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Prevalence and Correlates of Firesetting in the US: Results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC)

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Abstract

Objective—To estimate the prevalence, sociodemographic correlates, comorbidity and rates of mental health service utilization of firesetters in the general population.

Methods—A face-to-face survey of more than 43,000 adults aged 18 years and older residing in households was conducted during the 2001–2002 period. Diagnoses of mood, anxiety and drug disorders as well as personality disorders were based on the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV).

Results—The prevalence of lifetime firesetting in the US population was 1.13 (95% CI: 1.0–1.3). Being male, White, older than 30 years old, never married, US-born and with a yearly income over \$70,000 were risk factors of lifetime firesetting. The strongest associations with firesetting were with disorders often associated with deficits in impulse control, such as antisocial personality disorder (OR= 21.8, CI: 16.6–28.5), drug dependence (OR= 7.6, CI: 5.2–10.9), bipolar disorder (OR= 5.6, CI: 4.0–7.9) and pathological gambling (OR= 4.8, CI: 2.4–9.5). Associations between firesetting and all antisocial behaviors were positive and significant. A lifetime history of firesetting, even in the absence of ASPD diagnosis, was strongly associated with substantial rates of axis I comorbidity, history of antisocial behavior, family history of other antisocial behaviors, decreased functioning and higher treatment seeking rates.

Conclusions—Our findings suggest that firesetting may be better understood as a behavioral manifestation of a broader impaired control syndrome and part of the externalizing spectrum.

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Firesetting and other antisocial behaviors tend to be strongly associated with each other and increase the risk of lifetime and current psychiatric disorders, even in the absence of a DSM-IV diagnosis of APSD.

INTRODUCTION

Firesetting, defined as starting a fire on purpose to destroy someone else's property or just to see it burn, often results in property damage, injury or death of the firesetter or other people.

¹ Firesetting, defined as starting a fire on purpose, often results in property damage, injury or death of the firesetter or other people. Firesetting and pyromania are sometimes used synonymously, yet there are important differences between them. Firesetting is defined by a behavior, regardless of its motivation. By contrast pyromania has a narrower meaning and refers to a psychiatric diagnosis characterized by recurrent failure to resist impulses to set fires, tension before setting the fire and satisfaction and relief after doing it. Furthermore, the fire is not set to express anger or vengeance or to improve one's living circumstances. Nationally, an estimated 31,500 fires are set intentionally in any given year. These fires lead to several hundred civilian deaths each year and close to a billion dollars in property loss, making firesetting in the United States a problem of national importance.³ Some data suggest that the incidence of firesetting may be increasing.^{4,5}

Alongside with enuresis and cruelty with animals, firesetting is one of the three behaviors commonly referred as the McDonald triad for sociopathy.⁶ In a recent study, Dadds and Fraser⁷ found that firesetting in childhood was associated with chronic antisocial behavior. Not surprisingly, people who intentionally set fires often experience severe social and legal problems. Moreover, firesetting appears to be related to emotional distress, but the relationship of firesetting to other behaviors and psychiatric disorders is poorly understood.¹ Previous studies have suggested that the lifetime prevalence of firesetting may be 3%–26% in psychiatric patients^{8,9} and that a history of firesetting may be more common among unemployed, unmarried male youth.^{1, 10, 11} Partially based on those studies, it has been hypothesized that firesetting may be a manifestation of impulsivity,^{12–14} psychopathy,¹⁵ or affective^{16, 17} or obsessive-compulsive spectrum disorder.¹⁸ However, because prior research was conducted almost exclusively on clinical samples or on convicted arsonists,^{11, 13, 19} the prevalence, demographic correlates, comorbidity and rates of mental health service utilization of firesetters in the general population are unknown.

The purpose of this study was to fill these gaps in knowledge. Specifically we sought to: 1) Estimate the prevalence and demographic correlates of firesetting in the general population; 2) Examine antisocial behaviors associated with firesetting; 3) Investigate the lifetime and 12-month prevalence of psychiatric disorders associated with firesetting and level of psychosocial functioning in individuals with a lifetime history of firesetting; and 4) Estimate lifetime prevalence and 12 month rates of mental health treatment seeking among individuals with a lifetime history of firesetting.

METHOD

Sample

The 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) is a nationally representative sample of the adult population of the United States conducted by the US Census Bureau, under the direction of the National Institute of Alcoholism and Alcohol Abuse (NIAAA), as described in detail elsewhere.^{20, 21} The research protocol, including informed consent procedures, received full ethical review and approval from the U.S. Census Bureau and the U.S. Office of Management and Budget.

Diagnostic Assessment

Sociodemographic measures included age, sex, race-ethnicity, nativity (US-born vs. foreign-born), marital status, place of residence, and region of the country. Socioeconomic measures included education, family income measured as a continuous variable, and insurance type.

