Supplementary Online Content

Matthay EC, Kiang MV, Elser H, Schmidt L, Humphreys K. Evaluation of state cannabis laws and rates of self-harm and assault. *JAMA Netw Open*. 2021;4(3):e211955. doi:10.1001/jamanetworkopen.2021.1955

eMethods. Power Calculations

eTable 1. Covariate Data Sources and Information

eTable 2. International Classification of Diseases Clinical Modification (ICD-CM) 9th and 10th Revision Cause of Injury Codes Used to Identify and Classify Self-harm and Assault Injuries

eTable 3. Characteristics of Study State-Months Overall and by Policy Type

eTable 4. Beneficiary-Months of Observation and Baseline Self-harm and Assault Injury Rates for Age and Gender Subgroup Analyses

eFigure 1. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm and Assault Injury Rates, Using Unique Claims as the Denominator for Outcome Rates, for the Overall Study Population, 2003-2017

eFigure 2. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm and Assault Injury Rates, Using Active Members as the Denominator for Outcome Rates, for the Overall Study Population, 2003-2017

eFigure 3. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm and Assault Injury Rates, Adjusted for Firearm Availability, Without the District of Columbia, for the Overall Study Population, 2003-2017

eFigure 4. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm and Assault Injury Rates, With Recreational Dispensary Categories Disaggregated by THC Dosage-Related Restrictions, for the Overall Study Population, 2003-2017

eFigure 5. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm and Assault Injury Rates, With Medical and Recreational Policy Categories Collapsed, for the Overall Study Population, 2003-2017

eFigure 6. Adjusted Associations of Medical and Recreational Cannabis Commercialization With the All-Claims Rate as a Negative Control Outcome, for the Overall Study Population, 2003-2017

eFigure 7. Adjusted Associations of Naloxone Overdose Prevention Laws as a Negative Control Exposure With Self-harm and Assault Injury Rates, for the Overall Study Population, 2003-2017

eFigure 8. Adjusted Associations of Hypothetical, Randomly Generated Law Changes as a Negative Control Exposure With Self-harm and Assault Injury Rates, for the Overall Study Population, 2003-2017

eFigure 9. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm and Assault Injury Rates, With Additional Adjustment for Linear State-Specific Time Trends, for the Overall Study Population, 2003-2017

eFigure 10. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm and Assault Injury Rates, for States With Cannabis Legalization, for the Overall Study Population, 2003-2017

eFigure 11. Adjusted Associations of Recreational (Versus Medical) Cannabis Legalization and Commercialization (Dispensaries Versus Home-Grown Only) With Self-harm and Assault Injury Rates, for States With Cannabis Legalization, for the Overall Study Population, 2003-2017

eFigure 12. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, Using Unique Claims as the Denominator for Outcome Rates, by Age Group and Gender, 2003-2017

eFigure 13. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, Using Unique Claims as the Denominator for Outcome Rates, by Age Group and Gender, 2003-2017

eFigure 14. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Assault Injury Rates, Using Active Members as the Denominator for Outcome Rates, by Age Group and Gender, 2003-2017

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 15. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, Using Active Members as the Denominator for Outcome Rates, by Age Group and Gender, 2003-2017

eFigure 16. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Assault Injury Rates, Adjusted for Firearm Availability, Without the District of Columbia, by Age Group and Gender, 2003-2017

eFigure 17. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, Adjusted for Firearm Availability, Without the District of Columbia, by Age Group and Gender, 2003-2017

eFigure 18. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Assault Injury Rates, With Recreational Dispensary Categories Disaggregated by THC Dosage-Related Restrictions, by Age Group and Gender, 2003-2017

eFigure 19. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, With Recreational Dispensary Categories Disaggregated by THC Dosage-Related Restrictions, by Age Group and Gender, 2003-2017

eFigure 20. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Assault Injury Rates, With Medical and Recreational Policy Categories Collapsed, by Age Group and Gender, 2003-2017

eFigure 21. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, With Medical and Recreational Policy Categories Collapsed, by Age Group and Gender, 2003-2017

eFigure 22. Adjusted Associations of Naloxone Overdose Prevention Laws as a Negative Control Exposure With Assault Injury Rates, by Age Group and Gender, 2003-2017

eFigure 23. Adjusted Associations of Naloxone Overdose Prevention Laws as a Negative Control Exposure With Self-harm Injury Rates, by Age Group and Gender, 2003-2017

