



WHAKARATONGA IWI

**FIRE**  
**EMERGENCY**

NEW ZEALAND



# Preventing Arson by Adult Offenders

A review of the research literature, and survey of international practice.

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Fires lit with malicious intent can cause severe damage to homes, businesses and areas of vegetation, with single incidents potentially causing millions of dollars in losses. Arson attacks also can impose great emotional harm to those affected, as well as potentially endanger lives, not only of occupants but also the crews called to fight the fire.

Fire and Emergency New Zealand have sought to initiate a programme of work to investigate the feasibility and value of a strategy for preventing arson by adult offenders. The overall goal is to further expand and improve responses to firesetting behaviour within New Zealand, and thereby promote public safety and protection of the environment.

**In support of this objective, Fire and Emergency commissioned the writers to undertake a preliminary stage of work, largely centred on gathering up-to-date and relevant information on the following:**

1. The nature and characteristics of adult arson in New Zealand, and extent to which this impacts communities.
2. Important findings from research carried out in relation to arson offending by adults.
3. Current practice in arson prevention in other countries.



**Based on all information gathered, the intention is then to:**

- Organise these actions, services and interventions into a coherent Intervention Logic.
- Complete a gap analysis, comparing what currently exists to what is desired.
- Identify actions, services and interventions that could form elements of a strategy.

Information was gathered on:

1. The nature and characteristics of adult arson in New Zealand, and extent to which this impacts communities.
2. Important findings from research carried out in relation to arson offending by adults.
3. Current practice in arson prevention in other countries.

## Sources for information were:



- Interviews with several Fire and Emergency staff including: senior fire investigators, community risk managers, and academics with expertise in this area.



- Statistical information was sought through formal requests to relevant agencies, e.g. NZ Police, NZ Corrections, and the Insurance Council of NZ.



- Research databases were searched to find articles written on the topic of arsons, arsonists, fire-lighting, and arson prevention.



- Websites for overseas city, state and national fire services were searched to locate any information published concerning arson prevention approaches.





## Key findings

# Characteristics of adult arsonists

## Some key characteristics then, of the New Zealand adult arson cohort, are as follows:

- Predominantly male (although 20% of those convicted are female which is not insignificant).
- Approximately 60% are aged between 18 and 35 years.
- Adult arsonists appear most commonly to be of low socio-economic, disadvantaged backgrounds, with a history of poor educational achievement and unemployment (Doley *et al*, 2011).
- Māori are over-represented both in terms of those convicted for arson (31%) and imprisoned (44%), but Pacific peoples are under-represented.
- A majority (75%, according to Ducat *et al*, 2017) have criminal convictions for offenses other than arson.
- The most common arson scenarios are grievance-based, or semi-random opportunistic attacks (based on interviews with a number of senior Fire Investigation Officers).
- Gang-related activity appears to be implicated in a reasonably significant number of incidents – around 20% of people imprisoned for arson are gang members.
- Fire and Emergency NZ data suggest some regional variation in proportion of fires which are suspicious: rate in Te Ihu (Upper South Island) twice that of Te Kei (Lower South Island) – although it is recognised that this could simply reflect a data recording issue.

**Note:** statistical information about arsonists is mostly derived from records or studies of apprehended or convicted arson offenders. So these numbers may not accurately describe the entire group of arson offenders, as they only describe those who were convicted, not the vast number of those who remain unconvicted.

## Note on other assumptions from the data:

- Only a small minority (approx. 5%) have severe mental disorders such as schizophrenia and bi-polar disorder, but personality disorder, attention deficit/hyperactivity disorder, anxiety, depression and substance abuse problems are common (Ducat *et al*, 2013)
- Intellectual disability (i.e., IQ scores <70 IQ pts) is also relatively rare – also around 5%, according to a recent review (Collins *et al*, 2022)

# Volumes of people through the criminal justice system

- Based on Fire and Emergency annual figures for the last five years, around 18,700 fires were attended by fire crews each year. Of these, around 35%, or 6,545, were likely to have been deliberately lit. This equates to roughly 15-20 arson incidents per day, or 80-100 per week nationally.
- Only around 5% of attended fires were 'suspicious', but it is generally accepted that a reasonably large volume of potentially suspicious fires are not recorded as such (FENZ Data). The 35% figure is based partly on estimates of interviewed fire investigators, and figures that similar countries report, which can approach 50% of all fires attended (for the UK, see Arson Prevention Forum, 2017).
- NZ Police data obtained for this project indicates that around 1,450 arson-related offences were recorded by Police each year. This constitutes around one fifth (22%) of the estimated number of such incidents.
- Following on from the 1,450 arson-related offences recorded by Police, 345 offenders were identified and apprehended each year.
- Of the apprehended group, Police decided to prosecute 217 of the apprehended individuals, a proportion of whom were likely to be adolescents.
- Of the entire 'prosecuted' group, an average of 116 adult offenders were convicted each year. This resulted in the imposition of 102 Corrections-administered sentences. Half commenced community sentences such as Home Detention or Supervision, and half were imprisoned; the remainder likely were dealt with by way of fines, or conviction and discharge.