All lifetime psychiatric diagnoses were made according to the DSM-IV criteria using the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM IV Version (AUDADIS-IV), a valid and reliable fully structured diagnostic interview designed for use by professional interviewers who are not clinicians. Diagnoses included in the AUDADIS-IV can be separated into three groups: 1) Substance Use Disorders (including any alcohol abuse/dependence, any drug abuse/dependence, and any nicotine dependence); 2) Mood disorders (including major depressive disorder, dysthymia, and bipolar disorder); and 3) Anxiety disorders (including panic disorder, social anxiety disorder, specific phobia, and generalized anxiety disorder). The test-retest reliability and validity of AUDADIS-IV measures of DSM-IV disorders is adequate, as detailed elsewhere.^{22–28} Test-retest reliability and validity was good for major depressive disorder ($\kappa=0.65–0.73$)²² and reliability ($\kappa>0.74$) and validity were good to excellent for substance use disorders.^{22–24} Reliability was fair to excellent for other mood and anxiety disorders ($\kappa=0.40–0.60$) and personality disorders ($\kappa=0.40–0.67$).^{22, 23} Due to concerns about the validity of psychotic diagnoses in general population surveys as well as length of the interview, possible psychotic disorders were assessed by asking the respondent if the respondent was ever told by a doctor or other health professional that he or she had schizophrenia or a psychotic disorder.

Embedded in the antisocial personality disorder section was the following question: “Did you ever start a fire on purpose to destroy someone else’s property or just to see it burn?” This was queried to all NESARC respondents. Individuals who answered yes to this question were further asked, “Has this happened since you were 15?” While test-retest reliability of individual items is unavailable, we computed Cronbach’s α for the ASPD symptoms, which was .86, indicating excellent internal consistency of the ASPD section. This value was unchanged when the firesetting item was excluded, suggesting high reliability for the item. All respondents on the NESARC were asked about lifetime history of a broad range of other antisocial behaviors, as well as family history of antisocial behavior. The NESARC interview also used the Short Form 12v2 (SF-12v2) to generate measures of disability using the Physical Component Summary (PCS), mental health scale, role emotional scale and social functioning scale. The Short Form-12v2 is a reliable and valid measure of current disability widely used in population surveys.^{30,31}

To estimate rates of mental health service utilization, respondents were classified as receiving treatment if they sought help from a counselor, therapist, doctor, or psychologist, or from an emergency room, if they reported being hospitalized for a psychiatric disorder at least one night, or if they reported being prescribed medications for a psychological problem.

Statistical analyses

Weighted percentages and means were computed to derive sociodemographic and clinical characteristics of respondents with and without lifetime history of firesetting. Standard errors and 95% confidence intervals for all analyses were estimated using SUDAAN,³² a software package that uses Taylor series linearization to adjust for the design effects of complex sample surveys like the NESARC. Because the combined standard error of two means (or percents) is always equal or less than the sum of the standard errors of those two means, we conservatively consider that two CIs that share a boundary or do not overlap to be significantly different from one another.³³ We consider significant ORs those whose CI does not cross 1.³³ Logistic

regressions were conducted to adjust the ORs for sociodemographic variables that were significantly different between individuals with and without lifetime history of firesetting.

To examine whether the correlates of firesetting were due its association to antisocial personality disorder (ASPD), all analyses were repeated excluding individuals with a diagnosis of ASPD. Because these two sets of analyses resulted in a nearly identical pattern of significant odds ratios, only the results from the full sample are presented.

RESULTS

Sociodemographic Characteristics

Table 1 shows prevalence and sociodemographic characteristics of individuals with and without lifetime history of firesetting. The overall lifetime prevalence of firesetting in the general population was 1.13%. When individuals with ASPD were excluded from the analysis, firesetting prevalence decreased by about half, to 0.55%. As shown in Table 1, rates of lifetime history firesetting were significantly higher in men than women. Being never married, US-born, or with a yearly income over \$70,000 also increased the risk for firesetting. Furthermore, rates of lifetime history of firesetting were significantly lower in Blacks, Hispanics and Asians when compared with Non-Hispanic Whites, in respondents aged 30 and older relative to those from 18 to 29 years old and in respondents living in the Northeast, Midwest and South of the US when compared with those living in the West region of the country.

Table 2 shows that, in most cases, individuals reported firesetting occurring before age 15 but, in a substantial proportion of the cases (38%), firesetting persisted after that age. Individuals with a history of firesetting were more likely to have a family history of antisocial behaviors, as shown by both the adjusted and unadjusted ORs.

Associated Antisocial Behaviors

Table 2 describes clinical characteristics of individuals with and without lifetime history of firesetting. The prevalence of all antisocial behaviors was higher among individuals with a history of firesetting than among those without it. For both groups, the most common behavior was staying out at night against parental advice, which was endorsed by 61.4% of individuals with a history of firesetting and 21.5% of those without a history of firesetting. The behavior most strongly associated with firesetting, as measured by the OR, was destroying other people's property (OR=29.5). Even after adjustment for sociodemographic factors, this association remained strong and significant (AOR=18.4). Besides destroying someone's property, the behaviors more strongly associated with firesetting were robbing, mugging or purse-snatching (OR=19.4) and harassing, threatening or blackmailing someone (OR=18.0). When respondents with ASPD were excluded from the analyses, individuals with a history of firesetting continued to show significantly greater rates of every antisocial behavior assessed than those without history of firesetting individuals (data available upon request).

