

# PART TWO: INTERVENTIONS



## 5 Supply reduction

Unlike many other drugs, licit and illicit, volatile substances are not marketed and used primarily as intoxicants. Compared with frameworks in place for regulating supply of other legal drugs such as alcohol or tobacco, there is currently very little regulation of inhalant product availability in urban Australia. Where measures to modify either the availability or content of products subject to inhalant use have been taken, subsequent effects on either prevalence or harm have rarely been evaluated.

One objection frequently raised in response to efforts at reducing supply of volatile substances (as other drugs) is that users will simply substitute other sources of intoxication (Ives, 1994; Parliament of Victoria Drugs and Crime Prevention Committee, 2002). There is some evidence to support this concern: in the UK, the introduction of legislation and education targeting sales of glue products was followed by an increase in deaths from more dangerous butane and aerosol misuse (Esmail, Anderson, Ramsey, Taylor, & Pottier, 1992; Taylor, Field-Smith, Norman, Ramsey, & Anderson, 2000). Similarly, early anecdotal reports from some Cape York communities in north Queensland, where sniffable petrol is no longer available due to substitution with Opal non-sniffable fuel, suggest that paint sniffing has been observed (Robertson & Martin 2006 in Shaw, Watson, Wakerman, & Dewhurst, 2006).

In this section we review evidence relating to the effects of three approaches to VSM supply reduction: product modification, locking up supplies of petrol, and statutory and voluntary measures restricting sales of inhalants.

### 5.1 Product modification

Three ways of modifying volatile substances in order to deter VSM have been identified: replacement of harmful or psychoactive components, addition of deterrent chemicals, and package modification (Advisory Council on the Misuse of Drugs, 1995; World Health Organization, 1999). In discussing each of these in turn, we draw on an article published in 2006, where they are considered in more detail (MacLean & d'Abbs, 2006).

#### 5.1.1 *Replacement of harmful or psychoactive components*

This kind of intervention involves reformulating products either to reduce their psychoactive effect (and thus make misuse less attractive) or to replace particularly harmful chemical components with more benign alternatives. The approach has been described as the most effective form of volatile substance product modification (MacLean & d'Abbs, 2006; World Health Organization, 1999). The best known examples in Australia are the Comgas scheme, which involved substituting aviation fuel for unleaded petrol in Central Australia in the 1990s, and a subsequent scheme in which a new non-sniffable fuel known as Opal was substituted for unleaded petrol in remote communities (Shaw et al., 2004). Because of their importance, both of these schemes are described separately below.

In compliance with the Montreal Convention (an international environmental agreement), all products in Australia previously containing chlorofluorocarbons (CFCs) or trichlorethane (the intoxicating component of correction fluids) have now been reformulated. Some products are now produced without propellant chemicals, in pump packs (Flanagan & Ives, 1994; World Health Organization, 1999); however, not all products can be reformulated in this way. VSM products which have been modified to remove their intoxicating potential have subsequently been associated with reduced morbidity. Since 1995 there have been no UK deaths associated with correction fluid or pain relief sprays and only one associated with use of an old (unmodified) fire extinguisher (Field-Smith, Butland, Ramsey, & Anderson, 2006).

One Australian company, Barloworld, has reformulated its ‘White Knight’ spray-paint range to make these products less attractive to chromers (Drugs and Crime Prevention Committee, 2002). Toluene has been removed from paints in this range. It is unfortunate that no research has been undertaken to explore whether ‘White Knight’ paints have subsequently become less attractive as intoxicants. In Alice Springs promising information is emerging about the effectiveness of restricting paint sales to low-toxicity products. After meeting with CAYLUS staff, local retailers voluntarily agreed only to sell low-toxicity forms of spray-paint. Sales of paint have since dropped dramatically with some slight increase observed in glue sniffing (personal communication, Tristan Ray).

#### *5.1.2 Addition of deterrent chemicals*

Adding deterrent chemicals to VSM products is viable as an option only where the modification does not adversely affect legitimate users, a factor which has consistently confounded attempts of this nature (Akerman, 1982; Kerner, 1988; Sharp, Beauvais, & Spense, 1992).

In 1968 Testor Corporation, an American company, added oil of mustard (a deterrent chemical) to model aeroplane glues, then an inhalant popular with teenagers. This resulted in dramatic reductions not only in glue misuse but also in sales of the product (Bauerlein, 1993; Jeffrey, 1995). Oil of mustard has also been added to correction fluids. The Parliament of Victoria Drugs and Crime Prevention Committee (2002) reported claims by one agency that the addition of mustard oil to Liquid Paper in Australia in the 1980s reduced a fad of correction fluid sniffing. Nonetheless, one of the few published articles mentioning this intervention documents one young man’s death in the US from the direct effects of inhaling Liquid Paper despite the presence of a mustard oil additive (Troutman, 1988).