Figure 1 Annual volumes\* through the criminal justice system

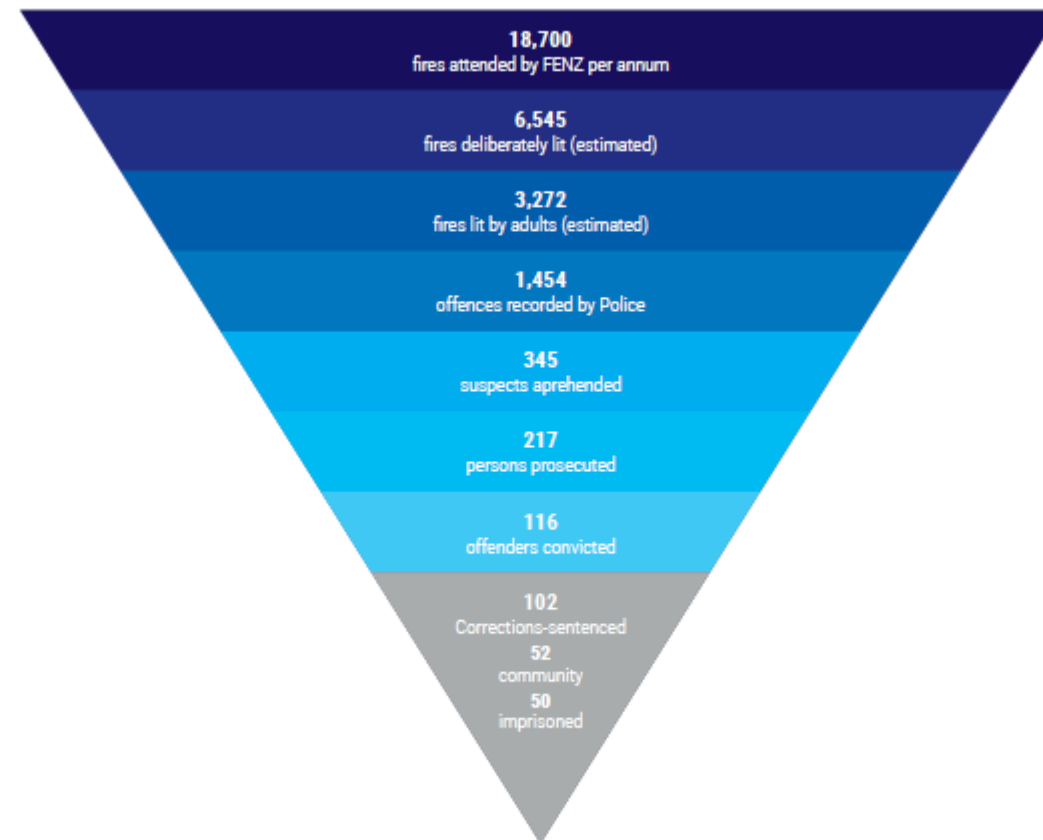


Figure notes: \* Based on averages of totals for each of last five years



# Cost and impact of arson in New Zealand

Arson is a somewhat unique form of crime, typically inflicting on its victims a distinct array of hurts and harms. The most obvious and immediate harm is the loss of valuable property such as houses, businesses, vehicles and forests. There is no way of precisely quantifying the total costs of arson attacks nationally, as no single agency has responsibility for compiling such data. However, **the Insurance Council of New Zealand provided a figure of \$70,000 as the average cost of each arson-related claim paid out on by insurers** here. If that figure was applied to total annual arson incidents, then the sum of costs of arson attacks by adults, to property owners, insurers, and local and national government, can be estimated at c. **\$200m per year**.