Comorbidity and Treatment-Seeking

The vast majority of individuals with lifetime history of firesetting (95.1%) had a lifetime history of at least one psychiatric diagnosis (Axis I or II diagnosis), compared to 53.5% of the individuals who did not endorse ever intentionally setting a fire (Table 3). Both lifetime axis I and axis II disorders were more common among firesetters than among non-firesetters (90.9% vs. 51.2% for axis I, and 68.9% vs. 14.5% for axis II disorders). In both groups, the most prevalent disorder category was "any alcohol use disorder". However, the strongest associations between firesetting and any psychiatric diagnoses were found for ASPD even when adjusting for sociodemographic characteristics (AOR: 21.8) and drug dependence (AOR:

7.6). Other disorders often associated with deficits in impulse control, such as pathological gambling (AOR: 4.8) and bipolar disorder (AOR: 5.7) were also strongly associated with firesetting when adjusting for sociodemographic characteristics. Associations with anxiety disorders, although also significant, were of smaller magnitude.

As shown in Table 4, a similar pattern was observed when examining current, rather than lifetime comorbid diagnoses of axis I disorders in adjusted ORs. Individuals with history of firesetting were significantly more likely than those without history of firesetting to have lower scores on social functioning, role emotional and mental health scales on the SF-12 after adjusting for sociodemographic characteristics.

Table 5 shows treatment-seeking characteristics of individuals with lifetime history of firesetting. Lifetime rates of mental health treatment seeking were significantly higher among firesetters than the individuals without a lifetime history of firesetting across all treatment settings regardless of whether lifetime or last year timeframe was considered (45.7% versus 18.8%). Similarly, firesetting in the absence of ASPD was significantly associated with lifetime and current psychiatric disorders, social and mental health low scores, and mental health service utilization even after adjusting for sociodemographic factors (data not shown).

DISCUSSION

This is the first national study to examine the prevalence and characteristics of firesetting in the US general population. We found that: 1) the prevalence of firesetting in the general population is about 1%; 2) individuals with a lifetime history of firesetting, even those without ASPD, are more likely than the individuals without a history of firesetting to engage in other antisocial behaviors; 3) almost all individuals with a lifetime history of firesetting have lifetime or current psychiatric comorbidity (even when those with ASPD were excluded from the analysis); and 4) approximately half of the individuals with lifetime history of firesetting have used mental health services at some point of their lives, more than threefold the rate in individuals without a history of firesetting.

Confirming results from clinical samples¹¹, we found that individuals with a history of firesetting were more likely than those without history of firesetting to be male, young and never married. Gender differences may be due a greater rate of impulsivity and risk-taking behaviors among men,^{34, 35} while the relationship of lifetime history firesetting and young age in this study may indicate a birth cohort effect of the youngest group, a recall bias of remote events, or higher mortality of firesetters in the oldest age group.³⁶ Although about 60% of cases of firesettings occurred before age 15, almost 40% of the cases persisted after that age.

In accord with previous research in clinical samples, 11, 13, 37, 38 we found that individuals with a history of firesetting were significantly more likely to have other psychiatric disorders associated with impaired impulse control, such as substance use disorders, bipolar disorder, pathological gambling, and ASPD even after adjusting for other psychiatric disorders. Dysthymia and anxiety disorders had the weakest association with firesetting in this study. Although obsessive compulsive disorder (OCD) was not assessed in the NESARC, obsessive-compulsive personality disorder (OCPD) was. Firesetting was significantly associated with OCPD, but its association with ASPD was much stronger, suggesting that firesetting may be closer to disorders of impulsivity than to obsessive-compulsive spectrum disorders. These findings are supported by the strong association of firesetting with other antisocial behaviors reported in this study. Overall, these data are consistent with prior research indicating that antisocial behavior, substance use, and impulsivity share a common underlying vulnerability.^{39–41} These findings suggest that firesetting may be better understood as a behavioral

manifestation of a broader impaired control syndrome and part of the externalizing spectrum rather than the internalizing spectrum disorders.

The finding that a lifetime history of firesetting and a family history of antisocial behaviors, even in the absence of ASPD diagnosis, is strongly associated with a history of other antisocial behaviors and substantial axis I comorbidity, raises questions about the current conceptualization of ASPD. About one half of the individuals with a lifetime history of firesetting met criteria for ASPD. Removal of those individuals from the analysis diminished the strength, but did not alter the direction or significance of our findings regarding psychiatric comorbidity, associated antisocial behaviors or treatment seeking (data available upon request). Consistent with the recommendations of the DSM-V Research Planning Nomenclature Work Group to conduct research on dimensional models of existing typologies^{42, 43} and specifically on the conceptualization of ASPD^{44, 45} and on the broader category of externalizing disorders,^{39, 45} our findings suggest that antisocial behaviors tend to be strongly associated with each other and increase the risk of lifetime and current psychiatric disorders, even in the absence of a DSM-IV diagnosis of APSD. These findings underscore the importance of antisocial syndromes of behaviors currently considered subthreshold. There may be certain nosological advantages of a dimensional rather than categorical conceptualization of ASPD. Future research should examine clinical, research and policy-making utility of dimensional, categorical or a combination of both approaches to better define ASPD and the implications of selecting specific diagnostic thresholds.

Our study also identified higher rates of lifetime and past year treatment utilization across a broad range of service settings. Respondents in the NESARC study were not specifically asked whether they sought treatment for other reasons but rather if they sought treatment for any Axis I disorder. Based on prior reports¹, it appears that very few individuals seek treatment for firesetting, and, when they seek treatment for other reasons, they are rarely queried about their history of firesetting behavior. Given the high rates of comorbidity, disability and treatment utilization of individuals with a lifetime history of firesetting documented in this study, it seems important to screen for history of firesetting among psychiatric patients.

