

## Supplemental Information

**SUPPLEMENTAL TABLE 6** POM by Individual- and School-Level Characteristics (2002–2017)

	Past-Year POM, Individual-Level Only ( <i>n</i> = 28 340), Model 1, <sup>a</sup> aOR (95% CI)	Past-Year POM, School-Level Only ( <i>n</i> = 34 481), Model 2, <sup>b</sup> aOR (95% CI)	Past-Year POM, Full Model 3, <sup>c</sup> aOR (95% CI)
Individual level			
Medical opioid use, lifetime: only medical			
No	Reference	—	Reference
Yes	3.12 (2.73–3.57) <sup>***</sup>	—	2.93 (2.55–3.37) <sup>***</sup>
School-level			
Percentage medical prescription opioid use, only medical			
None	—	Reference	Reference
Low (1%–11%)	—	1.49 (1.20–1.84) <sup>***</sup>	1.33 (1.02–1.72) <sup>*</sup>
Medium (12%–19%)	—	1.99 (1.61–2.47) <sup>***</sup>	1.65 (1.27–2.14) <sup>***</sup>
High (20%–83%)	—	1.92 (1.55–2.41) <sup>***</sup>	1.42 (1.09–1.84) <sup>**</sup>

“Reference” refers to the reference category. Sample sizes vary because of missing data. —, variable not included in the model.

<sup>a</sup> This model controls for individual-level factors that include sex, race and ethnicity, highest parental education, grade point average, past 2 week binge drinking, past 30 d cigarette use, past 30 d marijuana use, and cohort year (results not shown).

<sup>b</sup> This model controls for school-level factors that include cohort year, private or public status of school, urbanicity of school, school size, US Census region, percentage of students with low grades, percentage male, parental education, percentage white, percentage of binge drinking, percentage of cigarette use, and percentage of marijuana use (results not shown).

<sup>c</sup> This model controls for individual-level factors that include sex, race and ethnicity, highest parental education, grade point average, past 2 week binge drinking, past 30 d cigarette use, past 30 d marijuana use, and cohort year (results not shown). Moreover, this model also controls for school-level factors that include cohort year, private or public status of school, urbanicity of school, school size, US Census region, percentage of students with low grades, percentage male, parental education, percentage white, percentage binge drinking, percentage cigarette use, and percentage marijuana use (results not shown).

\*  $P < .05$ .

\*\*  $P < .01$ .

\*\*\*  $P < .001$ .

**SUPPLEMENTAL TABLE 7** Correlates of Nonmedical POM by School-Level and Individual-Level Characteristics (2002–2017)

Correlates	Past-Year Nonmedical POM, Individual-Level Only ( <i>n</i> = 28 340), Model 1, aOR (95% CI)	Past-Year Nonmedical POM, Full Model ( <i>n</i> = 28 340), Model 3, aOR (95% CI)
Individual level		
Sex		
Female	Reference	Reference
Male	0.904 (0.793–1.03)	0.882 (0.771–1.01)
Race and ethnicity		
White	Reference	Reference
Multiracial	0.714 (0.602, 0.847)***	0.762 (0.628–0.923)**
Highest parental education		
Less than a BA	Reference	Reference
BA or higher	0.877 (0.767–1.01)	0.876 (0.765–1.01)
Grade point average		
B– or higher	Reference	Reference
C+ or lower	1.32 (1.13–1.55)***	1.31 (1.12–1.55)***
Binge drinking		
No	Reference	Reference
Yes	1.67 (1.45–1.92)***	1.69 (1.47–1.95)***
Cigarette use		
No	Reference	Reference
Yes	3.07 (2.60–3.64)***	3.10 (2.61–3.68)***
Marijuana use		
No	Reference	Reference
Yes	4.44 (3.82–5.16)***	4.42 (3.80–5.14)***
Medical opioid use (lifetime)		
No	Reference	Reference
Yes	10.0 (8.83–11.4)***	9.25 (8.11–10.5)***
Cohort year, individual or school		
2002–2005	Reference	Reference
2006–2009	1.20 (0.994–1.45)	1.19 (0.999–1.43)
2010–2013	1.05 (0.865–1.28)	1.03 (0.845–1.27)
2014–2017	0.836 (0.663–1.05)	0.916 (0.711–1.18)
School level		
Private status		
Public school	—	Reference
Private school	—	0.898 (0.713–1.13)
Urbanicity of school		
Urban	—	Reference
Suburban	—	1.05 (0.898–1.24)
Rural	—	0.942 (0.746–1.18)
School size		
Small	—	Reference
Medium	—	0.965 (0.774–1.20)
High	—	1.07 (0.855–1.33)
US Census region		
Northeast	—	Reference
Midwest	—	1.12 (0.893–1.40)
South	—	1.27 (1.01–1.59)*
West	—	1.61 (1.27–2.04)***
Percentage with low grades		
Low	—	Reference
Medium	—	0.830 (0.696–0.990)*
High	—	0.920 (0.751–1.12)
Percentage male		
Low	—	Reference
Medium	—	1.12 (0.954–1.32)