eFigure 24. Adjusted Associations of Hypothetical, Randomly Generated Law Changes as a Negative Control Exposure With Assault Injury Rates, by Age Group and Gender, 2003-2017

eFigure 25. Adjusted Associations of Hypothetical, Randomly Generated Law Changes as a Negative Control Exposure With Self-harm Injury Rates, by Age Group and Gender, 2003-2017

eFigure 26. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Assault Injury Rates, With Additional Adjustment for Linear State-Specific Time Trends, by Age Group and Gender, 2003-2017

eFigure 27. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, With Additional Adjustment for Linear State-Specific Time Trends, by Age Group and Gender, 2003-2017

eFigure 28. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Assault Injury Rates, for States With Cannabis Legalization, by Age Group and Gender, 2003-2017

eFigure 29. Adjusted Associations of Medical and Recreational Cannabis Commercialization With Self-harm Injury Rates, for States With Cannabis Legalization, by Age Group and Gender, 2003-2017

This supplementary material has been provided by the authors to give readers additional information about their work.
Supplemental Methods

Power calculations
To confirm that our study had sufficient statistical power, we conducted a power analysis. Using the observed baseline rates of self-harm and assault with a negative binomial distribution, the main exposure measure, and a two-sided test with alpha 0.05, the analysis had 80% power to detect a minimum 5.1% increase in assault and 5.3% increase in self-harm for the rarest commercialization category.
| Covariates | Source | Time scale | Additional information |
|------------|--------|------------|------------------------|
| Percent non-Hispanic Asian, percent non-Hispanic Black, percent non-Hispanic White, percent Hispanic | US Census (2002-2009); American Community Survey 1-year estimates (2010-2017) | Annual |  |
| Percent in poverty, median income, | Small Area Income and Poverty Estimates Program (SAIPE) (2002-2017) | Annual |  |
| Percent unemployed | Bureau of Labor Statistics Local Area Unemployment Files | Monthly |  |
| Percent veterans, percent renters | US Census (2000); American Community Survey 1-year estimates (2010-2017) | Annual | Linear interpolation assumed for 2000-2010. |
| Violent crime rate | FBI Uniform Crime Reports | Annual |  |
| Percent females aged 15-29 years, percent females aged 30-44 years, percent males aged 15-29 years, percent males aged 30-44 years | Optum Clinformatics Data Mart | Monthly |  |
| Alcohol policy stringency | Blanchette JG, Lira MC, Heeren TC, Naimi TS. Alcohol Policies in U.S. States, 1999–2018. *J Stud Alcohol Drugs*. 2020;81(1):58-67. doi:10.15288/jsad.2020.81.58 | Annual |  |
| Opioid overdose mortality rate | Age-standardized mortality rates by state and month from National Center for Health Statistics mortality data and corresponding population estimates from the US Census. | Monthly |  |
| Overall claims rate | Optum Clinformatics Data Mart | Monthly |  |
| Indicator for the October 1, 2015 shift from the 9th to 10th ICD revision | None | Before versus after October 1, 2015 |  |
| Firearm access (percent of suicides completed with a firearm) | CDC WISQARS Fatal Injury Reports | Annual | Measure unavailable for the District of Columbia. |
| ICD-9-CM codes | Self-harm injury | Assault injury |
|----------------|-----------------|---------------|
| E950, E9500, E9501, E9502, E9503, E9504, E9505, E9506, E9507, E9508, E9509, E951, E9510, E9511, E9518, E952, E9520, E9521, E9528, E9529, E953, E9530, E9531, E9538, E9539, E954, E955, E9550, E9551, E9552, E9553, E9554, E9555, E9556, E9557, E9559, E956, E957, E9570, E9571, E9572, E9579, E958, E9580, E9581, E9582, E9583, E9584, E9585, E9586, E9587, E9589, E9589, E959 |
