Opioid Misuse Among American Indian Adolescents

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Objectives. To present data for opioid misuse among US reservation-based American Indian (AI) adolescents and to compare these data with national rates from Monitoring the Future (MTF).

Methods. Data were from a national sample of 33 schools participating in a substance use epidemiological survey of reservation-based AI adolescents during 2018 and 2019. Participants were 8th-, 10th-, and 12th-grade AI students (n = 1592). Measures included 12-month and 30-day use of OxyContin, Vicodin, heroin, and narcotics. We computed prevalence and compared it with MTF national prevalence.

Results. Across grades, AI youths demonstrated significantly greater past 12-month and 30-day opioid use relative to a national sample. Significant absolute differences in 12-month and 30-day prevalence levels ranged from 1.6% (8th-grade heroin) to 4.7% (12th-grade narcotics) and from 1.6% (12th-grade narcotics) to 1.8% (12th-grade heroin), respectively.

Conclusions. Opioid misuse prevalence levels were significantly greater for reservation-based AI adolescents relative to national prevalence levels.

Public Health Implications. Findings suggest that implementation of evidence-based efforts, adapted or developed to be culturally appropriate, should be significantly increased in tribal communities, along with policies to address the unique social, economic, and health issues they face. (*Am J Public Health*. 2021;111:471–474. https://doi.org/10.2105/AJPH.2020.306039)

AJPH March 2021, Vol 111, No. 3

Over the last 2 decades, opioid-related deaths have rapidly increased among Indigenous peoples of the United States.[1] For example, Centers for Disease Control and Prevention data indicate that 2018 age-adjusted, opioid-related overdose deaths among American Indians and Alaska Natives (AIANs) were nearly 5 times the comparable rate in 1999 (2.9 per 100 000 in 1999 vs 14.2 per 100 000 in 2018).[1,2] Moreover, these numbers are likely to be undercounted by as much as 40% through misidentification of race on AIAN death certificates.[3] Opioid misuse among AIANs aged 12 years and older is also higher than national levels (5.8% vs 3.6% for past-year misuse), according to 2018 data from the National Survey on Drug Use and Health (NSDUH).[4]

Many tribes report overwhelming consequences from misuse and overdose on their reservations; however, data on opioid misuse on American Indian (AI) reservations is sparse.[5] To help fill this data gap, this article presents 2018–2019 data on the prevalence of opioid misuse among AI adolescents attending schools on or near reservations in the United States. These rates are compared with national rates measured by Monitoring the Future (MTF), a long-term epidemiological study of substance use among US adolescents.[6]

METHODS

Study data were from 33 schools that participated in an ongoing substance use epidemiological study of reservation-based AI adolescents (Our Youth, Our Future [OYOF]) during fall 2018 and spring and fall 2019 (hereafter, 2018–2019). Each year, a geographically stratified random sample of schools on or near reservations is drawn, and for schools that participate in the study, all students enrolled in grades 7 through 12 are surveyed. A description of the sampling frame, sample, and recruitment procedures; 2018–2019 sample; and procedures are provided in the supplemental materials (available as a

TABLE 1— Prevalence of Opiates and Other Narcotics, Comparing Reservation AI Students (2018–2019) and MTF Students (2018) in Grades 8, 10, and 12: United States