Concerns have been raised in relation to the irritant effects of oil of mustard including blistering, slow healing ulcers, asthma, watery eyes, sneezing and contact dermatitis (Akerman, 1982). Some chronic inhalant misusers, having already severely damaged their nasal tissues, might be unable to detect deterrents or develop a tolerance to them.

In Australia, the CSIRO has conducted research into the technological issues relating to adding deterrents to petrol, spray paints and butane gas. Their study concludes that the modification of petrol is not feasible, as adding the substance at a level with potential to deter misuse would

breach legislation limiting sulphur content of petrol (National Inhalant Abuse Taskforce, 2006). Technological problems also undermine the potential to add deterrents to fuel gases. A dedicated production line would be required if mustard oils are to be added to butane gas to guard against release of sulphur into the atmosphere. The smell may also deter legitimate users. Adding deterrents to spray paint does not impair product performance but again might make products distasteful to legitimate users (National Inhalant Abuse Taskforce, 2006).

A further strategy involving addition of deterrent substances was tried in some remote Australian Indigenous communities during the 1980s. The Senate Select Committee on Volatile Substance Fumes reviewed four cases in which communities had added ethyl mercaptan to petrol (Commonwealth of Australia Senate Community Affairs References Committee, 2006, pp. 204–6). In none of the four communities did the addition prove successful. In one instance, residents objected to the offensive smell of the additive; in another, parents became distressed at the sight of their children vomiting (which, as the Senate Committee suggests, may simply point to the need to educate parents prior to introducing the additive). In another there was no genuine community support for the intervention, and in yet another, the resident medical officer concluded that the effects of the additive were no less harmful than those of petrol sniffing, particularly in the case of chronic sniffers who continued to inhale both petrol and the additive.

As an additive, ethyl mercaptan is also of limited use in VSM prevention because it is more volatile than petrol. Sniffers have discovered that it can be removed from petrol by ‘weathering’; that is, leaving the petrol out in the open, which causes the ethyl mercaptan to evaporate preferentially (Commonwealth of Australia Senate Community Affairs References Committee, 2006).

Experimental, social and chronic inhalant users may respond differently to this form of product modification. A sample of 33 users and ex-users of volatile substances at four research sites in Victoria and Queensland named cannabis and other inhalants (followed by alcohol, amphetamines and other drugs) as substances most likely to be substituted if their inhalant of choice became modified through addition of deterrent chemicals (MacLean et al., 2005, p. 39). Research participants argued that supply reduction strategies were most likely to affect the behaviour of experimental or new users, and least likely to influence chronic or long-term users who would find ways to access drugs or substitute alternative intoxicants.

### *5.1.3 Package modification*

The third method of volatile substance modification—modifying packaging so as to deter misuse while not interfering with legitimate use—has little support in the literature. Modification to aerosol can nozzles was trialled in the UK. Determined inhalers of these products managed to puncture cans or remove nozzles to access the contents, a practice that may in itself be hazardous (Parliament of Victoria Drugs and Crime Prevention Committee, 2002).

## 5.2 Introducing non-sniffable substitutes for petrol: aviation fuel and Opal

As mentioned above, one successful instance of supply reduction through product modification has been the use, firstly, of aviation fuel and, subsequently, of a low-hydrocarbon fuel known as Opal in Australian Aboriginal communities.

In the early 1990s several remote Aboriginal communities in the Top End of the Northern Territory began to use aviation fuel (known as Avgas) as a fuel substitute for petrol. Avgas had a relatively high lead content but was not volatile enough to be sniffed for intoxication. It could, however, be used safely in motor vehicles and other petrol-using engines, making it a potential alternative to unleaded petrol in communities beset by petrol sniffing.

Burns found that the use of Avgas as an aversion strategy was critical at Maningrida in eradicating petrol sniffing; however, community resolve and support were also key elements in this success. Four months after it was introduced at Maningrida in 1993, along with employment and skills training programs, petrol sniffing ceased (Burns, Currie et al., 1995). Although some sniffers tried Avgas, they did not persist (Burns 1995b, 1996). Following the Maningrida experience, Petrol Link-up (discussed in section 6.1.4) recommended that Central Australian communities consider using Avgas instead of petrol, at the same time cautioning against Avgas on its own being seen as the answer to petrol sniffing (Shaw et al. 1994, p.16).

