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Title

The Relationship Between Cannabis Legalization, Suicide and Mental Health Remains Unchanged After Recreational Access

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Abstract:

Background. We extend the model introduced by Anderson et al. [M.D. Anderson, D.I. Rees, J.J. Sabia, *American Journal of Public Health* 104, 2369-2376] to evaluate the public mental health implications of new developments in marijuana policy, such as recreational marijuana access and additional years of data on suicide mortality.

Methods. We obtained state-level suicide data from the National Vital Statistics System's Mortality Detail Files for 1999-2018. We used panel regression analysis to examine the association between suicides per 100 000 population and both medical and recreational marijuana access. Three specifications of the equation were employed as a robustness test.

Results. After adjusting for economic conditions, alcohol taxes and consumption, time effects, state fixed effects, and state-specific linear time trends, the legalization of recreational marijuana was associated with a 2.9% (95% confidence interval [CI] = -5.6, -.03) reduction in the suicide rate for the most rigorous specification, but didn't pass the robustness check at the $P < .05$ level for the other two specifications. However, recreational marijuana legalization was associated with a 5.4% reduction (95% CI = -9.4%, -1.4%) in suicide rates for males in the 40 to 49 age group, passing the robustness check for all specifications.

Conclusion. Suicide rates among men in the 40 to 49 age group fell after recreational marijuana legalization compared with those in states that did not legalize, which is consistent with the results found by Anderson et al. for medical marijuana when that same population was younger. There was no consistent relationship between medical marijuana legalization and suicide rates for any population. Additionally, mental health indicators at the state level were unaffected by either recreational or medical marijuana legalization. We confirm the findings of Anderson et al. (2014), observing no consistent relationship between marijuana legalization and observable mental health outcomes. However, suicide rates increase at lower rates on average relative to other states following recreational marijuana legalization.

The Relationship Between Cannabis Legalization, Suicide and Mental Health Remains Unchanged After Recreational Access

As of September 1 2020, 11 states and the District of Columbia have voted to legalize marijuana for recreational use, while medical marijuana is available in 33 states. A November 2019 survey from the Pew Research Center found that 67 percent of adults support national legalization of marijuana, including 63 percent of the Baby Boomer generation, 76 percent of Millennials, and 65 percent of Gen X. (Daniller, 2019) In October 2018 Canada became the first G7 country to federally legalize marijuana for recreational use, and the same month Mexico’s Supreme Court ruled marijuana prohibition unconstitutional, setting the stage for legalization in that country. (Hudak, 2020) In the not-too-distant future marijuana use in the United States might be federally decriminalized and the matter devolved to the states. Legislation to that effect was introduced in the 116th Congress. (Nadler, 2020) These developments reflect the increasing acceptance of the recreational use of marijuana, which trends suggest will further increase in days ahead.

Policy makers considering marijuana legalization should consider the public health implications of increasing access to a psychoactive substance that could lead to substance use disorder. In a 2009 Norwegian study, Pedersen concluded “exposure to marijuana by itself does not lead to depression but that it may be associated with later suicidal thoughts and attempts.” (Pederson, 2008) A 2014 systematic review and meta-analysis of longitudinal studies by Canadian researchers found an increased risk for developing depressive disorders may be associated with heavy marijuana use. (Lev-Ran, Roerecke, George, McKenzie, & Rehm, 2014) Agrawal et al., in a 2017 retrospective study, found that the correlation between marijuana use, suicidal thoughts, and major depressive disorders in discordant twins was not solely attributable to predisposing factors. (Agrawal, et al., 2017) This observation confirmed similar findings reported by researchers at the same institution ten years earlier. (Lynskey, et al., 2004) A 2015 study using community-based samples from the Australian Twin Registry by Delforterie et al. found a “modest association” of marijuana use with suicidal thoughts and attempts, concluding that the association of suicidal thoughts and behaviour with marijuana use disorder requires further study. (Delforterie, et al., 2015) In a 2020 study in *JAMA Network Open*, Gorfinkel et al. found that people reporting depression tend to use marijuana at a higher rate. (Gorfinkel, Stohl, & Hasin, 2020)