	8th Grade			10th Grade			12th Grade		
Type of Substance Use	AI (n = 647), % (95% CI)[a]	MTF, %[b] (95% CI)[a]	Diff % (95% CI)	AI (n = 559), % (95% CI)[a]	MTF, %[c] (95% CI)[a]	Diff, % (95% CI)	AI (n = 386), % (95% CI)[a]	MTF, %[d] (95% CI)[a]	Diff, % (95% CI)
Oxycontin, 12-mo	3.2 (1.9, 5.2)	0.8 (0.3, 1.7)	2.4* (1.2, 3.5)	6.3 (4.0, 9.7)	2.2 (1.4, 3.5)	4.1* (2.1, 6.0)	5.4 (2.5, 10.9)	2.3 (1.5, 3.3)	3.1* (0.5, 5.7)
Oxycontin, 30-d	1.3 (0.6, 3.2)	NA	. . .	2.5 (1.0, 6.1)	NA	...	3.1 (1.7, 5.5)	NA	...
Vicodin, 12-mo	0.8 (0.3, 1.8)	0.6 (0.2, 1.7)	0.2 (–0.6, 0.9)	2.4 (1.0, 5.6)	1.1 (0.5, 2.5)	1.3 (–0.3, 2.8)	1.7 (0.8, 3.7)	1.7 (1.3, 2.3)	0.0 (–1.4, 1.4)
Vicodin, 30-d	0.6 (0.2, 1.9)	NA	. . .	2.4 (1.0, 5.6)	NA	. . .	1.7 (0.8, 3.7)	NA	...
Narcotics (not heroin),[e] 12-mo	4.1 (2.5, 6.5)	NA	. . .	5.9 (3.6, 9.8)	NA	. . .	8.1 (5.3, 12.1)	3.4 (2.8, 4.1)	4.7* (2.5, 6.8)
Narcotics (not heroin), 30-d	0.9 (0.3, 2.6)	NA	. . .	3.3 (1.6, 6.8)	NA	. . .	2.7 (1.5, 4.7)	1.1 (0.7, 1.6)	1.6* (0.5, 2.7)
Heroin, 12-mo	1.9 (1.2, 2.9)	0.3 (0.2, 0.8)	1.6* (1.0, 2.2)	3.5 (2.0, 6.3)	0.2 (0.1, 0.3)	3.3* (2.8, 3.9)	2.5 (1.5, 4.1)	0.4 (0.2, 0.7)	2.1* (1.3, 2.9)
Heroin, 30-d	0.2 (0.0, 0.6)	0.1 (0.0, 0.3)	0.1 (–0.2, 0.3)	1.8 (0.7, 4.6)	0.1 (0.0, 0.2)	1.7* (1.3, 2.1)	2.0 (1.0, 4.3)	0.2 (0.1, 0.4)	1.8* (1.3, 2.4)
Opioids,[f] 12-mo	6.5 (4.7, 9.0)	NA	. . .	9.1 (6.7, 12.3)	NA	. . .	10.2 (6.8, 14.9)	NA	. . .
Opioids, 30-d	2.3 (1.2, 4.5)	NA	. . .	3.6 (1.8, 6.9)	NA	. . .	3.7 (2.1, 6.4)	NA	. . .

Note. AI = American Indian; CI = confidence interval; Diff = the absolute percentage point difference in prevalence (AI prevalence – MTF prevalence); MTF = Monitoring the Future; NA = not available.

[a]CIs are Clopper–Pearson binomial CIs, which are more optimal with proportions with a small number of events. The MTF CIs reported here may therefore differ from those in the MTF published report.
[b]MTF sample sizes for grade 8 are 3826 (annual OxyContin), 3814 (annual Vicodin), 9147 (annual heroin), and 9145 (30-day heroin).
[c]MTF sample sizes for grade 10 are 4294 (annual OxyContin), 4267 (annual Vicodin), 9521 (annual heroin), and 9506 (30-day heroin).
[d]MTF sample sizes for grade 12 are 6029 (annual OxyContin), 6008 (annual Vicodin), 13 460 (annual narcotics), 13454 (30-day narcotics), and 13 316 (30-day heroin).
[e]Narcotics defined as narcotics other than heroin—such as methadone, opium, morphine, codeine, Demerol, Vicodin, OxyContin, and Percocet—that are sometimes prescribed by doctors.
[f]Opioid use is use of any of the following: Oxycontin, Vicodin, narcotics other than heroin, and heroin.
*$\alpha < .01$.

supplement to the online version of this article at http://www.ajph.org), along with a brief summary of MTF sample and research design.

Prior to survey administration, parents could opt their child out of the survey; fewer than 1% of students were opted out. School staff administered the surveys online with Qualtrics software (Qualtrics, Provo, UT) during classroom hours to all 7th- through 12th-grade students enrolled and attending school on the survey dates. Responses were anonymous, and students were instructed to skip questions they did not wish to answer.

Participants were 8th-, 10th-, and 12th-grade students who self-identified as AI (n = 1592; we excluded students identifying as AN but not AI), with sample sizes of 647 for grade 8 (50.1% female, 49.3% male; mean age = 13.7 years), 559 for grade 10 (51.3% female, 47.8% male; mean age = 15.6 years), and 386 for grade 12 (47.2% female, 51.6% male; mean age = 17.5 years). MTF sample sizes were above 3500 for each grade and substance.[7]

The OYOF survey asks participants to report their last 12-month and 30-day use of OxyContin, Vicodin, heroin, and narcotics other than heroin (hereafter, narcotics), using verbatim wording from MTF (questions provided in the online supplemental materials). MTF reports 12-month use of OxyContin, Vicodin, and heroin, and 30-day use of heroin for 8th, 10th, and 12th grades, as well as 12-month and 30-day use of narcotics for 12th grade. Questions for OxyContin, Vicodin, and narcotics contain the phrase "without a doctor telling you to take it" to measure misuse. We coded all measures as 1 for any use and 0 for no use. Additionally, for OYOF, we calculated 12-month and 30-day opioid misuse as any use of OxyContin, Vicodin, narcotics, and heroin.

For each OYOF measure at each grade, we computed 12-month and 30-day prevalence and their 95% confidence intervals, excluding missing data (ranging from 3.8% to 4.5%), using Stata 15 survey commands (StataCorp LP, College Station, TX), with weighting to correct for regional over- or underrepresentation (for more information, see online supplemental materials). We calculated comparable MTF prevalence levels using data from Miech et al.,

following their instructions for use.[7,8] We calculated absolute differences between AI and MTF specific opioid use prevalence levels and corresponding 95% confidence intervals using a Wald test for significance.