In the next few months, more than 20 Anangu Pitjantjatjara communities switched to Avgas as part of a regional strategy. *Moving On* (Roper & Shaw, 1996) assesses the impact of its introduction on Anangu Pitjantjatjara Yankunytjatjara (APY) Land communities. The report found a marked decline in petrol sniffing between 1984 and 1995, with a particularly steep decline occurring following introduction of Avgas in 1994. In communities where sniffing continued, it had become episodic, as availability was irregular. Those who did continue sniffing were older, chronic sniffers; few young people commenced sniffing. Over the same period, petrol sniffing-related arrests dropped dramatically. Two years later, sniffing was reported to have increased, but not to pre-Avgas levels (Nganampa Health Council, 1996, 1997).

In 1998, the Australian Government raised the level of excise on Avgas when used for non-aviation purposes, making the cost of Avgas to communities considerably higher than unleaded fuel. In response, several communities successfully petitioned the government for assistance, leading to the introduction of a subsidy scheme known as the Comgas Scheme, under which the Commonwealth subsidised each litre of fuel purchased by participating communities to enable them to maintain price parity with unleaded petrol (Shaw et al., 2004; Youth Solvent Addiction Committee, 2003). By 2004 more than 30 communities were participating in the scheme.

An evaluation of the Comgas Scheme published in that year concluded that, while the strength of the effect varied, communities which had maintained the use of Avgas over a sustained period had eliminated regular petrol sniffing and associated harms. The degree of success depended on the consistency of application and the proximity of alternative sources of vehicle fuels. The scheme was also found to be popular in those communities where it had been maintained. The evaluators recommended not merely its continuation but an expansion (Shaw et al., 2004).

By now, however, the high lead content of Avgas meant that for environmental reasons it was no longer considered an acceptable fuel. In mid-2004 BP Australia, producer of Avgas, announced its intention to change the formula for Avgas fuel by reducing the lead content and increasing the level of aromatic hydrocarbons. The new fuel would be environmentally friendly—but no longer unsniffable. At around the same time, BP also began work on a potential replacement for Avgas in Aboriginal communities by producing a new vehicle fuel containing no lead and very low levels of the aromatic chemicals that give other forms of petrol their intoxicating properties.

The new fuel, known as Opal, was launched in February 2005 (Australian Government Department of Health and Ageing, 2007). Like Avgas, Opal was subject to a Commonwealth subsidy. However, whereas the original subsidy had been paid to distributors, under the new version a subsidy of around 33 cents per litre was paid to BP Australia in recognition of the higher production costs of Opal fuel.

Initially, the government's intention was to make Opal available to all 42 communities registered under the Comgas scheme or with 'registration pending' status. The Australian Government allocated \$9.6 million in the 2005–2006 budget to cover the Opal subsidy over the next four years (Minister for Health and Ageing (Tony Abbott MP) & Minister for Immigration and Multicultural and Indigenous Affairs (Senator Amanda Vanstone), 2005). Almost from the beginnings of the Opal rollout, however, pressures for its expansion emerged, probably the most influential being a report prepared by Access Economics and released in March 2006 (Access Economics Pty Ltd, 2006). Entitled *Opal Cost Benefit Analysis*, the report was commissioned by the Opal Alliance, a group comprising the GPT Group, owners of the Ayers Rock Resort, the Ngaanyatjarra Pitjantjatjara Yankunytjatjara (NPY) Women's Council and the Central Australian Youth Link-Up Service (CAYLUS). The report concluded that petrol sniffing in Central Australia cost an estimated \$79 million a year, and that governments would save \$27 million a year by rolling out Opal universally in Central Australia. The case for a regional rollout of Opal gained further support in June 2006 when the Senate Community Affairs References Committee tabled the results of an inquiry into petrol sniffing (Commonwealth of Australia Senate Community Affairs References Committee, 2006).

By this time, the Commonwealth had already expanded its commitment to Opal by acknowledging the need for a regional rather than a community-by-community approach. In September 2005 it successfully enlisted support from the state/territory governments of SA, WA and NT for an 'Eight Point Plan' to combat petrol sniffing, under which the respective governments committed themselves to:

- adopting consistent legislation with strong penalties for offences relating to sale or supply of volatile substances for sniffing;
- appropriate levels of policing;
- further rollout of Opal fuel;
- developing diversionary activities for young people;

- providing treatment and respite facilities;
- developing communication and education strategies;
- strengthening and supporting communities; and
- evaluating interventions (Minister for Families Community Services and Indigenous Affairs (Mal Brough MP) & Minister for Health and Ageing (Tony Abbott MP), 2006).