However, much of the literature finds no relationship between marijuana use and mental health outcomes. In particular a 2014 regression analysis of state-level data from the National Vital Statistics System (NVSS) Mortality Detail Files from 1990-2007 by Anderson et al. found no general association between medical marijuana legalization and suicide rates, but found 10.8% and 9.4% reductions in the suicide rates in males age 20 to 29 and 30 to 39 in the U.S., respectively. (Anderson, Rees, & Sabia, 2014) Additionally, a 2018 Canadian study found no correlation between suicidal behaviour and heavy marijuana use in male or female patients with psychiatric disorders. (Naji, et al., 2018) With the mental outcomes of marijuana use contested by much of the literature, policymakers would benefit from research investigating the population effects on mental health after marijuana legalization.

Marijuana use is tracked by the Substance Abuse and Mental Health Services Administration (SAMHSA) with the National Survey on Drug Use and Health (NSDUH). As of 2018, about 43.5 million people (or 15.9 percent of the U.S. population above the age of 12) consumed marijuana at least once that year—a historic high. Of those marijuana users, 3.1 million used marijuana for the first time, which has been a relatively consistent finding every year since Colorado became the first state to legalize marijuana in 2014. That year 12.9 percent of the U.S. population used marijuana in the past year and the recent trend of increase is predicted to continue into the near future. (SAMHSA, 2015) Marijuana use reported in the past month has also steadily increased in the U.S. since 2007, after a subtler increase starting after an all-time low in 1992. (Golub, Johnson, & Dunlap, 2005)

Reports of major depressive episodes have increased since 2010, while both serious thoughts of suicide and severe mental illness have increased each year since the inception of the survey questions in 2008. (SAMHSA, 2019) Suicide rates in the U.S. have been steadily increasing since an all-time low in 1999 and were at an all-time high in 2018. Respondents who reported past month marijuana use in 2017 were much more likely to experience major depression (2.29 times), suicidal thoughts (3.2 times), and slightly more prone to any/severe mental illness (1.16/1.64 times) than nonusers. (SAMHSA, 2018) This observation has garnered much interest in the relationship between marijuana use and possible mental health deterioration. But with increasing evidence of marijuana's medicinal benefits, and with its growing popularity as a recreational drug, it is necessary to definitively answer the questions surrounding heavy marijuana use and risk of depression and suicide.

In the years since the Anderson et al. review of data from 1990-2007, the advent of recreational marijuana laws has provided unprecedented access to marijuana. Significant gaps remain in the knowledge of the potential harms and benefits of marijuana use, and the effects these laws have on various facets of mental illness are a fertile topic for new research. (National Academies of Sciences, Engineering, and Medicine, 2017)

Methods

Employing most of the same techniques used by Anderson et al. (2014), we use population-weighted ordinary least squares (OLS) regressions for the observed groups to conduct a state-level panel analysis for various time periods of available data to estimate the effect recreational and medical marijuana laws have had on various proxies for mental health: suicide rates per 100 000 people for the general population, males, females, and both sexes separately for the age groups 15-19, 20-29, 30-39, 40-49, 50-59, and 60 and above (1999-2018); the percentages of the population that reported “serious thoughts of suicide in the past year,” “any mental illness in the past year,” and “serious mental illness in the past year” for the age groups 18-25, 18 and up, and 26 and up (2009-2018); and the percentages of the population that reported they “had at least one major depressive episode in the past year” for the age groups 12-17, 18-25, 18 and up, and 26 and up (2006-2018).

