

ARTICLE

Does the setting matter? Characterizing and classifying rural and urban arsonists

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Funding information

Fundação para a Ciência e a Tecnologia, Grant/Award Number: 2020.07799.BD

Abstract

Background: Thousands of fires are deliberately ignited around the world each year. The setting where it happens—rural versus urban areas—can lead to different crime opportunities. Rural arsonists set fires in vegetated areas, whereas urban arsonists target residences and other properties. Although urban and rural arsonists share similar features, some studies suggest that they differ in psychosocial and behavioural characteristics (e.g., age and motivation to set fires).

Aims: This study analyses the psychosocial, behavioural and criminal characteristics of arsonists and distinguishes rural from urban arsonists through the development of a typology.

Materials & Methods: The criminal records of 330 rural and urban arsonists (221 rural, 103 urban and six mixed rural/urban arsonists) were analysed and Latent Class Analysis was used to identify different subclasses within this sample. Results: Although rural and urban arsonists share some similar characteristics (e.g., no accomplices), differences in other variables were found, with higher effect sizes regarding motivation, relationship to victim, ignition devices and professional status. Furthermore, three different classes emerged to characterize this population: Rural Arsonists—Consumption Problems and Boredom (43%), Rural Arsonists—Mental Health Problems (36%) and Urban Arsonists—Consumption Problems and Revenge (21%).

Discussion: In rural areas, criminal behaviour patterns were influenced by psychological and social integration problems, while in urban settings, family relationships/intimate partner problems had a greater impact.

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Conclusions: How parole and probation officers interact with their clients impacts attitudes towards the law and, ultimately, clients' likelihood of recidivism.

KEYWORDS

arson, deliberate firesetting, latent class analysis, rural crime, urban crime

INTRODUCTION

Arson is the intentional criminal act of setting a fire (Burton et al., 2012; Palermo, 2015) resulting in an individual being arrested, charged or convicted for this crime (Gannon et al., 2022). Those that set fires in a rural field—also known as forest fires or bushfires (Cozens & Christensen, 2011)—affecting vegetation not meant to be burned (Parliament of Australia, 2006; Vélez, 2003), including forests, copses, woods, groves of trees or cornfields and other rural properties (Portuguese Criminal Code, Act 274, 2017) are referred to as rural arsonists. On the other hand, individuals that intentionally set fire to dwellings, public buildings, motor vehicles or aircraft and other properties are described as urban arsonists (e.g., Office for Victims of Crime, 2020; Uniform Crime Reporting, 2017). Given that fires have negative impacts on the community (Barrowcliffe et al., 2022), including financial losses, infrastructure damage, injuries and fatalities, destruction of the environment and psychological and emotional harm, this crime represents a common social concern that is often overlooked (Ducat & Ogloff, 2011; Stanley & Read, 2013; Welsh et al., 2008).

It is estimated that annually, thousands of fires are intentionally set worldwide, with an occurrence of between 40 and 200 cases of arson per 100,000 inhabitants (Gannon et al., 2022). In England, for instance, it is estimated that 353,158 fires were deliberately set in over a fifteen-year period (2005–2021), and that approximately 29% of these fires were for urban arson (66,930 in road vehicles, 14,428 in dwellings and 19,558 in other buildings; Home Office, 2024), which suggests that the majority of fires during this period were for rural arson. In Portugal, over 100,000 cases of arson were reported in a decade (Estatísticas da Justiça, 2021; Sistema de Segurança Interna, 2020). Out of these, 22,423 cases occurred in urban areas resulting in approximately 2000 cases of urban arson per year, while 86,503 cases were reported in rural areas resulting in over 8000 cases of rural arson per year (Sistema de Segurança Interna, 2020). This assertion is further substantiated by the findings of the Canadian Crime Severity Index (CSI), indicating that the volume and severity of crime in rural areas is 33% higher than in urban areas (Statistics Canada, 2023). Studies have also shown that between 50% and 95% of fires in rural areas were deliberately set (Doley et al., 2015; Elvan et al., 2021; Schmuck et al., 2012), emphasizing the importance of understanding the individuals behind this crime. Notwithstanding the legal, social and financial repercussions, most international studies and available data on deliberate firesetting tend to focus on the overall number of fires set, without differentiating between the settings in which they were ignited (i.e., rural or urban areas).

Criminal offences in rural areas are distinguished by different factors such as low population density, limited economic opportunities, geographical isolation and cultural barriers that may impede the reporting of crime (Weisheit et al., 1994). On the other hand, crime within urban areas is influenced by numerous factors, including socioeconomic conditions that serve as catalysts and enablers for violence, as well as characteristics of the built environment, such as disparities in residential locations, accessibility and neighbourhood conditions (Ventorim & Netto, 2024). Though urban areas have the highest overall crime rates because most people live in cities (Hogg & Carrington, 2006), differences in the number of arson occurrences have been consistently reported, pointing to a higher prevalence in rural areas concerning this type of crime (e.g., Sistema de Segurança Interna, 2020). However, rural crime is rarely studied independently from urban crime (Donnermeyer et al., 2006, 2013). Hence, the social

and environmental impacts of rural versus urban arson may also be considerably different (Ceccato & Abraham, 2022), particularly in countries that are less densely populated and have more bushland (e.g., Australia) than others (e.g., Britain; Fritzson et al., 2014).

Deliberate firesetters are known to have heterogeneous characteristics, different offending histories and diverse motives for setting fires (Gannon et al., 2022). For instance, the Multi-Trajectory Theory of Adult Firesetting (M-TTAF) merges empirical and theoretical knowledge on deliberate firesetters, proposing multiple distinct pathways to firesetting behaviour, characterized by unique aetiological, psychological and motivational features (Gannon, Ó Ciardha, et al., 2012). Consequently, the heterogeneity of this population justifies further investigation into the potential similarities and differences between individuals who set fires in rural and urban areas. Typologies facilitate the organization of this heterogeneity, providing a framework for understanding both the similarities and differences between subgroups. The utilization of typologies in the identification of features common to individuals engaging in specific behaviours, such as firesetting, is particularly beneficial in domains with limited explanatory theory (Tyler & Gannon, 2021). Given the absence of adequate theoretical frameworks for the classification of firesetting behaviours, developing typologies has gained significant importance (Gannon & Pina, 2010). Research of this nature is imperative to enhance comprehension of these offenders (Gannon et al., 2022; Ribeiro, Teles, et al., 2024), particularly as some countries have legislation that differentiates among arson types as previously reported (e.g., Portuguese Criminal Code, 2007).

Social and cultural features of setting a fire in a rural area may be associated with different motivations and different behavioural and psychosocial features in comparison with those features in individuals who set a fire in an urban area. In order to better identify these specific characteristics aiming to support the development of typologies and inform the implementation of differentiated intervention efforts, it is crucial to analyse deliberate firesetters in rural areas separately from those in urban areas (Willis, 2005), especially given the distinct characteristics of these settings that influence crime (e.g., population density and economic opportunities; Weisheit et al., 1994). Furthermore, arson prevention strategies should be tailored to the unique features and challenges of rural environments; therefore, understanding the characteristics of people who engage in this behaviour in rural settings may provide important information to assist with this task. The following sections will focus on the existing literature that separately analyses rural and urban deliberate firesetting.

Deliberate firesetting in the rural setting

To our best knowledge, until now only two studies have developed a typology with an adult sample of rural arsonists (Ribeiro, Teles, et al., 2024; Sotoca et al., 2013). Sotoca et al. (2013) developed a typology that examined 117 individuals detained for rural arson in Spain. Through their analysis, the researchers identified five distinct subtypes based on the specific type of rural area that had been burned (Agricultural, Rancher, Road Forest, Forest and Agricultural Hunting). Ribeiro, Teles, et al. (2024) developed a typology that was based on a sample of 450 criminal records of Portuguese rural arsonists. This typology based on motivation, psychosocial and criminal behaviour characteristics resulted in the identification of three groups: Expressive—Mental Health Problems, Expressive—Alcohol Consumption and Instrumental—Socially Adjusted. This categorization is based on the type of motivation, that is, expressive (setting a fire as a means to gain something or achieve an external goal, such as anger or pleasure) and instrumental motivation (setting a fire to gain something or achieve an external goal, such as crime concealment, vandalism or profit; Hennessey et al., 2015). The Expressive—Mental Health Problems group is characterized by rural arsonists aged 29 years or younger, with middle school education, who live with their parents and present mental health problems. On the other hand, the Expressive—Alcohol Consumption group is distinguished from the last group by including arsonists aged 40–59 years old, with no qualifications or primary school level education, who live alone and have alcohol consumption problems. Lastly, the Instrumental—Socially Adjusted Group is different from the remaining groups for having arsonists who more predominantly work in

agricultural or forestry works, live with their nuclear family, do not have any mental health or alcohol consumption problems identified and set the fire for instrumental reasons (Ribeiro, Teles, et al., 2024).

