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Trends and correlates of cocaine use and cocaine use disorder in the United States from 2011 to 2015

William S. John[a,*] and **Li-Tzy Wu**[a,b,c,d]

[a]Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC, USA

[b]Department of Medicine, Division of General Internal Medicine, Duke University Medical Center, Durham, NC, USA

[c]Duke Clinical Research Institute, Duke University Medical Center, Durham, NC, USA

[d]Center for Child and Family Policy, Sanford School of Public Policy, Duke University, Durham, NC, USA

Abstract

Background—Recent epidemiological data suggest a resurgence in cocaine use (CU) and cocaine-related problems in the United States. Demographic trends and correlates of problem CU are needed to determine potential factors that may be influencing the increased trend and to inform targeted prevention and intervention strategies.

Methods—Trends in any past-year CU, weekly CU, and cocaine use disorder (CUD) were examined among persons aged ≥12 years using the National Survey on Drug Use and Health from 2011 to 2015. Logistic regression analyses were used to determine correlates of past-year and weekly CU and CUD among adolescents and adults.

Results—The prevalence of past-year CU from 2011 to 2015 increased among females, ages 18–25, ages ≥50, non-Hispanic Blacks, and persons reporting low income, past-year tobacco use, past-year alcohol use, and past-month binge and heavy alcohol use. The prevalence of weekly CU increased among persons aged ≥50 years and persons reporting past-month heavy alcohol use. A significant increase in the prevalence of CUD was only found among persons aged ≥50 years. Adjusted logistic regression showed that older age, large metropolitan residence, past-year tobacco, alcohol, cannabis, and heroin use, and major depressive episode were associated with increased odds of CU or CUD among both adolescents and adults; however, sex and race/ethnicity correlates differed among adolescents and adults.

[*]Corresponding author at: Department of Psychiatry and Behavioral Sciences, Division of Social and Community Psychiatry, Duke University Medical Center, Durham, NC, 27701, USA. william.john@duke.edu (W.S. John), litzy.wu@duke.edu (L.-T. Wu).

Contributors

William S. John contributed to the design and concept for this manuscript, conducted data analysis, and drafted the manuscripts. Li-Tzy Wu contributed to the design and concept for this manuscript, revised/edited the manuscripts, and supervised the work. All authors approved of the final manuscript before submission.

Conflicts of interest

The authors have no conflicts of interest to disclose.

Conclusions—Findings have implications for increased monitoring of CU-related indicators among some high-risk groups, such as females, older adults, Blacks, and polysubstance users. Targeted screening and intervention strategies among these population subgroups may be needed.

Keywords

Cocaine; Cocaine use disorder; Polydrug use; National Survey on Drug Use and Health

1. Introduction

Problem cocaine/crack use is a public health concern associated with high socioeconomic costs (National Drug Intelligence Center, 2016). Past-year prevalence of cocaine use (CU) in the U.S. peaked in the early to mid-1980s (i.e., the “crack-cocaine epidemic”) and then sharply declined in the late 1980s until reaching a low point in 1994 (Johnston et al., 2016). Population levels of past-year CU rose again from the mid-1990s to 2004; however, between 2005 and 2011, annual prevalence appeared to decline again, possibly due to supply-side factors and resulting effects on demand (Caulkins et al., 2015).

Despite the decline in past-year prevalence over the past decade, recent data suggest a resurgence in CU. For instance, the National Survey on Drug Use and Health (NSDUH) indicated an increase in the prevalence of past-year CU by 20% among individuals aged ≥12 years from 2011 to 2015 (CBHSQ, 2016). The NSDUH also estimated that 968,000 individuals aged ≥12 years initiated CU in the past year in 2015, which was higher than any year since 2008 (CBHSQ, 2016). Moreover, data from the Centers for Diseases Control and Prevention (CDC, 2016) indicated that the number of cocaine-related deaths increased each year from 2012 to 2015, and the number in 2015 (6800) was the second highest since 1999.

Data also suggest that the emerging trend in CU may increase even further. For instance, the Office of National Drug Control Policy (ONDCP) estimated that the 2015 cocaine production potential from Columbia, the main source of cocaine consumed in the U.S. (US State Department, 2017), was the largest amount since 2007 and more than double the amount in 2013 (ONDCP, 2016). Hence, more export quality cocaine available for trafficking is expected, which typically reaches U.S. streets 18–24 months after harvest (Ehleringer et al., 2012). An increase in supply also has implications for increased retail-level purity and lower prices to attract new users (National Drug Intelligence Center, 2016). Thus, early identification of at-risk population subgroups will be critical to inform screening, intervention, and referral to treatment efforts given the potential effects of an increased cocaine supply on prevalence of CU and cocaine-related health risks.

Young adults may be at-risk for cocaine-related problems during this period of resurgence in CU. For instance, the NSDUH estimated that 663,000 young adults aged 18–25 tried cocaine for the first time in 2015, which represented approximately 70% of all individuals who initiated CU that year and was the highest number among young adults since 2008 (CBHSQ, 2016). However, it remains to be determined whether the prevalence of problematic use (i.e., frequent CU) or cocaine use disorder (CUD) also increased among young adults, which may be a better indicator of increased health risks and treatment need. Older adults (i.e., those aged ≥50 years) also appear to be a high-risk group for cocaine-

related problems. The U.S. Treatment Episode Data Set (TEDS) indicated that treatment admissions for CU significantly increased by 230–325% from 1992 to 2005 among older adults (Lofwall et al., 2008); however, it is unclear whether there has been an increase in the prevalence of problem CU and CUD among older adults.