SUPPLEMENTAL TABLE 7 Continued

Correlates	Past-Year Nonmedical POM, Individual-Level Only ( <i>n</i> = 28 340), Model 1, aOR (95% CI)	Past-Year Nonmedical POM, Full Model ( <i>n</i> = 28 340), Model 3, aOR (95% CI)
High	—	1.15 (0.978–1.37)
Parental education		
Low	—	Reference
Medium	—	0.900 (0.743–1.09)
High	—	0.892 (0.706–1.12)
Percentage white		
Low	—	Reference
Medium	—	1.14 (0.917–1.42)
High	—	1.35 (1.05–1.75)*
Percentage binge drinking		
None	—	Reference
Low	—	0.581 (0.195–1.72)
Medium	—	0.599 (0.200–1.79)
High	—	0.572 (0.190–1.72)
Percentage cigarette use		
None	—	Reference
Low	—	0.564 (0.140–2.27)
Medium	—	0.662 (0.163–2.68)
High	—	0.633 (0.154–2.59)
Percentage marijuana use		
None	—	Reference
Low	—	1.87 (0.729–4.82)
Medium	—	2.34 (0.904–6.05)
High	—	1.98 (0.760–5.20)
Percentage medical prescription opioid use		
None	—	Reference
Low	—	1.54 (0.999–2.30)
Medium	—	1.69 (1.12–2.54)*
High	—	1.70 (1.14–2.53)**

This table provides the individual-level variable for lifetime medical use. "Reference" refers to the reference category. Sample sizes vary because of missing data. BA, bachelor's degree; —, variable not included in the model.

\*  $P < .05$ .

\*\*  $P < .01$ .

\*\*\*  $P < .001$ .

SUPPLEMENTAL TABLE 8 School-Level Prevalence of Medical Use and Misuse of Prescription Opioids by School-Level Characteristics, 2002–2017

School-Level Characteristics (12th Grade)	POM, Past-Year, % (95% CI)	$P^a$	Medical Use of Prescription Opioids, Lifetime, % (95% CI)	$P^a$
Medical use of prescription opioids, lifetime		<.001		
None	4.8 (4.3–5.3)		—	
Low	6.1 (5.8–6.4)		—	
Medium	8.5 (8.1–8.9)		—	
High	10.2 (9.6–10.7)		—	
POM, past-year				<.001
None	—		10.3 (7.7–12.8)	
Low	—		12.2 (11.2–13.2)	
Medium	—		17.4 (16.4–18.4)	
High	—		22.6 (21.6–23.6)	

—, not applicable.

<sup>a</sup> F-test  $P$  values indicate whether rates of opioid use significantly vary by school-level characteristics.

**SUPPLEMENTAL TABLE 9** School-Level Prevalence of Medical Use and Misuse of Prescription Opioids by School-Level Characteristics, 2002–2005

School-Level Characteristics (12th Grade)	POM, Past-Year, % (95% CI)	<i>P</i> <sup>a</sup>	Medical Use of Prescription Opioids, Lifetime, % (95% CI)	<i>P</i> <sup>a</sup>
Medical use of prescription opioids, lifetime		<.001		
None	4.3 (3.3–5.4)		—	
Low	7.0 (6.1–7.8)		—	
Medium	9.8 (9.1–10.6)		—	
High	11.7 (10.4–13.1)		—	
POM, past-year				<.001
None	—		8.4 (3.6–13.1)	
Low	—		11.5 (9.3–13.8)	
Medium	—		17.4 (15.5–19.3)	
High	—		23.1 (21.4–24.8)	

—, not applicable.

<sup>a</sup> F-test *P* values indicate whether rates of opioid use significantly vary by school-level characteristics.

**SUPPLEMENTAL TABLE 10** School-Level Prevalence of Medical Use and Misuse of Prescription Opioids by School-Level Characteristics, 2006–2009

School-Level Characteristics (12th Grade)	POM, Past-Year, % (95% CI)	<i>P</i> <sup>a</sup>	Medical Use of Prescription Opioids, Lifetime, % (95% CI)	<i>P</i> <sup>a</sup>
Medical use of prescription opioids, lifetime		<.001		
None	5.8 (4.8–7.2)		—	
Low	7.5 (6.8–8.3)		—	
Medium	9.5 (8.7–10.3)		—	
High	12.4 (11.6–13.2)		—	
POM, past-year				<.001
None	—		5.4 (13.2–9.5)	
Low	—		10.3 (8.1–12.5)	
Medium	—		15.7 (13.7–17.7)	
High	—		23.3 (21.5–25.0)	

—, not applicable.