Apart from these two studies focused on rural arsonists, three other studies have identified a subtype within their proposed typologies of people that also set fire to rural areas (Inciardi, 1970—Institutionalized subtype; Kocsis & Cooksey, 2002—Thrill subtype; Kocsis et al., 1998—Disorganized subtype). In general, the studies about rural arson reveal that mental disorders and/or a psychiatric history (e.g. depression, schizophrenia) are often reported among people that set fire to rural areas (Inciardi, 1970; Ribeiro, Teles, et al., 2024). The underlying motivations for this behaviour are often intrinsic or expressive, varying from revenge (Ribeiro, Teles, et al., 2024; Sotoca et al., 2013), thrill resulting from the danger of getting caught (Kocsis & Cooksey, 2002), attention-seeking and boredom (Ribeiro, Teles, et al., 2024). However, when it comes to extrinsic/instrumental motivation, specifically profit or benefits (Ribeiro, Teles, et al., 2024; Sotoca et al., 2013), the characteristics of rural deliberate firesetters seem to be clearer and more distinguishable from the ones motivated by intrinsic/expressive: most work in agricultural or forestry work (Sotoca et al., 2013) and often do not have a criminal or psychiatric history, nor alcohol consumption (Ribeiro, Teles, et al., 2024). When comparing the rural setting where the fire is ignited, only Sotoca et al. (2013) provided a specific characterization of the type of burned area as the centre of their classification system. The remaining typologies pertain exclusively to rural areas (Inciardi, 1970), bushes, forests, or vegetation (Kocsis & Cooksey, 2002), or fields (Kocsis et al., 1998). Given the limited number of studies that focus exclusively on the rural setting, further research on this topic is necessary.

The challenge in identifying characteristics among deliberate rural firesetters may be related to how most studies have treated rural arson as a distinct subtype rather than considering the heterogeneity within this group. For example, apart from the median age of the sample (i.e., 19 years old), the Inciardi (1970) study lacked further individual and crime scene characteristics, including motivations. Moreover, the proportion of deliberate rural firesetters in the total sample was 6.5%. Similarly, Kocsis et al. (1998) reported that 15.4% of deliberate firesetters in the disorganized subtype set fire to rural areas. This study did not provide insight into the motivation behind the firesetting behaviour, nor did it examine the individual characteristics of the perpetrators. Additionally, Kocsis and Cooksey's (2002) study focused on serial arson, which could have led to the omission of single-incident arson. This is an important limitation given that research suggests only one in five people who set fires set more than one fire (Sambrooks et al., 2021).

Deliberate firesetting in urban settings

To date, no typology has been developed with the clear intent of studying individuals that set fire to urban areas. However, when analysing the type of area burned, we can observe that some typologies include a sample of deliberate firesetters who set fires in urban areas (e.g., Bradford, 1982; Green et al., 2014; Nanayakkara et al., 2020), while others have identified a subtype of deliberate firesetters who set fires in urban areas (e.g., Inciardi, 1970; Kocsis & Cooksey, 2002). Therefore, findings from these studies indicate that these individuals set fire to residential dwellings, including their own (e.g., Bradford, 1982; Nanayakkara et al., 2020; Rix, 1994), as well as public buildings (e.g., Canter & Fritzon, 1998; Del Bove & Mackay, 2011). One of the most common urban targets to set fire to is schools. School fires represented 5% of places burnt by young deliberate firesetters (Canter & Fritzon, 1998). In fact, several studies reported that a great part of deliberate firesetters are young offenders (e.g., Del Bove & MacKay, 2011; Kolko, 2001; Willis, 2005) even if there is contradictory evidence from other authors (e.g., Cassel & Bernstein, 2007; Estatísticas da Justiça, 2021). The existence of contradictory evidence may be indicative of cultural diversity across countries, particularly within urban contexts (cf. Ventorim & Netto, 2024), although there is no robust support that might indicate this.

The most frequently highlighted motivation to setting a fire in urban areas is revenge (e.g., Canter & Fritzon, 1998; Nanayakkara et al., 2020; Rix, 1994). Those setting fires for revenge typically target

the property of the victim, suggesting a close relationship between the offender and the victim. Moreover, emotional or sexual relief appears to be associated with setting public buildings on fire (e.g., Canter & Fritzon, 1998; Kocsis & Cooksey, 2002). In contrast, attention-seeking is usually associated with setting fire to objects (e.g., Canter & Fritzon, 1998). Profit or benefits are usually motivated by insurance claims (e.g., Inciardi, 1970; Nanayakkara et al., 2020; Rix, 1994). Another relevant motivation is setting fire to buildings for crime concealment (Canter & Fritzon, 1998; Inciardi, 1970; Nanayakkara et al., 2020; Rix, 1994). In addition, mental and personality disorders have been identified in several studies on urban deliberate firesetting (Bradford, 1982; Nanayakkara et al., 2020; Rix, 1994). Suicidal ideation, depressive symptoms and psychotic-related symptoms/disorders (e.g., Bradford, 1982; Green et al., 2014) have also been commonly reported in urban firesetters. This may be due to the fact that individuals who live in urban areas usually have worse symptoms of mental health problems than those living in rural areas (c.f., Bonnell et al., 2022). However, given the reduced stigma associated with reporting mental health problems in urban areas compared to rural areas (Solmi et al., 2017), the prevalence of specific mental health problems associated with deliberate firesetting among individuals residing in urban versus rural areas remains uncertain. In addition to guiding interventions in prisons, studying the setting of the fire is important for preventing future arson, both in terms of fire safety and law enforcement.

In summary, most studies on deliberate firesetting do not explicitly delineate the specific setting in which the fire was initiated. Among the studies where the setting can be inferred, there is a preponderance of literature focusing on urban settings, which hinders a comprehensive comparison with the rural setting. However, deliberate firesetters in both rural and urban settings appear to exhibit both similarities (e.g., alcohol consumption and mental health problems) and differences (e.g., type of area burnt). Arsonists have varying features, different backgrounds and motives and differ from other offenders in terms of their psychological functioning, including fire-related factors, emotional/self-regulation and self-concept (Gannon et al., 2022). For example, mental disorders are overrepresented among arsonists, compared to other types of offenders (e.g., Anwar et al., 2011; Ducat, McEwan, & Ogloff, 2013; Ducat, Ogloff, & McEwan, 2013; Enayati et al., 2008). While there is a higher prevalence of people with mental disorders in rural areas (Nunes et al., 2010; Peritogiannis et al., 2022; Weden et al., 2018), they are often underdiagnosed or underreported compared to people in urban areas due to fewer mental healthcare professionals and resources available (Dashputre et al., 2023; Forrest et al., 2023), no study has yet examined mental disorders in people who set fires in rural versus urban settings. Substance abuse, especially alcohol (Friesen et al., 2022), is also common among arsonists (e.g., Burton et al., 2012; Ritchie & Huff, 1999; Rix, 1994; Wilpert et al., 2017) and is equally common among rural populations (e.g., Borders & Booth, 2007; Dixon & Chartier, 2016; Jackson et al., 2014). Yet, there is no clear evidence that rural arsonists report more substance abuse than urban arsonists. Finally, although arsonists start setting fires at any age, some studies revealed that, in urban areas, deliberate firesetters were typically young offenders (e.g., Del Bove & MacKay, 2011; Willis, 2005), while in rural areas, most were adults (Ribeiro, Teles, et al., 2024; Sotoca et al., 2013), suggesting differences between those who set fires in rural versus urban settings.

The risk of firesetting behaviour should be taken seriously (Carthy et al., 2024), it is essential to classify arsonists for an integrative characterization and to guide the Justice System in determining the appropriate approach, including the type of penalties and control measures to be applied, as well as promoting rehabilitation efforts (Barrowcliffe & Gannon, 2015), especially within prison settings (Martinho, 2023). Thus, an understanding of whether the setting has a significant impact on the different characteristics of deliberate firesetters is imperative to provide insight into the heterogeneity and difficulty in classification of these offenders. Therefore, the present study aims to fill this gap, developing a typology that categorizes rural and urban arsonists into subclasses. In doing so, it seeks to identify patterns, similarities and differences among them, comparing a sample of rural and urban arsonists in terms of their sociodemographic, psychosocial and criminal characteristics. This integrative typology will take into account the setting, thereby providing a more comprehensive understanding of this crime.

METHODS

Data characterization

The sample included 330 criminal cases of arsonists, 67% in a rural area ($n=221$), 31% in urban areas ($n=103$) and the remaining 2% was set in mixed settings (both urban and rural areas; $n=6$). These cases represented a representative subsample of the total arsonists in probation (i.e., serving a sentence in the community) from 1 January 2015 to 29 February 2024. The selection of these criminal cases was based on the definition of rural and urban arson as established by the Portuguese jurisdiction. Therefore, urban arson is defined as: 'anyone who causes a major fire, in particular by setting fire to a building, structure or means of transport, creating a danger to the life or physical integrity of others or to the property of others of high value' (Portuguese Criminal Code, 2007, p.117), and rural arson is typified as 'anyone who causes a fire on land covered with forest, including woods, or pasture, bush, spontaneous plant formations or in agricultural land, on their own property or that of others...' (Portuguese Criminal Code, 2007, p.118).

Most arsonists were male (rural: $n=201$, 91%; urban: $n=81$, 79%) and their mean age was 42.22 years ($SD=14.18$; min. 16, max. 90), with ages between 46 and 60 years more common among rural arsonists ($n=72$, 33%) and ages between 31 and 45 years more prevalent among urban arsonists ($n=49$, 47.6%). The majority of the sample had completed middle school (rural: $n=78$, 35%; urban: $n=47$, 46%). Rural arsonists were either professionally inactive or retired ($n=114$, 52%), while urban arsonists were typically professionally active ($n=55$, 53%). The most common occupation was agriculture or forestry for rural arsonists ($n=54$, 36%), while urban arsonists were frequently services and sales workers ($n=24$, 27%). A large percentage of rural arsonists lived with their family of origin ($n=83$, 38%), in contrast to urban arsonists, who were more likely to live with their nuclear family ($n=45$, 44%; Table 1).