The literature also suggests that CU is associated with higher risks and distinct consequences as a function of sex, race/ethnicity, and polydrug use. Studies have found that females use cocaine at earlier ages, transition to dependence at faster rates, and have worse cocaine-related social consequences and treatment outcomes than males (Haas and Peters, 2000; McCance-Katz et al., 1999; Nich et al., 2004; Dackis et al., 2012; Siqueland et al., 2002). Some data suggest sex differences in the sensitivity to the reinforcing effects of cocaine, psychiatric co-morbidities, or brain-behavior relationships may be attributable (Lynch et al., 2002; Suh et al., 2008; van der Plas et al., 2009). Regarding race/ethnicity, Blacks appear to be disproportionately affected by CU. The TEDS indicated that 46% of treatment admissions primarily for CU in 2015 were Blacks, compared to 36% that were Whites and 13% that were Hispanics (SAMHSA, 2017). Research has also shown that Blacks, compared to other racial/ethnic groups, transition to cocaine dependence faster after first use, are more likely to have severe medical sequelae of CU (e.g., HIV, intracerebral hemorrhages), and worse treatment outcomes (Milligan et al., 2004; Montgomery et al., 2011, 2012, 2015; Martin-Schild et al., 2010; Tobin et al., 2011). Racial/ethnic differences in acculturative stress, discrimination, social capital, route of cocaine administration, or cocaine availability may be contributing factors (Gibbons et al., 2004; Fothergill et al., 2009; Lillie-Blanton et al., 1993). Moreover, cocaine is often used with alcohol, tobacco, marijuana, or opioids to increase subjective reinforcing effects of either drug alone (Farré et al., 1997; Leri et al., 2003). However, CU with other substances is associated with greater severity of use and likelihood of overdose, more treatment admissions, and worse treatment outcomes compared to the use of cocaine alone (Anderson et al., 2009; Kampman et al., 2015; McCall Jones et al., 2017). Taken together, it is important to identify and monitor population subgroups showing an increase in CU and CUD.

Here, we used data from national samples of the NSDUH to examine demographic trends in past-year CU, weekly CU (≥52 days/year), and CUD from 2011 to 2015. The NSDUH is particularly advantageous because of its consistent design across the study years and large sample size, which permits analyses among population subgroups. We also examined correlates of CU and CUD. Given that onset of CU during adolescence is associated with greater cocaine-related problems (Jordan and Andersen, 2017), correlates were determined separately for adolescents to inform prevention and intervention efforts for emerging population subgroups.

2. Methods

2.1. Data source

Data were obtained from public-use data files of the 2011–2015 NSDUH. The annual NSDUH is a cross-sectional survey designed to provide ongoing estimates of the prevalence of substance use and substance use disorders. The NSDUH's target population included civilian, noninstitutionalized persons in the U.S. who were 12 years of age or older at the

time of the survey. It used multistage area probability sampling methods for all 50 states and the District of Columbia. NSDUH data collection was conducted in the households of eligible respondents through a combination of computer-assisted personal interviewing conducted by an interviewer and audio computer-assisted self-interviewing for sensitive questions.

A total of 281,242 persons aged ≥12 years composed the NSDUH sample from 2011 to 2015 (N = 55,160–58,397/year). Weighted response rates of household screening and interviewing over these years ranged from 80 to 87% and 70–74%, respectively (CBHSQ, 2012, 2016).

2.2. Study variables

2.2.1. Demographics—We examined self-reported sex, age, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Other (i.e., non-Hispanic Asian-American, non-Hispanic Native-American (American Indian/Alaska-native), non-Hispanic native-Hawaiian/Pacific-Islander, or mixed-race)), total household income ($0–19,999, $20,000–49,999, $50,000–74,999, $75,000+), and residential location to describe respondents' demographics and to be included as control variables for the association of CU and CUD (Chen and Kandel, 2002; Compton et al., 2000; Palamar et al., 2015). Survey year was included as a categorical variable in the adjusted logistic regression analysis.

2.3. Cocaine use and cocaine use disorder

Self-reported CU included the use of any form of cocaine such as powder, "crack," free base, and coca paste. Respondents were first asked whether they had ever used any form of cocaine. Among those who responded affirmatively, their recency and frequency of use was assessed. Past-year CU was defined as any use during the preceding 12 months from the time of the survey. We created a variable to indicate more frequent CU, which was defined as using cocaine 52 days or more during the past year and was termed "weekly CU."

Among those who reported past-year CU, additional questions were administered to determine whether criteria for cocaine abuse or dependence was met based on DSM-IV criteria (APA, 2000). Criteria for cocaine abuse included the presence of ≥1 abuse symptoms and absence of dependence. Criteria for cocaine dependence included the presence of ≥3 dependence symptoms, regardless of abuse status. Past-year CUD was defined as having met criteria for either abuse or dependence during the preceding 12 months.

2.4. Other behavioral health

Past-year tobacco (cigarettes, chewing tobacco, snuff, cigars, pipe tobacco), alcohol, cannabis, and heroin use was determined and included as independent variables. We also included past-year major depressive episode (MDE) as an independent variable. MDE was determined based on DSM-IV criteria, which included separate questions for adolescents and adults (Kessler and Merikangas, 2004; Kessler et al., 2010). A person was defined has having past-year MDE if he/she had five or more of the nine MDE symptoms in the same 2-week period during his/her lifetime and a period of time in the past 12 months when he/she felt depressed or lost interest or pleasure in daily activities for 2 weeks or longer.

2.5. Data analysis

We first calculated descriptive statistics of demographic variables and the prevalence of past-year CU, weekly CU (≥52 days/year), and CUD for each survey year. The prevalence of past-year CU, weekly CU, and CUD was determined separately among each demographic variable across survey years. Potential yearly trends in the prevalence of past-year CU, weekly CU, and CUD were explored by separate logistic regression models that included survey year (2011–2015, continuous) as a covariate. Difference in prevalence and percent change in prevalence was also calculated for the end points of the period to inform the changes in the prevalence of past-year CU, weekly CU, and CUD (2015 vs. 2011). Next, we aggregated data from all survey years and used logistic regression analyses to estimate demographic correlates of CU and CUD. Logistic regression analyses were conducted separately for adolescents (12–17 years) and adults (≥18 years) and adjusted for age, race/ethnicity, family income, residential location, past-year tobacco, alcohol, cannabis, and heroin use, MDE, and survey year.

All analyses were conducted using SAS software (Version 9.4) and adjusted for the complex survey design of the NSDUH including weighting and clustering. All results are reported as weighted estimates except sample sizes, which are unweighted.