<sup>a</sup> F-test *P* values indicate whether rates of opioid use significantly vary by school-level characteristics.

**SUPPLEMENTAL TABLE 11** School-Level Prevalence of Medical Use and Misuse of Prescription Opioids by School-Level Characteristics, 2010–2013

School-Level Characteristics (12th Grade)	POM, Past-Year, % (95% CI)	<i>P</i> <sup>a</sup>	Medical Use of Prescription Opioids, Lifetime, % (95% CI)	<i>P</i> <sup>a</sup>
Medical use of prescription opioids, lifetime		<.001		
None	5.4 (4.4–6.3)		—	
Low	5.9 (5.4–6.5)		—	
Medium	8.4 (7.7–9.0)		—	
High	9.9 (8.9–10.9)		—	
POM, past-year				<.001
None	—		14.1 (8.3–19.8)	
Low	—		11.7 (9.9–13.5)	
Medium	—		17.9 (16.1–19.8)	
High	—		22.5 (20.4–24.5)	

—, not applicable.

<sup>a</sup> F-test *P* values indicate whether rates of opioid use significantly vary by school-level characteristics.

**SUPPLEMENTAL TABLE 12** School-Level Prevalence of Medical Use and Misuse of Prescription Opioids by School-Level Characteristics, 2014–2017

School-Level Characteristics (12th Grade)	POM, Past-Year, % (95% CI)	<i>P</i> <sup>a</sup>	Medical Use of Prescription Opioids, Lifetime, % (95% CI)	<i>P</i> <sup>a</sup>
Medical use of prescription opioids, lifetime		<.001		
None	4.1 (3.3–4.7)		—	
Low	4.1 (3.6–4.5)		—	
Medium	5.8 (5.2–6.2)		—	
High	5.7 (5.0–6.4)		—	
POM, past-year				<.001
None	—		12.1 (7.5–16.6)	
Low	—		13.6 (11.9–15.3)	
Medium	—		18.6 (16.7–20.7)	
High	—		17.1 (13.2–20.9)	

—, not applicable.

<sup>a</sup> F-test *P* values indicate whether rates of opioid use significantly vary by school-level characteristics.

**SUPPLEMENTAL TABLE 13** Correlates of POM by School-Level and Individual-Level Characteristics (2002–2005)

Correlates	Past-Year POM, Individual-Level Correlates Only ( <i>n</i> = 48 459), Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( <i>n</i> = 56 342), Model 2, aOR (95% CI)	Past-Year POM, Full Model ( <i>n</i> = 48 459), Model 3, aOR (95% CI)
<b>Individual Level</b>			
<b>Sex</b>			
Female	Reference	—	Reference
Male	1.13 (1.04–1.23)***	—	1.09 (1.00–1.19)*
<b>Race and ethnicity</b>			
White	Reference	—	Reference
Multiracial	0.546 (0.476–0.626)***	—	0.690 (0.607–0.785)***
<b>Highest parental education</b>			
Less than a BA	Reference	—	Reference
BA or higher	1.01 (0.931–1.11)	—	1.00 (0.921–1.10)
<b>Grade point average</b>			
B– or higher	Reference	—	Reference
C+ or lower	1.19 (1.06–1.32)**	—	1.17 (1.05–1.30)***
<b>Binge drinking</b>			
No	Reference	—	Reference
Yes	2.03 (1.84–2.22)***	—	2.01 (1.83–2.21)***
<b>Cigarette use</b>			
No	Reference	—	Reference
Yes	3.63 (3.23–4.07)***	—	3.65 (3.25–4.10)***
<b>Marijuana use</b>			
No	Reference	—	Reference
Yes	4.90 (4.41–5.43)***	—	4.88 (4.41–5.39)***
<b>Cohort year, individual or school</b>			
2002	Reference	Reference	Reference
2003	1.16 (0.984–1.38)	1.19 (1.05–1.34)**	1.20 (1.03, 1.39)*
2004	1.25 (0.901–1.51)*	1.20 (1.05–1.39)**	1.26 (1.07–1.50)***
2005	1.21 (1.01–1.46)*	1.15 (1.00–1.33)*	1.22 (1.03–1.44)*
<b>School level</b>			
<b>Private status</b>			
Public school	—	Reference	Reference
Private school	—	0.972 (0.826–1.14)	0.931 (0.772–1.44)
<b>Urbanicity of school</b>			
Urban	—	Reference	Reference
Suburban	—	1.01 (0.905–1.13)	0.993 (0.865–1.13)
Rural	—	1.00 (0.862–1.16)	1.00 (0.848–1.19)
<b>School size</b>			
Small	—	Reference	Reference
Medium	—	0.965 (0.803–1.15)	1.00 (0.815–1.23)
High	—	0.972 (0.815–1.15)	1.00 (0.823–1.22)
<b>US Census region</b>			
Northeast	—	Reference	Reference
Midwest	—	1.02 (0.864–1.20)	1.02 (0.848–1.25)
South	—	1.15 (0.980–1.34)	1.22 (1.01–1.47)*
West	—	1.39 (1.16–1.66)***	1.54 (1.25–1.89)***
<b>Percentage with low grades</b>			
Low	—	Reference	Reference
Medium	—	1.04 (0.921–1.18)	1.04 (0.903–1.21)
High	—	1.20 (1.04–1.38)**	1.15 (0.982–1.36)
<b>Percentage male</b>			
Low	—	Reference	Reference
Medium	—	1.01 (0.909–1.14)	0.989 (0.860–1.13)