The majority had no recorded reference to mental health problems (rural: $n=117$, 53%; urban: $n=57$, 55%), although a substantial proportion had a mental disorder reported in their files, especially cognitive impairment or other neurodivergent disorders within rural arsonists ($n=57$, 53%) and depression and/or anxiety within urban arsonists ($n=22$, 48%). Concerning substance use, participants had a history of consumption (rural: $n=142$, 64%; urban: $n=63$, 61%), especially alcohol (rural: $n=107$, 68%; urban: $n=40$, 55%). Therefore, at the moment of the crime, substance abuse had also been frequent (rural: $n=100$; 50%; urban: $n=45$; 44%), and alcohol was again the most commonly abused substance (rural: $n=98$, 65%; urban: $n=31$, 40%) at the moment the crimes occurred. Moreover, most individuals did not have a criminal record before the current crime (rural: $n=142$, 64%; urban: $n=55$, 53%). When they did, they were more likely to have been convicted of crimes other than arson, especially non-violent crimes (rural: $n=33$, 41%; urban: $n=28$, 58%). Rural arsonists set the fire mainly out of boredom ($n=85$, 39%), whereas urban arsonists were mostly motivated by revenge ($n=60$, 58%). Regarding the type of relationship with the owner of the property set on fire, the majority of owners were strangers to rural arsonists ($n=137$, 62%) but they were known to most urban arsonists ($n=91$, 88%). For the total sample, most arsonists left the scene after setting the fire (rural: $n=144$, 65%; urban: $n=61$, 60%). There were no accomplices in the majority of cases (rural: $n=206$; 93%; urban: $n=89$; 86%), and the vast number of the accused/convicted offenders admitted having set the fires (rural: $n=162$, 73%; urban: $n=73$, 71%; Table 2).

In general, individuals only had set one fire (rural: $n=165$, 75%; urban: $n=91$; 88%). More fires were set on weekdays (rural: $n=97$, 44%; urban: $n=52$, 50%), during the afternoon for rural arsonists ($n=88$, 40%) and during the evening for urban arsonists ($n=43$, 42%). The fire was mostly set during Spring/Summer in the rural sample ($n=171$, 77.4%), which is not as frequent in the urban sample ($n=58$, 56%). For rural arson, as expected, bushes were the most common type of targeted area ($n=124$, 54%), whereas for urban arson, buildings, especially residential dwellings, were the most common target ($n=74$; 69%). Both for rural and urban arsonists, the location of the fire was close to the arsonist's area of residence (rural: $n=174$, 79%; urban: $n=67$, 65%). The most common devices used to set the fires were simple ignition devices (i.e., lighters, candles, matches, rural: $n=191$, 86%; urban: $n=45$, 44%; Table 3).

TABLE 1 Sociodemographic characteristics of rural and urban arsonists.

Variable	Category	Rural arsonists	Urban arsonists	Mixed (rural and urban areas)	Total
Sex	Male	<i>n</i> = 201 (91%)	<i>n</i> = 81 (78.6%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 286 (86.7%)
	Female	<i>n</i> = 20 (9%)	<i>n</i> = 22 (21.4%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 44 (13.3%)
Age ^a	16–21 years old	<i>n</i> = 17 (12.4%)	<i>n</i> = 5 (4.9%)	–	<i>n</i> = 22 (9%)
	22–30 years old	<i>n</i> = 19 (13.8%)	<i>n</i> = 15 (14.6%)	–	<i>n</i> = 36 (14.6%)
	31–45 years old	<i>n</i> = 63 (28.5%)	<i>n</i> = 49 (47.6%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 116 (35.2%)
	46–60 years old	<i>n</i> = 72 (32.6%)	<i>n</i> = 31 (30.1%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 105 (31.8%)
	61–90 years old	<i>n</i> = 26 (11.8%)	<i>n</i> = 3 (2.9%)	–	<i>n</i> = 29 (8.8%)
	N/A	<i>n</i> = 2 (9%)	–	–	<i>n</i> = 2 (9%)
Marital status	Single	<i>n</i> = 59 (26.7%)	<i>n</i> = 14, 13.6%	<i>n</i> = 1 (16.7%)	<i>n</i> = 74 (22.4%)
	Married/civil partnership	<i>n</i> = 24 (10.8%)	<i>n</i> = 14, 13.6%	–	<i>n</i> = 38 (11.5%)
	Divorced	<i>n</i> = 18 (8.1%)	<i>n</i> = 13, 12.6%	<i>n</i> = 1 (16.7%)	<i>n</i> = 32 (9.9%)
	Widowed	<i>n</i> = 6 (2.7%)	<i>n</i> = 1, 1%	–	<i>n</i> = 7 (2%)
	N/A	<i>n</i> = 114 (51.6%)	<i>n</i> = 61, 59.2%	<i>n</i> = 4 (66.7%)	<i>n</i> = 179 (54.2%)
	None	<i>n</i> = 28 (12.7%)	<i>n</i> = 8 (7.8%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 37 (11.2%)
Academic qualifications	Primary school	<i>n</i> = 77 (34.8%)	<i>n</i> = 27 (26.2%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 106 (32.1%)
	Middle school	<i>n</i> = 78 (35.3%)	<i>n</i> = 47 (45.5%)	–	<i>n</i> = 125 (37.9%)
	High school	<i>n</i> = 18 (8.1%)	<i>n</i> = 14 (13.6%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 36 (10.3%)
	Higher education	<i>n</i> = 3 (1.4%)	<i>n</i> = 3 (2.9%)	–	<i>n</i> = 6 (1.8%)
	N/A	<i>n</i> = 17 (7.7%)	<i>n</i> = 4 (3.9%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 22 (6.7%)
Professional status	Active	<i>n</i> = 95 (43%)	<i>n</i> = 55 (53.4%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 151 (45.8%)
	Inactive	<i>n</i> = 77 (34.8%)	<i>n</i> = 42 (40.8%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 123 (37.3%)
	Retired	<i>n</i> = 37 (16.7%)	<i>n</i> = 2 (1.9%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 40 (12.1%)
	Student	<i>n</i> = 8 (3.6%)	<i>n</i> = 1 (1%)	–	<i>n</i> = 9 (2.7%)
	N/A	<i>n</i> = 4 (1.8%)	<i>n</i> = 3 (1%)	–	<i>n</i> = 7 (2.1%)

TABLE 1 (Continued)

Variable	Category	Rural arsonists	Urban arsonists	Mixed (rural and urban areas)	Total
Professional area	Agricultural or forestry	<i>n</i> = 54 (36%)	<i>n</i> = 8 (9.1%)	<i>n</i> = 1 (50%)	<i>n</i> = 63 (27%)
	Craft and related trades	<i>n</i> = 40 (26.7%)	<i>n</i> = 21 (23.9%)	–	<i>n</i> = 61 (26.2%)
	Services and sales workers	<i>n</i> = 14 (9.3%)	<i>n</i> = 24 (27.3%)	–	<i>n</i> = 38 (16.3%)
	Industry	<i>n</i> = 18 (12%)	<i>n</i> = 9 (10.2%)	–	<i>n</i> = 27 (11.6%)
	Others	<i>n</i> = 18 (12%)	<i>n</i> = 15 (17%)	–	<i>n</i> = 33 (14.2%)
	N/A	<i>n</i> = 6 (4%)	<i>n</i> = 11 (12.5%)	<i>n</i> = 1 (50%)	<i>n</i> = 11 (4.7%)
Household	Lives with their family of origin	<i>n</i> = 83 (37.6%)	<i>n</i> = 23 (22.3%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 108 (32.7%)
	Lives with their nuclear family	<i>n</i> = 61 (27.6%)	<i>n</i> = 45 (43.7%)	–	<i>n</i> = 106 (32.1%)
	Lives Alone	<i>n</i> = 59 (26.7%)	<i>n</i> = 23 (22.3%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 84 (25.5%)
	Other	<i>n</i> = 14 (6.3%)	<i>n</i> = 9 (8.7%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 25 (7.6%)
	N/A	<i>n</i> = 4 (1.8%)	<i>n</i> = 3 (2.9%)	–	<i>n</i> = 7 (2.1%)

Abbreviation: N/A, not available.

**M* = 42.22, *SD* = 14.18; *Min* = 16, *Max* = 90 years old; rural arsonists: *M* = 42.5, *SD* = 15.26, *Min* = 16, *Max* = 90 years old; urban arsonists: *M* = 41.44, *SD* = 12.01; *Min* = 17, *Max* = 74 years old; rural and urban arsonists: *M* = 45.33, *SD* = 5.47; *Min* = 39, *Max* = 55 years old.

TABLE 2 Mental health and criminal behaviour of rural and urban arsonists.