Similar to Anderson et al. (2014), we control for observable state-level characteristics the literature considers risk factors for suicide: unemployment rates, GDP per capita, beer taxes, and ethanol consumption per capita for the population age 21 and older. Also following Anderson et al. (2014), we attempt to control for unobserved factors with time effects, fixed effects, and state-specific linear time trends. Since previous studies suggest stricter alcohol policies can reduce suicides, (Markowitz, Chatterji, & Kaestner, 2003; Birckmayer & Hemenway, 1999; Jones, Pieper, & Robertson, 1992; Robertson, 2014) Anderson et al. (2014) controlled for whether a 0.08 blood-alcohol-content (BAC) law was in effect, whether a zero-tolerance drunk-driving law was in effect, and for the beer excise tax. We removed the controls for BAC laws because every state had implemented a 0.08 BAC limit for our entire period, except for Utah, which implemented a .05 limit December 25 2018. Additionally, we removed indicators for zero-tolerance drunk-driving laws because every state had implemented such restrictions by 2001.

(Carpenter, Heavy alcohol use and youth suicide: Evidence from tougher drunk driving laws, 2004; Carpenter, How do Zero Tolerance Drunk Driving Laws work?, 2004) We argue those variables ultimately attempted to capture state government interventions that reduce alcohol use, which is why we added a measurement for per capita ethanol consumption.

To test the robustness of our findings, we follow Anderson et al. (2014) and employ a sensitivity analysis involving three separate specifications for each dependent variable: first only adjusting for state and year effects; then adjusting for state effects, year effects, and covariates; and finally adjusting for state effects, year effects, covariates, and state-specific linear time trends in the most rigorous model. Robust standard errors were employed and clustered at the state level for all specifications. Additionally, we took the natural log transform of all dependent variables, and because the log of zero is undefined, we dropped all observations of zero suicides. If the coefficients for the marijuana law indicators remain relatively stable and significant for all regression specifications, there is evidence that a predictive relationship exists between marijuana legalization and the mental health variables of interest. (Miron & Tetelbaum, 2009; Thornton, 2011)

Suicide mortality (X60-X84, Y87.0, and U03 intentional self-harm) data and population estimates are sourced from the Centers for Disease Control and Prevention (CDC) Wide-ranging Online Data for Epidemiologic Research (WONDER) NVSS database, reports of mental illness from the SAMHSA NSDUH, unemployment rates and GDP per capita from the Bureau of Labor Statistics, ethanol consumption from the National Institute on Alcohol Abuse and Alcoholism, and beer excise tax figures from the Tax Policy Center at the Urban Institute and Brookings Institution. Marijuana policy indicators were calculated referencing reports by the Marijuana Policy Project and the National Organization for the Reform of Marijuana Laws (NORML). These indicators consider the dates laws were enacted and for the first year assume a value between 0 and 1 equal to the proportion of days the policies were effective. The year recreational marijuana laws became effective were used to graph unadjusted suicides per 100 000 population over the year of law change to compare rates with states that did not legalize recreational marijuana anytime during the period.

Results

Table 1 presents the dates that various marijuana laws went into effect. Average suicide rates per 100 000 population over the year of law change are displayed in Figure 1, graphing average suicides rates for the five jurisdictions that have legalized recreational marijuana for at least three years (Alaska, Colorado, District of Columbia, Oregon, and Washington) next to the 40 states that didn't legalize marijuana for the entire period of interest centred at 2014, the average year of implementation for the 5 legalizing states. Reviewing the slopes of both groups before policies went into effect, states that would eventually legalize recreational marijuana had a higher average annual increase in suicide rates (0.708 per 100 000 people) relative to states that never legalized (0.374 per 100 000 people). However, after legalization policies went into effect, states permitting access to recreational marijuana reduced their average annual increase to a level (0.339 per 100 000) below both groups before legalization and the non-legalizing group after legalization (0.411 per 100 000).

Table 2 presents the regression results measuring the effect marijuana legalization had on the mental health outcomes. The only relationship that passed each of the robustness check specifications was between suicide rates for males in the 40 to 49 age group and recreational marijuana legalization, where legalization is followed by a 5.4% reduction (95% confidence interval [CI] = -9.4%, -1.4%) in suicides per capita in the most rigorous model. Interestingly, Anderson et al. found that medical marijuana legalization led to 10.8% (95% CI = -17.1%, -3.7%) and 9.4% (95% CI = -16.1%, -2.4%) drops in the 20 to 29 and 30 to 39 age groups, respectively, many of whom would now be in the 40 to 49 age group. This population is now older because the youngest data from the previous study were published 13 years ago.