| X71, X710, X710XXXA, X711, X711XXXA, X712, X712XXXA, X713, X713XXXA, X718, X718XXXA, X719, X719XXXA, X72, X72XXXA, X73, X730, X730XXXA, X731, X731XXXA, X732, X732XXXA, X738, X738XXXA, X739, X739XXXA, X74, X740, X7401, X7401XXXA, X7402, X7402XXXA, X7409, X7409XXXA, X748, X748XXXA, X749, X749XXXA, X75, X75XXXA, X76, X76XXXA, X77, X770, X770XXXA, X771, X771XXXA, X772, X772XXXA, X773, X773XXXA, X778, X778XXXA, X779, X779XXXA, X78, X780, X780XXXA, X781, X781XXXA, X782, X782XXXA, X788, X788XXXA, X789, X789XXXA, X79, X79XXXA, X80, X80XXXA, X81, X810, X810XXXA, X811, X811XXXA, X818, X818XXXA, X82, X820, X820XXXA, X821, X821XXXA, X822, X822XXXA, X828, X828XXXA, X83, X830, X830XXXA, X831, X831XXXA, X832, X832XXXA, X838, X838XXXA, X360, X360XXA, X361XXA, X361XXA, X362XXA, X363XXA, X364XXA, X364XXA, X365XXA, X365XXA, X366XXA, X366XXA, X367XXA, X367XXA, X368XXA, X368XXA, X369XXA, X369XXA, X370XXA, X370XXA, X371XXA, X371XXA, X372XXA, X372XXA, X373XXA, X373XXA, X374XXA, X374XXA, X375XXA, X375XXA, X376XXA, X376XXA, X377XXA, X377XXA, X378XXA, X378XXA, X379XXA, X379XXA, X380XXA, X380XXA, X381XXA, X381XXA, X382, X382XXA, X383XXA, X383XXA, X388, X388XXXA |
| X92, X920, X920XXXA, X921, X921XXXA, X922, X922XXXA, X923, X923XXXA, X924, X924XXXA, X925, X925XXXA, X926, X926XXXA, X927, X927XXXA, X928, X928XXXA, X929, X929XXXA, X93, X93XXXA, X94, X940, X940XXXA, X941, X941XXXA, X942, X942XXXA, X948, X948XXXA, X949, X949XXXA, X95, X950, X950XXXA, X9501, X9501XXXA, X9502, X9502XXXA, X9509, X9509XXXA, X958, X958XXXA, X959, X959XXXA, X96, X960, X960XXXA, X961, X961XXXA, X962, X962XXXA, X963, X963XXXA, X964, X964XXXA, X968, X968XXXA, X969, X969XXXA, X97, X97XXXA, X98, X980, X980XXXA, X981, X981XXXA, X982, X982XXXA, X983, X983XXXA, X988, X988XXXA, X989, X989XXXA, X99, X990, X990XXXA, X991, X991XXXA, X992, X992XXXA, X998, X998XXXA, X999, X999XXXA, X00, X000XXXA, X01, X010XXXA, X02, X020, X020XXXA, X021, X021XXXA, X028, X028XXXA, X03, X030, X030XXXA, X038, X038XXXA, X04, X040, X040XXXA, X041, X041XXXA, X042, X042XXXA, X048, X048XXXA, X07, X070, X070XXXA, X072, X072XXXA, X073, X073XXXA, X074, X074XXXA, X0741, X0741XXXA, X0742, X07420, X07421, X0743, X0743XXXA, X07432, X07432XXXA, X07434, X07434XXXA, X07435, X07435XXXA, X07436, X07436XXXA, X07437, X07437XXXA, X07438, X07438XXXA, X0744, X07440, X07440XXXA, X07441, X07441XXXA, X07442, X07442XXXA, X07443, X07443XXXA, X07444, X07444XXXA, X07445, X07445XXXA, X07446, X07446XXXA, X07447, X07447XXXA, X07448, X07448XXXA, X07449, X07449XXXA, X0745, X07450, X07450XXXA, X07451, X07451XXXA, X07452, X07452XXXA, X07453, X07453XXXA, X07454, X07454XXXA, X07455, X07455XXXA, X07456, X07456XXXA, X07457, X07457XXXA, X07458, X07458XXXA, X07459, X07459XXXA, X0746, X07460, X07460XXXA, X07461, X07461XXXA, X07462, X07462XXXA, X07463, X07463XXXA |
T50992, T50992A, T50A12, T50A12A, T50A22, T50A22A, T50A92, T50A92A, T50B12, T50B12A, T50B92, T50B92A, T50Z12, T50Z12A, T50Z92, T50Z92A, T510X2, T510X2A, T511X2, T51112A, T5112X2, T512X2A, T513X2, T51312A, T518X2, T518X2A, T5192XA, T520X2, T5202XA, T521X2, T521X2A, T522X2, T5222X2, T523X2, T523X2A, T524X2, T5242X2A, T528X2, T528X2A, T5292XA, T530X2, T530X2A, T531X2, T5312A, T532X2, T532X2A, T533X2, T53312A, T534X2, T534X2A, T535X2, T53512A, T536X2, T536X2A, T537X2, T53712A, T5392XA, T540X2, T540X2A, T541X2, T5412X2A, T542X2, T542X2A, T543X2A, T5492XA, T550X2, T550X2A, T551X2, T55112A, T556X2, T560X2A, T561X2, T561X2A, T562X2, T562X2A, T563X2, T563X2A, T564X2, T56412A, T565X2, T565X2A, T566X2, T56612A, T567X2, T567X2A, T56812, T56812A, T56892, T56892A, T569X2A, T570X2, T570X2A, T571X2, T571X2A, T572X2, T5722X2A, T573X2, T573X2A, T578X2, T578X2A, T5792XA, T580X2A, T5812X2A, T582X2, T582X2A, T588X2, T588X2A, T589X2A, T590X2A, T59012A, T59012A, T591X2, T591X2A, T592X2, T592X2A, T593X2, T593X2A, T594X2, T594X2A, T595X2, T595X2A, T596X2A, T596X2A, T597X2, T59712A, T59812, T59812A, T59892, T59892A, T600X2, T600X2A, T601X2, T601X2A, T602X2, T602X2A, T603X2, T603X2A, T604X2, T604X2A, T608X2, T608X2A, T609X2A, T609X2A, T610X2A, T610X2A, T611X2A, T61172, T61172A, T61782, T61782A, T618X2, T618X2A, T6192XA, T620X2, T620X2A, T621X2, T621X2A, T622X2, T622X2A, T628X2, T628X2A, T6292XA, T63002, T63002A, T63012, T63012A, T63022, T63022A, T63032, T63032A, T63042, T63042A, T63062, T63062A, T63072, T63072A, T63082, T63082A, T63092, T63092A, T63112, T63112A, T63122, T63122A, T63192, T63192A, T632X2, T632X2A, T63302, T63302A, T63312, T63312A, T63322, T63322A, T63332, T63332A, T63392, T63392A, T63412, T63412A, T63422, T63422A, T63432, T63432A, T63442, T63442A, T63452, T63452A, T63462, T63462A, T63482, T63482A, T63512, T63512A, T63592, T63592A, T63612, T63612A, T63622, T63622A, T63632, T63632A, T63692, T63692A, T63812,