3. Results

3.1. Sample characteristics

Among the total sample (N = 281,242), 48.4% were male, 51.6% were female, 9.5% were adolescents aged 12–17 years, 90.5% were adults aged ≥18 years, and 35.3% were of nonwhite race (Black, 11.9%; Hispanic, 15.8%; Other, 7.6%). The distribution of sample characteristics was not significantly different across these years studied except 2015 and 2014 had a higher proportion of persons with high incomes compared to 2011, and 2014 had a higher proportion of residents in large metro areas compared to 2011 (Table S1).

3.2. Past-year cocaine use (Table 1)

Between 2011 and 2015, past-year CU prevalence among persons aged ≥12 years increased from 1.48% to 1.81% ($P < 0.05$). Regarding population subgroups, past-year CU prevalence between 2011 and 2015 increased among females (0.96% to 1.27%; $P < 0.01$), ages 18–25 (4.62% to 5.49%; $P < 0.05$), ages 26–34 (2.28% to 3.28%; $P < 0.05$), ages 50+ (0.30% to 0.68%; $P < 0.05$), Blacks (1.08% to 2.29%; $P < 0.01$), and persons reporting a family income of < $20,000 (2.29% to 3.12%; $P < 0.05$), past-year tobacco use (4.11% to 5.14%; $P < 0.05$) and non-use (0.25% to 0.42%; $P < 0.01$), past-year alcohol use (2.15% to 2.67%; $P < 0.01$), past-month binge (2.46% to 3.55%; $P < 0.01$) and heavy (9.51% to 11.81%; $P < 0.05$) alcohol use, and no past-year heroin use (1.34–1.65%; $P < 0.05$). Adults aged ≥50 years had the largest increase (+128%) followed by Blacks (+113%). There was a decrease in prevalence among ages 12–17 years old from 2011 to 2015 (0.93% to 0.61%; $P < 0.05$).

The prevalence of past-year crack use between 2011 and 2015 increased among persons aged ≥50 years (0.08% to 0.29%; $P < 0.05$) and among persons reporting no past-year tobacco use (0.01% to 0.07%; $P < 0.05$; Table S2).

We conducted exploratory analysis of past-month CU and found some significant increases ($P < 0.05$) in its prevalence from 2011 to 2015 among females, Whites, and persons reporting past-year tobacco use, and past-year alcohol use (Table S3).

3.3. Weekly cocaine use (Table 2)

The trend test did not indicate a significant increase in weekly CU from 2011 to 2015. However, between 2011 and 2015, the prevalence of weekly CU increased among persons aged ≥50 years (0.11% to 0.37%; $P < 0.05$), and among persons reporting past-month heavy alcohol use (1.45% to 3.01%; $P < 0.05$) and no past-year cannabis use (0.07% to 0.14%; $P < 0.05$).

3.4. Cocaine use disorder (Table 3)

Past-year CUD prevalence increased from 2011 to 2015 among persons aged ≥50 years (0.07% to 0.26%; $P < 0.05$). There was a decrease in CUD prevalence from 2011 to 2015 among ages 35–49 (0.46% to 0.23%; $P < 0.05$) and persons who reported no alcohol use within the past-year (0.08–0.04%; $P < 0.05$) or past-month (0.19% to 0.10%; $P < 0.001$).

3.5. Correlates of cocaine use and cocaine use disorder among adolescents (Table 4)

Among adolescents, ages 16–17 years (vs. 12–13 years) were associated with higher odds of any past-year CU but not weekly use or CUD. Hispanic adolescents had higher odds of past-year CU, weekly CU, and CUD compared to Whites, while Black adolescents had lower odds of past-year and weekly CU compared to Whites. Adolescents residing in large and small metro areas had increased odds of CUD compared to those residing in non-metro areas.

Past-year tobacco, alcohol, marijuana, and heroin use were associated with increased odds of past-year and weekly CU and CUD among adolescents. Past-year MDE was associated with increased odds of CUD among adolescents, but not with any past-year use or weekly use.

3.6. Correlates of cocaine use and cocaine use disorder among adults (Table 5)

Among adults, male sex, lower income, past-year tobacco, alcohol, cannabis, and heroin use, and MDE were associated with increased odds of past-year and weekly CU and CUD. Younger adults had increased odds of past-year CU, while older adults had increased odds of weekly CU or CUD. Black race and Hispanic race were associated with increased odds of weekly CU and CUD. Compared to 2011, years 2015 and 2012 were associated with increased odds of past-year and weekly CU among adults.

4. Discussion

Recent reports suggest that the overall prevalence of CU and cocaine-related overdoses/deaths in the U.S. increased from 2011 to 2015, which reveals a need to examine whether it may represent a new epidemiological trend compared to the previous decade (Johnston et al., 2016; CBHSQ, 2016). Using a large national sample, we examined trends among demographic subgroups during this period. We found a significant increase in past-year CU prevalence among several groups, including females, ages 18–25, ages ≥50, Blacks, and

persons reporting low income, past-year alcohol use, and past-month binge and heavy alcohol use. We found a significant increase in weekly CU prevalence among persons aged ≥50 years and persons reporting past-month heavy alcohol use. A significant increase in CUD prevalence was only found among persons aged ≥50 years. These findings from a large representative sample support the need for research to closely monitor emerging trends in problem CU indicators (e.g., overdose/deaths, CUD, emergency department visits) and investigate factors influencing the increased trend.