The only other relationship that was significant for the most rigorous specification was a 2.9% reduction (95% CI = -5.6, -.03) in the total suicide rate following recreational marijuana legalization. The relationship between recreational marijuana legalization was also weakly associated reductions in the total suicide rate for the other two specifications, but the estimates didn't quite achieve significance at the standard $P < .05$ level.

Discussion

Despite suicide rates reaching unprecedented levels across the country, suicides in states with recreational marijuana access have increased at slower rates after their policies went into effect

relative to their rates before legalization and relative to other states across the country. Our analysis finds strong evidence that recreational marijuana laws reduce suicide rates for middle age men and weak evidence recreational marijuana laws reduce suicide rates for the population as a whole. In line with the conclusions of Anderson et al. (2014), we find that marijuana laws in general don't have consistent effects on suicide rates or reports of mental illness, despite correlations between marijuana use and reports of depression.

While 24% of past year marijuana users report depression, 25.1% of people who report depression admit to using marijuana in the past year. (SAMHSA, 2018) The correlations concerning policy makers may be due to simultaneity, or "reverse causality," which could be the result of self-medication. Regardless, there is no evidence that the liberalization of marijuana in the U.S. is leading to reductions in public mental health.

Limitations

Unfortunately, due to the limitations of public SAMHSA data because of privacy concerns, it is not possible to utilize geographical controls for individual data. Our analysis suffers from the same limitations that plague observational studies in general. (Koopman & Lynch, 1999) To improve on future public research independent of the government's efforts, SAMHSA should add state-level identifiers to its public individual-response data for all years after 2002. Since NSDUH state-level samples are too large to identify the individuals who took the survey, privacy will not be a concern if state of residence information is released to the public for each individual response. Permitting state-level identifiers will allow for the employment of accepted metric methods that use geographic identifiers to control for environmental and reporting differences. The consequences of drug use in general are of the utmost interests to public health officials, and the literature would be best advanced by allowing public access to currently restricted data.

There have also been legitimate challenges to the accuracy of the NSDUH and suicide rates. Critics claim that because the NSDUH requires the surveyed individuals to have a residence, much of the population (especially homeless people) are not represented by the estimates. (Hedden, et al., 2012) Additionally, it is widely believed suicide rates are underreported. (Warshauer & Monk, 1978) These are legitimate criticisms, but the regression

analyses are much more concerned with the changes in rates, as opposed to the absolute accuracy of the rates themselves. Additionally, there's no reason to believe states with recreational marijuana access would be more likely to underreport suicides. Since consistent methods for collecting these data were employed for the entire period of interest for all dependent variables, we are confident that the variable regression coefficients reflect the relationships between evolving trends of substance availability and the mental health identifiers of interest.

Public Health Implications and Conclusion

The use of any drug, psychoactive or otherwise, entails certain risks along with any benefits. Marijuana is no exception. Critics of marijuana legalization point to studies showing correlations between heavy cannabis use and suicide, depression, and mental health disorders. However, such studies demonstrating correlation have yet to confirm causation, which should be determined by a model's ability to predict. (Arrow, 1963) Although those reporting depression to SAMHSA have increasingly used marijuana since states began increasing access to regulated cannabis, (Gorfinkel, Stohl, & Hasin, 2020) we observe no evidence that these laws have predictive relationships with reports of any mental illness. Additionally, recreational marijuana access is followed by reductions in suicide for some age groups. Anderson et al. (2014) had found similar relationships between medical marijuana access and suicide rates, and the lack of an association between mental health and medical marijuana access in our study is likely because recreational marijuana access is a superior substitute requiring fewer barriers to purchase cannabis.