Variable	Category	Rural arsonists	Urban arsonists	Mixed (rural and urban areas)	Total
Mental health problems	No	<i>n</i> = 117 (52.9%)	<i>n</i> = 57 (55.3%)	<i>n</i> = 3 (50%)	<i>n</i> = 177 (53.6%)
	Yes	<i>n</i> = 101 (45.7%)	<i>n</i> = 41 (39.8%)	<i>n</i> = 3 (50%)	<i>n</i> = 145 (43.9%)
	N/A	<i>n</i> = 3 (1.4%)	<i>n</i> = 5 (4.9%)	–	<i>n</i> = 8 (2.4%)
Types of mental disorders	Cognitive impairment and other neurodivergent disorders	<i>n</i> = 57 (52.8%)	<i>n</i> = 7 (15.2%)	<i>n</i> = 1 (33.3%)	<i>n</i> = 65 (41.4%)
	Depression and/or anxiety	<i>n</i> = 27 (25%)	<i>n</i> = 22 (47.8%)	<i>n</i> = 1 (33.3%)	<i>n</i> = 50 (31.8%)
	Psychotic disorders	<i>n</i> = 11 (10.2%)	<i>n</i> = 4 (8.7%)	–	<i>n</i> = 15 (9.5%)
	Personality disorders	<i>n</i> = 1 (9%)	<i>n</i> = 3 (6.5%)	–	<i>n</i> = 4 (2.5%)
	Others	<i>n</i> = 1 (9%)	<i>n</i> = 2 (4.3%)	–	<i>n</i> = 3 (1.9%)
	N/A	<i>n</i> = 11 (10.2%)	<i>n</i> = 8 (17.4%)	<i>n</i> = 1 (33.3%)	<i>n</i> = 20 (12.9%)
History of consumptions	Yes	<i>n</i> = 142 (64.3%)	<i>n</i> = 63 (61.2%)	<i>n</i> = 5 (83.3%)	<i>n</i> = 210 (63.6%)
	No	<i>n</i> = 66 (29.9%)	<i>n</i> = 34 (33%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 101 (30.6%)
	N/A	<i>n</i> = 13 (5.9%)	<i>n</i> = 6 (5.8%)	–	<i>n</i> = 19 (5.8%)
	Alcohol	<i>n</i> = 107 (67.7%)	<i>n</i> = 40 (54.8%)	<i>n</i> = 4 (80%)	<i>n</i> = 151 (71.9%)
	Drugs	<i>n</i> = 10 (6.3%)	<i>n</i> = 8 (11%)	–	<i>n</i> = 18 (8.6%)
Substance abuse during the moment of the crime	Medication	<i>n</i> = 1 (6%)	<i>n</i> = 1 (1.4%)	–	<i>n</i> = 2 (1%)
	Alcohol and drugs	<i>n</i> = 9 (5.7%)	<i>n</i> = 5 (6.8%)	–	<i>n</i> = 14 (6.7%)
	N/A	<i>n</i> = 31 (19.6%)	<i>n</i> = 19 (26%)	<i>n</i> = 1 (20%)	<i>n</i> = 51 (11.8%)
	Yes	<i>n</i> = 100 (49.8%)	<i>n</i> = 45 (43.7%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 159 (48.2%)
	No	<i>n</i> = 68 (30.8%)	<i>n</i> = 34 (33%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 103 (31.2%)
Type of substance abuse during the moment of the crime	N/A	<i>n</i> = 43 (19.5%)	<i>n</i> = 24 (23.3%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 68 (20.6%)
	Alcohol	<i>n</i> = 98 (65.3%)	<i>n</i> = 31 (39.7%)	<i>n</i> = 4 (80%)	<i>n</i> = 133 (56.4%)
	Drugs	<i>n</i> = 6 (4%)	<i>n</i> = 5 (6.4%)	–	<i>n</i> = 11 (4.7%)
	Medication	<i>n</i> = 3 (2%)	<i>n</i> = 5 (6.4%)	–	<i>n</i> = 8 (3.4%)
	Drugs and alcohol	<i>n</i> = 3 (2%)	<i>n</i> = 4 (5.1%)	–	<i>n</i> = 7 (3%)
	N/A	<i>n</i> = 43 (28.7%)	<i>n</i> = 33 (45.3%)	<i>n</i> = 1 (20%)	<i>n</i> = 77 (32.5%)

TABLE 2 (Continued)

Variable	Category	Rural arsonists	Urban arsonists	Mixed (rural and urban areas)	Total
Criminal record	No	<i>n</i> = 142 (64.3%)	<i>n</i> = 55 (53.4%)	<i>n</i> = 5 (83.3%)	<i>n</i> = 202 (61.2%)
	Yes	<i>n</i> = 75 (33.9%)	<i>n</i> = 47 (45.6%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 123 (37.3%)
	N/A	<i>n</i> = 4 (1.8%)	<i>n</i> = 1 (1%)	–	<i>n</i> = 5 (1.5%)
Type of criminal record	Previous conviction/measure for non-violent crimes (e.g., driving without licence)	<i>n</i> = 33 (41.3%)	<i>n</i> = 28 (58.3%)	<i>n</i> = 1 (100%)	<i>n</i> = 62 (50.4%)
	Previous conviction/measure for fire crimes	<i>n</i> = 24 (30%)	<i>n</i> = 5 (10.4%)	–	<i>n</i> = 29 (23.6%)
	Previous conviction/measure for violent crimes (e.g., sexual abuse)	<i>n</i> = 16 (20%)	<i>n</i> = 12 (25%)	–	<i>n</i> = 28 (22.8%)
	N/A	<i>n</i> = 7 (8.7%)	<i>n</i> = 3 (6.3%)	–	<i>n</i> = 10 (3.2%)
Motivation for setting the fire	Boredom	<i>n</i> = 85 (38.5%)	<i>n</i> = 4 (3.9%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 90 (27.2%)
	Revenge	<i>n</i> = 15 (6.8%)	<i>n</i> = 60 (58.3%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 76 (23%)
	Attention Seeking	<i>n</i> = 28 (12.7%)	<i>n</i> = 3 (2.9%)	–	<i>n</i> = 31 (9.4%)
	Anger	<i>n</i> = 15 (6.8%)	<i>n</i> = 13 (12.6%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 29 (8.8%)
	Land clearing	<i>n</i> = 20 (9%)	<i>n</i> = 8 (7.8%)	–	<i>n</i> = 28 (8.5%)
	Pleasure seeing firefighting	<i>n</i> = 11 (5%)	<i>n</i> = 3 (2.9%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 15 (4.5%)
	Attempt to end a life (e.g., suicide)	–	<i>n</i> = 5 (4.9%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 6 (1.8%)
	N/A	<i>n</i> = 47 (21.3%)	<i>n</i> = 7 (6.8%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 55 (16.7%)
	Stranger	<i>n</i> = 137 (62%)	<i>n</i> = 12 (11.7%)	–	<i>n</i> = 149 (45.2%)
	Acquaintance	<i>n</i> = 19 (8.6%)	<i>n</i> = 26 (25.2%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 47 (14.5%)
Relationship with the victim	Family member	<i>n</i> = 8 (3.6%)	<i>n</i> = 30 (29.1%)	–	<i>n</i> = 38 (11.4%)
	Neighbour	<i>n</i> = 18 (8.1%)	<i>n</i> = 5 (4.9%)	–	<i>n</i> = 24 (7.3%)
	None ^a	<i>n</i> = 13 (5.9%)	<i>n</i> = 9 (8.7%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 23 (7%)
	Romantic relationship (i.e., partner or ex-partner)	<i>n</i> = 3 (1.4%)	<i>n</i> = 16 (15.5%)	–	<i>n</i> = 19 (5.8%)
	Friend	–	<i>n</i> = 3 (2.9%)	–	<i>n</i> = 3 (0.9%)
	N/A	<i>n</i> = 23 (10.4%)	<i>n</i> = 2 (1.9%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 26 (7.9%)

(Continues)

TABLE 2 (Continued)

Variable	Category	Rural arsonists	Urban arsonists	Mixed (rural and urban areas)	Total
Behaviour after the crime	Left the crime scene	<i>n</i> = 144 (65.2%)	<i>n</i> = 61 (59.2%)	<i>n</i> = 3 (50%)	<i>n</i> = 208 (63%)
	Remained at the crime scene	<i>n</i> = 27 (12.2%)	<i>n</i> = 24 (23.3%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 53 (16.1%)
	Helped extinguishing the fire	<i>n</i> = 5 (2.3%)	<i>n</i> = 2 (1%)	–	<i>n</i> = 7 (2.1%)
	Left the crime scene and returned with the firefighters	<i>n</i> = 5 (2.3%)	<i>n</i> = 1 (1%)	–	<i>n</i> = 6 (1.8%)
Accomplice	N/A	<i>n</i> = 40 (18.1%)	<i>n</i> = 15 (14.6%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 56 (17%)
	No	<i>n</i> = 206 (93.2%)	<i>n</i> = 89 (86.4%)	<i>n</i> = 6 (100%)	<i>n</i> = 301 (91.2%)
	Yes	<i>n</i> = 13 (5.9%)	<i>n</i> = 14 (13.6%)	–	<i>n</i> = 27 (8.2%)
	N/A	<i>n</i> = 2 (9%)	–	–	<i>n</i> = 2 (6%)
Confession of the crime	Confesses	<i>n</i> = 162 (73.3%)	<i>n</i> = 73 (70.9%)	<i>n</i> = 5 (83.3%)	<i>n</i> = 240 (72.7%)
	Does not confess	<i>n</i> = 37 (16.7%)	<i>n</i> = 21 (20.4%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 59 (17.9%)
	N/A	<i>n</i> = 22 (10%)	<i>n</i> = 9 (8.7%)	–	<i>n</i> = 31 (9.4%)

Abbreviation: N/A, not available.
The fire was set in the arsonists' own property.

TABLE 3 Crime scene information.

