**Supplemental Table 1.** Combined cohort estimates and Project STRIDE estimates of the association of substance use change with depressive symptoms as measured with the PHQ-9 (linear PHQ-9 score) using linear mixed models

|  |  |  |  |
| --- | --- | --- | --- |
| **Combined cohort** | **∆PHQ-9 Score** | **95% CI** | **P-value** |
| **Cocaine/crack** | Decrease | -0.59 | (-1.36, 0.19) | 0.10 |
| (N=771) | Quit | -0.82 | (-1.26, -0.37) | <0.001 |
| **Amphetamine-type substances (ATS)** | Decrease | -1.73 | (-2.27, -1.20) | <0.001 |
| (N=1,023) | Quit | -2.23 | (-2.65, -1.81) | <0.001 |
| **Opioids** | Decrease | -0.50 | (-1.82, 0.81) | 0.50 |
| (N=373) | Quit | -0.71 | (-1.39, -0.03) | 0.04 |
| **Marijuana** | Decrease | -0.40 | (-0.66, -0.13) | 0.003 |
| (N=3,304) | Quit | -0.49 | (-0.72, -0.27) | <0.001 |
| **Project STRIDE** |  |  |  |
| **Cocaine/crack** | Decrease | -0.98 | (-3.20, 1.24) | 0.4 |
| (N=43) | Quit | -1.11 | (-3.16, 0.94) | 0.3 |
| **Amphetamine-type substances (ATS)** | Decrease | N/A |  |  |
| (N=7) | Quit | N/A |  |  |
| **Opioids** | Decrease | -1.09 | (-3.28, 1.09) | 0.3 |
| (N=83) | Quit | -1.26 | (-2.91, 0.40) | 0.1 |
| **Marijuana** | Decrease | 0.32 | (-3.60, 4.24) | 0.9 |
| (N=27) | Quit | 1.22 | (-2.52, 4.96) | 0.5 |

**Supplement Table 2.** The association between reducing PHQ-9 score over follow-up and frequency of substance use using linear mixed models

|  |  |  |  |
| --- | --- | --- | --- |
|  | **∆ days of use** | **95% CI** | **P-value** |
| **Cocaine/crack** | -0.07 | (-0.12, -0.02) | 0.004 |
| **Amphetamine-type substances (ATS)** | -0.21 | (-0.30, -0.13) | <0.001 |
| **Opioids** | -0.03 | (-0.08, 0.02) | 0.263 |
| **Marijuana** | -0.25 | (-0.44, -0.06) | 0.011 |

**Supplemental Table 3.** Factors associated with screen positive PHQ-9 score among persons living with HIV in clinical care across the US in the CNICS cohort between 2010-2017 in adjusted models\* among 728 cocaine/crack users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **PHQ-9 Score≥10** | **OR** | **95% CI** | **P-value** |
| Cocaine/crack | Decrease | 0.97 | 0.60, 1.58 | 0.912 |
|   | Quit | 0.76 | 0.56, 1.03 | 0.080 |
| Female | 2.21 | 1.26, 3.87 | 0.006 |
| Age (per decade, centered at 40) | 1.00 | 0.97, 1.02 | 0.702 |
| Calendar time (cohort entry year from 2010) | 0.92 | 0.81, 1.04 | 0.194 |
| Years in Study | 0.87 | 0.77, 0.98 | 0.021 |
| Amphetamine-type substances use | 1.07 | 1.04, 1.10 | <0.001 |
| Opioid/heroin use | 1.02 | 0.98, 1.06 | 0.374 |
| Marijuana use | 1.01 | 1.00, 1.02 | 0.172 |
| Alcohol use | 1.02 | 0.99, 1.04 | 0.162 |
| Binge alcohol use | 1.01 | 0.99, 1.04 | 0.368 |

