



# The paradox of decreasing nonmedical opioid analgesic use and increasing abuse or dependence – An assessment of demographic and substance use trends, United States, 2003–2014<sup>☆</sup>



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## HIGHLIGHTS

- Opioid analgesic nonmedical use decreased between 2003–2005 and 2012–2014.
- Declines were seen among most demographic and substance using groups examined.
- Opioid analgesic abuse or dependence increased between 2003–2005 and 2012–2014.
- Increases were seen among most demographic and substance using groups examined.
- Efforts are needed to curb opioid overprescribing and expand treatment for addiction.

## ARTICLE INFO

### Article history:

Received 1 June 2016

Received in revised form 18 July 2016

Accepted 13 August 2016

Available online 17 August 2016

### Keywords:

Opioid abuse

Overdose

Substance use

Nonmedical use

Opioid addiction

Substance abuse

## ABSTRACT

**Background:** The harms related to nonmedical use of opioid analgesics have impacted the United States for more than a decade. Examining trends in nonmedical use, abuse, and dependence among various demographic and substance using groups can provide critical insight for prevention and treatment activities.

**Methods:** Data from the National Survey on Drug Use and Health were used to assess trends in opioid analgesic nonmedical use, abuse, and dependence for 2003–2005, 2006–2008, 2009–2011, and 2012–2014. Multivariable logistic regression was used to identify characteristics associated with opioid analgesic abuse or dependence.

**Results:** Rates of past-year opioid analgesic nonmedical use decreased from 48.4 per 1000 persons aged 12 years and older in 2003–2005 to 43.3 in 2012–2014. Declines were seen among most demographic and substance using groups. In contrast, rates of past-year opioid analgesic abuse or dependence increased from 6.0 per 1000 persons in 2003–2005 to 7.5 in 2012–2014; increases were seen among most demographic and substance using groups. In 2012–2014, odds of opioid analgesic abuse or dependence were highest among those with sedative or tranquilizer and heroin abuse or dependence.

**Conclusions:** These findings indicate encouraging trends in overall nonmedical use of opioid analgesics which declined among many demographic and substance using groups. However, continued increases in rates of opioid analgesic abuse or dependence highlight the critical importance of maintaining efforts to drive down inappropriate opioid prescribing and expanding efforts to increase the provision of medication assisted treatment and psychosocial services for opioid use disorders and equipping individuals with naloxone to reverse opioid overdose.

Published by Elsevier Ltd.

## 1. Introduction

The nonmedical use of opioid analgesics and its related health and social harms have impacted the United States for more than a decade and have gained increased attention among the public, policy makers, and the clinical community in recent years. The public health effects of

nonmedical opioid use are extensive. In 2014, 18,893 overdose deaths involved opioid analgesics, and > 150,000 admissions to publicly funded substance abuse treatment programs reported opioid analgesics as their primary substance of abuse (Compton, Jones, & Baldwin, 2016; Substance Abuse and Mental Health Services Administration, 2015a, 2015b). Rising rates of neonatal abstinence syndrome and hepatitis C virus as well as the HIV outbreak in Scott County, Indiana in 2015, have been associated with the nonmedical use of opioid analgesics (Patrick, Davis, Lehmann, & Cooper, 2015; Valdiserri et al., 2014; Conrad et al., 2015). In addition, it is estimated that opioid analgesic

<sup>☆</sup> Disclaimers: The findings and conclusions of this study are those of the authors and do not necessarily reflect the views of the U.S. Department of Health and Human Services.  
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abuse results in \$55 billion in health and social costs each year in the U.S. (Birnbaum et al., 2011).

Recent research using a number of proprietary data sources indicates that overall nonmedical use appears to be stabilizing or declining (Dart, Severtson, & Bucher-Bartelson, 2015). However, a nationally-representative study among 18–64 year olds found that the frequency and intensity of opioid analgesic nonmedical use and use disorders (abuse or dependence) have increased even as overall nonmedical use declined in this population between 2003 and 2013 (Han, Compton, Jones, & Cai, 2015).

In addition, previous research shows differences in rates of nonmedical use and abuse or dependence across different demographic groups. For example, although men have historically had higher rates of opioid analgesic nonmedical use compared to women, rates of overdose death and emergency department visits associated with nonmedical use of opioids have been increasing faster among women than men (Centers for Disease Control and Prevention, 2013). Research has also found differences in nonmedical use, and abuse or dependence across age and race/ethnicity groups, geography (rural versus urban populations), household income, and type of insurance coverage (Jones, 2012; Substance Abuse and Mental Health Services Administration, 2015a, 2015b; Green, Grau, Carver, Kinzly, & Heimer, 2011; Becker, Fiellin, Merrill, Schulman, et al., 2008; Han et al., 2015).

Given the increased attention to the issue of nonmedical use and continued high rates of associated morbidity and mortality, an assessment of how trends have changed over time in these populations is needed. Using nationally representative data, this study builds on the prior literature to assess trends in opioid analgesic nonmedical use, and abuse or dependence among demographic and substance using groups in the United States between 2003 and 2014. These findings information can provide essential context for understanding how and among what populations opioid analgesic nonmedical use, and abuse or dependence is changing identify populations who are at risk for opioid-related harms, and inform the development and refinement of prevention and treatment policies and programs.