Variable	Category	Rural arsonists	Urban arsonists	Mixed (rural and urban areas)	Total
Multiple fires set	No	<i>n</i> = 165 (74.7%)	<i>n</i> = 91 (88.3%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 258 (78.2%)
	Yes	<i>n</i> = 55 (24.9%)	<i>n</i> = 12 (11.7%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 71 (21.5%)
	N/A	<i>n</i> = 1 (.5%)	–	–	<i>n</i> = 1 (.3%)
Day of the crime	Weekdays	<i>n</i> = 97 (43.9%)	<i>n</i> = 52 (50.5%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 151 (45.8%)
	Weekends	<i>n</i> = 55 (24.9%)	<i>n</i> = 26 (25.2%)	–	<i>n</i> = 81 (24.5%)
	Both	<i>n</i> = 13 (5.9%)	<i>n</i> = 1 (1%)	–	<i>n</i> = 14 (4.2%)
	N/A	<i>n</i> = 56 (25.3%)	<i>n</i> = 24 (23.3%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 84 (25.5%)
		<i>n</i> = 18 (8.1%)	<i>n</i> = 14 (13.6%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 34 (10.3%)
Time	Dawn (3 a.m.–6:59 a.m.)	<i>n</i> = 27 (12.2%)	<i>n</i> = 9 (8.7%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 37 (11.2%)
	Morning (7 a.m.–12:59 p.m.)	<i>n</i> = 88 (39.8%)	<i>n</i> = 28 (27.2%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 118 (35.8%)
	Afternoon (1 p.m.–7:59 p.m.)	<i>n</i> = 70 (31.7%)	<i>n</i> = 43 (41.7%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 114 (34.5%)
	Evening (8 p.m.–2:59 a.m.)	<i>n</i> = 8 (3.6%)	<i>n</i> = 5 (4.9%)	–	<i>n</i> = 13 (3.9%)
	Different times	<i>n</i> = 10 (4.5%)	<i>n</i> = 4 (3.9%)	–	<i>n</i> = 14 (4.2%)
	N/A	<i>n</i> = 171 (77.4%)	<i>n</i> = 58 (56.3%)	<i>n</i> = 3 (50%)	<i>n</i> = 232 (70.3%)
		<i>n</i> = 44 (19.9%)	<i>n</i> = 43 (41.7%)	<i>n</i> = 3 (50%)	<i>n</i> = 90 (27.3%)
Season	Spring/Summer	<i>n</i> = 3 (1.4%)	<i>n</i> = 2 (1.9%)	–	<i>n</i> = 5 (1.5%)
	Autumn/Winter	<i>n</i> = 3 (1.4%)	–	–	<i>n</i> = 3 (.9%)
	Both	<i>n</i> = 3 (1.4%)	–	–	<i>n</i> = 3 (.9%)
	N/A	<i>n</i> = 119 (53.8%)	–	<i>n</i> = 4 (66.7%)	<i>n</i> = 123 (54.1%)
	Bushes	<i>n</i> = 47 (21.3%)	–	<i>n</i> = 1 (16.7%)	<i>n</i> = 48 (21%)
	Forest	<i>n</i> = 42 (19%)	–	<i>n</i> = 1 (16.7%)	<i>n</i> = 43 (19.8%)
	Pasture/Farmer field	<i>n</i> = 4 (1.8%)	–	–	<i>n</i> = 4 (1.7%)
Type of burned area ^a	Others	<i>n</i> = 9 (4.1%)	–	–	<i>n</i> = 10 (3.4%)
	N/A	–	<i>n</i> = 70 (68%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 74 (68.5%)
	Dwellings	–	<i>n</i> = 20 (19.4%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 22 (20.4%)
	Vehicle	–	<i>n</i> = 11 (10.7%)	–	<i>n</i> = 11 (10.2%)
	Objects	–	<i>n</i> = 1 (1%)	–	<i>n</i> = 1 (.9%)
	N/A	–	–	–	–
	Type of burned area (urban) ¹	–	–	–	–

(Continues)

TABLE 3 (Continued)

Variable	Category	Rural arsonists	Urban arsonists	Mixed (rural and urban areas)	Total
Distance of fire set from offender's House/Work	Nearby the residential area of the offender	<i>n</i> = 174 (78.7%)	<i>n</i> = 67 (65%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 243 (73.6%)
	Outside the residential area of the offender	<i>n</i> = 38 (17.2%)	<i>n</i> = 25 (24.3%)	<i>n</i> = 3 (50%)	<i>n</i> = 66 (20%)
	Nearby the workplace of the offended	<i>n</i> = 5 (2.3%)	<i>n</i> = 4 (3.9%)	–	<i>n</i> = 9 (2.7%)
	N/A	<i>n</i> = 4 (1.8%)	<i>n</i> = 7 (6.8%)	<i>n</i> = 1 (16.7%)	<i>n</i> = 12 (3.6%)
Ignition device	Simple (e.g., lighter)	<i>n</i> = 191 (86.4%)	<i>n</i> = 45 (43.7%)	<i>n</i> = 4 (66.7%)	<i>n</i> = 240 (72.7%)
	Complex (e.g., gasoline)	<i>n</i> = 12 (5.4%)	<i>n</i> = 32 (31.1%)	<i>n</i> = 2 (33.3%)	<i>n</i> = 46 (13.9%)
	N/A	<i>n</i> = 18 (8.1%)	<i>n</i> = 26 (25.2%)	–	<i>n</i> = 44 (13.3%)

Abbreviations: N/A, not available.
Categories are not exclusive, hence more than one type of area burned can be reported within the same conviction.

Measures

The *Arsonists Information Gathering Grid* (AIGG, Ribeiro, Neves, et al., 2024) was used for data collection. This checklist grid is based on the *Recidivism Risk Factors of Rural Arson Checklist* (RRFRA; Institute of Judicial Police and Criminal Sciences, IPJCC, 2015), an original checklist designed to assist police officers in gathering information on arsonists, including 23 variables based on the literature on arsonists (e.g., Canter & Fritzon, 1998; Douglas et al., 2013; Gannon, Tyler, et al., 2012; Gannon & Pina, 2010). RRFRA is divided into four main sections: Sociodemographic Characteristics (e.g., age, occupation), Psychosocial Characteristics (e.g., mental health problems, consumption problems), Criminal Behaviour (e.g., motivation, relationship with the victim) and Crime Scene Characteristics (e.g., type of ignition, time of the crime). This checklist was adapted by the Directorate-General of Reintegration and Prison Services (DGRSP) to evaluate the characteristics of both rural and urban arsonists. Therefore, the AIGG has the same 23 variables as RRFRA, divided by the same four main sections (i.e., Sociodemographic Characteristics, Psychosocial Characteristics, Criminal Behaviour and Crime Scene Characteristics), with the addition of risk factors for setting fires (e.g., impulsivity, low self-esteem; cf. Taylor & Thorne, 2019), type of burned area (e.g., bushes, forest, dwellings, vehicles) and type of mental illness (e.g., depression and/or anxiety, cognitive impairment and other neurodivergent disorder). It is pertinent to reinforce that the variables 'Mental Health Problems' and 'Type of Mental Health Problems' were evaluated based on the analysis of collateral information such as technical reports.

Hence, this checklist has a total of 28 items with multiple choice (e.g., time of the crime: 1 = 6 a.m.–1:59 p.m., 2 = 2 p.m.–8:59 p.m., 3 = 9 p.m.–5:59 p.m., 4 = different times), dichotomic response (e.g., type of ignition: 1 = simple, 2 = complex) and open-ended questions for additional input (e.g., measurements of the area affected by the fire), allowing for a qualitative assessment of each criminal case and improving the quality of data collection.

Data analysis

Descriptive statistics were performed using SPSS (IBM SPSS® v.26) to detail sociodemographic and psychological characteristics, criminal behaviour and crime scene information of each case. A chi-squared test of independence was also performed to examine the relationship between the setting of the fire and the remaining variables. In doing so, the evaluation was conducted to determine which characteristics might be associated more with rural or urban arsonists, taking into consideration the difference between the observed and expected counts. The strength of the associations between these variables was assessed using Cramer's V . The effect size is considered weak if it is 0.20 or lower, moderate if it is greater than 0.20 and 0.60 or lower and strong when the effect is greater than 0.60 (IBM, 2025).

Considering the categorical nature of the data, Latent Class Analysis (LCA) was performed in Jamovi (The Jamovi Project, 2023) to analyse whether this sample could be classified into different classes. LCA is a statistical technique for identifying qualitatively distinct subclasses within populations, often sharing external characteristics (Weller et al., 2020). The original data set (with information from the previously mentioned measures) had a total of 28 variables. To reduce the bias associated with missing data, variables with 25% or more missing values were excluded from this analysis. Given the categorical nature of the data, imputing missing values using methods such as mode or interpolation would not be feasible (see Stavseth et al. 2019). Therefore, missing values imputation was not used, resulting in the elimination of three variables from the original data set for this analysis (i.e., measurement of the area affected by the fire, marital status and day of the crime). Thus, 25 variables were used to perform the LCA (see Data S1).

Procedure

DGRSP gave permission to the authors to consult rural and urban arson cases, and ethical approval was given to conduct the research. From January to March 2024, we visited several DGRSP delegation teams from Portugal Mainland to collect information from these cases using AIGG (Ribeiro, Neves, et al., 2024). The information was coded by the professionals of DGRSP who contacted directly with each offender. To ensure data anonymity and due to data protection reasons, cases were identified only by a number attributed by the researchers. The authors ensured that the privacy and confidentiality of the information was respected in accordance with the Portuguese General Data Protection Regulation (Regulation, 2016). Three-hundred and thirty-nine criminal cases were collected. However, nine cases were excluded from the subsequent data analysis due to a significant number of missing values (i.e., over 30% missing data), which would potentially bias the results. Therefore, a total of 330 criminal cases were included in the current study sample.

RESULTS

Main characteristics of Portuguese arsonists

When it comes to the statistically significant association between the setting and the aforementioned variables, a chi-squared analysis was conducted (c.f., Prematunga, 2012). The following subsections represent the significant association (Table 4).