At the same time, the Commonwealth allocated an additional \$9.5 million to addressing petrol sniffing in Central Desert communities, an area of approximately 128,000 sq. km that included Yulara Resort and other roadhouses on the Lassetter and Stuart Highways (Minister for Health and Ageing (Tony Abbott MP) & Minister for Immigration and Multicultural and Indigenous Affairs (Senator Amanda Vanstone), 2005). In October 2005 the government officially renamed the Comgas scheme the Petrol Sniffing Prevention Program (PSPP) (Australian Government Department of Health and Ageing, 2007).

In July 2006 the Australian Government committed \$12 million to supply unleaded Opal fuel in all petrol stations in Alice Springs. In February 2007, the then Minister for Health and Ageing, Tony Abbott MP and the then Minister for Families, Community Services and Indigenous Affairs, Mal Brough MP, jointly announced an expansion of the Central Desert Region to incorporate Alice Springs and extending north to just above Ti Tree and west of the Stuart Highway, as well as a new region in the East Kimberley. The regions covered by these decisions are shown in Figure 3.

*Figure 3: Regions involved in Opal rollout*



As of September 2007, there were 72 communities, 3 pastoral properties and 29 service stations/roadhouses receiving Opal fuel under the PSPP program. In December 2007 the Department of Health and Ageing commissioned an independent evaluation of the impact of the Opal rollout in PSPP communities. The evaluation is expected to be completed by mid-2008.

In the months following the introduction of Opal, a number of observers claimed to have witnessed (or, more frequently, heard of) adverse consequences, including black marketeering in unleaded petrol, trading petrol for sex, and mixing Opal fuel with various additives in attempts to get high from it (Bockmann, 2006; Chapman, 2006; Hughes, 2005). More recent evidence suggests that the overall impact has been beneficial. A 2006 survey of petrol sniffing prevalence among communities in the APY Lands served by Nganampa Health Service revealed a 60% drop on 2005 levels, which in turn represented a 20% reduction on 2004.

In May 2007 Nganampa Health Service repeated its prevalence survey and found evidence of a further decline in sniffing—to just 38 individuals, or 1.3% of the total population of the NPY Lands (Nganampa Health Council, 2007). In all but two communities, no sniffing was reported between October 2006 and May 2007. The report states:

The lack of availability of sniffable fuels is likely to have contributed significantly to the marked and to date sustained reduction in petrol sniffing on the APY Lands. The introduction of Opal fuel has largely (though not completely) eliminated supply. Active policing is required to eradicate illegal dealing in sniffable fuels. Although not specifically investigated, informal comment from informants suggests that whilst some other volatile substance abuse had occurred (e.g. sprays, paint or glues), this has not been widespread (Nganampa Health Council, 2007, p. 4).

Wilson (2007) cites several local observers as reporting that the petrol sniffing crisis in Central Australia appeared to be over; that while some sniffing was still taking place in Alice Springs itself, numbers of users in remote communities had dropped sharply and, on the NT side of the border, the practice had virtually disappeared. According to Wilson, there was widespread agreement that the introduction of Opal had played a major role in the change, but in at least one community local leaders insisted that community concern had also been important. Wilson also urged caution in interpreting the short-term findings, noting that Comgas had also brought about a short-term sharp reduction in sniffing, followed by relapses in some places. Some communities were reported to be expressing concern about an apparent increase in marijuana use, while some motorists in Alice Springs were also reluctant to use Opal in the mistaken belief that it would damage their engines. The decline in sniffing apparently brought about by Opal, Wilson concluded, should be used as a window of opportunity to address other causes, such as the lack of alternative activities.

### 5.3 Locking up petrol supplies

The 1985 Senate inquiry into VSM concluded that the strategy of restricting or preventing access to petrol, being the most obvious response to sniffing, had been tried in just about every place where sniffing had become a problem—with just about universal lack of success (Commonwealth of Australia Senate Select Committee on Volatile Substance Fumes, 1985). Even where petrol supplies are carefully controlled in remote communities, people have found ingenious ways to access sniffable fuel. A petrol sniffer in a remote NT community was known to simulate ‘vehicle breakdowns’ in order to plead with passing tourist traffic for petrol (Fietz, 2005). As the Senate Committee pointed out, regardless of the measures employed—and these included fitting locking petrol caps, surrounding pumps with weldmesh cages and using guard dogs—sniffers would cut fuel lines, break into the pumps or break open petrol tanks. Watson (1986) documents the failure of protective measures at one Top End community in the early 1980s. Despite the fact that the local council had installed a second cyclone fence around the petrol pumps in the main vehicle yard, and employed both a guard dog and, subsequently, a patrolman, an estimated 600 litres of fuel were stolen each month.