| T63812A, T63822, T63822A, T63832, T63832A, T63892, T63892A, T651X2, T651X2A, T65212, T65212A, T65222, T65222A, T65292, T65292A, T653X2, T653X2A, T654X2, T654X2A, T655X2, T655X2A, T656X2, T656X2A, T65812, T65812A, T65822, T65822A, T65832, T65832A, T65892, T65892A, T6592Xa, T71112, T71112A, T71122, T71122A, T71132, T71132A, T71152, T71152A, T71162, T71162A, T71192, T71192A, T71222, T71222A, T71232, T71232A |
|---|
| T511X3, T511X3A, T512X3, T512X3A, T513X3, T513X3A, T518X3, T518X3A, T5193XA, T520X3, T520X3A, T521X3, T521X3A, T522X3, T522X3A, T523X3, T523X3A, T524X3, T524X3A, T528X3, T528X3A, T5293XA, T530X3, T530X3A, T531X3, T531X3A, T532X3, T532X3A, T533X3, T533X3A, T534X3, T534X3A, T535X3, T535X3A, T536X3, T536X3A, T537X3, T537X3A, T5393XA, T540X3, T540X3A, T541X3, T541X3A, T542X3, T542X3A, T543X3, T543X3A, T5493XA, T550X3, T550X3A, T551X3, T551X3A, T560X3, T560X3A, T561X3, T561X3A, T562X3, T562X3A, T563X3, T563X3A, T564X3, T564X3A, T565X3, T565X3A, T566X3, T566X3A, T567X3, T567X3A, T56813, T56813A, T56893, T56893A, T5693XA, T570X3, T570X3A, T571X3, T571X3A, T572X3, T572X3A, T573X3, T573X3A, T578X3, T578X3A, T5793XA, T5803XA, T5813XA, T582X3, T582X3A, T588X3, T588X3A, T5893XA, T590X3, T590X3A, T591X3, T591X3A, T592X3, T592X3A, T593X3, T593X3A, T594X3, T594X3A, T595X3, T595X3A, T596X3, T596X3A, T597X3, T597X3A, T59813, T59813A, T59893, T59893A, T5993XA, T600X3, T600X3A, T601X3, T601X3A, T602X3, T602X3A, T603X3, T603X3A, T604X3, T604X3A, T608X3, T608X3A, T6093XA, T6103XA, T6113XA, T61773, T61773A, T61783, T61783A, T618X3, T618X3A, T6193XA, T620X3, T620X3A, T621X3, T621X3A, T622X3, T622X3A, T628X3, T628X3A, T6293XA, T63003, T63003A, T63013, T63013A, T63023, T63023A, T63033, T63033A, T63043, T63043A, T63063, T63063A, T63073, T63073A, T63083, T63083A, T63093, T63093A, T63113, T63113A, T63123, T63123A, T63193, T63193A, T632X3, T632X3A, T63303, T63303A, T63313, T63313A, T63323, T63323A, T63333, T63333A, T63393, T63393A, T63413, T63413A, T63423, T63423A, T63433, T63433A, T63443, T63443A, T63453, T63453A, T63463, T63463A, T63483, T63483A, T63513, T63513A, T63593, T63593A, T63613, T63613A, T63623, T63623A, T63633, T63633A, T63693, T63693A, T63813, T63813A, T63823, T63823A, T63833, T63833A, T63893, T63893A, T6393XA, T63713, T63713A, T63793, T63793A, T6403XA, T6483XA, T650X3, T650X3A, T651X3, T651X3A |
| T65213, T65213A, T65223, T65223A, T65293, T65293A, T653X3, T653X3A, T654X3, T654X3A, T655X3, T655X3A, T656X3, T656X3A, T65813, T65813A, T65823, T65823A, T65833, T65833A, T65893, T65893A, T6593XA, T71113, T71113A, T71123, T71123A, T71133, T71133A, T71143, T71143A, T71153, T71153A, T71163, T71163A, T71193, T71193A, T71223, T71223A, T71233, T71233A |
Supplemental Results
| Variable                                                                 | Overall       | No cannabis legalization policy | Medical, no dispensaries | Medical, dispensaries | Recreational, no dispensaries | Recreational, dispensaries |
|--------------------------------------------------------------------------|---------------|---------------------------------|--------------------------|----------------------|--------------------------------|---------------------------|
| State-months (%)                                                         | 9180 (100.0)  | 6144 (67.0)                     | 1469 (16.2)              | 1259 (13.9)          | 125 (1.4)                      | 138 (1.5)                 |
| States contributing any time at risk                                     | 51 (100)      | 43 (84)                         | 28 (55)                  | 23 (45)              | 8 (16)                         | 5 (10)                    |
| Self-harm injury claim rate (per 100,000 persons, annualized [95% CI])  | 79.5 (79.0, 80.0) | 75.4 (74.2, 76.6)               | 73.0 (72.7, 73.3)        | 95.1 (92.5, 97.7)     | 110.8 (109.4, 112.2)           | 162.8 (161.8, 163.8)      |