This study has the limitations common to most large-scale surveys. First, information was based on self-report, potentially resulting in over- or underestimation of the true rates of firesetting. The NESARC did not examine the reliability of individual items. However, the ASPD module of the AUDADIS, which contained the firesetting questions, had a kappa=0.67, which compares favorably with other standardized assessments of ASPD.²⁹ Furthermore, the reliability of the ASPD module, as measured by Cronbach α , is 0.86, and does not change whether or not the firesetting questions are included in the calculation, supporting the reliability of the firesetting questions. Third, because the NESARC sample only included civilian households and quarters populations, information on individuals in prison, who may have higher rates of firesetting, were unavailable. Fourth, frequency, severity and the negative consequences of firesetting were not assessed, leaving the possibility that the behavior occurred only once in the individual's life and/or may not have resulted in substantive damages. Even with this broad definition, the results of the study suggest that a lifetime history of firesetting is strongly associated with high rates of psychopathology and treatment seeking. At present, little is known about firesetting or pyromania in the general population. Longitudinal data are needed to examine the course of firesetting and to distinguish individuals with firesetting from those who develop pyromania. Differences between individuals who set fires and those with the diagnosis could inform on the need of a broader definition of DSM-IV pyromania. Fifth, Wave 1 of the NESARC did not include data on Borderline Personality Disorder or ADHD, both of which are associated with high levels of impulsivity. Finally, because the questions about firesetting were embedded in the ASPD module, the associations detected in this study could have been better explained as correlates of ASPD. However, removal of individuals with

ASPD did not change the pattern of associations, suggesting that our findings reflect true associations with firesetting. Future research should evaluate whether the associations found in this study could be also be explained as correlates of pyromania.

Despite these limitations, our study constitutes a critical step improving the understanding of the prevalence and characteristics of firesetting behavior in the US. The study found high rates of other antisocial behaviors and comorbidity with externalizing spectrum disorders in a large nationally representative sample of the general population. Given the legal and social consequences of firesetting, its associated disability and high rates of treatment-seeking, and its cost to society, the results of this study suggest that more attention may be needed to address the needs of individuals with a history of firesetting.

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Table 1
Sociodemographic characteristics of individuals with and without lifetime history of firesetting

Sociodemographic Characteristic	Firesetters N=407		General population N=41,552		OR	95% CI
	%	95% C.I.	%	95% C.I.		
Sex						
Men	82,1	(77,4- 85,9)	47,4	(46,8- 48,1)	5,1	(3,8- 6,8)
female(ref)	17,9	(14,1- 22,6)	52,6	(51,9- 53,2)	1,0	(1,0- 1,0)
Race/Ethnicity						
White(ref)	80,5	(74,9- 85,0)	70,9	(67,6- 74,0)	1,0	(1,0- 1,0)
Black	8,6	(6,0- 12,2)	11,0	(9,8- 12,4)	0,7	(0,5- 1,0)
Native American	2,2	(1,0- 4,6)	2,1	(1,8- 2,4)	0,9	(0,4- 1,9)
Asian	1,5	(0,5- 4,3)	4,4	(3,5- 5,7)	0,3	(0,1- 0,9)
Hispanic	7,3	(4,7- 11,0)	11,6	(9,3- 14,3)	0,6	(0,4- 0,8)
Nativity						
US-born(ref)	94,2	(88,7- 97,1)	85,3	(82,1- 88,1)	2,8	(1,4- 5,7)
Foreign-born					1,0	(1,0- 1,0)
Age						
18-29(ref)	37,7	(31,6- 44,2)	21,7	(21,0- 22,5)	1,0	(1,0- 1,0)
30-44	32,0	(26,6- 38,0)	30,8	(30,1- 31,5)	0,6	(0,4- 0,8)
45-64	26,1	(20,9- 32,1)	31,1	(30,5- 31,7)	0,5	(0,3- 0,7)
65+	4,2	(2,4- 7,1)	16,4	(15,7- 17,1)	0,2	(0,1- 0,3)
Education						
Less than high school	12,9	(9,6- 17,1)	15,5	(14,6- 16,5)	0,8	(0,6- 1,0)
High school graduate	27,4	(21,8- 33,7)	29,3	(28,2- 30,5)	0,9	(0,6- 1,2)
Some college or higher	59,7	(53,8- 65,3)	55,1	(53,8- 56,4)	1,0	(1,0- 1,0)
Personal income,\$						
0-19,999	42,5	(36,2- 49,1)	47,3	(46,1- 48,5)	1,0	(1,0- 1,0)
20,000-34,999	25,9	(20,3- 32,5)	22,6	(21,8- 23,3)	1,3	(0,9- 1,8)
35,000-69,999	19,7	(15,5- 24,7)	22,0	(21,3- 22,8)	1,0	(0,7- 1,4)
70,000+	11,8	(8,3- 16,6)	8,1	(7,4- 8,9)	1,6	(1,1- 2,5)
Family Income						