The increased trend in CU among females is particularly concerning considering previous studies suggest that female cocaine users may be more vulnerable to cocaine-related problems than male users. Studies suggest that female cocaine users may transition to dependence at a faster rate ("telescoping" effect) and exhibit greater severity of use than male users (Griffin et al., 1989; Lundy et al., 1995). To this end, preclinical and clinical studies suggest that female subjects, compared to males, may be more sensitive to the reinforcing effects of cocaine, a critical measure of its abuse liability (Lynch et al., 2002). Data from the National Institute of Drug Abuse Collaborative Cocaine Treatment Study showed that female participants had greater medical, family, social, and employment problems, more physical and sexual trauma, and more severe psychiatric problems than males (Najavits and Lester, 2008). Another study of treatment-seeking cocaine users revealed that females had shorter periods of abstinence than males (Kosten et al., 1993), which may be associated with the aforementioned psychosocial/medical factors or increased reactivity to cocaine-related cues/craving (Robbins et al., 1999; Elman et al., 2001). Thus, there is a need for research to recruit adequate numbers of females to further evaluate sex differences in CU and CUD trends and to identify at-risk groups of female users. Research in clinical settings, including the emergency department, may identify problem users to inform their healthcare use and treatment needs.

These findings also have implications for research and targeted intervention for CU and CUD among older adults. Adults aged ≥50 years showed significant increases in not only the prevalence of past-year CU but also weekly use and CUD. Notably, the weekly CU prevalence from 2011 to 2015 among older adults increased by 236%, while the CUD prevalence increased by 271%. In line with these findings, earlier TEDS data indicated a significant increase in CU-related admissions among older adults (Lofwall et al., 2008). These results may be reflective of the aging population of Baby Boomers (those born in the post-World War II period, 1946–1964), which have a greater likelihood of illicit drug use than other birth cohorts in the U.S. (Wu and Blazer, 2011). Other factors such as stressful late-life events, loss of productive social roles, increased alcohol use, and the absence of supportive social relationships also may attribute to increased substance use among older adults (Weintraub et al., 2002; Wu and Blazer, 2011). Older adults are at an elevated risk of neurotoxicity, adverse consequences, and worsening of underlying medical/psychological conditions from substance use. CU, in particular, carries significant risk of cerebral and cardiovascular events among older populations (Yarnell, 2015). Despite these risks, problem substance use tends to be underdiagnosed and undertreated among older adults (Wu and Blazer, 2011). This is due in part to limited/insufficient screening or other potential confounders among older populations such as denial, lack of social clues (e.g., job loss, legal issues), the precedence of other medical conditions, ageism, or low index of suspicion (Chait

et al., 2010; Yarnell, 2015). Thus, it will be necessary to adapt to this growing population by increasing research to better understand CU and CUD among older adults in order to inform targeted screening and treatment options.

The increased trend in CU among Blacks is concerning given the abundant literature indicating greater cocaine-related problems compared to other racial/ethnic groups. O'Brien and Anthony (2005) analyzed NSDUH data and showed that Blacks were an estimated nine times as likely to have cocaine dependence within 24 months of initiating CU compared to White recent-onset users. Moreover, we found that weekly CU increased among Blacks by 138% from 2011 to 2015, which bears concern given that frequency of use is positively associated with CUD (Chen and Kandel, 2002). Hence, increased surveillance and screening of problem CU indicators among Blacks is recommended. A better understanding of potential causal mechanisms for increased frequent CU among the Black population is also needed. Previous research suggests that greater cocaine availability in Black communities could be accountable (Lillie-Blanton et al., 1993), which may be problematic given the estimated increase in cocaine supply entering the U.S. (ONDCP, 2016).

Our findings also indicated a different demographic profile between adolescents and adults who used cocaine. For instance, among adults, males had greater odds of CU or CUD; however, there was no sex difference in odds among adolescents. These findings are consistent with previous research among adults that used earlier study periods (Palamar et al., 2015; Pope et al., 2011). However, previous research using adolescents and earlier study periods indicated increased odds of CU among males compared to females, which is in contrast with our results (Braun et al., 1996; Palamar and Ompad, 2014). Hence, these findings suggest a narrowing gender gap in CU and CUD among adolescents compared to previous years. Notable racial differences in odds of CU were also observed among adolescents and adults. Blacks, compared to Whites, had lower odds of weekly CU among adolescents, but higher odds among adults. These findings are consistent with studies using earlier study periods (Kasperski et al., 2011; Palamar et al., 2014). Studies have shown that the onset of CU during adolescence is associated with greater odds of developing CUD than adult onset (Reboussin and Anthony, 2006). Taken together, the trend in CU and frequent CU, as well as their risk factors, among adolescents should be studied further to inform interventions aimed at preventing escalation to CUD.

The presence of other substance use was strongly associated with CU and CUD. The most robust association with CU and CUD among both adolescents and adults was heroin use. Cocaine and heroin are often used together to enhance subjective reinforcing effects and their co-use is associated with more health, social, and legal problems and worse treatment outcomes compared to use of only one of the substances (Leri et al., 2003). Moreover, data from the National Vital Statistics System indicated that the increased rate of cocaine-related overdose deaths in the U.S. from 2010 to 2015 were driven by heroin and synthetic opioid (e.g., fentanyl) involvement (McCall Jones et al., 2017). Medical providers should be informed of these associations when screening and implementing intervention strategies for problematic CU, especially in light of the growing supply and use of heroin and fentanyl in the U.S.

Our study also found a strong association of cannabis use with past-year CU (AOR = 10.28), weekly CU (AOR = 6.83), and CUD (AOR = 4.39). Cannabis use may increase health risks among cocaine users. Aharonovich et al. (2005) found that cocaine dependent patients who continuously used cannabis after treatment discharge had increased odds of relapsing to CU following sustained remission. Likewise, another study showed that early-onset cannabis use and long-term cannabis use disorder were associated with greater severity in cocaine withdrawal symptoms, increased cocaine craving, and rehospitilizations among cocaine dependent inpatients (Viola et al., 2014). Given the increased prevalence of cannabis use and cannabis use disorder among adults in the U.S. (Hasin and Grant, 2016), more research is needed to better understand how CU may intensify cannabis use problems and vice versa. Treatment for CUD should screen for cannabis use to inform treatment plans.