\*Survival model component included in Supplement Table 4

**Supplemental Table 4.** Survival model for the joint longitudinal and survival model (using a Weibull distribution with shape parameter k=0.48) among 728 cocaine/crack users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time to loss to follow-up** | **HR** | **95% CI** | **P-value** |
| Cocaine/crack | Decrease | 0.44 | 0.30, 0.63 | <0.001 |
|   | Quit | 0.40 | 0.32, 0.49 | <0.001 |
| Female | 0.66 | 0.50, 0.89 | 0.006 |
| Age (per decade, centered at 40) | 0.98 | 0.97, 0.99 | <0.001 |
| Calendar time (cohort entry year from 2010) | 0.85 | 0.79, 0.91 | <0.001 |
| Amphetamine-type substances use | 1.01 | 0.99, 1.02 | 0.252 |
| Opioid/heroin use | 1.00 | 0.97, 1.03 | 0.977 |
| Marijuana use | 1.00 | 0.99, 1.01 | 0.678 |
| Alcohol use | 0.99 | 0.98, 1.01 | 0.513 |
| Binge alcohol use | 1.02 | 1.00, 1.03 | 0.058 |

HR: hazard ratio

**Supplemental Table 5.** Factors associated with screen positive PHQ-9 score among persons living with HIV in clinical care across the US in the CNICS cohort between 2010-2017 in adjusted models\* among 1,016 amphetamine-type substances (ATS) users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **PHQ-9 Score≥10** | **OR** | **95% CI** | **P-value** |
| ATS | Decrease | 0.38 | 0.25, 0.56 | <0.001 |
|   | Quit | 0.39 | 0.30, 0.52 | <0.001 |
| Female | 2.54 | 1.21, 5.34 | 0.014 |
| Age (per decade, centered at 40) | 1.00 | 0.98, 1.01 | 0.599 |
| Calendar time (cohort entry year from 2010) | 1.13 | 1.02, 1.25 | 0.014 |
| Years in Study | 0.90 | 0.77, 1.04 | 0.152 |
| Cocaine/crack use | 1.03 | 0.98, 1.08 | 0.269 |
| Opioid/heroin use | 1.03 | 0.99, 1.06 | 0.171 |
| Marijuana use | 1.01 | 1.00, 1.02 | 0.088 |
| Alcohol use | 0.99 | 0.97. 1.02 | 0.514 |
| Binge alcohol use | 1.02 | 0.99, 1.05 | 0.149 |

\*Survival model component included in Supplement Table 6

**Supplemental Table 6.** Survival model for the joint longitudinal and survival model (using a Weibull distribution with shape parameter k=0.50) among 1,016 amphetamine-type substances (ATS) users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time to loss to follow-up** | **HR** | **95% CI** | **P-value** |
| ATS | Decrease | 0.56 | 0.43, 0.73 | <0.001 |
|   | Quit | 0.48 | 0.40, 0.57 | <0.001 |
| Female | 0.91 | 0.64, 1.31 | 0.629 |
| Age (per decade, centered at 40) | 0.99 | 0.99, 1.00 | 0.134 |
| Calendar time (cohort entry year from 2010) | 0.90 | 0.86, 0.96 | <0.001 |
| Cocaine/crack use | 1.03 | 1.00, 1.06 | 0.050 |
| Opioid/heroin use | 1.02 | 0.99, 1.04 | 0.173 |
| Marijuana use | 1.01 | 1.00, 1.02 | 0.009 |
| Alcohol use | 1.00 | 0.98, 1.02 | 0.927 |
| Binge alcohol use | 1.00 | 0.98, 1.02 | 0.840 |

**Supplemental Table 7.** Factors associated with screen positive PHQ-9 score among persons living with HIV in clinical care across the US in the CNICS cohort between 2010-2017 in adjusted models\* among 290 illicit Opioid users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **PHQ-9 Score≥10** | **OR** | **95% CI** | **P-value** |
| Opioid/heroin | Decrease | 1.20 | 0.39, 3.72 | 0.746 |
|   | Quit | 0.79 | 0.48, 1.29 | 0.352 |
| Female | 1.06 | 0.42, 2.67 | 0.908 |
| Age (per decade, centered at 40) | 0.97 | 0.93, 1.00 | 0.062 |
| Calendar time (cohort entry year from 2010) | 0.90 | 0.75, 1.09 | 0.285 |
| Years in Study | 0.92 | 0.72, 1.16 | 0.471 |
| Amphetamine-type substances use | 1.05 | 1.02, 1.09 | 0.001 |
| Cocaine/crack use | 1.03 | 0.99, 1.08 | 0.156 |
| Marijuana use | 1.00 | 0.98, 1.02 | 0.816 |
| Alcohol use | 0.99 | 0.95, 1.03 | 0.531 |
| Binge alcohol use | 1.05 | 1.00, 1.09 | 0.045 |