Sociodemographic and psychosocial information

Moderate positive associations between the variable setting of the fire and three variables of sociodemographic and psychosocial information were found (1) professional area [χ^2 (7, $N=319$) = 38.52, $p < .001$, Cramer's $V = .35$]: agricultural or forestry works and rural arsonists and service and sales workers and urban arsonists; (2) age [χ^2 (3, $N=328$) = 16.36, $p = .001$, Cramer's $V = .22$]: 61 years old or older and rural arsonists and 31–45 years old and urban arsonists and (3) professional status [χ^2 (3, $N=323$) = 15.38, $p = 0.002$, Cramer's $V = 0.22$]: retired and rural arsonists and active and urban arsonists. Besides these variables, two other variables from this section had weaker significant associations with the setting of the fire, such as (1) household [χ^2 (7, $N=323$) = 9.55, $p = .023$, Cramer's $V = .17$]: family of origin and rural arsonists and nuclear family and urban arsonists and (2) sex [χ^2 (1, $N=330$) = 7.16, $p = .007$, Cramer's $V = 0.15$]: male and rural arsonists and female and urban arsonists.

Mental health and criminal behaviour

Strong positive associations were found between the setting of the fire and two variables such as (1) motivation [χ^2 (6, $N=275$) = 119.26, $p < .001$, Cramer's $V = .66$]: boredom and rural arsonists and revenge and urban arsonists and (2) relationship with the victim [χ^2 (6, $N=304$) = 118.15, $p < .001$, Cramer's $V = .62$]: stranger and rural arsonists and acquaintance, family member, romantic relationship and urban arsonists. A moderate positive association between the setting of the fire and type of mental disorders was also found [χ^2 (4, $N=310$) = 19.96, $p = .001$, Cramer's $V = .25$]: cognitive impairment and other neurodivergent disorders and rural arsonists and depression/anxiety and urban arsonists. Lastly, a weaker significant association was found between the setting of the fire and the type of criminal record [χ^2 (3, $N=320$) = 9.89, $p = .020$, Cramer's $V = .18$]: no criminal record and rural arsonists and nonviolent crimes and urban arsonists.

TABLE 4 Chi-squared and effect size test between the variable setting and each remaining variables.

Variable	Setting	Variable category	N	χ^2 (df)	p	Cramer's V
Sex	Rural	Male	Obs. = 201 Exp. = 193.2	7.16 (1)	.007	.15
	Urban	Female	Obs. = 22 Exp. = 14.3			
Age	Rural	61 years or older	Obs. = 26 Exp. = 19.5	16.36 (3)	.001	.22
	Urban	31–45 years old	Obs. = 52 Exp. = 37.8			
Professional status	Rural	Retired	Obs. = 37 Exp. = 27.1	38.52 (7)	<.001	.35
	Urban	Active	Obs. = 56 Exp. = 48.6			
Professional area	Rural	Agricultural or forestry works	Obs. = 54 Exp. = 42.9	15.38 (3)	.002	.22
	Urban	Service and sales workers	Obs. = 24 Exp. = 12.2			
Household	Rural	Family of origin	Obs. = 83 Exp. = 73.2	9.55 (3)	.023	.17
	Urban	Nuclear family	Obs. = 45 Exp. = 34.1			
Types of mental disorders	Rural	Cognitive impairment and other neurodivergent disorders	Obs. = 57 Exp. = 44.2	21.66 (4)	<.001	.26
	Urban	Depression/anxiety	Obs. = 23 Exp. = 16			
Type of criminal record	Rural	No criminal record	Obs. = 142 Exp. = 135.7	9.89 (3)	.020	.18
	Urban	Nonviolent crimes	Obs. = 28 Exp. = 20.2			
Motivation for setting the fire	Rural	Boredom	Obs. = 85 Exp. = 57.6	119.26 (6)	<.001	.66
	Urban	Revenge	Obs. = 60 Exp. = 27.4			
Relationship with the victim	Rural	Stranger	Obs. = 85 Exp. = 57.6	118.15 (6)	<.001	.62
	Urban	Acquaintance	Obs. = 29 Exp. = 16.8			
		Family member	Obs. = 29 Exp. = 13			
		Romantic relationship	Obs. = 16 Exp. = 6.5			
Multiple fires set	Rural	Yes	Obs. = 55 Exp. = 47.9	4.12 (1)	.040	.11
	Urban	No	Obs. = 91 Exp. = 83.9			
Season	Rural	Spring/Summer	Obs. = 173 Exp. = 156.1	19.55 (2)	<.001	.24
	Urban	Autumn/Winter	Obs. = 46 Exp. = 29.4			
Ignition device	Rural	Simple	Obs. = 193 Exp. = 172	56.13 (1)	<.001	.44
	Urban	Complex	Obs. = 34 Exp. = 13			

Abbreviations: Exp., expected; Obs., observed.

Crime scene information

Moderate positive associations between the variable setting of the fire and two variables were also observed: (1) ignition device [χ^2 (6, $N=286$) = 56.13, $p < .001$, Cramer's $V = .44$]: simple ignition devices and rural arsonists and complex ignition devices and urban arsonists and (2) season [χ^2 (2, $N=327$) = 19.55, $p < .001$, Cramer's $V = .24$]: Spring/Summer and rural arsonists and Autumn/Winter and urban arsonists. A weaker significant association with the setting of the fire and multiple fires set was also observed [χ^2 (1, $N=329$) = 4.12, $p = 0.04$, Cramer's $V = 0.11$]: multiple fires and rural arsonists and one fire and urban arsonists.

Development of the arson typology

Five statistical criteria were used to select the optimal number of classes in the current model, as reported in some guidelines (e.g., Aflaki et al., 2023): Akaike Information Criterion (AIC) and its variant (AIC3), Bayesian Information Criterion (BIC), Sample-Sized Adjusted Bayesian Information Criterion (SABIC) and Consistent Akaike Information Criterion (CAIC). AIC penalizes models with more parameters to balance model fit and complexity, and its variant AIC3, compared to AIC, adds more emphasis on parsimony; BIC has a similar goal to AIC but has a tendency to select models with fewer latent classes. Its variant (SABIC) emphasizes parsimony and simplicity of the model, which prevents overfitting; CAIC has a wider range of conditions to balance model fit and complexity. The combination of these five parameters allows the selection of the best model that fits the current sample. Overall, lower values indicate better fit (cf. Weller et al., 2020). In general, the best model evaluated from the class solutions was the model with three classes (Table 5).

After examining the distribution of each variable across the classes, only 12 were representative of the population: type of area burnt, age, professional status, academic qualifications, household, relationship with the victim, criminal record, previous consumption problems, mental disorders, time (of the crime), motivation for the crime and substance abuse at the moment of crime. This analysis resulted in the following three classes: (1) Rural Arsonists—Consumption Problems and Boredom, (2) Rural Arsonists—Mental Health Problems and (3) Urban Arsonists—Consumption Problems and Revenge (Table 6).

Class 1: Rural arsonists—Consumption problems and boredom ($n = 141$, 42.7%)

The first class includes mostly rural arsonists ($n = 137$, 97%), the majority between 46 and 60 years old ($n = 59$, 42%). Most were also professionally active ($n = 58$, 42%), had a primary school education ($n = 58$, 44%) and lived with their family of origin ($n = 49$, 36%). Individuals in this class tended not to have a previous criminal record ($n = 88$, 62%) or a mental disorder ($n = 82$, 59%), but most had a history of substance abuse ($n = 135$, 99%), especially related to alcohol consumption ($n = 102$, 73%). They did not know the owner of the property they set fire to ($n = 87$, 70%) and usually set fire during the afternoon ($n = 55$, 41%), often out of boredom ($n = 68$, 59%). The abuse of substances during the crime was present in all of them ($n = 110$, 100%), with alcohol being the most prevalent substance ($n = 101$, 92%).

Class 2: Rural arsonists—Mental health problems ($n = 120$, 36.4%)

The second class also included mostly rural arsonists ($n = 84$, 70%). However, they were 30 years old or younger ($n = 44$, 37%). They were often professionally active ($n = 62$, 53%), had a middle school education ($n = 48$, 44%) and lived with their nuclear family ($n = 47$, 40%). In this class, most individuals did not have a criminal record ($n = 82$, 71%) or previous history of substance abuse ($n = 100$, 89%), but they

TABLE 5 Evaluating class solutions.

Class	AIC	AIC3	BIC	SABIC	CAIC
1	13,958	14,029	14,228	14,003	14,299
2	12,882	13,025	13,425	12,972	13,568
3	12,369	12,584	13,186	12,504	13,401
4	12,334	12,621	13,424	12,514	13,711
5	12,286	12,645	13,650	12,511	14,009

Abbreviations: AIC, Akaike Information Criterion; AIC3, Akaike Information Criterion-3; BIC, Bayesian Information Criterion; CAIC, Consistent Akaike Information Criterion; SABIC, Sample-Sized Adjusted Bayesian Information Criterion.

often had mental health problems ($n=64$, 55%), especially depression and/or anxiety symptoms ($n=28$, 43%). In this class, the majority of arsonists knew the owner of the property they set on fire ($n=67$, 53%), and the victim was often someone they were acquainted with ($n=22$, 20%). They set the fire in the afternoon ($n=42$, 37%), usually for revenge motives ($n=28$, 29%) and did not exhibit substance abuse during the crime ($n=95$, 95%).

Class 3: Urban arsonists—Consumption problems and revenge ($n=69$, 20.9%)

The third class included almost only urban arsonists ($n=68$, 99%), the majority between the ages of 31 and 45 years old ($n=34$, 49%). Most of them were professionally inactive (i.e., they were unemployed or retired, $n=37$, 54%), had a middle school education ($n=33$, 49%) and lived mostly with their nuclear family ($n=28$, 41%). Unlike the two other classes, the majority of individuals from the urban arsonists class had criminal records (for non-violent crimes such as driving without licence, $n=36$, 53%). Moreover, all of them had a history of substance abuse ($n=63$, 100%), especially for alcohol ($n=40$, 58%). Yet, most had no mental health problems ($n=43$, 65%). Within this class, most arsonists knew the owner of the property they set fire to ($n=60$, 87%), having a family/intimate relationship with that person ($n=32$, 47%). Most of them set the fire due to revenge motives ($n=40$, 64%), during the night ($n=29$, 43%) and usually intoxicated ($n=44$, 85%) with alcohol ($n=32$, 63%).