Monetary losses are of course only one element in the equation. Arson incidents also have the capacity to injure and kill people. Injuries can be life-changing, resulting in loss or impairment to employment prospects, long-term health-related costs, and diminished capacity to enjoy life. **NZ Treasury modelling for calculating costs and benefits for any social intervention indicates \$5m as (in their terms) the 'value of a statistical life'**.

The emotional harms resulting from arson can also be severe. Arson is arguably a symbolic form of personal violence, an assault on victims' sense of safety, security and well-being. In addition, arson attacks can have a severe and debilitating impact on the wider communities in which they occur. This is especially so when structures or sites with particular cultural or spiritual significance are damaged or destroyed.

Finally, arson can have significant adverse environmental effects. Structures typically contain a wide range of materials, many of which can emit toxic fumes in smoke. Destruction of vegetation can equate in some circumstances to literal deforestation, with all the associated harms of that practice.

The cost of arson per year can be estimated at around \$200 million.



This doesn't take into account the cost of loss of life, impact of emotional harm, cultural or spiritual loss, or environmental impact.



# Typologies of arsonists

The Multi-Trajectory Theory of Adult Firesetting (M-TTAF) framework has two 'tiers', the first describing the distinct developmental pathways that arsonists typically traverse on their way to becoming offenders, and the second on certain explanatory 'trajectories' (or types) of individual perpetrators. These types are briefly outlined here:

1. **'Antisocial'** firesetters are criminally oriented, have antisocial attitudes, may be impulsive and lacking self-control, and may exhibit violent and vengeful sentiments.
2. **'Grievance'** firesetters are prone to anger and hostility, have poor communication skills and low self-control, and characteristically conflate fire with aggression and a means of expressing anger.
3. **'Fire interest'** offenders display a strong fascination with fire, express inappropriate attitudes and emotions attached to fire, are prone to boredom, and are motivated to engage in thrill-seeking.
4. **'Expressive'** firesetters feature personality disorder or psychiatric problems; they have particular difficulty in managing emotion, lack communication skills, and may be prone to self-harm.
5. The **'multi-faceted'** type is reserved for individuals who display a mixture of characteristic associated with the other types, especially combinations of 'antisocial' and 'fire interest' characteristics.

There are a number of typologies used to describe arson behaviour, however the M-TTAF has attracted interest from a number of research teams and while there has been mixed findings, it remains the most widely referenced framework for sub-typing arsonists. Research is continuing in this space and will likely improve its utility moving forward.

More typologies can be found in the longform report.

# Are adult arson offenders distinct from other offenders?

Research opinion on this topic is mixed. Gannon *et al.* (2013) asserted that arsonists are indeed distinct; their reading of the accumulated research led them to propose the following features as uniquely characteristic of arsonists:

1. **A distinct and pervasive interest in fire events, especially dangerous and seriously damaging fires.**
2. **Peculiar identification of self with the phenomenon of fire, accompanied by low fire-safety awareness.**
3. **Greater levels of anger-related cognition.**
4. **More pronounced deficits in self-esteem.**
5. **Proneness to 'external locus of control' (i.e., they do not feel they have much personal control over their behaviour and feel their behaviour is a result of external influences or fate).**

It has also been pointed out that arsonists are five times more likely to commit a subsequent arson offence than offenders convicted of other types of offences (Sambrooks *et al.*, 2021).

However, a broader consensus across research appears to favour the opposite view, that arsonists are 'not so different' to other offenders (see, for example, Ducat *et al.*, 2013). Many similarities have been identified in terms of developmental history, personality features, and factors such as poor emotional control, impulsiveness, substance misuse, and excitement seeking. **Such features are found to be present in arsonists but are also highly characteristic of offenders generally.** Thus the wider view is that arson offenders have a great deal in common with other types of offenders, and that differences – such as the presence of fire interest – exist but are not overwhelmingly important.

Evidence confirms that arsonists typically are recidivist offenders (i.e., they continue to commit offences). At the individual level, a convicted arsonist's next offence is much more likely to be a *non-arson* offence. In other words, their overall reoffending pattern is not dissimilar to that of other, generalist offenders.

In summary, while there are dissenting views, similarities between arson offenders and general offenders appear greater than their supposedly unique features. This has potentially important implications for how they should be managed through the criminal justice system.

# Fire interest

Fire interest is regarded as having four component features; these are:

1. **'Identification with fire'**: fire is viewed by the person as central to their identity, somehow an essential accompaniment to their normal functioning.
2. **'Serious fire interest'**: excitement (rather than fear or horror) in response to especially destructive or life-threatening fires.
3. **'Fire safety'**: minimisation, disregard, or recklessness with regard to the importance of fire safety – and usually accompanied by deficient fire safety knowledge.
4. **'Firesetting as normal'**: beliefs that setting (or being suspected of setting) fires is commonplace, and not especially noteworthy (Ó Ciardha, Magali *et al*, 2015).