We propose as medicinal and recreational use of marijuana becomes more widespread and mainstream, concerns about the correlation between marijuana use and depression shouldn't interfere with state or federal efforts to decriminalize or legalize marijuana. In fact, legalization will have the salutary effect of allowing more rigorous research—now inhibited by federal prohibition—into the further benefits, as well as any other potential harms, from the long-term use of marijuana, and promote safer use.

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304 Tables and Figures

305

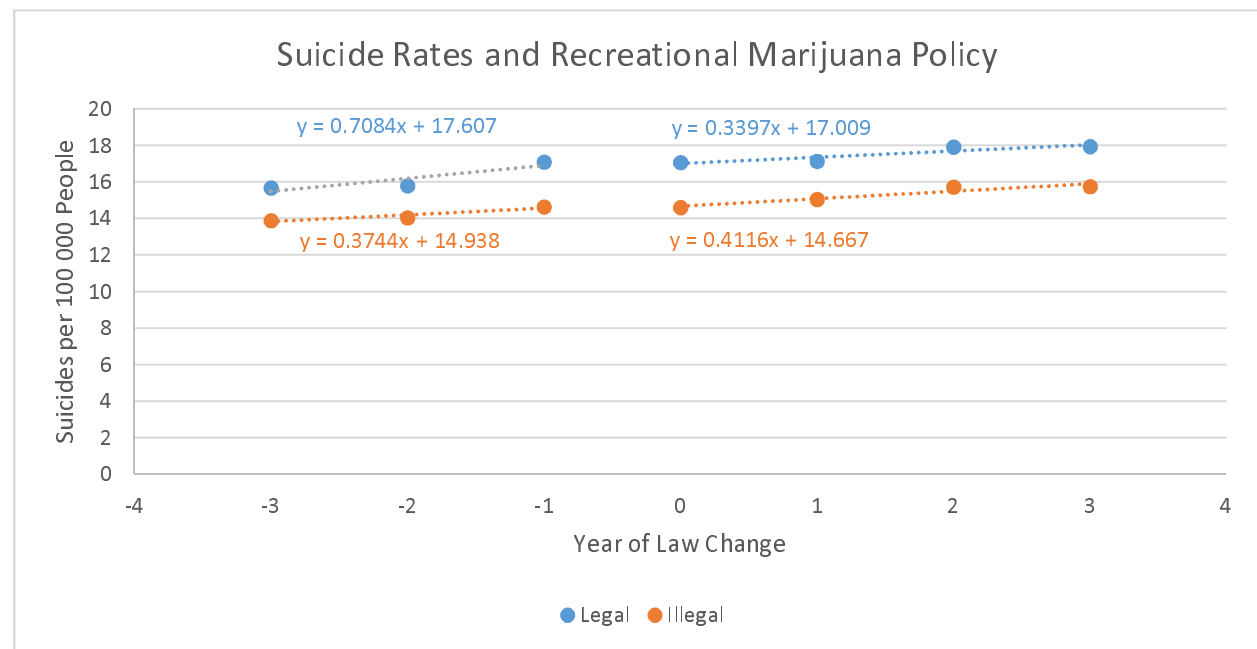
306 Table 1 — Effective Dates of Marijuana Legalization

State	FIPS	Recreational Effective	Medical Effective	Decriminalized Effective
Alabama	1			
Alaska	2	2/24/15	1999	1975-1990, 8/29/2003-6/14/2006, 2/24/2015
Arizona	4		3/14/11	
Arkansas	5		4/8/17	
California	6	11/9/16		1976
Colorado	8	1/3/13	6/1/01	1975
Connecticut	9		3/5/12	6/6/11
Delaware	10		5/13/11	12/18/15
District of Columbia	11	2/26/15	3/29/13	7/17/14
Florida	12		1/3/17	
Georgia	13			
Hawaii	15	1/11/20	8/8/17	1/11/20
Idaho	16			
Illinois	17	1/1/20	1/1/14	
Indiana	18			
Iowa	19			
Kansas	20			
Kentucky	21			
Louisiana	22		8/6/19	
Maine	23	12/17/16	5/10/10	5/1/76
Maryland	24		1/1/17	10/1/14
Massachusetts	25	12/15/16	1/1/13	1/2/09
Michigan	26	12/6/19	10/25/18	
Minnesota	27		7/1/15	1976
Mississippi	28			
Missouri	29		12/6/18	1/1/17
Montana	30		11/2/04	
Nebraska	31			1/1/79
Nevada	32	1/1/17	10/1/01	10/1/01
New Hampshire	33		7/23/13	9/16/17
New Jersey	34		1/1/11	
New Mexico	35		7/1/07	7/1/19
New York	36		7/7/14	7/29/77
North Carolina	37			7/1/77
North Dakota	38		1/28/17	5/2/19