DISCUSSION

The current study analysed the psychosocial, behavioural and criminal characteristics of arsonists and distinguished rural arsonists from urban arsonists through the development of a typology. The main aim of this research was to assess whether the setting of the fire significantly contributes to the advancement of arson research, especially by clarifying differences in the features of arsonists in rural and urban areas. Apart from the similar characteristics shared between rural and urban arsonists, particularly regarding criminal behaviour (e.g., leaving the crime scene after setting the fire, confessing to the crime), the present study emphasized the significance of the setting in differentiating arsonists. In addition to its association with several key variables, which will be discussed in greater detail subsequently, the analysis of the setting of the fire contributed to the development of a typology represented by the three classes of arsonists (Rural Arsonists—Consumption Problems and Boredom, Rural Arsonists—Mental Health Problems and Urban Arsonists—Consumption Problems and Revenge). It should be noted that Rural Arsonists—Mental Health Problems encompasses a 30% proportion of urban arsonists, suggesting that while predominantly characteristic of rural arsonists, similarities may emerge between rural and urban arsonists.

The most salient findings of the current study included the presence of moderate to strong positive associations between the setting and other characterization variables (e.g., motivation and relationship with the victim). The analysis of the higher effects on each category indicated that rural arsonists usually

TABLE 6 Representation of each class of rural and urban arsonists.

Variable	Category	Class 1 (<i>n</i> = 141, 42.7%)		Class 2 (<i>n</i> = 120, 36.4%)		Class 3 (<i>n</i> = 69, 20.9%)	
		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Type of area burnt	Rural	137	97.2	84	70	—	—
	Urban	—	—	35	29.2	68	98.6
	Both	4	2.8	1	.8	1	1.4
Age	30years old or younger	22	15.8	44	36.7	12	17.4
	31–45years old	48	34.5	34	28.3	34	49.3
	46–60years old	59	42.4	25	20.8	21	30.4
	61years old or older	10	7.2	17	14.2	2	2.9
Professional status	Professionally active	58	41.7	62	53.4	31	45.6
	Professionally inactive	55	39.6	33	27.5	35	51.5
	Retired	24	17.3	14	12.1	2	2.9
	Student	2	1.4	7	6	—	—
Academic qualifications	None	22	16.7	9	7.5	6	8.7
	Primary school	58	43.9	27	24.8	21	31.3
	Middle school	44	33.3	48	44	33	49.3
	High school	6	4.5	22	20.2	6	9
	College degree	2	1.5	3	2.8	1	1.5
Household	Family of origin	49	35.5	42	35.9	17	25
	Nuclear family	31	22.5	47	40.2	28	41.2
	Alone	46	33.3	21	17.9	17	25
	Other	12	8.7	7	6	6	8.8
Criminal record	No	88	62.4	82	70.7	32	47.1
	Yes	53	37.6	34	29.3	36	52.9
Previous consumption problems	No	1	.7	100	89.3	—	—
	Yes	135	99.3	12	10.7	63	100
Mental disorders	No	82	58.6	52	44.8	43	65.2
	Yes	58	41.1	64	55.2	23	34.8
Relationship with the victim	Stranger	87	70.2	53	47.3	9	13.2
	Acquainted	13	10.5	22	19.6	14	20.6
	Neighbour	12	9.7	6	5.4	5	7.4
	Family / Intimate relationship	7	5.6	18	16.1	32	47
	Friend	—	—	1	.9	2	2.9
	None (i.e., the fire set in their own property)	5	4	12	10.7	6	8.8
Motivation for the crime	Attention seeking	16	13.8	13	13.5	2	3.2
	Anger	8	6.9	14	14.6	7	11.1
	Revenge	8	6.9	28	29.2	40	63.5
	Boredom	68	58.6	19	19.8	3	4.8
	Pleasure/excitement	7	6	6	6.3	2	3.2
	For own benefits (e.g., land clearing)	9	7.8	15	15.6	4	6.3
	Suicide/homicide attempt	—	—	1	1	5	7.9

TABLE 6 (Continued)

Variable	Category	Class 1 (<i>n</i> = 141, 42.7%)		Class 2 (<i>n</i> = 120, 36.4%)		Class 3 (<i>n</i> = 69, 20.9%)	
		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Hour	Dawn (3 a.m.–6:59 a.m.)	15	11.1	10	8.8	9	13.2
	Morning (7 a.m.–12:59 p.m.)	16	11.9	13	11.5	8	11.8
	Afternoon (1 p.m.–7:59 p.m.)	55	40.7	42	37.2	21	30.9
	Night (8 p.m.–2:59 a.m.)	46	34.1	39	34.5	29	42.6
	Multiple hours	3	2.2	9	8	1	1.5
Substance abuse at the moment of the crime	No	—	—	95	95	8	15.4
	Yes	110	100	5	5	44	84.6

set fire for boredom and did not know the owner of the property that was set on fire, while urban arsonists were more likely to be associated with setting fire for revenge and being an acquaintance, a family member of or in an intimate relationship with the owner of the property that was set on fire. The present findings are consistent with existing literature, which suggests that boredom and an unknown relationship were more frequently associated with rural arsonists (Ribeiro, Teles, et al., 2024), while revenge and a close relationship were often observed in studies with an urban sample (e.g., Canter & Fritzon, 1998; Nanayakkara et al., 2020). This is further supported by the Rural Arsonists—Mental Health Problems and the Urban Arsonists—Consumption Problems and Revenge classes. Revenge was the main motivation in both classes; however, 62% of rural arsonists did not know the owner of the property they set on fire, and while the Rural Arsonists—Mental Health Problems class had a greater percentage of arsonists who set fire to the property of acquaintances (20%), a potential explanation for this observation could be the higher proportion of urban arsonists in this group (i.e., 30%). In contrast, the urban arsonists class demonstrated a higher likelihood of setting fire to properties owned by individuals with whom they had an intimate or familiar relationship (47%). Given the latter, the findings may suggest that fire was used in the context of family violence in these cases, especially considering that revenge is usually the motive behind the firesetting behaviour. Previous studies have presented evidence of a potential association between firesetting and family violence in a particular subset of cases (e.g., Nanayakkara et al., 2020). It is important to note that revenge typically requires a relationship with the victim and that fire is often used as a powerful tool to send a message in these contexts (Barnoux & Gannon, 2013). Thus, further research is needed concerning this topic, especially because most urban arsonists in the current study had a weak, yet significant, association with nonviolent crime.

The absence of previously recorded crimes is consistent with the findings of Canter and Fritzon (1998), but contrary to other studies in which arsonists had a history of repeated fires, had been convicted of arson (Rix, 1994), or had been convicted of other types of crimes (Wilpert et al., 2017). The fact that the arsonists in our sample who had criminal records were mostly for nonviolent offences supports the idea that arsonists may be different from the violent criminal population. Nevertheless, and specifically for the Urban Arsonists—Consumption Problems and Revenge class, a greater percentage of arsonists with previous criminal history was higher, in comparison to the two Rural Arsonists classes, which is also supported by the significant association of rural arsonists with no criminal record and urban arsonists with a criminal record for nonviolent crimes.

In addition to some moderate associations indicating that rural arsonists were more likely to be retired, aged 61 years or older and employed in agricultural-related occupations, characteristics that are prevalent among individuals residing in rural areas (e.g., Zhu & Wu, 2025), a notable finding was the association of these rural offenders with cognitive impairment and other neurodivergent disorders. Some studies have reported the presence of personality disorders and schizophrenia (e.g., Rice & Harris, 1991; Ritchie & Huff, 1999) as opposed to our findings. This difference is most likely related to the fact that cognitive impairment is higher in rural areas than in urban ones (e.g., Nunes et al., 2010;

Peritogiannis et al., 2022), which may be attributed to factors such as lower educational attainment and limited access to health care (Forrest et al., 2023; Weden et al., 2018). Although the Urban Arsonists—Consumption Problems and Revenge category exhibited a higher percentage of arsonists without mental disorders (65%), it is noteworthy that a substantial proportion of urban arsonists were significantly associated with depression and/or anxiety. Given that the Rural Arsonists—Mental Health Problems class exhibited a 55% prevalence of individuals with mental disorders, it may be indicative of an additional distinction between individuals who set fire in rural settings and those who set fire in urban settings. This may be due to the fact that there are fewer mental healthcare professionals and resources available, therefore less access to care, in rural areas than in urban areas (Forrest et al., 2023). Furthermore, the data indicate that 54% of the arsonists did not have a diagnosed mental disorder, which is a higher proportion than is typically observed in most studies (e.g., Anwar et al., 2011; Carthy et al., 2024; Ritchie & Huff, 1999; Rix, 1994). This discrepancy may be attributed to the absence of a standardized methodology for assessing mental health problems present in the criminal records. A potential explanation for these findings is the prevalence of undiagnosed mental disorders, which suggests a necessity for further research in this area. On the other hand, the lower percentage of diagnosed mental disorders compared to the extant literature may be due to the fact that most existing studies collect data from mental institutions, while the present study collected data from the judicial system.