| Assault injury claim rate (per 100,000 persons, annualized [95% CI])    | 93.9 (92.8, 95.0) | 96.9 (95.5, 98.3)               | 92.5 (92.1, 92.9)        | 80.5 (78.1, 82.9)     | 106.5 (105.1, 107.9)           | 91.8 (91.1, 92.5)         |
| % male aged 15-29 years                                                 | 9.0           | 9.4                             | 8.2                      | 8.2                  | 8.9                            | 8.0                       |
| % female aged 15-29 years                                               | 8.9           | 9.3                             | 8.3                      | 7.9                  | 8.9                            | 7.6                       |
| % Asian                                                                  | 3.6           | 2.2                             | 7.8                      | 4.9                  | 5.9                            | 5.4                       |
| % Black                                                                  | 11.0          | 12.5                            | 8.6                      | 6.7                  | 15.9                           | 3.6                       |
| % Hispanic                                                               | 10.2          | 8.3                             | 9.6                      | 18.5                 | 14.3                           | 15.6                      |
| % White                                                                  | 71.5          | 74.2                            | 66.4                     | 65.8                 | 57.7                           | 69.3                      |
| % in poverty                                                             | 13.7          | 14.0                            | 11.7                     | 14.4                 | 14.2                           | 12.5                      |
| Median income ($)                                                        | 50,048        | 47,171                          | 55,500                   | 54,526               | 66,023                         | 62,217                    |
| % unemployed                                                             | 6.0           | 5.8                             | 5.9                      | 7.1                  | 6.3                            | 5.4                       |
| % renters                                                                | 33.7          | 32.4                            | 35.8                     | 36.2                 | 44.0                           | 37.4                      |
| % single-parent households                                              | 6.9           | 7.1                             | 6.6                      | 6.7                  | 6.6                            | 5.8                       |
| % veterans                                                               | 10.4          | 10.6                            | 11.3                     | 9.1                  | 8.2                            | 9.7                       |
| % firearm suicides                                                       | 52.1          | 54.9                            | 45.7                     | 46.5                 | 47.7                           | 50.5                      |
| Violent crime rate (per 100,000 persons, annual)                         | 403.8         | 403.0                           | 400.6                    | 392.1                | 638.8                          | 363.5                     |
| Alcohol Policy Score*                                                    | 42.8          | 42.9                            | 42.5                     | 42.1                 | 42.7                           | 42.6                      |
| Overall claim rate (per 100,000 persons, annualized [95% CI])            | 802,417       | 772,958                         | 842,175                  | 878,621              | 897,350                        | 869,423                   |
|                                                                              | (801,491, 803,343) | (771,857, 774,059)             | (841,831, 842,519)       | (876,427, 880,815)   | (896,067, 898,633)             | (868,729, 870,117)       |

