

Supplementary Table S1. Generic names of opioid agents.

Opioid agents	
Buprenorphine	Methadone
Codeine	Morphine
Fentanyl	Oxycodone
Hydrocodone	Oxymorphone
Hydromorphone	Tapentadol
Meperidine	Tramadol

Listed agents may be present in medications alone or in combination with other opioid or non-opioid agents.

Supplementary Table S2. Population prevalence of self-reported prescription opioid use, cannabis use, and co-use within the past 30 days.

	Opioid use	Cannabis use	Co-use
Overall (2009–2018)	5.59 ± 0.43	17.75 ± 0.72	1.03 ± 0.19
<i>By survey cycle:</i>			
2009–2010	6.32 ± 0.98	15.64 ± 1.46	1.18 ± 0.43
2011–2012	6.57 ± 1.05	15.63 ± 1.54	1.01 ± 0.43
2013–2014	5.89 ± 0.96	17.16 ± 1.54	1.15 ± 0.43
2015–2016	4.16 ± 0.85	19.70 ± 1.69	0.90 ± 0.40
2017–2018	5.06 ± 0.97	20.41 ± 1.78	0.92 ± 0.42

Values are presented as proportion (%) ± standard error.

All proportions displayed are weighted to represent the non-institutionalized population in the continental United States. Survey weights are adjusted by the number of years of data included in analysis.

Supplementary Table S3. Primary multivariable logistic regression model for recent cannabis use, with recent prescription opioid use as primary exposure.

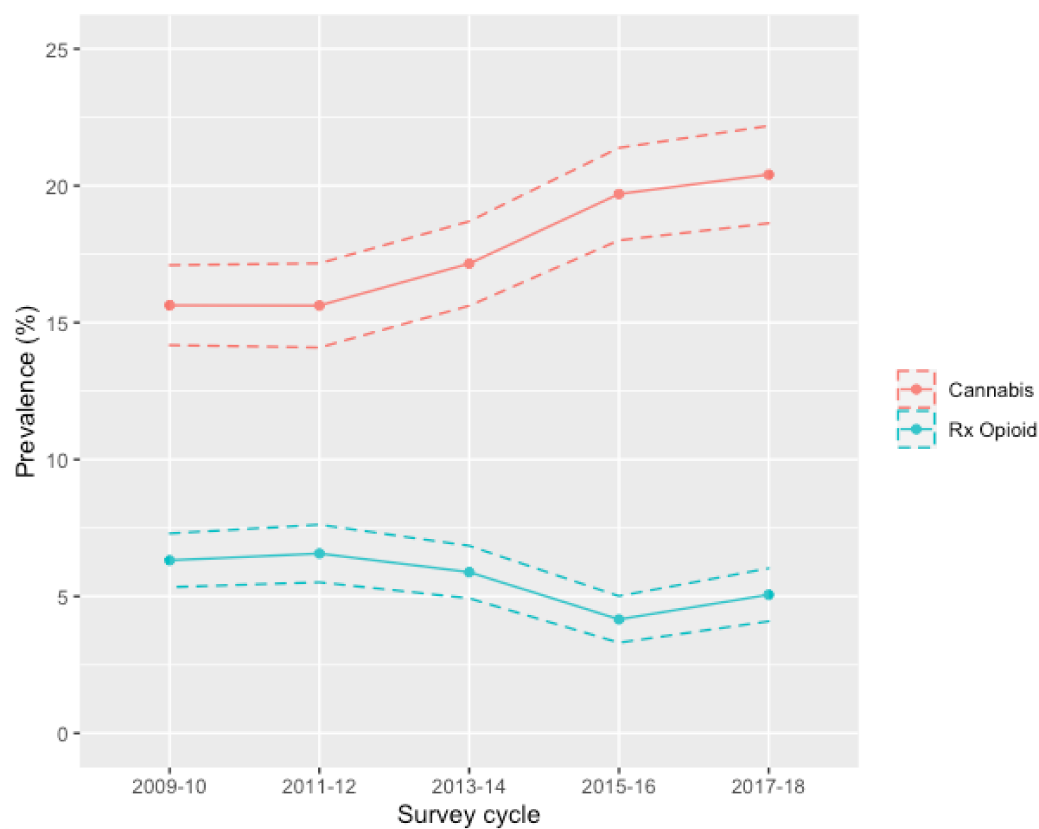
	Recent cannabis use				
	beta	OR	95% CI		p-value
			Lower	Upper	
(Intercept)	-1.340	0.26	0.17	0.39	<0.001
Recent prescription opioid use	-0.352	0.70	0.51	0.97	0.032
Age (years)					
18–25	--	1 (ref)	--	--	
26–40	-0.731	0.48	0.40	0.58	<0.001
41–59	-1.299	0.27	0.21	0.35	<0.001
Sex					
Male	--	1 (ref)	--	--	
Female	-0.338	0.71	0.62	0.81	<0.001
Ethnicity					
Hispanic	--	1 (ref)	--	--	
White	0.436	1.55	1.25	1.91	<0.001
Black	1.116	3.05	2.47	3.76	<0.001
Other	0.357	1.43	1.10	1.86	0.008
Education beyond high school	-0.028	0.97	0.83	1.14	0.735
Family income-to-poverty ratio					
≤1	--	1 (ref)	--	--	
1–3	-0.141	0.87	0.74	1.02	0.094
>3	-0.360	0.70	0.57	0.85	<0.001
Health insurance	-0.298	0.74	0.61	0.90	0.003
Self-rated health status					
Poor or fair	--	1 (ref)	--	--	
Good, very good, or excellent	-0.042	0.96	0.77	1.19	0.710
Hypertension	0.070	1.07	0.90	1.28	0.430
Diabetes	-0.193	0.82	0.57	1.18	0.295
BMI (kg/m²)					
<25	--	1 (ref)	--	--	
25–30	-0.285	0.75	0.65	0.87	<0.001
≥30	-0.441	0.64	0.55	0.76	<0.001
Coronary artery disease	0.041	1.04	0.37	2.91	0.938
Heart failure	-0.583	0.56	0.25	1.22	0.146