SUPPLEMENTAL TABLE 13 Continued

Correlates	Past-Year POM, Individual-Level Correlates Only ( $n = 48\,459$ ), Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( $n = 56\,342$ ), Model 2, aOR (95% CI)	Past-Year POM, Full Model ( $n = 48\,459$ ), Model 3, aOR (95% CI)
High	—	1.23 (1.08–1.40)**	1.23 (1.05–1.45)**
Parental education, percentage with a BA or higher			
Low	—	Reference	Reference
Medium	—	0.965 (0.846–1.10)	0.962 (0.825–1.12)
High	—	1.00 (0.875–1.15)	0.980 (0.829–1.15)
Percentage white			
Low	—	Reference	Reference
Medium	—	1.61 (1.37–1.89)***	1.47 (1.20–1.80)***
High	—	1.86 (1.52–2.21)***	1.72 (1.38–2.13)***
Percentage binge drinking			
None	—	Reference	Reference
Low	—	0.574 (0.387–0.852)**	0.437 (0.212–0.899)*
Medium	—	0.672 (0.455–0.994)*	0.431 (0.208, 0–.891)*
High	—	0.692 (0.465–1.03)	0.406 (0.195–0.846)*
Percentage cigarette use			
None	—	Reference	Reference
Low	—	0.711 (0.175–2.89)	0.499 (0.102–2.43)
Medium	—	1.26 (0.320–4.96)	0.823 (0.174–3.89)
High	—	1.31 (0.337–5.15)	0.760 (0.161–3.57)
Percentage marijuana use			
None	—	Reference	Reference
Low	—	5.13 (1.38–19.1)*	3.20 (0.801–12.7)
Medium	—	6.91 (1.87–25.5)**	3.60 (0.907–14.3)
High	—	8.49 (2.27–31.7)***	3.48 (0.867–13.9)
Percentage medical use of prescription opioids			
None	—	Reference	Reference
Low	—	1.49 (1.18–1.89)***	1.75 (1.35–2.27)***
Medium	—	1.53 (1.22–1.92)***	1.79 (1.40–2.29)***
High	—	1.91 (1.52–2.41)***	2.13 (1.66–2.74)***

"Reference" refers to the reference category. Sample sizes vary because of missing data. BA, bachelor's degree; —, variable not included in the model.

\*  $P < .05$ .

\*\*  $P < .01$ .

\*\*\*  $P < .001$ .