* Range: 0 to 100; 0: least restrictive. 100: most restrictive.
eTable 4: Beneficiary-months of observation and baseline self-harm and assault injury rates for age and gender subgroup analyses

| Subgroup                  | Beneficiary-months of observation | Baseline self-harm injury claim rate (per 100,000 persons, annualized [95% CI]) | Baseline assault injury claim rate (per 100,000 persons, annualized [95% CI]) |
|---------------------------|---------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Women, under 21 years     | 267,114,523                     | 125.0 (121.1 – 128.9)                                                           | 65.9 (63.0 – 68.8)                                                             |
| Women, 21-39 years        | 306,409,253                     | 100.5 (97.3 – 103.7)                                                            | 100.2 (97.0 – 103.4)                                                           |
| Women, 40-64 years        | 425,770,567                     | 90.6 (88.0 – 93.2)                                                              | 51.0 (49.1 – 52.9)                                                             |
| Women, 65 years and older | 237,543,284                     | 43.3 (40.9 – 45.7)                                                              | 28.6 (26.6 – 30.6)                                                             |
| Men, under 21 years       | 278,632,987                     | 52.9 (50.5 – 55.3)                                                              | 128.4 (124.7 – 132.1)                                                          |
| Men, 21-39 years          | 299,574,900                     | 65.7 (62.9 – 68.5)                                                              | 178.4 (173.8 – 183.0)                                                          |
| Men, 40-64 years          | 412,363,604                     | 53.1 (51.0 – 55.2)                                                              | 72.6 (70.2 – 75.0)                                                             |
| Men, 65 years and older   | 183,075,491                     | 65.9 (62.6 – 69.2)                                                              | 40.4 (37.9 – 42.9)                                                             |