	Recent cannabis use				
	beta	OR	95% CI		p-value
			Lower	Upper	
Stroke	-0.407	0.67	0.31	1.44	0.301
Asthma	0.001	1.00	0.86	1.17	0.988
COPD	0.281	1.32	0.95	1.85	0.100
Cancer	0.349	1.42	1.00	2.01	0.050
Arthritis	0.139	1.15	0.94	1.40	0.165
Depression	0.457	1.58	1.23	2.02	<0.001
Smoker	0.816	2.26	1.94	2.63	<0.001
Heavy alcohol use	0.329	1.39	1.17	1.65	<0.001
Any illicit substance use	1.305	3.69	3.10	4.40	<0.001
Survey cycle					
2009–10	--	1 (ref)	--	--	
2011–12	-0.006	0.99	0.78	1.27	0.962
2013–14	0.131	1.14	0.93	1.40	0.214
2015–16	0.432	1.54	1.10	2.16	0.012
2017–18	0.527	1.69	1.28	2.24	<0.001

Supplementary Table S4. Multivariable logistic regression model for recent cannabis use with interaction terms between recent prescription opioid use (exposure) and year of survey administration.

	Recent cannabis use				
	beta	OR	95% CI		p-value
			Lower	Upper	
(Intercept)	-1.364	0.26	0.17	0.39	<0.001
Recent prescription opioid use	0.021	1.02	0.63	1.65	0.932
Survey cycle					
2009–10	--	1 (ref)	--	--	
2011–12	0.035	1.04	0.80	1.35	0.795
2013–14	0.151	1.16	0.93	1.45	0.181
2015–16	0.454	1.57	1.13	2.20	0.008
2017–18	0.563	1.76	1.30	2.38	<0.001
(Interaction terms)					
Opioid * 2009–10	--	1 (ref)	--	--	
Opioid * 2011–12	-0.614	0.54	0.24	1.20	0.132
Opioid * 2013–14	-0.303	0.74	0.32	1.70	0.475
Opioid * 2015–16	-0.305	0.74	0.27	2.02	0.553
Opioid * 2017–18	-0.632	0.53	0.23	1.24	0.142
Age (years)					
18–25	--	1 (ref)	--	--	
26–40	-0.729	0.48	0.40	0.58	<0.001
41–59	-1.299	0.27	0.21	0.35	<0.001
Sex					
Male	--	1 (ref)	--	--	
Female	-0.340	0.71	0.62	0.81	<0.001
Ethnicity					
Hispanic	--	1 (ref)	--	--	
White	0.437	1.55	1.25	1.91	<0.001
Black	1.116	3.05	2.48	3.77	<0.001
Other	0.357	1.43	1.10	1.86	0.008
Education beyond high school	-0.028	0.97	0.83	1.14	0.736
Family income-to-poverty ratio					
≤1	--	1 (ref)	--	--	
1-3	-0.142	0.87	0.74	1.02	0.093
>3	-0.359	0.70	0.57	0.85	<0.001

	Recent cannabis use				
	beta	OR	95% CI		p-value
			Lower	Upper	
Health insurance	-0.297	0.74	0.61	0.90	0.003
Self-rated health status					
Poor or fair	--	1 (ref)	--	--	
Good, very good, or excellent	-0.044	0.96	0.77	1.19	0.693
Hypertension	0.069	1.07	0.90	1.27	0.433
Diabetes	-0.193	0.82	0.57	1.18	0.294
BMI (kg/m²)					
<25	--	1 (ref)	--	--	
25–30	-0.285	0.75	0.65	0.87	<0.001
≥30	-0.444	0.64	0.54	0.76	<0.001
Coronary artery disease	0.043	1.04	0.37	2.93	0.935
Heart failure	-0.604	0.55	0.24	1.23	0.144
Stroke	-0.404	0.67	0.31	1.45	0.307
Asthma	0.005	1.00	0.86	1.17	0.953
COPD	0.283	1.33	0.95	1.85	0.097
Cancer	0.346	1.41	1.00	2.00	0.053
Arthritis	0.139	1.15	0.95	1.40	0.162
Depression	0.457	1.58	1.23	2.02	<0.001
Smoker	0.818	2.26	1.95	2.64	<0.001
Heavy alcohol use	0.329	1.39	1.17	1.65	<0.001
Any illicit substance use	1.307	3.70	3.09	4.41	<0.001



Supplementary Figure S1. Weighted prevalence of self-reported prescription opioid use and self-reported cannabis use in the past 30 days from participants of the National Health and Nutrition Examination Survey, 2009–2018. Values have been adjusted using survey sample weights to represent the non-institutionalized population of the continental United States.