## 2. Materials and methods

### 2.1. Data source

Substance use data are from the 2003–2014 National Survey on Drug Use and Health (NSDUH). The NSDUH is conducted annually by the Substance Abuse and Mental Health Services Administration and provides national- and state-level estimates of the use of illicit drugs, including nonmedical use of certain prescription drugs, alcohol, and tobacco among the civilian, noninstitutionalized population aged 12 years and older in the United States (Substance Abuse and Mental Health Services Administration, 2015a, 2015b). Excluded from NSDUH are persons without a household address (e.g., homeless persons not living in shelters), active-duty military personnel, and institutional residents. The NSDUH employs a state-based design with an independent, multistage area probability sample within each state and the District of Columbia. The data collection protocol of the NSDUH was approved by the institutional review board at the Research Triangle Institute (RTI) International. Written informed consent was obtained from each study participant. The weighted interview response rate for the NSDUH during the study period (2003–2014) ranged from 71% to 79% each year. (Substance Abuse and Mental Health Services Administration, 2015a, 2015b).

### 2.2. Measures

The NSDUH defined past-year nonmedical use of opioid analgesics as use in the prior 12 months without a prescription or as use with a prescription simply for the experience or feeling caused by the opioid analgesic. Similar to past-year nonmedical use of opioid analgesics,

past-year nonmedical use of prescription sedatives or tranquilizers and past-year nonmedical use of prescription stimulants was defined as use in the prior 12 months without a prescription or as use with a prescription simply for the experience or feeling caused by the drug. Past-year use of marijuana, cocaine, or heroin was defined as use of the substance in the prior 12 months. Heavy alcohol use was defined as drinking five or more drinks on the same occasion on each of 5 or more days in the past 30 days.

The NSDUH estimated past-year abuse or dependence of specific substances (opioid analgesics, alcohol, marijuana, cocaine, heroin, sedatives or tranquilizers, and stimulants) based on assessments of individual diagnostic criteria contained in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (American Psychiatric Association, 1994).

Demographic characteristics from the NSDUH data included in this study were: age (12–17 years, 18–25 years, 26–34 years, and 35 years and over); sex; race/ethnicity (Hispanic, non-Hispanic white, non-Hispanic black, and non-Hispanic other); place of residence (residence in a Core-Based Statistical Area with 1 million or more persons, residence in a Core-Based Statistical Area with fewer than 1 million persons, and residence not in a Core-Based Statistical Area); annual household income (<\$20,000, \$20,000–\$49,999, \$50,000–\$74,999, and \$75,000 and over); and insurance coverage (uninsured, Medicaid, and private or other insurance).

### 2.3. Data analysis

For this study, the NSDUH annual public use files for 2003–2014 were combined into four, 3-year time periods: 1) 2003–2005; 2) 2006–2008; 3) 2009–2011; and 4) 2012–2014. This was done to improve the precision of estimates and the detection of differences across subpopulations. The pooling of survey years results in an average estimate across the combined survey years that accounts for the complex survey design and weighting for each individual year within the survey groupings. This average estimate is referred to as the average annual rate or average annual percentage.

First, to assess trends in nonmedical use of opioid analgesics in the United States, rates of past-year nonmedical use per 1000 persons aged 12 years and older were calculated overall and stratified by sex, age, race/ethnicity, place of residence, annual household income, insurance coverage, and past-year substance use for each time period (2003–2005, 2006–2008, 2009–2011, 2012–2014).

Second, to assess trends in abuse or dependence on opioid analgesics, rates of past-year abuse or dependence per 1000 persons aged 12 years and older were calculated overall and stratified by sex, age, race/ethnicity, place of residence, annual household income, insurance coverage, and past-year substance use for each time period.

Third, to assess high-risk use of other substances among people with opioid analgesic abuse or dependence, the percentages of people with past-year opioid analgesic abuse or dependence who met diagnostic criteria for past-year alcohol, marijuana, cocaine, heroin, prescription sedative or tranquilizer, or prescription stimulant abuse or dependence were calculated for each time period. All rates are based on U.S. Census Bureau population estimates. Two-sided t-tests were used to assess statistically significant differences between 2012–2014 rates and earlier survey year groups. To assess statistically significant changes in trends, bivariate logistic regression models were applied to test p-values of beta coefficients of the year variable.

Finally, to identify individual-level risk factors associated with past-year opioid analgesic abuse or dependence, a multivariable logistic regression model incorporating sex, age group, race/ethnicity group, place of residence, annual household income, insurance coverage, and the presence or absence of past-year alcohol, marijuana, cocaine, heroin, prescription sedative or tranquilizer, and prescription stimulant abuse or dependence was estimated using the 2012–2014 NSDUH data. Associations were reported as adjusted odds ratios with 95% confidence

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