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Ohio	39		9/6/16	8/22/75
Oklahoma	40		8/30/18	
Oregon	41	7/1/15	12/3/98	10/1/73
Pennsylvania	42		5/17/16	
Rhode Island	44		1/3/06	4/1/13
South Carolina	45			
South Dakota	46			
Tennessee	47			
Texas	48			
Utah	49			
Vermont	50	7/1/18	5/19/04	7/1/13
Virginia	51			7/1/20
Washington	53	12/2/12	1998	12/2/12
West Virginia	54			
Wisconsin	55			
Wyoming	56			

Figure 1



Year of Law Change	Centred Years	Legal Slope	Illegal Slope
-3 to -1	2011-2013	0.7084	0.3744
0 to 3	2014-2017	0.3397	0.4116

312 Table 2 — Regression Results

Dependent Variable	Policies	Coefficients			Coefficients			Coefficients		
		Controls, TE, FE, ST	[95% Conf.	Interval]	Controls, TE, FE	[95% Conf.	Interval]	TE, FE	[95% Conf.	Interval]
Total Suicide Rate ^a	Recreational Marijuana	-0.0299 *	-0.0567	-0.0030	-0.0444	-0.0918	0.0030	-0.0340	-0.0852	0.0171
	Medical Marijuana	-0.0176	-0.0696	0.0344	0.0134	-0.0182	0.0450	0.0272	-0.0045	0.0590
Male Suicide Rate ^a	Recreational Marijuana	0.0749	-0.1508	0.3006	0.0783	-0.0963	0.2529	0.0838	-0.0917	0.2593
	Medical Marijuana	-0.0587	-0.1683	0.0510	-0.0073	-0.0761	0.0614	-0.0070	-0.0729	0.0590
Female Suicide Rate ^a	Recreational Marijuana	-0.0373	-0.0938	0.0192	-0.0561	-0.1330	0.0207	-0.0432	-0.1275	0.0410
	Medical Marijuana	0.0233	-0.0500	0.0967	0.0546 *	0.0091	0.1001	0.0766 **	0.0278	0.1253
Suicide Rate Male 15 to 19 ^b	Recreational Marijuana	-0.0843	-0.2344	0.0657	0.0319	-0.1021	0.1660	0.0387	-0.0756	0.1530
	Medical Marijuana	0.0058	-0.0730	0.0846	-0.0263	-0.1093	0.0566	-0.0242	-0.1050	0.0566
Suicide Rate Male 20 to 29 ^a	Recreational Marijuana	-0.0131	-0.0645	0.0382	-0.0018	-0.0589	0.0553	0.0142	-0.0368	0.0652
	Medical Marijuana	-0.0084	-0.0755	0.0587	-0.0136	-0.0805	0.0534	-0.0200	-0.0852	0.0451
Suicide Rate Male 30 to 39 ^a	Recreational Marijuana	-0.0026	-0.0422	0.0370	-0.0184	-0.0822	0.0454	-0.0214	-0.0834	0.0406
	Medical Marijuana	-0.0213	-0.0739	0.0313	-0.0263	-0.0674	0.0148	-0.0252	-0.0627	0.0124
Suicide Rate Male 40 to 49 ^a	Recreational Marijuana	-0.0543 **	-0.0942	-0.0145	-0.0873 **	-0.1400	-0.0346	-0.0824 **	-0.1402	-0.0245
	Medical Marijuana	-0.0339	-0.1186	0.0507	0.0110	-0.0406	0.0626	0.0307	-0.0231	0.0845
Suicide Rate Male 50 to 59 ^a	Recreational Marijuana	-0.0259	-0.0629	0.0110	-0.0973 **	-0.1535	-0.0412	-0.0827 *	-0.1567	-0.0086
	Medical Marijuana	-0.0357	-0.0840	0.0126	0.0195	-0.0213	0.0603	0.0439	-0.0059	0.0938
Suicide Rate Male 60 and Up ^a	Recreational Marijuana	0.0023	-0.0555	0.0602	-0.0545	-0.1126	0.0036	-0.0469	-0.1187	0.0250
	Medical Marijuana	-0.0216	-0.0826	0.0394	0.0219	-0.0133	0.0570	0.0340	-0.0043	0.0723
Suicide Rate Female 15 to 19 ^c	Recreational Marijuana	-0.1013	-0.2976	0.0950	-0.1706	-0.3420	0.0007	-0.1431	-0.3040	0.0178
	Medical Marijuana	-0.1753	-0.3846	0.0340	-0.0761	-0.2200	0.0678	-0.0839	-0.2142	0.0465
Suicide Rate Female 20 to 29 ^d	Recreational Marijuana	0.0057	-0.0920	0.1034	-0.0470	-0.1198	0.0257	-0.0281	-0.1033	0.0471
	Medical Marijuana	-0.0484	-0.1596	0.0627	-0.0167	-0.0909	0.0576	0.0056	-0.0674	0.0785
Suicide Rate Female 30 to 39 ^e	Recreational Marijuana	0.0121	-0.0686	0.0928	-0.0354	-0.1182	0.0474	-0.0185	-0.0950	0.0579
	Medical Marijuana	0.0900	-0.0005	0.1806	0.1128 **	0.0450	0.1807	0.1276 **	0.0554	0.1998