Sociodemographic Characteristic	Firesetters N=407		General population N=41,552		OR	(95% CI)
	%	95% C.I.	%	95% C.I.		
0–19K(ref)	24,1	(19,0–30,2)	23,4	(22,4–24,3)	1,0	(1,0–1,0)
20–34K	16,3	(12,4–21,3)	20,2	(19,6–20,9)	0,8	(0,5–1,1)
35–69K	35,4	(29,5–41,8)	32,2	(31,5–32,8)	1,1	(0,8–1,5)
>70K	24,1	(19,2–29,8)	24,3	(22,9–25,7)	1,0	(0,7–1,4)
Marital status						
Married/cohabiting	54,5	(48,2–60,6)	62,0	(61,1–63,0)	1,0	(1,0–1,0)
Widowed/separated/divorced	11,1	(8,1–15,1)	17,4	(17,0–17,9)	0,7	(0,5–1,0)
Never married	34,4	(28,5–40,8)	20,5	(19,6–21,5)	1,9	(1,4–2,6)
Urbanicity						
Urban	82,1	(75,7–87,0)	80,2	(76,7–83,2)	1,0	(1,0–1,0)
Rural	17,9	(13,0–24,3)	19,8	(16,8–23,3)	0,9	(0,6–1,2)
Region						
Northeast	12,7	(7,6–20,5)	19,8	(13,9–27,5)	0,4	(0,3–0,6)
Midwest	22,1	(15,9–29,9)	23,2	(17,4–30,1)	0,7	(0,5–0,9)
South	33,4	(25,5–42,3)	35,1	(29,0–41,9)	0,7	(0,5–0,9)
West(ref)	31,9	(23,0–42,2)	21,9	(15,7–29,7)	1,0	(1,0–1,0)
Insurance						
Private(ref)	64,5	(58,4–70,1)	68,3	(66,8–69,8)	1,0	(1,0–1,0)
Public	12,1	(8,9–16,1)	12,9	(12,2–13,6)	1,0	(0,7–1,4)
No insurance	23,4	(18,3–29,4)	18,8	(17,6–20,0)	1,3	(1,0–1,8)

Table 2

Clinical characteristics of individuals with and without lifetime history of firesetting

Other Antisocial behaviors	Firesetters N=407			General population N=41,552		
	%	(95% C.I.)	%	(95% C.I.)	OR	(95% C.I.) AOR ^a (95% C.I.)
Cut class and leave without permission	61.4	(55.5- 67.0)	21.5	(20.8- 22.2)	5.8	(4.5- 7.5) 4.1 (3.2- 5.4)
Stay out late at night	62.6	(56.5- 68.3)	25.4	(24.5- 26.3)	4.9	(3.8- 6.5) 3.5 (2.6- 4.6)
Bullied/pushed people	34.1	(28.5- 40.2)	5.9	(5.6- 6.3)	8.2	(6.3- 10.8) 5.4 (4.1- 7.2)
Run away from home overnight	26.4	(21.4- 32.2)	4.9	(4.6- 5.2)	7.0	(5.3- 9.3) 5.8 (4.3- 7.8)
Absent from work/school a lot	32.8	(26.8- 39.5)	6.6	(6.2- 7.0)	6.9	(5.2- 9.3) 5.0 (3.7- 6.8)
Quit a job without knowing where to find another	42.1	(36.4- 48.0)	11.3	(10.7- 11.9)	5.7	(4.5- 7.3) 4.1 (3.1- 5.4)
Quit school program without know what to do next	19.0	(15.2- 23.4)	3.6	(3.4- 4.0)	6.2	(4.7- 8.1) 4.5 (3.3- 6.1)
Travel around more than one month without plans	17.9	(13.8- 22.8)	3.3	(3.0- 3.5)	6.4	(4.7- 8.7) 4.1 (3.0- 5.7)
Had no regular place to live for at least 1 month	20.0	(15.6- 25.2)	2.6	(2.3- 2.8)	9.5	(7.0- 12.9) 6.6 (4.8- 9.1)
Lived with others at least 1 month	37.9	(32.0- 44.1)	10.9	(10.2- 11.6)	5.0	(3.9- 6.4) 4.0 (3.1- 5.1)
Lied a lot	33.3	(27.5- 39.7)	5.0	(4.7- 5.3)	9.5	(7.2- 12.7) 7.3 (5.3- 10.0)
Using a false or made-up name/alias	19.6	(15.1- 25.2)	1.9	(1.8- 2.1)	12.3	(8.8- 17.1) 9.2 (6.5- 12.9)
Scam/con someone for money	18.9	(14.5- 24.2)	1.3	(1.2- 1.5)	17.5	(12.6- 24.1) 10.6 (7.3- 15.3)
Doing things that could have easily hurt you/others	53.1	(46.8- 59.3)	13.7	(12.7- 14.7)	7.1	(5.5- 9.2) 4.6 (3.5- 6.1)
Getting 3+ traffic tickets for reckless/causing accidents	23.4	(18.9- 28.6)	8.5	(7.9- 9.29)	3.3	(2.4- 4.4) 2.0 (1.5- 2.7)
Driver licenses suspended/revoked	26.4	(21.7- 31.7)	7.6	(7.1- 8.1)	4.4	(3.4- 5.7) 2.6 (2.0- 3.5)
Destroy others' property	49.6	(43.5- 55.7)	3.2	(2.9- 3.5)	29.5	(22.8- 38.4) 18.4 (13.7- 24.8)
Fail to pay off your debts	24.1	(18.8- 30.5)	3.9	(3.6- 4.3)	7.7	(5.6- 10.8) 5.8 (4.0- 8.3)
Stealing anything from others	56.8	(50.1- 63.2)	8.5	(7.9- 9.0)	14.2	(10.7- 18.9) 9.9 (7.3- 13.4)
Forge someone's signature	14.2	(10.5- 18.9)	2.0	(1.8- 2.2)	8.1	(5.7- 11.5) 5.9 (4.0- 8.7)
Shoplift	58.2	(51.8- 64.3)	10.8	(10.1- 11.5)	11.5	(8.8- 15.0) 8.1 (6.1- 10.8)
Rob/mug someone or snatch a purse	4.6	(2.8- 7.3)	0.2	(0.2- 0.3)	19.4	(10.9- 34.4) 12.4 (6.8- 22.7)
Making money illegally	27.9	(22.5- 34.1)	2.5	(2.3- 2.7)	15.2	(11.1- 20.8) 8.7 (6.1- 12.2)
having been arrested for	76.2	(70.5- 81.0)	14.8	(14.0- 15.8)	18.4	(13.7- 24.6) 12.1 (8.8- 16.6)
Forcing someone to have sex	1.4	(0.6- 3.4)	0.1	(0.1- 0.2)	11.6	(4.4- 30.5) 11.0 (3.6- 33.3)
Getting into lots of fights that you started	21.0	(16.4- 26.5)	2.6	(2.4- 2.9)	10.0	(7.2- 13.8) 6.6 (4.6- 9.6)
Getting into a fight that came to swapping blows with others	18.9	(15.1- 23.4)	6.5	(6.1- 7.0)	3.4	(2.5- 4.5) 3.2 (2.3- 4.3)

