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| Online Table 1: Unadjusted associations between past 30-day nicotine and past 30-day cannabis use among US adolescents, 2017-2019 |
| Exposure: Past 30-Day Nicotine Use  | Outcome: Past 30-Day Cannabis Use | Odds Ratio | Lower 95% Confidence Interval Limit | Upper 95% Confidence Interval Limit |
| Smoking Only (vs. No Use) | Without Vaping  | 10.97 | 8.77 | 13.72 |
| Smoking Only (vs. No Use) | With Vaping  | 11.02 | 8.02 | 15.14 |
| Vaping Only (vs. No Use) | Without Vaping  | 4.96 | 4.38 | 5.61 |
| Vaping Only (vs. No Use) | With Vaping  | 29.11 | 25.63 | 33.07 |
| Smoking and Vaping (vs. No Use) | Without Vaping  | 14.79 | 12.03 | 18.20 |
| Smoking and Vaping (vs. No Use) | With Vaping  | 72.18 | 58.83 | 88.57 |

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| Online Table 2: Unimputed associations between past 30-day nicotine and past 30-day cannabis use among US adolescents, 2017-2019 |
| Exposure: Past 30-Day Nicotine Use  | Outcome: Past 30-Day Cannabis Use | Odds Ratio\* | Lower 95% Confidence Interval Limit | Upper 95% Confidence Interval Limit |
| Smoking Only (vs. No Use) | Without Vaping  | 7.92 | 6.02 | 10.42 |
| Smoking Only (vs. No Use) | With Vaping  | 6.18 | 4.07 | 9.37 |
| Vaping Only (vs. No Use) | Without Vaping  | 4.23 | 3.62 | 4.94 |
| Vaping Only (vs. No Use) | With Vaping  | 18.69 | 16.02 | 21.81 |
| Smoking and Vaping (vs. No Use) | Without Vaping  | 9.67 | 7.27 | 12.86 |
| Smoking and Vaping (vs. No Use) | With Vaping  | 36.15 | 27.62 | 47.33 |

\*Adjusted for grade, sex, race, parental education, urbanicity, binge drinking, and year

Online Table 3: Associations between past 30-day nicotine and past 30-day cannabis use among US adolescents, 2017-2019, full regression results

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| **Outcome: Cannabis Use Without Vaping**  |
| Predictor | Odds Ratio\* | Lower 95% Confidence Interval Limit | Upper 95% Confidence Interval Limit |
| Past 30-Day Nicotine Use (ref = None) |  |  |  |
| Smoking Only | 7.01 | 5.43 | 9.03 |
| Vaping Only | 4.26 | 3.75 | 4.85 |
| Smoking and Vaping | 8.95 | 7.09 | 11.30 |
| Sex (Female) | 1.10 | 1.00 | 1.21 |
| Race/Ethnicity (ref=non-Hispanic white) |  |  |  |
| non-Hispanic Black | 2.18 | 1.87 | 2.55 |
| Hispanic/Latino | 1.38 | 1.22 | 1.57 |
| Multiracial | 1.67 | 1.38 | 2.01 |
| non-Hispanic Asian/Pacific Islander | 0.77 | 0.59 | 1.01 |
| Parental Education (At least one parent a college graduate) | 0.73 | 0.66 | 0.81 |
| Urbanicity (ref = Urban) |  |  |  |
| Suburban | 0.79 | 0.69 | 0.90 |
| Rural | 0.68 | 0.57 | 0.82 |
| Binge Drinking in Past Two Weeks (ref = None) |  |  |  |
| Once | 3.89 | 3.23 | 4.69 |
| Twice | 4.20 | 3.34 | 5.28 |
| Three to Five Times | 4.34 | 3.24 | 5.81 |
| Six to Nine Times | 5.64 | 3.17 | 10.04 |
| Ten+ Times | 5.46 | 2.39 | 12.48 |
| Year (Ref = 2017) |  |  |  |
| 2018 | 0.74 | 0.66 | 0.84 |
| 2019 | 0.57 | 0.49 | 0.65 |
| Grade (Ref = 8) |  |  |  |
| 10 | 2.69 | 2.28 | 3.16 |
| 12 | 3.24 | 2.73 | 3.85 |
| **Outcome: Cannabis Use with Vaping**  |
| Past 30-Day Nicotine Use (ref = None) |  |  |  |
| Smoking Only | 8.03 | 5.75 | 11.23 |
| Vaping Only | 20.31 | 17.85 | 23.11 |
| Smoking and Vaping | 40.10 | 31.62 | 50.86 |
| Sex (Female) | 0.86 | 0.76 | 0.98 |
| Race/Ethnicity (ref=non-Hispanic white) |  |  |  |
| non-Hispanic Black | 1.54 | 1.22 | 1.94 |
| Hispanic/Latino | 2.04 | 1.74 | 2.38 |
| Multiracial | 1.76 | 1.40 | 2.21 |
| non-Hispanic Asian/Pacific Islander | 0.83 | 0.60 | 1.15 |
| Parental Education (At least one parent a college graduate) | 0.83 | 0.73 | 0.95 |
| Urbanicity (ref = Urban) |  |  |  |
| Suburban | 0.72 | 0.60 | 0.87 |
| Rural | 0.42 | 0.31 | 0.56 |
| Binge Drinking in Past Two Weeks (ref = None) |  |  |  |
| Once | 4.43 | 3.59 | 5.47 |
| Twice | 5.59 | 4.30 | 7.25 |
| Three to Five Times | 8.10 | 5.89 | 11.13 |
| Six to Nine Times | 5.71 | 2.78 | 11.73 |
| Ten+ Times | 11.15 | 4.83 | 25.73 |
| Year (Ref = 2017) |  |  |  |
| 2018 | 1.12 | 0.92 | 1.35 |
| 2019 | 2.04 | 1.69 | 2.45 |
| Grade (Ref = 8) |  |  |  |
| 10 | 2.49 | 2.03 | 3.07 |
| 12 | 2.30 | 1.87 | 2.83 |