Suicide Rate Female 40 to 49 ^f	Recreational Marijuana	-0.0867	-0.1762	0.0028	-0.1547	**	-0.2558	-0.0537	-0.1234	*	-0.2249	-0.0219
	Medical Marijuana	0.0001	-0.0854	0.0856	0.0620		-0.0209	0.1450	0.0919		-0.0021	0.1859
Suicide Rate Female 50 to 59 ^b	Recreational Marijuana	-0.0532	-0.1900	0.0836	-0.0548		-0.2322	0.1227	-0.0767		-0.2684	0.1151
	Medical Marijuana	0.0750	-0.0257	0.1757	0.0808		-0.0079	0.1695	0.1019	*	0.0098	0.1940
Suicide Rate Female 60 and Up ^e	Recreational Marijuana	-0.0009	-0.1391	0.1373	0.0031		-0.1335	0.1396	-0.0051		-0.1464	0.1363
	Medical Marijuana	0.0388	-0.0764	0.1540	0.0396		-0.0363	0.1156	0.0580		-0.0157	0.1317
Reports of Major Depression 12 to 17 ^h	Recreational Marijuana	-0.0401	-0.0864	0.0063	0.0171		-0.0241	0.0583	0.0278		-0.0048	0.0604
	Medical Marijuana	0.0107	-0.0443	0.0657	0.0073		-0.0263	0.0409	0.0141		-0.0193	0.0476
Reports of Major Depression 18 to 25 ^h	Recreational Marijuana	0.0614	-0.0103	0.1331	0.0908	**	0.0515	0.1300	0.0927	**	0.0650	0.1205
	Medical Marijuana	0.0004	-0.0461	0.0468	0.0125		-0.0229	0.0478	0.0192		-0.0126	0.0510
Reports of Major Depression 26 and Up ^h	Recreational Marijuana	-0.0508	-0.1227	0.0210	0.0115		-0.0329	0.0559	0.0138		-0.0236	0.0512
	Medical Marijuana	-0.0084	-0.0409	0.0241	-0.0078		-0.0437	0.0281	-0.0027		-0.0348	0.0294
Reports of Major Depression 18 and Up ^h	Recreational Marijuana	-0.0220	-0.0852	0.0411	0.0315		-0.0071	0.0701	0.0357		0.0061	0.0654
	Medical Marijuana	-0.0066	-0.0380	0.0248	-0.0031		-0.0341	0.0278	0.0026		-0.0247	0.0299
Serious Mental Illness 18 to 25 ⁱ	Recreational Marijuana	0.0717	-0.0438	0.1872	0.0837	**	0.0375	0.1299	0.0603	**	0.0223	0.0983
	Medical Marijuana	-0.0186	-0.0802	0.0431	-0.0042		-0.0416	0.0333	-0.0035		-0.0445	0.0376
Serious Mental Illness 26 and Up ⁱ	Recreational Marijuana	-0.0658	-0.1630	0.0314	-0.0060		-0.0639	0.0518	-0.0023		-0.0486	0.0440
	Medical Marijuana	0.0454	-0.0379	0.1286	0.0024		-0.0370	0.0418	-0.0063		-0.0483	0.0357
Serious Mental Illness 18 and Up ⁱ	Recreational Marijuana	-0.0375	-0.1300	0.0550	0.0096		-0.0440	0.0632	0.0128		-0.0304	0.0561
	Medical Marijuana	0.0335	-0.0419	0.1090	0.0029		-0.0301	0.0358	-0.0032		-0.0388	0.0324
Serious Thoughts of Suicide 18 to 25 ⁱ	Recreational Marijuana	-0.0124	-0.0554	0.0306	0.0333		-0.0322	0.0988	0.0192		-0.0545	0.0929
	Medical Marijuana	0.0039	-0.0702	0.0780	-0.0240		-0.0648	0.0168	-0.0205		-0.0579	0.0168
Serious Thoughts of Suicide 26 and Up ⁱ	Recreational Marijuana	-0.0038	-0.0980	0.0905	0.0603		-0.0075	0.1280	0.0470		-0.0042	0.0983
	Medical Marijuana	0.0489	-0.0112	0.1091	-0.0281		-0.0790	0.0229	-0.0295		-0.0899	0.0310
Serious Thoughts of Suicide 18	Recreational Marijuana	-0.0034	-0.0789	0.0721	0.0464		-0.0148	0.1076	0.0342		-0.0157	0.0841