**SUPPLEMENTAL TABLE 14** Correlates of POM by School-Level and Individual-Level Characteristics (2006–2009)

Correlates	Past-Year POM, Individual-Level Correlates Only ( <i>n</i> = 48 156), Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( <i>n</i> = 56 226), Model 2, aOR (95% CI)	Past-Year POM, Full Model ( <i>n</i> = 48 156), Model 3, aOR (95% CI)
<b>Individual level</b>			
<b>Sex</b>			
Female	Reference	—	Reference
Male	1.14 (1.04–1.25)**	—	1.11 (1.02–1.22)*
<b>Race and ethnicity</b>			
White	Reference	—	Reference
Multiracial	0.407 (0.35–0.464)***	—	0.492 (0.432–0.561)***
<b>Highest parental education</b>			
Less than a BA	Reference	—	Reference
BA or higher	1.01 (0.935–1.10)	—	1.01 (0.940–1.10)
<b>Grade point average</b>			
B– or higher	Reference	—	Reference
C+ or lower	1.30 (1.18–1.44)***	—	1.31 (1.19–1.44)***
<b>Binge drinking</b>			
No	Reference	—	Reference
Yes	2.25 (2.02–2.49)***	—	2.24 (2.02–2.49)***
<b>Cigarette use</b>			
No	Reference	—	Reference
Yes	3.64 (3.18–4.16)***	—	3.66 (3.20–4.18)***
<b>Marijuana use</b>			
No	Reference	—	Reference
Yes	4.14 (3.75–4.56)***	—	4.24 (3.85–4.67)***
<b>Cohort year, individual or school</b>			
2006	Reference	Reference	Reference
2007	1.01 (0.886–1.15)	0.981 (0.886–1.08)	0.990 (0.877–1.11)
2008	1.05 (0.917–1.21)	0.989 (0.886–1.10)	1.00 (0.878–1.14)
2009	1.06 (0.891–1.26)	0.977 (0.867–1.10)	1.00 (0.865–1.17)
<b>School level</b>			
<b>Private status</b>			
Public school	—	Reference	Reference
Private school	—	1.03 (0.875–1.23)	0.950 (0.770–1.17)
<b>Urbanicity of school</b>			
Urban	—	Reference	Reference
Suburban	—	1.17 (1.06–1.29)***	1.28 (1.12–1.45)***
Rural	—	1.19 (1.03–1.38)*	1.23 (1.03, 1.47)*
<b>School size</b>			
Small	—	Reference	Reference
Medium	—	0.699 (0.846–1.11)	0.942 (0.787–1.12)
High	—	0.346 (0.807–1.07)	0.931 (0.777–1.11)
<b>US Census region</b>			
Northeast	—	Reference	Reference
Midwest	—	1.05 (0.913–1.21)	1.10 (0.921–1.31)
South	—	1.03 (0.911–1.17)	1.13 (0.965–1.32)
West	—	1.30 (1.13–1.49)***	1.50 (1.25–1.80)***
<b>Percentage with low grades</b>			
Low	—	Reference	Reference
Medium	—	1.02 (0.908–1.15)	0.929 (0.798–1.08)
High	—	1.01 (0.895–1.16)	0.932 (0.794–1.09)
<b>Percentage male</b>			
Low	—	Reference	Reference
Medium	—	1.03 (0.936–1.15)	1.04 (0.915–1.19)



SUPPLEMENTAL TABLE 14 Continued

Correlates	Past-Year POM, Individual-Level Correlates Only ( <i>n</i> = 48 156), Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( <i>n</i> = 56 226), Model 2, aOR (95% CI)	Past-Year POM, Full Model ( <i>n</i> = 48 156), Model 3, aOR (95% CI)
High	—	1.06 (0.953–1.19)	1.05 (0.961–1.22)
Parental education, percentage with a BA or higher			
Low	—	Reference	Reference
Medium	—	1.00 (0.911–1.11)	0.997 (0.879–1.13)
High	—	1.01 (0.890–1.14)	0.999 (0.848–1.17)
Percentage white			
Low	—	Reference	Reference
Medium	—	1.33 (1.16–1.52)***	1.16 (0.977–1.37)
High	—	1.55 (1.33–1.81)***	1.29 (1.07–1.56)**
Percentage binge drinking			
None	—	Reference	Reference
Low	—	1.08 (0.215–5.43)	0.278 (0.055–1.41)
Medium	—	1.45 (0.285–7.44)	0.323 (0.063–1.65)
High	—	1.69 (0.330–8.69)	0.316 (0.061–1.62)
Percentage cigarette use			
None	—	Reference	Reference
Low	—	0.410 (0.313–0.537)***	0.264 (0.190–0.368)***
Medium	—	0.615 (0.454–0.833)**	0.330 (0.226–0.480)***
High	—	0.632 (0.455–0.878)**	0.294 (0.195–0.445)***
Percentage marijuana use			
None	—	Reference	Reference
Low	—	4.19 (1.91–9.22)***	7.50 (2.12–26.5)**
Medium	—	5.19 (1.87–11.4)***	7.33 (2.06–26.0)**
High	—	6.31 (2.84–13.9)***	7.39 (2.07–26.4)**
Percentage medical use of prescription opioids			
None	—	Reference	Reference
Low	—	1.27 (1.02–1.58)*	1.33 (1.35–2.27)*
Medium	—	1.46 (1.17–1.84)***	1.56 (1.40–2.29)***
High	—	1.63 (1.30–2.04)***	1.81 (1.43–2.74)***

"Reference" refers to the reference category. Sample sizes vary because of missing data. BA, bachelor's degree; —, variable not included in the model.

\*  $P < .05$ .

\*\*  $P < .01$ .

\*\*\*  $P < .001$ .