A history of alcohol problems was common in the current sample and had been previously corroborated by other studies (e.g., Enayati et al., 2008; Ritchie & Huff, 1999; Rix, 1994; Wilpert et al., 2017). However, substance abuse is more prevalent in rural areas than in urban areas (e.g., Borders & Booth, 2007; Dixon & Chartier, 2016). Hazardous alcohol abuse, in particular, has been reported in several countries, as the Friesen et al. (2022) scoping review indicated. In general, 72% of the arsonists in this sample, regardless of the setting, had a history of alcohol abuse, in line with findings from previous studies (e.g., Burton et al., 2012). The current typology also showed a prevalence of a history of alcohol abuse in both the rural (Rural Arsonists—Consumption Problems) and urban (Urban Arsonists—Consumption Problems and Revenge) classes. However, the prevalence of a history of alcohol abuse at the time of the crime was higher for the Rural Arsonists—Consumption Problems class (92%) than for the Urban Arsonists class (63%). This may be because alcohol consumption in rural areas is often associated with social isolation (Jackson et al., 2014) and feelings of loneliness, which are more prevalent in rural areas than in urban areas, especially among older adults (Zhu & Wu, 2025).

When analysing the characteristics of rural and urban arsonists considering the typology proposed within this work, it was possible to observe that both the Rural Arsonists—Mental Health Problems and Urban Arsonists—Consumption Problems and Revenge classes shared similar characteristics with two of the four themes in Canter and Fritzon's (1998) typology (i.e., *Psychiatric History* and *Failed Relationship*), emphasizing that these variables may play a significant role in differentiating between urban arsonists and at least a subgroup of these offenders committing this crime in rural settings. For instance, the presence of mental illness, including depression, has been documented in both groups (Rural Arsonists—Mental Health Problems and *Psychiatric History*). The other two groups (Urban Arsonists—Consumption Problems and Revenge and *Failed Relationship*) demonstrated a history of alcohol consumption problems and intimate relationship dynamics that may have contributed to the firesetting behaviour. These findings suggest that the prevalence of these characteristics varies considerably between rural and urban settings, emphasizing the importance of the setting in characterizing this population. This heterogeneity is not surprising, in agreement with previous typologies that distinguish rural arsonists into multiple groups with respect to the type of area burned (Sotoca et al., 2013) or their psychological and criminal characteristics (Ribeiro, Teles, et al., 2024). Notwithstanding, the current study provided support for the idea that the arson occurrence may be related to different factors such as specific motivations or psychological characteristics of the person setting the fire, reinforcing the firesetting behaviour theories. For instance, as seen in M-TTAF, mental health is an important moderating factor for the firesetting behaviour (Gannon, Ó Ciardha, et al., 2012; Gannon, Tyler, et al., 2012).

In conclusion, the analysis of the setting and the development of the typology of rural and urban arsonists in this study was of the utmost importance for research in this area, as it led to the distinction of

arsonists into three different classes, especially considering the setting, which was the main objective of the current study. It provides new insights into the behaviour of arsonists by demonstrating the relevance of distinguishing rural from urban arsonists in future research on this type of criminal behaviour.

Limitations and future research

The current research is not free of limitations that should be taken into consideration when interpreting findings. Despite the substantial sample size, only Portuguese arsonists were included in this study. This is a limitation for generalizing the results to other countries and cultures. Adding to this, the current study only included arsonists on probation. Including a sample of arsonists serving other sentences (e.g., prison sentence) or even self-reported firesetters could be beneficial (e.g., Barrowcliffe & Gannon, 2015). It would provide more insight into the different sociodemographic, psychological and behavioural characteristics of rural/urban arsonists serving different sentences compared to a population of self-reported firesetters that had no contact with the justice system. Another limitation relates to the missing values of some variables, such as marital status, which may bias a comprehensive understanding of the characteristics of this sample and the differences between rural and urban settings. Although most variables had a low percentage of missing data, future research should seek to validate the findings regarding the characteristics of these variables. Furthermore, the coding was not completed by the same coders, which presents a potential limitation of the study. Moreover, other characteristics should be added in accordance with the theoretical framework of arson (e.g., M-TTAF). This framework includes development and contextual factors, which would deepen our understanding of rural and urban arsonists. It is important to note that a few criminal cases reported a clinical diagnosis of mental disorders. Most mental disorders were reported by the professionals responsible for collecting information on each case. Considering that mental health in Portugal is still underreported in the criminal justice systems, especially in prisons (c.f., Martinho, 2023), it limits a more accurate clinical assessment of the mental health among the arsonists.

Furthermore, social, legal and cultural contexts differ from country to country. It would be pertinent that future research focuses on whether deliberate firesetters have dynamic characteristics that differ from culture to culture, considering the setting of the fire. In addition, it would be helpful to understand whether including other factors, such as social and community support, socioeconomic status, or specific environmental factors—such as climate type and biodiversity—could provide more in-depth knowledge about rural and urban arsonists. Lastly, validating this typology with different samples (e.g., samples from other countries) would be an important step for future research. Notwithstanding, the interplay between setting, motivation and offender characteristics leads this typology to support a more nuanced understanding of arson as a multifaceted phenomenon that intersects with criminological, psychological and sociological theory (Gannon, Ó Ciardha, et al., 2012). This enables different practitioners, such as fire services, mental health professionals and law enforcement, to identify and intervene with individuals based on the existing groups of the typology.

Implications

The current typology helps educate about arson in rural and urban areas. By characterizing the different features of rural and urban arsonists, it provides information on the main psychosocial characteristics that may indicate a higher risk of firesetting as well as the most common motivations. Therefore, prevention strategies can be adapted for rural and urban communities to support individuals who may need it. For example, therapeutic support groups can be developed or reinforced for individuals, especially those with mental disorders such as cognitive impairment in rural areas and depression and anxiety in urban areas. Working with arsonists in individual or group therapies in developing coping strategies,

self-esteem and other skills is important for preventing relapse (Carthy et al., 2024), particularly in cognitive behavioural therapy (e.g., Gannon et al., 2015), taking into consideration the specific needs of rural and urban arsonists. For instance, an intervention for an individual who fits into the Rural Arsonists—Consumption Problems and Boredom group would most likely centre on developing different hobbies and healthy habits, as well as assertiveness and peer support groups that would provide psychoeducation with the purpose of reducing and avoiding substance consumption, aligned with consumption prevention campaigns. For an individual with characteristics consistent with the Rural Arsonists—Mental Health Problems profile, resources focused on self-care, psychological and emotional regulation support would be of particular relevance. Finally, the strategies for intervening with an individual that would align with the Urban Arsonists—Consumption Problems and Revenge group could be more focused on developing social and coping skills, conflict management and understanding relationship dynamics.

CONCLUSION

Fires have a negative impact on communities, causing psychological, emotional, financial and environmental effects. Notwithstanding the international prevalence of arson and its impact at several levels, the importance of the setting of the fire has not yet been adequately addressed in research, despite the existence of legislation in different countries differentiating rural from urban arson (e.g., Parliament of Australia, 2006; Portuguese Criminal Code, Act 274, 2017; Spanish Criminal Code, Act 352, 2003) as well as the different impact of rural and urban crime (cf. Ventorim & Netto, 2024; Weisheit et al., 1994). This study highlights the importance of studying the different dimensions of crime (e.g., crime scene information, psychosocial characteristics of the offender, criminal behaviour) and how the setting plays an important role in this specific type of crime. Rural arsonists share similar characteristics with urban arsonists such as academic qualifications, history and type of consumption, behaviour after the crime, lack of accomplices, confession to the crime and distance travelled to set the fire. However, they differ in other variables such as age, professional activity, type of mental disorder, motivation and relationship with the victim. In the rural setting, criminal behaviour patterns are influenced by psychological and social integration problems, whereas in the urban setting, family relationships or intimate partner problems seem to have a greater impact. Prevention programs may need to be offender-specific, as the psychology of rural arsonists does not seem to be the same as that of urban arsonists (Ducat & Ogloff, 2011). The present study made a significant contribution to the improvement of the groundwork in the deliberate firesetting field, while concomitantly aiding police work and investigation in Portugal.

AUTHOR CONTRIBUTIONS

Rita Ribeiro: Conceptualization; investigation; funding acquisition; methodology; writing – original draft; formal analysis; data curation. **Cristina Neves:** Resources. **Daniel Rijo:** Writing – review and editing; supervision. **Cristina Soeiro:** Writing – review and editing; investigation; supervision.

FUNDING INFORMATION

This study was supported by the Foundation for Science and Technology (FCT) through the Portuguese State Budget (Grant numbers 2020.07799.BD; DOI: <https://doi.org/10.54499/2020.07799.BD>).

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing financial and non-financial interests.

DATA AVAILABILITY STATEMENT

Due to the judicial nature of this study, it was assured that raw data would remain confidential and would not be shared. Data are not available/The data that have been used which is confidential.

ACKNOWLEDGEMENTS

Open access publication funding provided by FCT (b-on). [Correction added on 18 February, 2026, after first online publication: FCT (b-on) funding statement has been corrected.]

ETHICS STATEMENT

The Psychology Department of the Institute of Judiciary, Police and Criminal Sciences (IPJCC), approved the research on which this paper is based and consented to the use of information contained in criminal records to develop the database for the purposes of this study, ensuring the anonymity and confidentiality of individual data during the process. The study was conducted under the ethical standards laid down in the 1964 Declaration of Helsinki.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Data S1.

How to cite this article: Ribeiro, R., Neves, C., Rijo, D., & Soeiro, C. (2026). Does the setting matter? Characterizing and classifying rural and urban arsonists. *Legal and Criminological Psychology*, 31, 158–184. <https://doi.org/10.1111/lcrp.70007>