Abbreviations: CI: confidence interval
eFigure 1: Adjusted associations of medical and recreational cannabis commercialization with self-harm and assault injury rates, using unique claims as the denominator for outcome rates, for the overall study population, 2003-2017.

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals. The primary analysis used the number of insured beneficiaries in the given state and month as the denominator when calculating rates of self-harm and assault. In this sensitivity analysis, we used unique claims (the number of unique claims made per state-month) as the denominator, to account for changes in overall utilization over time.

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 2: Adjusted associations of medical and recreational cannabis commercialization with self-harm and assault injury rates, using active members as the denominator for outcome rates, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals. The primary analysis used the number of insured beneficiaries in the given state and month as the denominator when calculating rates of self-harm and assault. In this sensitivity analysis, we used active members (the number of unique members who filed at least one claim per state month), because this approach is more robust to high-utilizing members.
Figure 3: Adjusted associations of medical and recreational cannabis commercialization with self-harm and assault injury rates, adjusted for firearm availability, without the District of Columbia, for the overall study population, 2003-2017.

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.
eFigure 4: Adjusted associations of medical and recreational cannabis commercialization with self-harm and assault injury rates, with recreational dispensary categories disaggregated by THC dosage-related restrictions, for the overall study population, 2003-2017.

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.
eFigure 5: Adjusted associations of medical and recreational cannabis commercialization with self-harm and assault injury rates, with medical and recreational policy categories collapsed, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 6: Adjusted associations of medical and recreational cannabis commercialization with the all-claims rate as a negative control outcome, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.
eFigure 7: Adjusted associations of naloxone overdose prevention laws as a negative control exposure with self-harm and assault injury rates, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of naloxone overdose prevention laws (a negative control exposure) with self-harm or assault injuries, relative to state-months not adopting such laws over the same period. The bars represent the corresponding 95% confidence intervals.
eFigure 8: Adjusted associations of hypothetical, randomly generated law changes as a negative control exposure with self-harm and assault injury rates, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of a hypothetical, randomly generated policy change (a negative control exposure) with self-harm or assault injuries, relative to state-months not adopting such “laws” over the same period. The bars represent the corresponding 95% confidence intervals.
eFigure 9: Adjusted associations of medical and recreational cannabis commercialization with self-harm and assault injury rates, with additional adjustment for linear state-specific time trends, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.
eFigure 10: Adjusted associations of medical and recreational cannabis commercialization with self-harm and assault injury rates, for states with cannabis legalization, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months with medical cannabis without dispensaries. The primary analysis used all state-months 2003-2017, including state-months with and without cannabis legalization laws. This analysis used only state-months in which some form of cannabis legalization was effective, with the most stringent category (medical, without dispensaries) as the reference category. Bars represent the corresponding 95% confidence intervals.
Figure 11: Adjusted associations of recreational (versus medical) cannabis legalization and commercialization (dispensaries versus home-grow only) with self-harm and assault injury rates, for states with cannabis legalization, for the overall study population, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm or assault injuries, relative to state-months with medical cannabis without dispensaries. Bars represent the corresponding 95% confidence intervals. The primary analysis used all state-months 2003-2017, including state-months with and without cannabis legalization laws. This analysis used only state-months in which some form of cannabis legalization was effective, with the most stringent category (medical, without dispensaries) as the reference category. Commercialization refers to the presence of dispensaries in either medical or recreational cannabis states. “Recreational with dispensaries” refers to the estimate for an interaction term between recreation (versus medical) legalization and commercialization. This analytic specification was not tested for analyses by age group and gender because such analyses effectively involve third-order interactions and were under powered.

© 2021 Matthay EC et al. JAMA Network Open.
Figure 12: Adjusted associations of medical and recreational cannabis commercialization with assault injury rates, using unique claims as the denominator for outcome rates, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals. The primary analysis used the number of insured beneficiaries in the given state and month as the denominator when calculating rates of self-harm and assault. In this sensitivity analysis, we used unique claims (the number of unique claims made per state-month) as the denominator, to account for changes in overall utilization over time.

Policy level

© 2021 Matthay EC et al. JAMA Network Open.
Figure 13: Adjusted associations of medical and recreational cannabis commercialization with self-harm injury rates, using unique claims as the denominator for outcome rates, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals. The primary analysis used the number of insured beneficiaries in the given state and month as the denominator when calculating rates of self-harm and assault. In this sensitivity analysis, we used unique claims (the number of unique claims made per state-month) as the denominator, to account for changes in overall utilization over time.

© 2021 Matthay EC et al. JAMA Network Open.
Figure 14: Adjusted associations of medical and recreational cannabis commercialization with assault injury rates, using active members as the denominator for outcome rates, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals. The primary analysis used the number of insured beneficiaries in the given state and month as the denominator when calculating rates of self-harm and assault. In this sensitivity analysis, we used active members (the number of unique members who filed at least one claim per state month), because this approach is more robust to high-utilizing members.
eFigure 15: Adjusted associations of medical and recreational cannabis commercialization with self-harm injury rates, using active members as the denominator for outcome rates, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals. The primary analysis used the number of insured beneficiaries in the given state and month as the denominator when calculating rates of self-harm and assault. In this sensitivity analysis, we used active members (the number of unique members who filed at least one claim per state month), because this approach is more robust to high-utilizing members.
eFigure 16: Adjusted associations of medical and recreational cannabis commercialization with assault injury rates, adjusted for firearm availability, without the District of Columbia, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