**SUPPLEMENTAL TABLE 15** Correlates of POM by School-Level and Individual-Level Characteristics (2010–2013)

Correlates	Past-Year POM, Individual-Level Correlates Only ( <i>n</i> = 46 363) Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( <i>n</i> = 54 607), Model 2, aOR (95% CI)	Past-Year POM, Full Model ( <i>n</i> = 46 363), Model 3, aOR (95% CI)
<b>Individual level</b>			
<b>Sex</b>			
Female	Reference	—	Reference
Male	1.05 (0.966–1.15)	—	1.04 (0.957–1.14)
<b>Race and ethnicity</b>			
White	Reference	—	Reference
Multiracial	0.569 (0.505–0.642)***	—	0.611 (0.539–0.693)***
<b>Highest parental education</b>			
Less than a BA	Reference	—	Reference
BA or higher	0.932 (0.844–1.02)	—	0.944 (0.865–1.04)
<b>Grade point average</b>			
B– or higher	Reference	—	Reference
C+ or lower	1.24 (1.11–1.38)***	—	1.22 (1.10–1.36)***
<b>Binge drinking</b>			
No	Reference	—	Reference
Yes	1.99 (1.79–2.20)***	—	2.08 (1.89–2.28)***
<b>Cigarette use</b>			
No	Reference	—	Reference
Yes	3.40 (3.05–3.79)***	—	3.34 (3.01–3.70)***
<b>Marijuana use</b>			
No	Reference	—	Reference
Yes	4.23 (3.82–4.69)***	—	4.22 (3.80–4.69)***
<b>Cohort year, individual or school</b>			
2010	Reference	Reference	Reference
2011	1.01 (0.885–1.16)	0.959 (0.856–1.07)	0.966 (0.851–1.09)
2012	0.842 (0.702–1.01)	0.863 (0.760–0.981)*	0.809 (0.693–0.945)
2013	0.792 (0.673–0.932)**	0.754 (0.663–0.857)***	0.739 (0.636–0.860)
<b>School level</b>			
<b>Private status</b>			
Public school	—	Reference	Reference
Private school	—	0.837 (0.681–1.02)	0.820 (0.646–1.04)
<b>Urbanicity of school</b>			
Urban	—	Reference	Reference
Suburban	—	0.970 (0.868–1.08)	0.990 (0.857–1.14)
Rural	—	0.975 (0.849–1.11)	1.03 (0.872–1.22)
<b>School size</b>			
Small	—	Reference	Reference
Medium	—	1.00 (0.874–1.15)	0.999 (0.836–1.19)
High	—	0.903 (0.776–1.05)	0.937 (0.778–1.12)
<b>US Census region</b>			
Northeast	—	Reference	Reference
Midwest	—	1.16 (1.01–1.33)	1.15 (0.967–1.37)
South	—	1.12 (0.987–1.28)	1.17 (0.994–1.38)
West	—	1.31 (1.13–1.53)***	1.41 (1.17–1.71)***
<b>Percentage with low grades</b>			
Low	—	Reference	Reference
Medium	—	1.09 (0.978–1.21)	1.12 (0.985–1.29)
High	—	1.00 (0.879–1.14)	0.994 (0.838–1.17)
<b>Percentage male</b>			
Low	—	Reference	Reference
Medium	—	1.11 (0.999–1.25)	1.09 (0.958–1.24)

SUPPLEMENTAL TABLE 15 Continued

Correlates	Past-Year POM, Individual-Level Correlates Only ( <i>n</i> = 46 363) Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( <i>n</i> = 54 607), Model 2, aOR (95% CI)	Past-Year POM, Full Model ( <i>n</i> = 46 363), Model 3, aOR (95% CI)
High Parental education, percentage with a BA or higher	—	1.09 (0.969–1.22)	1.04 (0.910–1.20)
Low	—	Reference	Reference
Medium	—	0.975 (0.854–1.11)	0.992 (0.846–1.16)
High	—	0.923 (0.788–1.08)	1.00 (0.822–1.23)
Percentage white			
Low	—	Reference	Reference
Medium	—	1.45 (1.25–1.67)***	1.16 (0.974–1.40)
High	—	1.45 (1.25–1.68)***	1.14 (0.950–1.38)
Percentage binge drinking			
None	—	Reference	Reference
Low	—	0.698 (0.339–1.43)	0.426 (0.185–0.981)
Medium	—	0.710 (0.344–1.46)	0.381 (0.165–0.882)*
High	—	0.726 (0.352–1.49)	0.311 (0.134–0.718)**
Percentage cigarette use			
None	—	Reference	Reference
Low	—	2.64 (1.16–6.04)*	2.38 (0.952–5.95)
Medium	—	3.05 (1.33–7.00)**	2.36 (0.939–5.92)
High	—	3.74 (1.62–8.62)**	2.75 (1.08–6.97)*
Percentage marijuana use			
None	—	Reference	Reference
Low	—	2.12 (1.09–4.12)*	1.37 (0.690–2.72)
Medium	—	2.98 (1.52–5.85)***	1.56 (0.772–3.15)
High	—	3.44 (1.75–6.75)***	1.60 (0.790–3.24)
Percentage medical use of prescription opioids			
None	—	Reference	Reference
Low	—	0.982 (0.803–1.20)	0.833 (0.681–1.14)
Medium	—	1.23 (1.01–1.50)*	1.16 (0.899–1.51)
High	—	1.52 (1.24–1.85)***	1.41 (1.08–1.83)**