Tobacco and alcohol use was associated with CU and CUD among adolescents and adults to a lesser degree than cocaine and heroin use. However, we found a significant increase in past-year CU from 2011 to 2015 among both tobacco and alcohol users as well as a significant increase in weekly CU among alcohol users. The increase in cocaine use among persons reporting past-year alcohol use appeared to be related to those with heavy alcohol use. Cocaine users who also use tobacco or alcohol represent a higher risk group of individuals than those who do not (Althobaiti and Sari, 2016; Roll et al., 1996; Weinberger and Sofuoglu, 2009), which suggests the importance of targeted screening for CUD among substance users.

The present study has limitations. First, the cross-sectional nature of the NSDUH precludes determinations of causality. NSDUH data are also based on self-reports, which may lead to underestimations of CU prevalence due to stigma associated with drug use. Our analysis also did not differentiate between powder and crack CU because of sample size limitations. Nevertheless, we found an increased trend in past-year crack use among older adults, which may be considered in surveillance and prevention efforts given the differences between crack vs. powder users including reasons for use, CUD, and adverse outcomes (Palamar et al., 2014, 2015). Moreover, these results must be interpreted in the context of noninstitutionalized persons as the NSDUH excludes homeless individuals not in shelters, active military personnel, and residents of institutionalized group quarters. Notwithstanding these limitations, the NSDUH is a large, nation-wide sample administered annually, which has high generalizability.

In summary, we identified several key population subgroups that may be driving the increased prevalence of CU since 2011 in the U.S. Specifically, increased prevalence of CU or CUD was found among females, ages 18–25, older adults, Whites, Blacks, past-year tobacco users, and past-year alcohol users. Given the high addiction potential of cocaine, especially among adolescent users, targeted prevention and early intervention strategies among at-risk population subgroups will be vital for decreasing the likelihood of developing cocaine-related health problems. However, until then, further epidemiological studies and longitudinal research are needed to confirm demographic trends in CU and to understand potential triggers/drivers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.drugalcdep.2017.08.031.

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Table 1

Prevalence estimates of any past-year cocaine use among persons aged 12 or older: 2011–2015 NSDUH.

	2011	2015	Difference in prevalence 2015 vs. 2011[a]	Percent change in prevalence: 2015 vs. 2011	P value for trend[b]
Sample size, unweighted **Weighted prevalence**	**N = 58,397** **Row% (95% CI)**	**N = 57,146** **Row% (95% CI)**	**%**	**%**	
Overall	1.48 (1.36–1.59)	1.81 (1.64–1.98)	0.33	22.59	< 0.05
Sex					
Female	0.96 (0.84–1.08)	1.27 (1.11–1.43)	0.31	32.23	< 0.01
Male	2.02 (1.77–2.27)	2.38 (2.09–2.67)	0.36	17.61	0.37
Age					
12–17	0.93 (0.76–1.09)	0.61 (0.45–0.77)	−0.32	−34.26	< 0.05
18–25	4.62 (4.23–5.02)	5.49 (4.88–6.11)	0.87	18.80	< 0.05
26–34	2.28 (1.83–2.72)	3.28 (2.75–3.81)	1.01	44.17	0.06
35–49	1.39 (1.03–1.76)	1.28 (1.01–1.55)	−0.11	−8.03	0.52
50+	0.30 (0.15–0.45)	0.68 (0.47–0.89)	0.38	127.78	< 0.05
Race/ethnicity					
White, Non-Hispanic	1.47 (1.33–1.61)	1.83 (1.63–2.03)	0.36	24.42	0.06
Black, Non-Hispanic	1.08 (0.72–1.43)	2.29 (1.65–2.93)	1.21	112.93	< 0.01
Hispanic	1.93 (1.53–2.33)	1.69 (1.34–2.05)	−0.24	−12.36	0.60
Other	1.20 (0.74–1.65)	1.15 (0.91–1.39)	−0.05	−3.96	0.73
Total family income					
< $20,000	2.29 (1.94–2.65)	3.12 (2.50–3.75)	0.83	36.15	< 0.05
$20,000–$49,000	1.55 (1.34–1.76)	1.73 (1.48–1.99)	0.19	12.08	0.21
$50,000–$74,999	1.22 (0.95–1.50)	1.65 (1.25–2.06)	0.43	34.98	0.14
≥$75,000	1.04 (0.84–1.23)	1.29 (1.09–1.50)	0.25	24.51	0.40
County Type					
Non-metro	0.90 (0.66–1.15)	1.21 (0.96–1.45)	0.30	33.59	0.09
Small metro	1.36 (1.15–1.57)	1.56 (1.34–1.78)	0.20	14.95	0.30
Large metro	1.71 (1.52–1.90)	2.11 (1.84–2.38)	0.40	23.46	0.09
Tobacco use-past year					
No	0.25 (0.17–0.33)	0.42 (0.34–0.51)	0.17	68.91	< 0.01

	2011	2015	Difference in prevalence 2015 vs. 2011[a]	Percent change in prevalence: 2015 vs. 2011	P value for trend[b]
Sample size, unweighted **Weighted prevalence**	**N = 58,397** **Row% (95% CI)**	**N = 57,146** **Row% (95% CI)**	**%**	**%**	
Yes	4.11 (3.74–4.49)	5.14 (4.61–5.66)	1.02	24.88	< 0.05
Alcohol use-past year					
No	0.16 (0.08–0.24)	0.17 (0.11–0.23)	0.01	3.87	0.88
Yes	2.15 (1.99–2.32)	2.67 (2.42–2.92)	0.51	23.85	< 0.01
Alcohol use-monthly					
No	0.50 (0.39–0.62)	0.47 (0.38–0.56)	−0.04	−7.07	0.13
Use but no binge use	0.57 (0.45–0.70)	0.57 (0.42–0.73)	0.00	0.28	0.78
Binge but no heavy use	2.46 (2.07–2.86)	3.55 (3.06–4.05)	1.09	44.20	< 0.01
Heavy use	9.51 (8.27–10.74)	11.81 (10.15–13.46)	2.30	24.20	< 0.05
Cannabis use-past year					
No	0.34 (0.26–0.42)	0.37 (0.29–0.46)	0.03	8.91	0.41
Yes	10.17 (9.34–11.00)	10.98 (9.87–12.08)	0.81	7.92	0.89
Heroin use-past year					
No	1.34 (1.23–1.46)	1.65 (1.50–1.81)	0.31	22.88	< 0.05
Yes	52.93 (41.14–64.72)	51.33 (42.20–60.47)	−1.60	−3.02	0.36
Major depressive episode-past year					
No	1.35 (1.23–1.46)	1.64 (1.47–1.81)	0.29	21.82	0.06
Yes	3.25 (2.49–4.01)	3.99 (3.28–4.71)	0.74	22.91	0.11

[a] Difference in the estimated prevalence for the end-points of the time period (i.e., 2015 minus 2011); differences were calculated from unrounded prevalence estimates.