A number of additional and interesting lines of research enquiry exists which are, to varying degrees, related to the concept of fire interest including:

1. **'Fire-aggression fusion', 'fire-coping fusion'** – understood to be habitual tendencies to resort to firesetting as a means of expressing anger or reducing painful emotional states (Butler & Gannon, 2021).
2. **'Implicit beliefs'** of arsonists – psychologists working in this area have found that, though careful assessment and dialogue, arsonists can be assisted to recognise deeply held attitudes or beliefs about fire, centred on ideas such as:
  - a. 'fire is a powerful tool'
  - b. 'fire is fascinating'
  - c. 'fire is controllable'
  - d. 'aggression against others (using fire) is normal' (Ó Ciardha & Gannon, 2012).
3. **'Offence chain' analysis** – this perspective attempts to unpack typical sequences of predisposing tendencies, events and circumstances, internal emotions and cognitions, and then situational triggers, that are implicated in an individual's arson behaviour (Tyler *et al*, 2014; Barnoux, 2015).

Fire interest has been linked with a tendency towards **'sensation-seeking'**, a temperamental characteristic associated with **general antisociality** (Gannon *et al*, 2012), although more recent research has linked fire interest with **sadistic tendencies** (Wehner *et al*, 2022).

In summary, while not necessarily present in all, or even most individuals who commit this form of crime, when assessed as present, fire interest almost certainly should be taken into account when determining how the person is best managed therapeutically.

# Reoffending rates

## Internationally

A number of studies mostly based on US, UK and Australian samples, and each providing reoffending rates for arsonists. A recent review of 19 studies (Sambrooks *et al*, 2021) reported a range of reoffending rates, with variation influenced by different lengths of follow-up, cohort characteristics, and reoffending measure used.

When narrowed down to studies using reconviction for an arson offence as the key measure, the review concluded that **“Arson, as a recidivistic event, appears relatively uncommon, with a base rate between 8% and 10%”**.

Studies which included a broader measure of reoffending (one study involved mentally disordered offenders and defined reoffending as any ‘conduct warranting a criminal charge’) **indicated a rate of around 20%**.

## New Zealand

Edwards and Grace (2014) published the results of a New Zealand study involving a 10-year follow-up of 1,250 convicted arsonists for whom an index arson conviction was recorded between 1985 and 1994. Across this sample, the rate of reconviction for **a new arson offence was 6.2%**. Michael Edwards (2020) further validated this finding with a later, similar-sized sample (n=1464, sample convicted 1998-2008, 5-year follow-up), **observing a reconviction rate of 5.9%**.

Further analysis of arsonists’ reconviction rates for other types of offences found rates were very high: Edwards and Grace (2014) **found 79% were reconvicted for any new offence (and 49% for violent offences)**. The high rates of non-arson reoffending amongst arsonists are similar to, perhaps even slightly higher, than reoffending rates recorded for all offenders.

All reoffending research is unhelpfully affected by the issue of unresolved crime. That is, while it is straightforward to count the number within any given cohort who are reconvicted within a set follow-up period, there is no way of determining how many others in that cohort reoffended but were not caught. This is an especially acute problem for arson research, in light of estimates that less than 10% of arson incidents result in prosecution of an offender (Sambrooks *et al*, 2021).



## Predicting who will reoffend

Across a great many studies, just one single characteristic emerges as consistently predictive of arson reoffending. That is, the number of prior arsons. In other words, the greater the number of prior convictions or relevant offences (however measured) an individual has, the more likely to reoffend they are, relative to those for whom the recent offence is their only known arson event.

Less consistently, various additional characteristics have emerged from studies as probable risk indicators, and include the following:

- offender under 18 years old
- multiple arsons as part of index offence
- prior vandalism offences (Edwards & Grace, 2014)
- general criminality
- psychiatric disorder (Ducat *et al*, 2015)
- substance abuse
- sustained fire interest (Doley, Fineman *et al*, 2011).

Finally, there appears to be widespread agreement that, while only a small minority of child/adolescent firesetting will go on to commit arsons as adults, any adult arsonist with a history of child/adolescent firesetting is undoubtedly a higher risk for future repeat arson.