\*Adjusted for grade, sex, race, parental education, urbanicity, binge drinking, and year

Online Table 4: Unadjusted associations between past 30-day nicotine use and past two-week binge drinking among US adolescents, 2017-2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exposure: Past 30-Day Nicotine Use | Outcome: Number of Times Binge Drinking in Past Two Weeks | Odds Ratio | Lower 95% Confidence Interval Limit | Upper 95% Confidence Interval Limit |
|  Smoking Only (vs. No Use) |  Once  | 5.99 | 4.27 | 8.40 |
|  Vaping Only (vs. No Use) |  Once  | 8.39 | 7.27 | 9.68 |
|  Smoking and Vaping (vs. No Use) |  Once  | 14.32 | 11.33 | 18.10 |
|  Smoking Only (vs. No Use) | Twice  | 10.73 | 7.65 | 15.05 |
|  Vaping Only (vs. No Use) | Twice  | 10.69 | 8.87 | 12.89 |
|  Smoking and Vaping (vs. No Use) | Twice  | 34.68 | 27.30 | 44.05 |
|  Smoking Only (vs. No Use) | Three to Five  | 21.52 | 14.70 | 31.51 |
|  Vaping Only (vs. No Use) | Three to Five  | 13.74 | 10.83 | 17.44 |
|  Smoking and Vaping (vs. No Use) | Three to Five  | 66.80 | 49.96 | 89.32 |
|  Smoking Only (vs. No Use) | Six to Nine  | 14.01 | 4.85 | 40.47 |
|  Vaping Only (vs. No Use) | Six to Nine  | 11.56 | 7.17 | 18.63 |
|  Smoking and Vaping (vs. No Use) | Six to Nine  | 63.89 | 37.15 | 109.87 |
|  Smoking Only (vs. No Use) | Ten+  | 21.49 | 8.24 | 56.05 |
|  Vaping Only (vs. No Use) | Ten+  | 12.67 | 7.22 | 22.25 |
|  Smoking and Vaping (vs. No Use) | Ten+  | 117.01 | 68.22 | 200.70 |

Online Table 5: Unimputed associations between past 30-day nicotine use and past two-week binge drinking among US adolescents, 2017-2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exposure: Past 30-Day Nicotine Use | Outcome: Number of Times Binge Drinking in Past Two Weeks | Odds Ratio\* | Lower 95% Confidence Interval Limit | Upper 95% Confidence Interval Limit |
|  Smoking Only (vs. No Use) |  Once  | 2.82 | 1.98 | 4.01 |
|  Vaping Only (vs. No Use) |  Once  | 4.41 | 3.64 | 5.35 |
|  Smoking and Vaping (vs. No Use) |  Once  | 5.89 | 4.35 | 7.98 |
|  Smoking Only (vs. No Use) | Twice  | 5.88 | 3.85 | 8.98 |
|  Vaping Only (vs. No Use) | Twice  | 5.29 | 4.14 | 6.77 |
|  Smoking and Vaping (vs. No Use) | Twice  | 12.91 | 9.32 | 17.88 |
|  Smoking Only (vs. No Use) | Three to Five  | 8.94 | 5.61 | 14.26 |
|  Vaping Only (vs. No Use) | Three to Five  | 6.44 | 4.47 | 9.28 |
|  Smoking and Vaping (vs. No Use) | Three to Five  | 25.39 | 16.92 | 38.09 |
|  Smoking Only (vs. No Use) | Six to Nine  | 6.12 | 1.90 | 20.78 |
|  Vaping Only (vs. No Use) | Six to Nine  | 5.38 | 2.74 | 10.59 |
|  Smoking and Vaping (vs. No Use) | Six to Nine  | 25.47 | 11.97 | 54.19 |
|  Smoking Only (vs. No Use) | Ten+  | 6.58 | 1.40 | 31.03 |
|  Vaping Only (vs. No Use) | Ten+  | 4.79 | 1.64 | 13.99 |
|  Smoking and Vaping (vs. No Use) | Ten+  | 25.68 | 8.33 | 79.16 |