[b] P-value for trend was exploratory and estimated from a logistic regression model that included survey year as a covariate (2011–2015, continuous).

Table 2

Prevalence estimates of weekly cocaine use (≥52 days/year) among persons aged 12 or older: 2011–2015 NSDUH.

	2011	2015	Differences in prevalence 2015 vs. 2011[a]	Percent change in prevalence: 2015 vs. 2011	P value for trend[b]
Sample size, unweighted **Weighted prevalence**	**N = 58,397** **Row% (95% CI)**	**N = 57,146** **Row% (95% CI)**	**%**	**%**	
Overall	0.29 (0.22–0.35)	0.43 (0.34–0.52)	0.15	51.47	0.15
Sex					
Female	0.18 (0.12–0.24)	0.29 (0.18–0.41)	0.11	60.47	0.07
Male	0.40 (0.29–0.50)	0.58 (0.45–0.71)	0.19	46.89	0.58
Age					
12–17	0.11 (0.05–0.17)	0.07 (0.02–0.12)	−0.04	−38.21	0.14
18–25	0.53 (0.40–0.65)	0.80 (0.56–1.05)	0.28	52.85	0.07
26–34	0.55 (0.31–0.80)	0.51 (0.34–0.69)	−0.04	−6.77	0.29
35–49	0.35 (0.19–0.50)	0.43 (0.29–0.56)	0.08	22.66	0.60
50+	0.11 (0.04–0.18)	0.37 (0.22–0.53)	0.26	228.81	< 0.05
Race/ethnicity					
White, Non-Hispanic	0.23 (0.16–0.29)	0.32 (0.23–0.42)	0.10	43.52	0.78
Black, Non-Hispanic	0.47 (0.27–0.66)	1.12 (0.70–1.54)	0.65	138.94	0.09
Hispanic	0.42 (0.24–0.60)	0.44 (0.28–0.61)	0.02	5.33	0.45
Other	0.25 (0.04–0.46)	0.25 (0.12–0.39)	0.00	1.85	0.80
Total family income					
< $20,000	0.53 (0.34–0.72)	1.03 (0.69–1.37)	0.50	94.84	0.09
$20,000–$49,000	0.38 (0.25–0.51)	0.47 (0.32–0.62)	0.08	21.55	0.53
$50,000–$74,999	0.13 (0.07–0.19)	0.25 (0.08–0.42)	0.12	96.25	0.32
≥$75,000	0.12 (0.06–0.18)	0.19 (0.11–0.28)	0.07	58.18	0.88
County Type					
Non-metro	0.11 (0.05–0.18)	0.34 (0.16–0.51)	0.22	197.88	0.11
Small metro	0.34 (0.20–0.47)	0.45 (0.32–0.57)	0.11	32.20	0.62
Large metro	0.31 (0.22–0.39)	0.45 (0.33–0.57)	0.15	47.81	0.33
Tobacco use-past year					
No	0.01 (0.00–0.02)	0.07 (0.04–0.11)	0.07	1060.94	0.11

	2011	2015	Differences in prevalence 2015 vs. 2011[a]	Percent change in prevalence: 2015 vs. 2011	P value for trend[b]
Sample size, unweighted **Weighted prevalence**	**N = 58,397** **Row% (95% CI)**	**N = 57,146** **Row% (95% CI)**	**%**	**%**	
Yes	0.89 (0.70–1.08)	1.29 (1.00–1.58)	0.41	45.78	0.14
Alcohol use-past year					
No	0.06 (0.02–0.11)	0.06 (0.02–0.10)	0.00	−3.38	0.69
Yes	0.40 (0.31–0.49)	0.63 (0.49–0.76)	0.23	56.48	0.12
Alcohol use-monthly					
No	0.15 (0.09–0.21)	0.12 (0.08–0.16)	−0.03	−19.57	0.09
Use but no binge use	0.11 (0.04–0.18)	0.09 (0.03–0.15)	−0.02	−17.22	0.70
Binge but no heavy use	0.48 (0.30–0.67)	0.83 (0.51–1.14)	0.34	71.09	0.22
Heavy use	1.45 (0.91–2.00)	3.01 (2.14–3.88)	1.56	107.07	< 0.05
Cannabis use-past year					
No	0.07 (0.04–0.11)	0.14 (0.09–0.20)	0.07	101.70	< 0.05
Yes	1.93 (1.50–2.36)	2.28 (1.71–2.85)	0.35	18.06	0.50
Heroin use-past year					
No	0.24 (0.18–0.30)	0.37 (0.29–0.46)	0.13	53.91	0.26
Yes	17.46 (10.02–24.91)	19.48 (9.11–29.84)	2.01	11.52	0.96
Major depressive episode-past year					
No	0.25 (0.19–0.31)	0.37 (0.29–0.44)	0.11	45.45	0.34
Yes	0.75 (0.38–1.12)	1.29 (0.71–1.87)	0.54	72.13	0.13

[a] Difference in the estimated prevalence for the end-points of the time period (i.e., 2015 minus 2011); differences were calculated from unrounded prevalence estimates.

[b] P-value for trend was exploratory and estimated from a logistic regression model that included survey year as a covariate (2011–2015, continuous).

Table 3

Prevalence estimates of cocaine use disorder among persons aged 12 or older: 2011–2015 NSDUH.