Policy level

© 2021 Matthay EC et al. JAMA Network Open.
Figure 17: Adjusted associations of medical and recreational cannabis commercialization with self-harm injury rates, adjusted for firearm availability, without the District of Columbia, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

Policy level

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.
eFigure 18: Adjusted associations of medical and recreational cannabis commercialization with assault injury rates, with recreational dispensary categories disaggregated by THC dosage-related restrictions, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

Policy level

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 19: Adjusted associations of medical and recreational cannabis commercialization with self-harm injury rates, with recreational dispensary categories disaggregated by THC dosage-related restrictions, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

Policy level

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.
eFigure 20: Adjusted associations of medical and recreational cannabis commercialization with assault injury rates, with medical and recreational policy categories collapsed, by age group and gender, 2003-2017.

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

© 2021 Matthay EC et al. JAMA Network Open.
Figure 21: Adjusted associations of medical and recreational cannabis commercialization with self-harm injury rates, with medical and recreational policy categories collapsed, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

**Policy level**

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 22: Adjusted associations of naloxone overdose prevention laws as a negative control exposure with assault injury rates, by age group and gender, 2003-2017

|   | Rate Ratio |   |
|---|------------|---|
| Females | Males |   |
| <21 years | |   |
| 21-39 years | |   |
| 40-64 years | |   |
| 65+ years | |   |

Legend: Points represent the estimated rate ratio for the association of naloxone overdose prevention laws (a negative control exposure) with assault injuries, relative to state-months not adopting such laws over the same period. The bars represent the corresponding 95% confidence intervals.
eFigure 23: Adjusted associations of naloxone overdose prevention laws as a negative control exposure with self-harm injury rates, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of naloxone overdose prevention laws (a negative control exposure) with self-harm injuries, relative to state-months not adopting such laws over the same period. The bars represent the corresponding 95% confidence intervals.

Policy level

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 24: Adjusted associations of hypothetical, randomly generated law changes as a negative control exposure with assault injury rates, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of a hypothetical, randomly generated policy change (a negative control exposure) with assault injuries, relative to state-months not adopting such “laws” over the same period. The bars represent the corresponding 95% confidence intervals.
Figure 25: Adjusted associations of hypothetical, randomly generated law changes as a negative control exposure with self-harm injury rates, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of a hypothetical, randomly generated policy change (a negative control exposure) with self-harm injuries, relative to state-months not adopting such “laws” over the same period. The bars represent the corresponding 95% confidence intervals.
Figure 26: Adjusted associations of medical and recreational cannabis commercialization with assault injury rates, with additional adjustment for linear state-specific time trends, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.

Policy level

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals.
eFigure 27: Adjusted associations of medical and recreational cannabis commercialization with self-harm injury rates, with additional adjustment for linear state-specific time trends, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months not adopting any medical or recreational cannabis legalization over the same period. Bars represent the corresponding 95% confidence intervals. Self-harm claims for women aged 65 and older were very rare; results for this age-gender group were unstable and are not reported.

Policy level

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 28: Adjusted associations of medical and recreational cannabis commercialization with assault injury rates, for states with cannabis legalization, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with assault injuries, relative to state-months with medical cannabis without dispensaries. The primary analysis used all state-months 2003-2017, including state-months with and without cannabis legalization laws. This analysis used only state-months in which some form of cannabis legalization was effective, with the most stringent category (medical, without dispensaries) as the reference category. Bars represent the corresponding 95% confidence intervals. Assault claims for women aged 65 and older were rare in cannabis legalization states; results for this age-gender group were unstable and are not reported.

© 2021 Matthay EC et al. JAMA Network Open.
eFigure 29: Adjusted associations of medical and recreational cannabis commercialization with self-harm injury rates, for states with cannabis legalization, by age group and gender, 2003-2017

Legend: Points represent the estimated rate ratio for the association of each type of cannabis commercialization with self-harm injuries, relative to state-months with medical cannabis without dispensaries. The primary analysis used all state-months 2003-2017, including state-months with and without cannabis legalization laws. This analysis used only state-months in which some form of cannabis legalization was effective, with the most stringent category (medical, without dispensaries) as the reference category. Bars represent the corresponding 95% confidence intervals. Self-harm claims for women aged 65 and older were rare in cannabis legalization states; results for this age-gender group were unstable and are not reported.

© 2021 Matthay EC et al. JAMA Network Open.