\*Adjusted for grade, sex, race, parental education, urbanicity, cannabis use, and year

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| Online Table 6: Associations between past 30-day nicotine use and past two-week binge drinking among US adolescents, 2017-2019, full regression results |
| **Outcome: Binge Drinking Once in the Past Two Weeks**  |
| Predictor | Odds Ratio\* | Lower 95% Confidence Interval Limit | Upper 95% Confidence Interval Limit |
| Past 30-Day Nicotine Use (ref = None) |  |  |  |
| Smoking Only | 2.80 | 1.97 | 3.99 |
| Vaping Only | 4.27 | 3.56 | 5.13 |
| Smoking and Vaping | 5.60 | 4.19 | 7.48 |
| Sex (Female) | 1.14 | 1.01 | 1.28 |
| Race/Ethnicity (ref=non-Hispanic white) |  |  |  |
| non-Hispanic Black | 0.45 | 0.34 | 0.60 |
| Hispanic/Latino | 0.93 | 0.80 | 1.08 |
| Multiracial | 0.62 | 0.47 | 0.84 |
| non-Hispanic Asian/Pacific Islander | 0.53 | 0.38 | 0.75 |
| Parental Education (At least one parent a college graduate) | 1.10 | 0.95 | 1.27 |
| Urbanicity (ref = Urban) |  |  |  |
| Suburban | 1.04 | 0.90 | 1.21 |
| Rural | 1.10 | 0.89 | 1.36 |
| Cannabis Use (ref = None) |  |  |  |
| Cannabis Use without Vaping | 3.85 | 3.19 | 4.64 |
| Cannabis Use with Vaping | 4.41 | 3.58 | 5.43 |
| Year (Ref = 2017) |  |  |  |
| 2018 | 0.78 | 0.65 | 0.93 |
| 2019 | 0.71 | 0.60 | 0.83 |
| Grade (Ref = 8) |  |  |  |
| 10 | 1.66 | 1.38 | 2.00 |
| 12 | 2.34 | 1.94 | 2.83 |
| **Outcome: Binge Drinking Twice in the Past Two Weeks**  |
| Past 30-Day Nicotine Use (ref = None) |  |  |  |
| Smoking Only | 4.88 | 3.38 | 7.04 |
| Vaping Only | 5.23 | 4.20 | 6.52 |
| Smoking and Vaping | 12.83 | 9.56 | 17.22 |
| Sex (Female) | 0.99 | 0.86 | 1.15 |
| Race/Ethnicity (ref=non-Hispanic white) |  |  |  |
| non-Hispanic Black | 0.52 | 0.36 | 0.74 |
| Hispanic/Latino | 1.23 | 1.04 | 1.46 |
| Multiracial | 0.80 | 0.55 | 1.15 |
| non-Hispanic Asian/Pacific Islander | 0.50 | 0.26 | 0.95 |
| Parental Education (At least one parent a college graduate) | 1.15 | 0.97 | 1.35 |
| Urbanicity (ref = Urban) |  |  |  |
| Suburban | 0.98 | 0.78 | 1.24 |
| Rural | 1.07 | 0.79 | 1.45 |
| Cannabis Use (ref = None) |  |  |  |
| Cannabis Use without Vaping | 4.21 | 3.34 | 5.30 |
| Cannabis Use with Vaping | 5.49 | 4.22 | 7.16 |
| Year (Ref = 2017) |  |  |  |
| 2018 | 0.80 | 0.64 | 1.00 |
| 2019 | 0.64 | 0.52 | 0.79 |
| Grade (Ref = 8) |  |  |  |
| 10 | 1.78 | 1.37 | 2.31 |
| 12 | 2.28 | 1.78 | 2.92 |
| **Outcome: Binge Drinking Three to Five Times in the Past Two Weeks**  |
| Past 30-Day Nicotine Use (ref = None) |  |  |  |
| Smoking Only | 8.82 | 5.60 | 13.88 |
| Vaping Only | 6.45 | 4.71 | 8.85 |
| Smoking and Vaping | 21.60 | 14.89 | 31.33 |
| Sex (Female) | 0.82 | 0.67 | 1.01 |
| Race/Ethnicity (ref=non-Hispanic white) |  |  |  |
| non-Hispanic Black | 0.89 | 0.59 | 1.35 |