"Reference" refers to the reference category. Sample sizes vary because of missing data. BA, bachelor's degree; —, variable not included in the model.

\*  $P < .05$ .

\*\*  $P < .01$ .

\*\*\*  $P < .001$ .

**SUPPLEMENTAL TABLE 16** Correlates of POM by School-Level and Individual-Level Characteristics (2014–2017)

Correlates	Past-Year POM, Individual-Level Correlates Only ( <i>n</i> = 40 624), Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( <i>n</i> = 49 582, Model 2), aOR (95% CI)	Past-Year POM, Full Model <i>n</i> = 40 624, (Model 3), aOR (95% CI)
<b>Individual level</b>			
<b>Sex</b>			
Female	Reference	—	Reference
Male	1.22 (1.07–1.39)**	—	1.21 (1.06–1.38)**
<b>Race and ethnicity</b>			
White	Reference	—	Reference
Multiracial	0.863 (734, 1.01)	—	0.815 (0.692–0.691)*
<b>Highest parental education</b>			
Less than a BA	Reference	—	Reference
BA or higher	1.06 (0.944–1.20)	—	1.01 (0.899–1.14)
<b>Grade point average</b>			
B– or higher	Reference	—	Reference
C+ or lower	1.19 (1.02–1.40)*	—	1.21 (1.04–1.41)*
<b>Binge drinking</b>			
No	Reference	—	Reference
Yes	1.88 (1.67–2.10)***	—	2.00 (1.78–2.24)***
<b>Cigarette use</b>			
No	Reference	—	Reference
Yes	3.62 (3.08–4.25)***	—	3.52 (3.00–4.12)***
<b>Marijuana use</b>			
No	Reference	—	Reference
Yes	4.29 (3.69–4.99)***	—	4.44 (3.80–5.20)***
<b>Cohort year, individual or school</b>			
2014	Reference	Reference	Reference
2015	0.952 (0.808–1.12)	0.959 (0.835–1.10)	0.916 (0.778–1.07)
2016	0.869 (0.700–1.07)	0.816 (0.696–0.956)*	0.821 (0.688–0.979)*
2017	0.783 (0.635–0.965)*	0.727 (0.623–0.849)***	0.770 (0.645–0.920)**
<b>School level</b>			
<b>Private status</b>			
Public school	—	Reference	Reference
Private school	—	1.01 (0.839–1.22)	1.08 (0.869–1.35)
<b>Urbanicity of school</b>			
Urban	—	Reference	Reference
Suburban	—	1.30 (1.12–1.50)***	1.32 (1.13–1.55)
Rural	—	1.08 (0.884–1.31)	1.04 (0.822–1.31)
<b>School size</b>			
Small	—	Reference	Reference
Medium	—	0.894 (0.756–1.05)	0.915 (0.751–1.11)
High	—	0.823 (0.693,0.978)*	0.834 (0.679–1.02)
<b>US Census region</b>			
Northeast	—	Reference	Reference
Midwest	—	1.64 (1.38–1.96)***	1.56 (1.27–1.92)***
South	—	1.90 (1.59–2.25)***	1.88 (1.53–2.31)***
West	—	1.88 (1.54–2.28)***	1.77 (1.43–2.18)***
<b>Percentage with low grades</b>			
Low	—	Reference	Reference
Medium	—	1.03 (0.901–1.19)	1.07 (0.910–1.26)
High	—	1.02 (0.854–1.22)	0.999 (0.805–1.23)
<b>Percentage male</b>			
Low	—	Reference	Reference
Medium	—	1.02 (0.890–1.18)	1.00 (0.847–1.19)