Other Antisocial behaviors	Firesetters N=407		General population N=41,552			
	%	(95% C.I.)	%	(95% C.I.)	OR	(95% C.I.)
Using a weapon in a fight	21,3	(16,8- 26,7)	2,5	(2,3- 2,7)	10,7	(7,8- 14,6)
Hitting someone so hard that you injured them	34,9	(29,2- 41,1)	5,7	(5,3- 6,1)	8,9	(6,7- 11,8)
Harass/threaten/blackmail someone	21,5	(16,5- 27,69)	1,5	(1,3- 1,7)	18,0	(12,8- 25,2)
Physically hurt others on purpose	34,8	(29,1- 41,0)	4,7	(4,4- 5,1)	10,8	(8,2- 14,1)
Hurting an animal on purpose	17,6	(13,0- 23,4)	1,6	(1,5- 1,8)	12,8	(8,9- 18,5)
Firesetting persisted after age 15						
Yes	38,1	(31,8- 44,7)				
No	61,9	(55,3- 68,2)				
Family history of antisocial behavior	49,0	(43,1- 54,9)	17,6	(16,7- 18,5)	4,5	(3,5- 5,7)
					4,2	(3,3- 5,4)

^aOdds ratios adjusted for sex, race, nativity, age, personal income, marital status, and region

Table 3
Lifetime Psychiatric comorbidity of individuals with and without lifetime history of firesetting