| Hispanic/Latino | 1.20 | 0.92 | 1.57 |
| Multiracial | 1.22 | 0.83 | 1.78 |
| non-Hispanic Asian/Pacific Islander | 0.76 | 0.46 | 1.26 |
| Parental Education (At least one parent a college graduate) | 1.07 | 0.86 | 1.32 |
| Urbanicity (ref = Urban) |  |  |  |
| Suburban | 1.14 | 0.87 | 1.49 |
| Rural | 1.67 | 1.19 | 2.34 |
| Cannabis Use (ref = None) |  |  |  |
| Cannabis Use without Vaping | 4.37 | 3.25 | 5.87 |
| Cannabis Use with Vaping | 7.95 | 5.75 | 11.00 |
| Year (Ref = 2017) |  |  |  |
| 2018 | 0.61 | 0.47 | 0.79 |
| 2019 | 0.45 | 0.35 | 0.59 |
| Grade (Ref = 8) |  |  |  |
| 10 | 1.37 | 0.98 | 1.90 |
| 12 | 1.94 | 1.41 | 2.68 |
| **Outcome: Binge Drinking Six to Nine Times in the Past Two Weeks**  |
| Past 30-Day Nicotine Use (ref = None) |  |  |  |
| Smoking Only | 5.84 | 1.84 | 18.55 |
| Vaping Only | 5.75 | 3.09 | 10.70 |
| Smoking and Vaping | 21.81 | 11.22 | 42.40 |
| Sex (Female) | 0.56 | 0.36 | 0.88 |
| Race/Ethnicity (ref=non-Hispanic white) |  |  |  |
| non-Hispanic Black | 0.56 | 0.21 | 1.50 |
| Hispanic/Latino | 1.05 | 0.60 | 1.81 |
| Multiracial | 0.83 | 0.42 | 1.64 |
| non-Hispanic Asian/Pacific Islander | 0.44 | 0.12 | 1.59 |
| Parental Education (At least one parent a college graduate) | 1.07 | 0.67 | 1.70 |
| Urbanicity (ref = Urban) |  |  |  |
| Suburban | 0.93 | 0.57 | 1.50 |
| Rural | 1.39 | 0.78 | 2.46 |
| Cannabis Use (ref = None) |  |  |  |
| Cannabis Use without Vaping | 5.68 | 3.21 | 10.08 |
| Cannabis Use with Vaping | 5.67 | 2.79 | 11.51 |
| Year (Ref = 2017) |  |  |  |
| 2018 | 0.49 | 0.26 | 0.91 |
| 2019 | 0.61 | 0.36 | 1.04 |
| Grade (Ref = 8) |  |  |  |
| 10 | 1.33 | 0.66 | 2.68 |
| 12 | 1.54 | 0.81 | 2.93 |
| **Outcome: Binge Drinking Ten+ Times in the Past Two Weeks**  |
| Past 30-Day Nicotine Use (ref = None) |  |  |  |
| Smoking Only | 9.03 | 3.16 | 25.85 |
| Vaping Only | 5.08 | 2.40 | 10.78 |
| Smoking and Vaping | 36.53 | 16.16 | 82.60 |
| Sex (Female) | 0.40 | 0.25 | 0.65 |
| Race/Ethnicity (ref=non-Hispanic white) |  |  |  |
| non-Hispanic Black | 1.39 | 0.60 | 3.22 |
| Hispanic/Latino | 2.12 | 1.26 | 3.55 |
| Multiracial | 1.32 | 0.54 | 3.24 |
| non-Hispanic Asian/Pacific Islander | 4.21 | 1.82 | 9.72 |
| Parental Education (At least one parent a college graduate) | 1.37 | 0.81 | 2.32 |
| Urbanicity (ref = Urban) |  |  |  |
| Suburban | 0.99 | 0.58 | 1.68 |
| Rural | 1.05 | 0.50 | 2.22 |
| Cannabis Use (ref = None) |  |  |  |
| Cannabis Use without Vaping | 5.70 | 2.49 | 13.06 |
| Cannabis Use with Vaping | 11.09 | 4.75 | 25.91 |
| Year (Ref = 2017) |  |  |  |
| 2018 | 0.65 | 0.37 | 1.14 |
| 2019 | 0.63 | 0.33 | 1.21 |
| Grade (Ref = 8) |  |  |  |
| 10 | 1.90 | 0.90 | 4.04 |
| 12 | 2.07 | 1.05 | 4.10 |

\*Adjusted for grade, sex, race, parental education, urbanicity, cannabis use, and year