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# Racial and ethnic trends and correlates of non-medical use of prescription opioids among adolescents in the United States 2004–2013

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ABSTRACT

*Purpose:* Our objective was to elucidate the trends in non-medical use of prescription opioids (NMUPO) among whites, African-Americans, and Hispanic adolescents in the United States. An additional aim was to examine the sociodemographic, behavioral, and psychosocial correlates of NMUPO across each of these aforementioned racial and ethnic groups.

*Methods:* Data was derived from the National Survey on Drug Use and Health (NSDUH) involving non-Hispanic white, African American, and Hispanic respondents ages 12–17 ($n$ = 164,028) and spanning the years 2004–2013. Consistent with prior NSDUH-based studies, respondents reporting use within the previous 12 months were classified as nonmedical prescription opioid users. Logistic regression was used to examine significance of trend year and correlates of NMUPO.

*Results:* Non-Hispanic white youth consistently reported higher levels of NMUPO as did older adolescents (ages 15–17) and females. However, there was a decrease in the prevalence of NMUPO overall driven largely by a significant decline ($p < 0.001$) in NMUPO among non-Hispanic whites of approximately 35% over the study period such that by 2013 no statistically significant differences across race/ethnicity remained. Further, logistic regression models found that externalizing behaviors such as comorbid drug use and fighting was associated with NMUPO and religiosity and parental involvement were identified as protective correlates.

*Conclusions:* To our knowledge, this is the first study to identify a declining trend in NMUPO among adolescents. Although the present study findings provide a source for optimism, there is still a relatively high prevalence of NMUPO and it remains to be seen whether our findings portend a long-term decline. Given the harm done by NMUPO, continued awareness and targeted prevention efforts should be implemented.



Nonmedical opioid use is defined as the unauthorized use of prescription analgesic opioids such as oxycodone (Oxycontin®, Percocet®) or hydrocodone (Lortab®, Vicodin®). Several studies have documented the surge in nonmedical use of prescription opioids (NMUPO) in the United States (Blanco et al., 2007; Compton and Volkow, 2006; Friedman, 2006; Hasegawa et al., 2014; Sung et al., 2005). There has been a corresponding surge in deleterious consequences stemming from nonmedical use of these substances resulting in increased rates of mortality and emergency department visits (Paulozzi, 2006) and increased delinquency and subsequent juvenile and criminal justice system involvement (Caudy et al., 2015; Johnson et al., 2013; Sevigny et al., 2013; Stogner and Gibson, 2013).

While much has been learned about NMUPO in adulthood (Beaudoin et al., 2014; Blanco et al., 2013; Bonnar et al., 2014; Lusted et al., 2013; Svendsen et al., 2014), less is known about the trends and correlates in adolescents particularly among racial and ethnic subgroups. For instance, Fortuna et al. (2010) found that

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there was a near doubling of prescribing of controlled medications to adolescents based on data between 1994 and 2007 from emergency departments and hospital-based outpatient clinics. Data from the Monitoring the Future (MTF) survey indicated that among 12th graders in the United States, the lifetime prevalence of NMUPO increased from approximately 6% in the early 1990's to 13% by 2009 (Johnston et al., 2009). Using data from another population-based survey, the 2005 National Survey on Drug Use and Health, Wu et al., (2008) found that 9.8% of adolescents age 12–17 had reported NMUPO. Non-Hispanic whites (10.5%) were somewhat more likely to report use compared to non-Hispanic blacks (8.9%) and Hispanics (9.4%). In an earlier study using the NSDUH data, Sung et al. (2005) revealed that a similar pattern with whites (7.8%) reporting greater NMUPO than African-Americans (5.8%) and Hispanics (7.1%). These researchers also showed that the medications most commonly used were Vicodin®, Lortab®, Darvocet®, Tylenol with codeine, Oxycontin®, and Percocet®. More recently, McCabe et al. (2013a) found that nearly 37% of adolescent NMUPO was obtained from a leftover previous prescription. However, no racial and ethnic differences were reported.