and Up ⁱ

	Medical Marijuana	0.0330	-0.0157	0.0817	-0.0291	-0.0630	0.0048	-0.0285	-0.0719	0.0149
Any Mental Illness 18 to 25 ⁱ	Recreational Marijuana	-0.0052	-0.0452	0.0348	0.0260	-0.0019	0.0538	0.0341 **	0.0090	0.0591
	Medical Marijuana	0.0012	-0.0429	0.0454	0.0101	-0.0168	0.0369	0.0092	-0.0170	0.0354
Any Mental Illness 26 and Up ⁱ	Recreational Marijuana	-0.0277	-0.0898	0.0345	0.0295	-0.0135	0.0725	0.0230	-0.0127	0.0588
	Medical Marijuana	-0.0146	-0.0598	0.0307	-0.0248	-0.0710	0.0213	-0.0269	-0.0738	0.0199
Any Mental Illness 18 and Up ⁱ	Recreational Marijuana	-0.0230	-0.0776	0.0315	0.0286	-0.0087	0.0659	0.0258	-0.0049	0.0566
	Medical Marijuana	-0.0119	-0.0519	0.0280	-0.0191	-0.0590	0.0209	-0.0204	-0.0605	0.0198

* $P < .05$

** $P < .01$

^a n = 1 020

^b n = 1 012

^c n = 951

^d n = 1 005

^e n = 1 008

^f n = 1 014

^g n = 1 009

^h n = 663

ⁱ n = 510