Comorbid psychiatric disorders	Firesetters N=407				General population N=41,552				Adjusted Odds Ratios (95% Confidence Intervals)			
	%	SE	%	SE	%	SE	AOR	95% CI	AOR	95% CI	AOR	95% CI
Any Psychiatric diagnoses	95.1	1.3	53.6	0.9	12.8	0.9	12.8	(7.3- 22.4)	12.8	(7.3- 22.4)		(7.3- 22.4)
Any Axis I diagnoses	90.9	1.9	51.2	0.9	7.2	0.9	7.2	(4.5- 11.5)	3.6	(2.2- 5.9)		(2.2- 5.9)
Any Substance Use Disorder	80.4	2.5	38.2	0.8	4.3	0.8	4.3	(3.0- 6.3)	2.5	(1.7- 3.6)		(1.7- 3.6)
Any alcohol use disorder	71.7	3.0	29.9	0.8	3.8	0.8	3.8	(2.7- 5.3)	1.6	(1.1- 2.3)		(1.1- 2.3)
Alcohol abuse	27.4	2.8	17.8	0.5	1.2	0.5	1.2	(0.9- 1.6)	0.9	(0.7- 1.3)		(0.7- 1.3)
Alcohol dependence	44.3	3.2	12.2	0.4	3.5	0.4	3.5	(2.6- 4.7)	1.3	(1.0- 1.8)		(1.0- 1.8)
Any drug use disorder	48.4	3.0	10.0	0.3	5.4	0.3	5.4	(4.0- 7.2)	2.4	(1.8- 3.3)		(1.8- 3.3)
Drug abuse	26.3	2.5	7.6	0.3	2.6	0.3	2.6	(1.9- 3.5)	1.3	(0.9- 1.8)		(0.9- 1.8)
Drug dependence	22.2	2.7	2.4	0.1	7.6	0.1	7.6	(5.2- 10.9)	2.6	(1.8- 3.7)		(1.8- 3.7)
Nicotine dependence	43.0	3.1	17.6	0.5	2.7	0.5	2.7	(2.0- 3.7)	1.0	(0.8- 1.4)		(0.8- 1.4)
Any mood disorder	40.3	3.2	18.5	0.4	3.3	0.4	3.3	(2.5- 4.29)	1.0	(0.8- 1.4)		(0.8- 1.4)
Major Depressive Disorder	15.9	2.1	13.5	0.3	1.4	0.3	1.4	(1.0- 1.9)	0.7	(0.5- 1.0)		(0.5- 1.0)
Bipolar Disorder	23.0	2.9	4.3	0.2	5.6	0.2	5.6	(4.0- 7.9)	1.6	(1.1- 2.2)		(1.1- 2.2)
Dysthymia	7.7	1.6	3.2	0.1	3.1	0.1	3.1	(1.9- 5.0)	1.3	(0.8- 2.2)		(0.8- 2.2)
Any anxiety disorder	32.9	3.1	17.4	0.5	2.7	0.5	2.7	(2.0- 3.6)	0.9	(0.7- 1.3)		(0.7- 1.3)
Panic disorder	13.3	2.0	5.3	0.2	3.3	0.2	3.3	(2.3- 4.8)	1.3	(0.9- 2.1)		(0.9- 2.1)
Social phobia	10.7	2.3	5.0	0.2	2.1	0.2	2.1	(1.3- 3.5)	0.7	(0.4- 1.2)		(0.4- 1.2)
Specific phobia	18.2	2.2	9.5	0.3	2.5	0.3	2.5	(1.9- 3.4)	1.1	(0.8- 1.6)		(0.8- 1.6)
Generalized anxiety disorder	7.4	1.5	4.2	0.2	2.1	0.2	2.1	(1.3- 3.3)	0.7	(0.4- 1.2)		(0.4- 1.2)
Conduct disorder	9.0	1.7	1.0	0.1	6.9	0.1	6.9	(4.4- 10.9)	6.1	(3.6- 10.4)		(3.6- 10.4)
Pathological Gambling	2.7	0.8	0.4	0.0	4.8	0.0	4.8	(2.4- 9.5)	1.4	(0.6- 3.0)		(0.6- 3.0)
Psychotic Disorder	1.6	0.6	0.3	0.0	5.0	0.0	5.0	(2.2- 11.4)	1.3	(0.5- 3.4)		(0.5- 3.4)
Any personality disorder	68.9	2.7	14.5	0.3	11.2	0.3	11.2	(8.8- 14.2)	7.9	(5.9- 10.6)		(5.9- 10.6)
Avoidant	6.7	1.6	2.4	0.1	2.6	0.1	2.6	(1.6- 4.4)	0.6	(0.3- 1.5)		(0.3- 1.5)
Dependant	1.9	0.7	0.5	0.1	3.3	0.1	3.3	(1.4- 7.9)	0.5	(0.2- 1.5)		(0.2- 1.5)
Obsessive-compulsive	30.4	2.9	7.8	0.2	4.7	0.2	4.7	(3.6- 6.2)	2.2	(1.5- 3.1)		(1.5- 3.1)

Firesetters N=407		General population N=41,552		Adjusted Odds Ratios (95% Confidence Intervals)				
Comorbid psychiatric disorders				Sociodemographic Characteristics ^a		Sociodemographic Characteristic and Other Psychiatric Disorders ^b		
				AOR	95% CI	AOR	95% CI	
%	SE	%	SE					
Paranoid	17.2	2.3	4.4	0.2	4.4	(3.1- 6.2)	1.0	(0.6- 1.7)
Schizoid	11.0	1.6	3.1	0.1	3.4	(2.4- 4.9)	0.9	(0.5- 1.7)
Histrionic	12.1	1.9	1.8	0.1	5.8	(4.0- 8.6)	1.5	(0.9- 2.7)
Antisocial	51.5	2.9	3.2	0.1	21.8	(16.6- 28.5)	14.3	(10.1- 20.3)

^aOdds ratios adjusted for sex, race, nativity, age, personal income, marital status, and region

^bOdds ratios adjusted for sex, race, nativity, age, personal income, marital status, region, and other psychiatric disorders.

Table 4
12-month Psychiatric comorbidity of individuals with and without lifetime history of firesetting