Investigations into the correlates of NMUPO among adolescents indicate that use and abuse of illicit substances may be the strongest predictor (Boyd et al., 2006; Sung et al., 2005). Several other correlates have also been identified including drug selling and early onset of alcohol use (Wu et al., 2008). To illustrate, Vaughn et al. (2012) explored latent classes of adolescent NMPUO and risk correlates in relation to different subtypes of adolescents (i.e., heterogeneity) and found a substantial overlap between MMPUO and externalizing behaviors such as fighting, theft, a history of incarceration and a propensity toward risk taking and danger. However, they also found that among the highest risk youth, anxiety increased the probability of use and that parental involvement (e.g., helping and checking with homework and voicing pride) decreased its probability. Given that most substance use, including NMPUO, is multifactorial in its etiology, including a broad array of risk factors is useful. In short, additional epidemiological studies are needed that examine a fuller range of risk correlates of NMPUO among adolescents generally and among racial and ethnic subgroups in particular.

## 1. The present study

Our objective in the present investigation is to elucidate trends in NMUPO among whites, African-Americans, and Hispanic adolescents ages 12–17 in the United States from 2004 to 2013. While whites are more likely to report NMUPO (Sung et al., 2005; Wu et al., 2008), we do not know if these rates have changed significantly over time and what these trends look like by adolescent developmental period (i.e., 12–14 year olds versus 15–17 year olds). An additional aim is to examine the sociodemographic, behavioral, and psychosocial correlates of NMUPO across each of these aforementioned racial and ethnic groups. As noted by Compton and Volkow (2006) moving forward with prevention efforts for NMUPO depends upon greater specification of risk among various subgroups. As such, we employ a wide swath of individual-level externalizing behaviors including drug use, school-related factors such as grades, and parental involvement. We do so because prior research has indicated multiple pathways to harmful substance use that involve demographic, behavioral, neuropsychological, and familial (including genetic) risks (Boisvert et al., 2013; Kreek et al., 2005; Lubman et al., 2004; Portnoy et al., 2013; Vanyukov et al., 2003; Vaughn et al., 2014, 2015). Thus, studying both racial and ethnic trends and their correlates will shed needed light on prevention of adolescent NMUPO.

## 2. Method

### 2.1. Sample and procedures

This study examines public-use data collected between 2004 and 2013 as part of the National Study on Drug Use and Health (NSDUH). The NSDUH provides population estimates for drug use and an array of health-related behaviors in the U.S. general population. Multistage area probability sampling methods are used to select a representative sample of the U.S. civilian, non-institutionalized population aged 12 years or older for participation. Participants include household residents; civilians residing on military bases; and residents of shelters and group homes. NSDUH study participants are interviewed in private at their places of residence using a computer-assisted interviewing (CAI) methodology to increase the likelihood of valid respondent reports of illicit drug use and other high-risk behaviors (SAMHSA, 2014). While minor fluctuations can be observed from year to year, the weighted screening and weighted interview response rates for the NSDUH are both consistently well above 80% and 70%, respectively. The design and methods are summarized briefly here; however, detailed descriptions of NSDUH procedures are available elsewhere (see SAMHSA, 2014). Since 2002, a total of 668,012 respondents have completed the NSDUH survey; however, the current study restricted analyses to non-Hispanic white, African American, and Hispanic respondents between the ages of 12 and 17 ($n = 164{,}028$) who have completed the survey since the NSDUH began collecting information related to non-medical opioid use in 2004.

### 2.2. Measures

#### 2.2.1. Non-medical use of prescription opioids

NMUPO use was determined by asking participants: “How long has it been since you last used any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused?” Consistent with prior NSDUH-based studies, respondents reporting use within the previous 12 months were classified as nonmedical opioid users (Fiellin et al., 2013; Martins et al., 2009).

#### 2.2.2. Comorbid substance use

We also examined past 12-month use of tobacco, alcohol (any [1 + drinks] and binge [5 + drinks at the same occasion] use), marijuana/hashish, and any other illicit drug use excluding marijuana and nonmedical opioid use (e.g., cocaine/crack, methamphetamine, etc.). For each of these items, participants reporting any instances of use were coded as 1 and all others coded as 0. Prior studies examining substance use and substance use disorders using the NSDUH measures have shown acceptable reliability and validity (Jordan et al., 2008; Grucza et al., 2007).

#### 2.2.3. Delinquency/violence

Delinquency and violence were examined based on self-reports of youth involvement in drug selling, theft, fighting at school/work and handgun carrying. To measure delinquency, youth were asked: “During the past 12 months, how many times have you sold illegal drugs?” and “During the past 12 months, how many times of you stolen or tried to steal anything worth more than $50?” To assess violence, youth were asked: “During the past 12 months, how many times have you gotten into a serious fight at school or work” and “During the past 12 months, how many times have you carried a handgun?” For all of these items, adolescents reporting one or more instances of involvement were coded as 1 and those reporting no involvement were coded as 0.