	2011	2015	Differences in prevalence 2015 vs. 2011[a]	Percent change in prevalence: 2015 vs. 2011	P value for trend[b]
Sample size, unweighted Weighted prevalence	**N = 58,397 Row% (95% CI)**	**N = 57,146 Row% (95% CI)**	**%**	**%**	
Overall	0.32 (0.24–0.39)	0.32 (0.25–0.40)	0.01	2.32	0.67
Sex					
Female	0.23 (0.16–0.31)	0.19 (0.11–0.28)	−0.04	−16.31	0.99
Male	0.40 (0.29–0.52)	0.46 (0.34–0.58)	0.05	13.58	0.61
Age					
12–17	0.16 (0.08–0.25)	0.12 (0.04–0.20)	−0.04	−26.78	0.25
18–25	0.64 (0.46–0.81)	0.65 (0.47–0.83)	0.01	2.08	0.75
26–34	0.54 (0.28–0.80)	0.48 (0.29–0.68)	−0.06	−10.50	0.31
35–49	0.46 (0.21–0.70)	0.23 (0.14–0.32)	−0.23	−49.58	< 0.05
50+	0.07 (0.02–0.13)	0.26 (0.10–0.41)	0.18	245.44	< 0.05
Race/ethnicity					
White, Non-Hispanic	0.25 (0.17–0.33)	0.25 (0.17–0.33)	0.00	−0.56	0.36
Black, Non-Hispanic	0.48 (0.22–0.74)	0.86 (0.40–1.32)	0.38	78.97	0.24
Hispanic	0.55 (0.33–0.78)	0.33 (0.20–0.45)	−0.23	−41.25	0.22
Other	0.14 (0.03–0.26)	0.11 (0.03–0.19)	−0.03	−23.04	0.84
Total family income					
< $20,000	0.58 (0.38–0.78)	0.67 (0.41–0.94)	0.10	16.65	0.88
$20,000–$49,000	0.43 (0.28–0.58)	0.33 (0.21–0.45)	−0.10	−23.79	0.19
$50,000–$74,999	0.13 (0.06–0.20)	0.28 (0.09–0.47)	0.15	114.79	0.07
≥ $75,000	0.13 (0.05–0.21)	0.16 (0.08–0.25)	0.03	21.87	0.93
County Type					
Non-metro	0.14 (0.04–0.23)	0.21 (0.14–0.28)	0.07	53.17	0.88
Small metro	0.35 (0.21–0.48)	0.28 (0.18–0.39)	−0.06	−18.29	0.29
Large metro	0.35 (0.24–0.45)	0.38 (0.26–0.49)	0.03	7.66	0.97
Tobacco use-past year					
No	0.03 (0.01–0.04)	0.05 (0.01–0.08)	0.02	78.91	0.14

Sample size, unweighted Weighted prevalence	2011 N = 58,397 Row% (95% CI)	2015 N = 57,146 Row% (95% CI)	Differences in prevalence 2015 vs. 2011[a] %	Percent change in prevalence: 2015 vs. 2011 %	P value for trend[b]
Yes	0.94 (0.72–1.16)	0.99 (0.74–1.23)	0.05	5.15	0.72
Alcohol use-past year					
No	0.08 (0.03–0.13)	0.04 (0.01–0.07)	−0.04	−49.74	< 0.05
Yes	0.44 (0.33–0.54)	0.47 (0.35–0.59)	0.03	7.53	0.99
Alcohol use-monthly					
No	0.19 (0.12–0.26)	0.10 (0.06–0.14)	−0.09	−46.57	< 0.001
Use but no binge use	0.10 (0.04–0.17)	0.10 (0.04–0.16)	0.00	−1.96	0.28
Binge but no heavy use	0.47 (0.27–0.66)	0.59 (0.33–0.85)	0.13	26.94	0.66
Heavy use	1.67 (1.02–2.33)	2.10 (1.44–2.76)	0.43	25.53	0.44
Cannabis use-past year					
No	0.11 (0.06–0.17)	0.09 (0.05–0.14)	−0.02	−19.84	0.79
Yes	1.85 (1.41–2.30)	1.79 (1.38–2.21)	−0.06	−3.24	0.16
Heroin use-past year					
No	0.25 (0.19–0.32)	0.26 (0.19–0.32)	0.01	2.10	0.67
Yes	24.96 (14.91–35.02)	20.77 (12.19–29.35)	−4.19	−16.8	0.19
Major depressive episode-past year					
No	0.22 (0.17–0.28)	0.27 (0.19–0.34)	0.04	18.52	0.89
Yes	1.56 (0.98–2.14)	1.06 (0.61–1.51)	−0.50	−32.33	0.23

[a] Difference in the estimated prevalence for the end-points of the time period (i.e., 2015 minus 2011); differences were calculated from unrounded prevalence estimates.

[b] P-value for trend was exploratory and estimated from a logistic regression model that included survey year as a covariate (2011–2015, continuous).

Table 4

Adjusted odds ratios of past-year cocaine use and cocaine use disorder among adolescents aged 12–17 years: 2011–2015 NSDUH (N = 81,584).