Arson risk prediction is a worthwhile area of research endeavour and should continue. However, in the short to medium-term, it is probably better for professionals working in this domain to rely on generic assessments of reoffending risk with arsonists.

# Spatio-temporal analysis

Research in this area is still emerging. Canter and Fritzson (1998) supported the hypothesis that 'instrumental' arsonists were more likely to travel some distance from home to commit their crimes when compared to 'expressive arsonists' (Wachi *et al*, 2007). Another example is research by Curman (2004) that highlighted that serial arsonists are likely to operate relatively close to their home residence. Temporally focused research has documented elevated arson incidence during the weekend and holidays (e.g., Prestemon *et al*, 2013).

In the US spatio-temporal studies have been applied to investigate patterns in forest and wildland incidents (Prestemon *et al*, 2012); more recently attention has also turned to urban settings. For example, modelling of arson hotspots within large cities produced evidence for spatio-temporal clustering of arson (Prestemon *et al*, 2013). US researchers have also investigated patterns of arson incidents in a large urban county and found evidence for the likelihood of near repeat follow-up incidents in close spatial and temporal proximity to an initiating event (Grubb & Nobles, 2016). Arsons also exhibited systematic differences with respect to subtypes including residential versus non-residential, daytime versus night-time, and weekday versus weekend arsons.

**Instrumental arsonists: those who start fires for their own indulgence, like personal revenge, or to hide evidence from a crime.**

**Expressive arsonists: those who are acting on their own feelings or objects.**

**Prestemon et al, 2013 found elevated incidents of arson during the weekends and holidays**

**US researchers found evidence for arsons having a near repeat follow up in a close spatial area and temporal proximity to the initiating event.**

# Pyromania

The key diagnostic characteristic of this disorder is a sense of compulsion which, for arsonists, is experienced as an unbearable build-up of tension that is 'relieved' or 'released' by lighting fires. Evidence of such a trait or tendency is a necessary criterion for a diagnosis of pyromania.

Interestingly, early researchers studying arsonists in 1950s and '60s (such as Lewis & Yarnell, 1951) claimed that up to 50% of firesetters were in the grip of 'irresistible compulsion'. However, as research subsequently developed and expanded across larger and more diverse cohorts of offenders, it became increasingly clear that impulsiveness at that level of severity was in fact only occasionally observed amongst arsonists.

Many arsonists display an unusual interest in fire and may well be excited or fascinated by fire. However, being fascinated by fire, or finding pleasure and excitement in creating fires is, conceptually, quite a different thing to a compulsion, and therefore cannot be regarded as evidence for pyromania.

**Currently, the consensus within research and rehabilitative specialists is that true pyromania is rare – possibly as few as 1% of cases encountered in any year (Ducat & Ogloff, 2011).**

# International practice in arson prevention

A conceptual framework to organising diverse approaches to prevention can be based within the 'routine activity theory' of crime (Cohen & Felson, 1979). Sometimes called the crime triangle, this theory holds that the occurrence of any crime – including arson – typically requires three things to occur together:

1. an attractive target
2. a motivated offender
3. a location lacking a capable guardian.

