 2011	129,010,294	915	0.709	0.696	0.674		-0.001
Jun., 2011	129,122,595	786	0.609	0.617	0.674		-0.001
Jul., 2011	129,234,564	918	0.710	0.697	0.674		-0.002
Aug., 2011	129,346,198	881	0.681	0.668	0.674		-0.002
Sep., 2011	129,457,491	826	0.638	0.647	0.674		-0.002
Oct., 2011	129,568,439	873	0.674	0.661	0.674		-0.002
Nov., 2011	129,679,037	907	0.699	0.709	0.674		-0.002
Dec., 2011	129,789,280	914	0.704	0.691	0.674		-0.002
Jan., 2012	129,899,164	922	0.710	0.698	0.674		-0.002
Feb., 2012	130,008,684	885	0.681	0.716	0.674		-0.002
Mar., 2012	130,117,835	921	0.708	0.696	0.673		-0.002
Apr., 2012	130,226,612	841	0.646	0.657	0.673		-0.002
May, 2012	130,335,011	785	0.602	0.593	0.673	AAPC = -0.16	-0.002
Jun., 2012	130,443,027	807	0.619	0.629	0.673	p = 0.85	-0.003
Jul., 2012	130,550,656	881	0.675	0.664	0.673		-0.003
Aug., 2012	130,657,892	878	0.672	0.661	0.673		-0.003
Sep., 2012	130,764,731	885	0.677	0.688	0.673		-0.003
Oct., 2012	130,871,168	873	0.667	0.656	0.673		-0.003
Nov., 2012	130,977,198	794	0.606	0.616	0.673		-0.003
Dec., 2012	131,082,817	887	0.677	0.666	0.673		-0.003
Jan., 2013	131,188,020	946	0.721	0.708	0.673		-0.003
Feb., 2013	131,292,803	861	0.656	0.712	0.672		-0.003

Mar., 2013	131,397,159	977	0.744	0.730	0.672		-0.003
Apr., 2013	131,501,086	931	0.708	0.718	0.672		-0.003
May, 2013	131,604,578	910	0.691	0.678	0.672		-0.004
Jun., 2013	131,707,630	909	0.690	0.700	0.672		-0.004
Jul., 2013	131,810,238	867	0.658	0.645	0.672		-0.004
Aug., 2013	131,912,396	857	0.650	0.637	0.672		-0.004
Sep., 2013	132,014,101	848	0.642	0.651	0.672		-0.004
Oct., 2013	132,115,348	869	0.658	0.645	0.672	Joinpoint	-0.004
Nov., 2013	132,216,131	901	0.681	0.691	0.681		0.005
Dec., 2013	132,316,446	889	0.672	0.659	0.690		0.014
Jan., 2014	132,416,289	985	0.744	0.730	0.700		0.024
Feb., 2014	132,515,654	1,042	0.786	0.854	0.709		0.033
Mar., 2014	132,614,537	1,013	0.764	0.749	0.719		0.043
Apr., 2014	132,712,933	979	0.738	0.748	0.729		0.053
May, 2014	132,810,838	959	0.722	0.708	0.739		0.063
Jun., 2014	132,908,246	954	0.718	0.728	0.749		0.073
Jul., 2014	133,005,154	1,009	0.759	0.744	0.759		0.083
Aug., 2014	133,101,556	1,108	0.832	0.817	0.769		0.094
Sep., 2014	133,197,447	972	0.730	0.740	0.780		0.104
Oct., 2014	133,292,823	1,005	0.754	0.740	0.791		0.115
Nov., 2014	133,387,680	1,067	0.800	0.811	0.801		0.126
Dec., 2014	133,482,011	1,082	0.811	0.795	0.812		0.137
Jan., 2015	133,575,814	1,113	0.833	0.818	0.823		0.148
Feb., 2015	133,669,082	1,120	0.838	0.910	0.835		0.159
Mar., 2015	133,761,812	1,246	0.932	0.914	0.846		0.170
Apr., 2015	133,853,998	1,106	0.826	0.838	0.858		0.182
May, 2015	133,945,636	1,147	0.856	0.840	0.869		0.194
Jun., 2015	134,036,721	1,067	0.796	0.807	0.881		0.205
Jul., 2015	134,127,249	1,157	0.863	0.846	0.893		0.217
Aug., 2015	134,217,214	1,174	0.875	0.858	0.905	AAPC = 16.40	0.230
Sep., 2015	134,306,612	1,228	0.914	0.927	0.918	p < 0.0001	0.242
Oct., 2015	134,395,438	1,197	0.891	0.874	0.930		0.255
Nov., 2015	134,483,688	1,084	0.806	0.817	0.943		0.267
Dec., 2015	134,571,357	1,201	0.892	0.876	0.956		0.280
Jan., 2016	134,658,439	1,264	0.939	0.924	0.969		0.293
Feb., 2016	134,744,931	1,367	1.015	1.067	0.982		0.306
Mar., 2016	134,830,828	1,516	1.124	1.106	0.996		0.320
Apr., 2016	134,916,124	1,357	1.006	1.023	1.009		0.334
May, 2016	135,000,816	1,374	1.018	1.001	1.023		0.347
Jun., 2016	135,084,898	1,396	1.033	1.051	1.037		0.361
Jul., 2016	135,168,366	1,463	1.082	1.065	1.051		0.375
Aug., 2016	135,251,215	1,561	1.154	1.136	1.066		0.390
Sep., 2016	135,333,440	1,444	1.067	1.085	1.080		0.404
Oct., 2016	135,415,037	1,537	1.135	1.117	1.095		0.419
Nov., 2016	135,496,001	1,519	1.121	1.140	1.110		0.434
Dec., 2016	135,576,326	1,611	1.188	1.169	1.125		0.449

^^^Area Under Regression Curve above January 2010 Death Rate 7.853

* AAPC-average annual percent change

^^ Monthly values determined from annual rates via 3^o polynomial regression, with annual rate assumed to be July

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