RESULTS

Table 1 presents OYOF (AI) and MTF (national) prevalence levels and absolute differences in prevalence levels, where available. Frequency of use and relative risk ratios are provided in Table B (available as a supplement to the online version of this article at http://www.ajph.org). For brevity, the following summarizes notable absolute differences in prevalence levels across grades and specific opioids.

Last 12-Month Prevalence

Within each grade level, 12-month prevalence of use across specific opioids was significantly greater for the AI sample than for the national sample, except for Vicodin use, which showed no difference for any grade. Narcotics use in grade 12 demonstrated the largest difference, with AI prevalence nearly 5 percentage points greater than national prevalence (absolute difference = 4.7; $z = 4.2$; $P < .001$). Overall, 12-month AI opioid misuse was 6.5%, 9.1%, and 10.2% for grades 8, 10, and 12, respectively.

Last 30-Day Prevalence

Within each grade level, AI 30-day prevalence of use across specific opioids was significantly greater compared with the national sample, except for Vicodin and 8th-grade heroin. Grade-10 and grade-12 heroin use and grade-12 narcotics use showed the largest differences, with levels nearly 2 percentage points greater than national levels (absolute difference = 1.7, $z = 11.5$, $P < .001$; absolute difference = 1.8, $z = 6.8$, $P < .001$; absolute difference = 1.6, $z = 2.8$, $P = .005$, respectively). Overall, OYOF 30-day opioid misuse was 2.3%, 3.6%, and 3.7% for grades 8, 10, and 12, respectively.

DISCUSSION

AI 12-month and 30-day levels of opioid misuse, except for Vicodin and 8th-grade heroin, were significantly greater than national levels. These significant differences are further substantiated by the finding that AI opioid misuse levels were several times higher than 2018 NSDUH annual and 30-day opioid misuse prevalence for ages 12 to 17 years (2.8% and 0.7%, respectively).[4]

The higher misuse for AIs may reflect, in part, regional differences between the more rural sample of OYOF compared with MTF. We compared prevalence of misuse for 10th- and 12th-grade non-AI students in the OYOF sample with the corresponding levels for AI students (there were not enough non-AI 8th graders for these comparisons). The non-AI levels were generally lower than AI levels, although the differences were not always as large as those found in this study. This suggests that our results are not solely caused by a regional phenomenon. In addition, OYOF sample sizes are relatively small compared with those of MTF, and use of opioids, especially heroin, is low. A larger sample would give greater reliability in estimation and more confidence in the findings. However, the OYOF sample represents the largest and most representative sample of reservation AI youths to date.

Higher AI opioid misuse prevalence does not necessarily indicate higher levels of prescription opioid disorder, but it may portend subsequent increases in diagnoses of disorders, a diagnosis more common among AI adults than among other racial/ethnic groups.[9] Yule et al.[10] note that safe medication storage and disposal and evidence-based prevention can decrease adolescent opioid misuse. Our results suggest that implementation of such efforts, adapted or developed to be culturally appropriate, should be significantly increased in tribal communities. In conjunction with such efforts, there is an imperative for strategies to address the broader social and economic issues—giving special consideration to the roles of systemic discrimination and historical trauma—that lead to adverse childhood and community events and, ultimately, to the substantially higher rates of substance use among AI adolescents.[11,12] AJPH

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PUBLICATION INFORMATION

Full Citation: Stanley LR, Crabtree MA, Swaim RC. Opioid misuse among American Indian adolescents. *Am J Public Health*. 2021;111(3):471–474.

Acceptance Date: October 26, 2020.

DOI: https://doi.org/10.2105/AJPH.2020.306039

CONTRIBUTORS

L. R. Stanley, the primary author, conducted the statistical analysis and drafted the original article. M. A. Crabtree helped revise the article and wrote the supplementary materials. L. R. Stanley and R. C. Swaim were co-investigators and designers of the

original study. R. C. Swaim edited the original and revised articles.

ACKNOWLEDGMENTS

Research reported in this study was supported by the National Institute on Drug Abuse of the National Institutes of Health under award no. R01DA003371.

We thank Stacy Biggerstaff, MS, for managing the data for this study. We also thank Allison Burford, MA, for coordinating all relationships and procedures with all participating schools, and Erin Whipple, BA, for grant management. Finally, we offer special thanks to all tribal groups, school boards, school staff, and students for their participation in this study.

Note. The contents of this article are solely the responsibility of the authors and do not necessarily represent the official views of the National Institutes of Health.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

HUMAN PARTICIPANT PROTECTION

The Colorado State University institutional review board approved all procedures, under Protocol 19-9522H. Several tribal institutional review boards also approved conduct of the study.

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