SUPPLEMENTAL TABLE 16 Continued

Correlates	Past-Year POM, Individual-Level Correlates Only ( $n = 40\,624$ ), Model 1, aOR (95% CI)	Past-Year POM, School-Level Correlates Only ( $n = 49\,582$ , Model 2), aOR (95% CI)	Past-Year POM, Full Model ( $n = 40\,624$ , Model 3), aOR (95% CI)
High	—	1.01 (0.873–1.17)	0.965 (0.811–1.14)
Parental education, percentage with a BA or higher			
Low	—	Reference	Reference
Medium	—	1.25 (1.04–1.49)*	1.24 (1.00–1.53)*
High	—	1.40 (1.13–1.72)**	1.35 (1.03–1.75)*
Percentage white			
Low	—	Reference	Reference
Medium	—	1.02 (0.892–1.18)	0.875 (0.731–1.04)
High	—	1.06 (0.866–1.30)	0.835 (0.656–1.06)
Percentage binge drinking			
None	—	Reference	Reference
Low	—	1.69 (0.704–4.07)	1.67 (0.607–4.63)
Medium	—	1.83 (0.759–4.44)	1.53 (0.547–4.27)
High	—	1.73 (0.711–4.23)	1.29 (0.456–3.66)
Percentage cigarette use			
None	—	Reference	Reference
Low	—	1.01 (0.532–1.92)	0.527 (0.307–0.905)*
Medium	—	1.22 (0.631–2.38)	0.499 (0.284–0.875)*
High	—	1.42 (0.710–2.86)	0.534 (0.286–0.998)*
Percentage marijuana use			
None	—	Reference	Reference
Low	—	1.55 (1.18–2.03)**	0.818 (0.610–1.09)
Medium	—	2.29 (1.72–3.06)***	0.979 (0.705–1.35)
High	—	2.60 (1.95–3.45)***	0.907 (0.653–1.26)
Percentage medical use of prescription opioids			
None	—	Reference	Reference
Low	—	0.885 (0.701–1.11)	0.860 (0.659–1.12)
Medium	—	1.13 (0.891–1.44)	1.05 (0.797–1.39)
High	—	1.01 (0.784–1.32)	1.06 (0.792–1.43)

"Reference" refers to the reference category. Sample sizes vary because of missing data. BA, bachelor's degree; —, variable not included in the model.

\*  $P < .05$ .

\*\*  $P < .01$ .

\*\*\*  $P < .001$ .

**SUPPLEMENTAL TABLE 17** POM by Individual- and School-Level Characteristics (2002–2017):  
Interaction Effect Model (Cohort Year × Different Levels of Medical Prescription Opioid Use)

	Past-Year POM, Full Model ( <i>n</i> = 183 479), Model 1, <sup>a</sup> aOR (95% CI)	Past-Year POM, Interaction Effect Model ( <i>n</i> = 183 479), Model 2, <sup>a</sup> aOR (95% CI)
<b>Main effects</b>		
Cohort year, individual or school		
2002–2005	Reference	Reference
2006–2009	1.14 (1.05–1.25)**	1.34 (0.995–1.80)
2010–2013	0.962 (0.872–1.06)	1.68 (1.22–2.31)***
2014–2017	0.743 (0.654–0.845)***	1.36 (0.934–1.98)
Percentage medical prescription opioid use, school-level		
None	Reference	Reference
Low	1.12 (0.969–1.31)	1.71 (1.29–2.25)***
Medium	1.37 (1.17–1.60)***	1.93 (1.51–2.48)***
High	1.57 (1.35–1.83)***	2.23 (1.73–2.87)***
<b>Interaction effects</b>		
2006–2009 × low medical prescription opioid use	—	0.796 (0.562–1.12)
2006–2009 × medium medical prescription opioid use	—	0.834 (0.559–1.16)
2006–2009 × high medical prescription opioid use	—	0.886 (0.639–1.22)
2010–2013 × low medical prescription opioid use	—	0.502 (0.346–0.728)***
2010–2013 × medium medical prescription opioid use	—	0.554 (0.391–0.784)***
2010–2013 × high medical prescription opioid use	—	0.596 (0.402–0.806)**
2014–2017 × low medical prescription opioid use	—	0.487 (0.322–0.735)***
2014–2017 × medium medical prescription opioid use	—	0.571 (0.385–0.845)**
2014–2017 × high medical prescription opioid use	—	0.449 (0.297–0.678)***

“Reference” refers to the reference category. Sample sizes vary because of missing data. —, variable not included in the model.

<sup>a</sup> These models control for individual-level factors that include sex, race and ethnicity, highest parental education, grade point average, past 2 week binge drinking, past 30 d cigarette use, past 30 d marijuana use, and cohort year (results not shown). Moreover, this model also controls for school-level factors that include cohort year, private or public status of school, urbanicity of school, school size, US Census region, percentage of students with low grades, percentage male, parental education, percentage white, percentage binge drinking, percentage cigarette use, and percentage marijuana use (results not shown).

\*\* *p* < .01.

\*\*\* *p* < .001.