\*Survival model component included in Supplement Table 8

**Supplemental Table 8.** Survival model for the joint longitudinal and survival model (using a Weibull distribution with shape parameter k=0.55) among 290 illicit Opioid users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time to loss to follow-up** | **HR** | **95% CI** | **P-value** |
| Opioid/heroin | Decrease | 0.28 | 0.09, 0.92 | 0.037 |
|   | Quit | 0.36 | 0.25, 0.51 | <0.001 |
| Female | 1.47 | 0.89, 2.42 | 0.131 |
| Age (per decade, centered at 40) | 1.00 | 0.98, 1.02 | 0.969 |
| Calendar time (cohort entry year from 2010) | 0.78 | 0.69, 0.88 | <0.001 |
| Amphetamine-type substances use | 1.00 | 0.98, 1.02 | 0.822 |
| Cocaine/crack use | 0.98 | 0.93, 1.03 | 0.422 |
| Marijuana use | 1.02 | 1.01, 1.04 | <0.001 |
| Alcohol use | 1.02 | 0.98, 1.05 | 0.350 |
| Binge alcohol use | 0.99 | 0.96, 1.03 | 0.773 |

**Supplemental Table 9.** Factors associated with screen positive PHQ-9 score among persons living with HIV in clinical care across the US in the CNICS cohort between 2010-2017 in adjusted models\* among 3,277 marijuana users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **PHQ-9 Score≥10** | **OR** | **95% CI** | **P-value** |
| Marijuana | Decrease | 0.72 | 0.58, 0.88 | 0.002 |
|   | Quit | 0.70 | 0.59, 0.84 | <0.001 |
| Female | 1.73 | 1.21, 2.46 | 0.002 |
| Age (per decade, centered at 40) | 0.99 | 0.98, 1.00 | 0.039 |
| Calendar time (cohort entry year from 2010) | 0.97 | 0.91, 1.03 | 0.337 |
| Years in Study | 0.88 | 0.84, 0.93 | <0.001 |
| Amphetamine-type substances use | 1.05 | 1.04, 1.07 | <0.001 |
| Cocaine/crack use | 1.02 | 1.00, 1.05 | 0.105 |
| Opioid/heroin use | 1.02 | 1.00, 1.04 | 0.073 |
| Alcohol use | 0.98 | 0.97, 0.99 | 0.002 |
| Binge alcohol use | 1.03 | 1.01, 1.05 | 0.002 |

\*Survival model component included in Supplement Table 10

**Supplemental Table 10.** Survival model for the joint longitudinal and survival model (using a Weibull distribution with shape parameter k=0.47) among 3,277 marijuana users at baseline.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time to loss to follow-up** | **HR** | **95% CI** | **P-value** |
| Marijuana | Decrease | 0. 69 | 0.60, 0.79 | <0.001 |
|   | Quit | 0.48 | 0.42, 0.54 | <0.001 |
| Female | 0.84 | 0.71, 0.99 | 0.041 |
| Age (per decade, centered at 40) | 0.99 | 0.98, 0.99 | <0.001 |
| Calendar time (cohort entry year from 2010) | 0.92 | 0.89, 0.95 | <0.001 |
| Amphetamine-type substances use | 1.00 | 0.99, 1.01 | 0.620 |
| Cocaine/crack use | 1.01 | 0.99, 1.02 | 0.579 |
| Opioid/heroin use | 1.00 | 0.99, 1.02 | 0.794 |
| Alcohol use | 1.01 | 1.00, 1.01 | 0.083 |
| Binge alcohol use | 1.00 | 0.99, 1.02 | 0.602 |