Comorbid psychiatric disorders	Firesetters N=407				General population N=41,552				Adjusted Odds Ratios (95% Confidence Intervals)			
	%	SE	%	SE	AOR	SE	AOR	SE	95% CI	AOR	SE	95% CI
Any Axis I diagnoses	63.7	2.9	29.7	0.6	3.4	0.6	3.4	0.6	(2.6- 4.4)	1.7		(1.2- 2.2)
Any Substance Use Disorder	47.3	3.1	18.6	0.5	2.6	0.5	2.6	0.5	(2.0- 3.5)	1.6		(1.1- 2.1)
Any alcohol use disorder	27.7	2.7	8.2	0.2	2.4	0.2	2.4	0.2	(1.8- 3.3)	1.3		(0.9- 1.8)
Alcohol abuse	10.8	2.2	4.6	0.2	1.5	0.2	1.5	0.2	(0.9- 2.4)	1.1		(0.7- 1.9)
Alcohol dependence	16.9	2.0	3.6	0.1	3.0	0.1	3.0	0.1	(2.2- 4.0)	1.2		(0.8- 1.7)
Any drug use disorder	13.9	2.2	1.9	0.1	4.7	0.1	4.7	0.1	(2.9- 7.4)	1.8		(1.0- 3.1)
Drug abuse	10.2	2.0	1.5	0.1	4.0	0.1	4.0	0.1	(2.3- 6.7)	1.6		(0.9- 3.0)
Drug dependence	7.2	1.6	0.6	0.1	7.8	0.1	7.8	0.1	(4.4- 13.8)	2.2		(1.1- 4.7)
Nicotine dependence	34.5	3.0	12.6	0.4	2.7	0.4	2.7	0.4	(2.0- 3.7)	1.4		(1.0- 1.9)
Any mood disorder	22.7	2.4	8.4	0.2	3.3	0.2	3.3	0.2	(2.5- 4.4)	1.2		(0.8- 1.7)
Major Depressive Disorder	8.5	1.6	5.3	0.2	1.8	0.2	1.8	0.2	(1.2- 2.7)	0.8		(0.5- 1.4)
Bipolar	12.8	2.1	2.6	0.1	4.7	0.1	4.7	0.1	(3.2- 6.8)	1.3		(0.8- 2.1)
Dysthymia	3.8	1.3	1.3	0.1	3.6	0.1	3.6	0.1	(1.7- 7.3)	1.4		(0.6- 3.1)
Any anxiety disorder	21.7	2.6	11.2	0.3	2.5	0.3	2.5	0.3	(1.8- 3.4)	0.9		(0.6- 1.3)
Panic disorder	6.9	1.3	2.2	0.1	3.9	0.1	3.9	0.1	(2.5- 5.9)	1.8		(1.1- 3.0)
Social phobia	4.2	1.0	2.8	0.1	1.5	0.1	1.5	0.1	(0.9- 2.6)	0.5		(0.3- 0.9)
Specific phobia	13.4	2.0	7.2	0.3	2.3	0.3	2.3	0.3	(1.6- 3.3)	1.1		(0.8- 1.6)
Generalized anxiety disorder	3.7	1.1	2.1	0.1	2.1	0.1	2.1	0.1	(1.1- 3.8)	0.6		(0.3- 1.3)
Pathological gambling	1.6	0.6	0.1	0.0	7.8	0.0	7.8	0.0	(3.3- 18.6)	2.7		(1.0- 7.0)
	mean	SE	mean	SE	Wald F	SE	Wald F	SE	p-value	Wald F	SE	p-value
Social Functioning Scale	49.9	0.6	51.8	0.1	20.15	0.1	20.15	0.1	<0.0001	0.07		0.7983
Role Emotional Scale	49.9	0.6	51.0	0.1	12.58	0.1	12.58	0.1	0.0007	2.15		0.1477
Mental Health Scale	49.4	0.7	52.2	0.1	28.36	0.1	28.36	0.1	<0.0001	0.88		0.3510
Physical Component Summary	51.3	0.6	50.6	0.1	3.79	0.1	3.79	0.1	0.0559	0.12		0.7333

^aOdds ratios adjusted for sex, race, nativity, age, personal income, marital status, and region

^b Odds ratios adjusted for sex, race, nativity, age, personal income, marital status, region, and other psychiatric disorders.

Table 5

Treatment correlates of individuals with and without lifetime history of firesetting

Treatment correlates	Firesetters N=407			General population N=41,552			OR (95% CI)	AOR ^a (95% CI)
	%	95%CI	%	95%CI	%	95%CI		
Any mental health treatment (lifetime)	45.7	(39.5- 52.1)	18.8	(18.0- 19.7)			3.6	(2.8- 4.7)
Any mental health treatment (12-month)	6.9	(4.4- 10.6)	1.0	(0.8- 1.1)			7.6	(4.5- 12.7)
Any psychiatric hospitalization (lifetime)	15.6	(12.3- 19.6)	3.8	(3.6- 4.1)			4.6	(3.5- 6.2)
Any psychiatric hospitalization (12-month)	1.9	(0.9- 4.0)	0.2	(0.2- 0.3)			8.1	(3.6- 18.0)
Any emergency room visit (lifetime)	15.5	(11.9- 19.9)	5.0	(4.6- 5.3)			3.5	(2.5- 4.9)
Any emergency room visit (12-month)	2.7	(1.2- 6.0)	0.2	(0.1- 0.2)			15.2	(6.2- 37.3)
Any prescribed psychotropic medication (lifetime)	21.0	(16.4- 26.5)	12.0	(11.3- 12.7)			1.9	(1.5- 2.6)
Outpatient treatment (lifetime)	38.9	(33.1- 45.1)	16.1	(15.3- 16.8)			3.3	(2.6- 4.3)
Outpatient treatment (12-month)	5.1	(3.0- 8.5)	0.8	(0.7- 0.9)			6.8	(3.8- 12.0)
Inpatient treatment (lifetime)	22.9	(18.4- 28.0)	4.7	(4.4- 5.1)			6.0	(4.5- 8.0)
Inpatient treatment (12-month)	3.7	(2.1- 6.6)	0.5	(0.4- 0.6)			7.8	(4.1- 14.8)

^a Odds ratios adjusted for sex, race, nativity, age, personal income, marital status, and region