Adjusted odds ratio (AOR)	Any past-year cocaine use (vs. no) AOR (95% CI)	Weekly cocaine use (≥52 days/year) (vs. no) AOR (95% CI)	Cocaine use disorder (vs. no) AOR (95% CI)
Sex			
Female	1.00	1.00	1.00
Male	1.00 (0.78–1.29)	0.94 (0.55–1.59)	1.19 (0.70–2.03)
Age			
12–13	1.00	1.00	1.00
14–15	1.03 (0.56–1.89)	0.73 (0.18–3.00)	0.52 (0.18–1.51)
16–17	**1.98 (1.11–3.53)**	2.32 (0.59–9.04)	0.97 (0.35–2.75)
Race/ethnicity			
White, Non-Hispanic	1.00	1.00	1.00
Black, Non-Hispanic	**0.26 (0.14–0.50)**	**0.16 (0.04–0.70)**	0.43 (0.11–1.76)
Hispanic	**1.58 (1.16–2.16)**	**2.20 (1.17–4.13)**	**3.68 (1.88–7.20)**
Other	0.85 (0.57–1.27)	1.46 (0.53–4.01)	1.87 (0.62–5.62)
Total family income			
< $20,000	1.00	1.00	1.00
$20,000–$49,000	0.99 (0.70–1.42)	0.80 (0.37–1.76)	1.24 (0.63–2.47)
$50,000–$74,999	0.80 (0.52–1.24)	0.68 (0.24–1.95)	1.19 (0.46–3.05)
≥$75,000	0.72 (0.47–1.09)	1.33 (0.61–2.94)	1.18 (0.59–2.34)
County Type			
Non-metro	1.00	1.00	1.00
Small metro	1.19 (0.81–1.76)	1.12 (0.54–2.32)	**3.99 (1.69–9.43)**
Large metro	1.31 (0.89–1.93)	1.15 (0.60–2.19)	**2.77 (1.22–6.27)**
Tobacco use-past year (yes vs. no)	**5.59 (3.41–9.18)**	**21.94 (7.70–62.47)**	**10.59 (3.25–34.49)**
Alcohol use-past year (yes vs. no)	**2.90 (1.89–4.46)**	**5.61 (2.05–15.38)**	**4.57 (1.36–15.41)**
Cannabis use-past year (yes vs. no)	**18.17 (11.13–29.66)**	**11.72 (4.98–27.57)**	**16.58 (4.94–55.59)**
Heroin-past year (yes vs. no)	**23.82 (11.59–48.98)**	**20.27 (8.21–50.04)**	**23.85 (10.00–56.85)**
Major depressive episode-past-year (yes vs. no)	1.29 (0.92–1.81)	1.55 (0.90–2.66)	**2.36 (1.24–4.50)**
Survey year			
2011	1.00	1.00	1.00
2012	0.90 (0.68–1.19)	1.79 (0.81–3.97)	1.30 (0.61–2.76)
2013	0.70 (0.48–1.02)	0.81 (0.33–1.97)	0.67 (0.25–1.82)
2014	1.01 (0.71–1.45)	1.05 (0.41–2.70)	0.80 (0.33–1.94)
2015	0.93 (0.67–1.30)	0.92 (0.33–2.56)	1.20 (0.50–2.88)

Note: Each column represents a separate adjusted logistic regression model.

Boldface: P < 0.05. CI: confidence interval.

Table 5

Adjusted odds ratios of cocaine use and cocaine use disorder among adults aged ≥18 years: 2011–2015 NSDUH (N = 199,658).

Adjusted odds ratio (AOR)	Any past-year cocaine use (vs. no) AOR (95% CI)	Weekly cocaine use (≥52 days/year) (vs. no) AOR (95% CI)	Cocaine use disorder (vs. no) AOR (95% CI)
Sex			
Female	1.00	1.00	1.00
Male	**1.40 (1.28–1.55)**	**1.44 (1.17–1.79)**	**1.61 (1.32–1.96)**
Age			
18–25	1.00	1.00	1.00
26–34	0.92 (0.82–1.03)	**1.44 (1.09–1.89)**	1.31 (1.00–1.73)
35–49	**0.80 (0.71–0.90)**	**1.80 (1.41–2.29)**	**1.75 (1.36–2.27)**
50+	**0.55 (0.46–0.65)**	**2.37 (1.81–3.10)**	**1.49 (1.05–2.11)**
Race/ethnicity			
White, Non-Hispanic	1.00	1.00	1.00
Black, Non-Hispanic	**0.81 (0.69–0.96)**	**2.84 (2.20–3.67)**	**2.30 (1.66–3.20)**
Hispanic	1.14 (0.99–1.30)	**1.96 (1.51–2.54)**	**1.85 (1.34–2.55)**
Other	**0.82 (0.70–0.97)**	1.26 (0.89–1.78)	0.86 (0.53–1.40)
Total family income			
< $20,000	1.00	1.00	1.00
$20,000–$49,000	**0.75 (0.67–0.85)**	**0.73 (0.56–0.94)**	**0.62 (0.49–0.79)**
$50,000–$74,999	**0.71 (0.60–0.84)**	**0.39 (0.27–0.57)**	**0.45 (0.31–0.65)**
≥$75,000	**0.70 (0.61–0.80)**	**0.43 (0.31–0.59)**	**0.37 (0.26–0.53)**
County Type			
Non-metro	1.00	1.00	1.00
Small metro	**1.91 (1.65–2.20)**	1.32 (0.94–1.85)	**2.17 (1.54–3.05)**
Large metro	**1.53 (1.32–1.77)**	1.33 (0.94–1.87)	**1.93 (1.42–2.61)**
Tobacco use-past year (yes vs. no)	**3.96 (3.46–4.54)**	**6.71 (4.41–10.19)**	**7.47 (4.99–11.19)**
Alcohol use-past year (yes vs. no)	**4.43 (3.39–5.81)**	**3.29 (2.16–5.02)**	**3.13 (2.05–4.79)**
Cannabis use-past year (yes vs. no)	**10.28 (8.96–11.79)**	**6.83 (5.28–8.82)**	**4.39 (3.41–5.66)**
Heroin use-past year (yes vs. no)	**15.81 (11.76–21.26)**	**16.03 (11.50–22.35)**	**17.24 (12.59–23.62)**
Major depressive episode-past-year (yes vs. no)	**1.52 (1.32–1.76)**	**1.70 (1.30–2.22)**	**3.06 (2.45–3.84)**
Survey year			
2011	1.00	1.00	1.00
2012	**1.23 (1.04–1.45)**	**1.69 (1.22–2.35)**	1.34 (0.98–1.85)
2013	1.15 (1.00–1.33)	1.25 (0.89–1.75)	1.17 (0.84–1.65)
2014	1.12 (0.97–1.31)	1.19 (0.86–1.64)	1.05 (0.77–1.45)
2015	**1.25 (1.08–1.45)**	**1.52 (1.10–2.10)**	1.05 (0.75–1.48)

Note: Each column represents a separate adjusted logistic regression model.

Boldface: P < 0.05. CI: confidence interval.