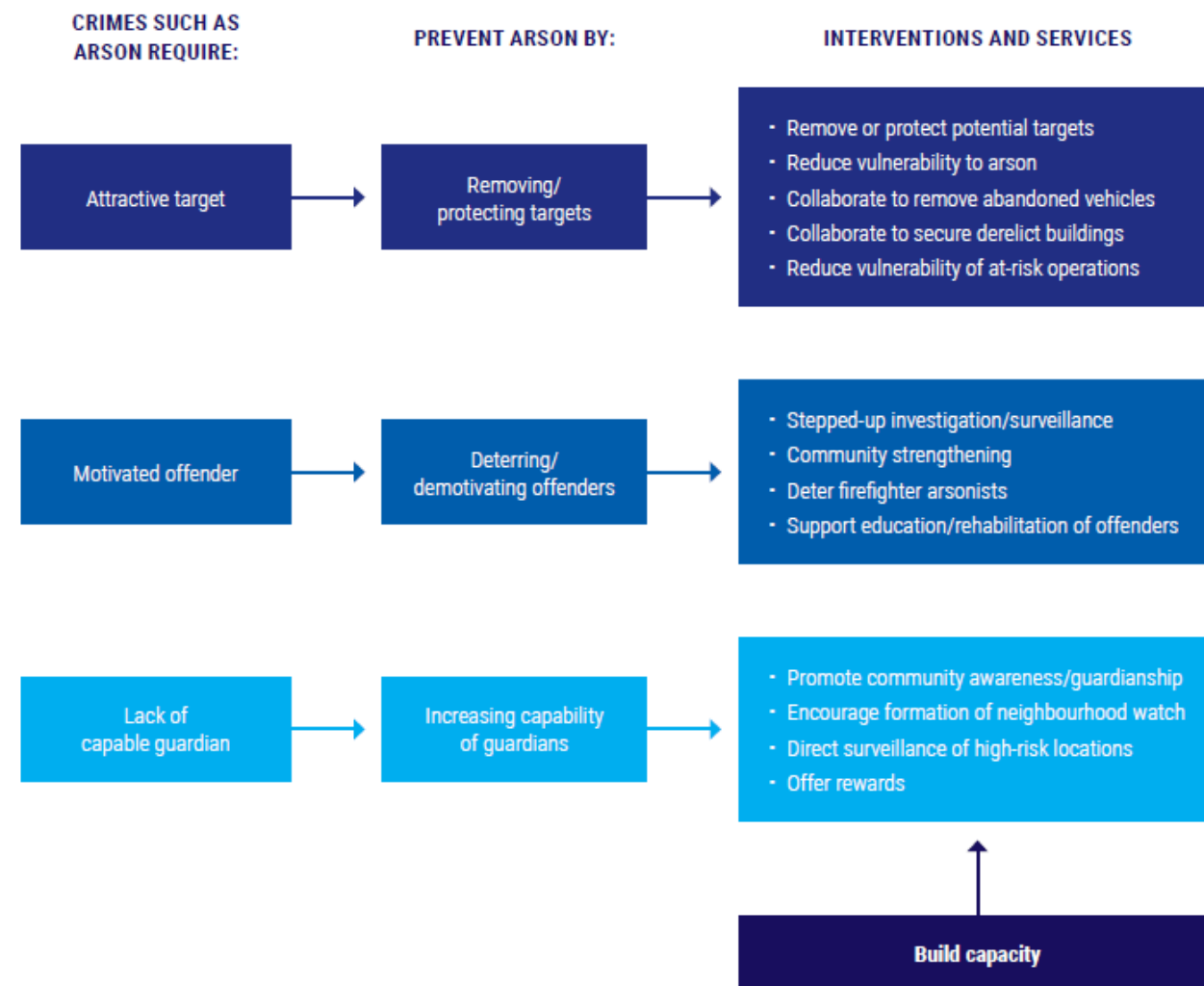
The following hypothetical example illustrates how these pre-requisites function together to bring about an arson event:

1. A rubbish skip outside an op-shop, overflowing with paper, cardboard and old and broken wooden furniture, might constitute an attractive target.
2. An intoxicated individual, on his way home after midnight, feeling aggrieved and angry about something that happened earlier that evening, might become a motivated offender.
3. And the fact that the area is otherwise deserted at the time, and without any working CCTV cameras, could constitute the absence of capable guardians.

Arguably, a comprehensive arson prevention strategy will therefore attend to all three dimensions, and include interventions that:

- reduce or remove attractive targets
- deter or otherwise de-motivate potential offenders AND
- increase capability of guardians.

Further, interventions across all dimensions should be grounded in a good understanding and appreciation for the cultural context within which they are delivered.







**Next steps**

## Summary of findings

Our arsons appear to be perpetrated mainly by individuals who are generally criminally active, arson is simply one way they express their antisocial tendencies.

The data also suggests that perpetrators are subsequently more likely to engage in other forms of crime.

Māori are over-represented amongst those apprehended and sentenced for arson offending.

Environmentally-based preventive actions are the most promising form of prevention. This particularly includes efforts to protect potential target sites, and promoting general arson awareness so that citizens are active in observing and reporting suspicious behaviour.

Arson is in some ways a uniquely difficult crime to both prevent, given the ease with which fires can be started, and the infinite number of possible reasons why an individual may decide to act in this manner.

Ensuring that arson incidents are correctly identified as such, and maximising the chances of apprehending the persons responsible, will almost certainly have a strong deterrent effect.

Finally, improving the data on arson incidents would be a critical step not just for determining where and in which manner to intervene with prevention efforts, but also in determining whether prevention methods are having an impact in terms of reducing arson.

## Now what?

- How can your organisation learn from this work?
- What is something you think your team could learn from this research?
- How can you use this information?
- What does this mean for our future roles?
- What does this mean for cross agency relationships?