This does not, of course, mean that sniffable petrol should be left unsecured in any community where VSM might occur. However, as the basis for a VSM prevention strategy it is clearly inadequate.

### 5.4 Restricting sale of VSM products

Most inhalable substances are exempt from scheduling as drugs or poisons in Australia, with a result that their supply is not restricted in the same way that governments manage availability of other intoxicating substances (see National Inhalant Abuse Taskforce, 2005, p. 55 for a discussion of this matter). However, a number of jurisdictions have introduced statutory restrictions on supply of specified VSM products to persons under 18 years, while some community-based groups have successfully negotiated agreements with retailers under which the latter voluntarily reduce availability of such products, for example by agreeing to keep spray paints under a counter rather than on open shelves.

#### 5.4.1 *Legislative approaches to sales restriction*

The benefits of legislating to restrict sales of volatile products are unclear. Some commentators have argued that compulsory sales restrictions are hard to enforce, and alert young people to the potential misuse of products or simply encourage users to substitute other, potentially more harmful, inhalants (Ives, 1994; Parliament of Victoria Drugs and Crime Prevention Committee, 2002). As observed above, this was evident in the UK when introduction of legislation and education targeting sales of glue products was followed by an increase in deaths from butane and aerosol misuse (Esmail et al., 1992; Taylor et al., 2000). Also in the UK, regulations introduced in 1999 banned the sale of cigarette lighter refills to persons under 18 years. Deaths associated with lighter fuel VSM among under 18s fell in 2000, 2003 and 2004 but returned to earlier levels in the

intervening years of 2001 and 2002 (Field-Smith et al., 2006). Other governments considering the efficacy of VSM product sales restrictions will no doubt be watching these trends closely.

Some Australian states restrict sale of inhalant products. In South Australia it is illegal to sell spray paint cans to people under 18 years of age, and such products must also be stored in locked cabinets. It is also illegal to sell petrol to people under 16. New South Wales similarly prohibits spray-paint sales to minors. In both instances legislation was introduced to deter graffiti rather than chroming, but effects on either practice have not been evaluated (National Inhalant Abuse Taskforce, 2005). In 2007 South Australian legislation was introduced extending restrictions to the sale of wide-tip markers as well as paints, and requiring retailers to maintain a register of VSM product sales. Amendments to legislation in Queensland prohibited the sale of spray paints to under-18 year olds from September 2007 (Queensland, 2007).

In most Australian jurisdictions it is an offence to sell VSM-affected products where the vendor could reasonably be expected to know they are intended for this purpose. It is of course very difficult to prove that a retailer was aware of intended misuse when selling a product (National Inhalant Abuse Taskforce, 2005).

#### *5.4.2 Voluntary approaches to sales restriction*

Many local attempts to reduce VSM prevalence have entailed efforts to reduce supply through voluntary agreements with retailers. The limited evidence indicates that targeting retailers has been an effective strategy when introduced through a local community development process entailing retailer education (Helfgott & Rose, 1994; Mosey, 2004).

For instance, a campaign in Alice Springs involved a project officer visiting all retail outlets that stocked spray paints, asking vendors to keep affected products locked away and advising them of legislation making it an offence to knowingly sell products that will be used for VSM. This intervention reduced spray can sales in Alice Springs by over 600 cans a week and numbers of sniffers fell from an estimated 70 to 17 sniffers (Mosey 2004). Those who persisted were generally more long-term and intensive users. Interestingly the community experienced only a small amount of transfer from spray paint misuse to misuse of deodorants, glues and cannabis. This strategy is unlikely to be as effective in a larger urban context where people may continue to access VSM products at retail outlets outside the targeted area. Staff at one Alice Springs store now maintain a registry of paint sales which is shared with police and staff of Central Australian Youth Link-Up Service (CAYLUS) (Central Australian Youth Link-Up Service, 2006a).

Also in the NT, a retailer resource kit to guide the responsible sale of solvents has been developed in the NT by Amity Community Services (see Central Australian Youth Link-Up Service, 2006a, p. 47). Amity have conducted a responsible sale of solvents campaign in the NT town of Palmerston and offered diversionary activities for young people. An evaluation of the project found the reduction in harm, supply and demand of solvents was addressed and arguably the major factor in the success of the project has been in providing recreational alternatives and a safer environment for the community (Entwistle, Piper, Ford, & Burch, 2007).

Figure 4: Poster from retailer resource kit developed by Amity Community Services, NT



Some retailers appear to be anxious about possible legal consequences of refusing to sell products subject to VSM. One anti-VSM project in Western Australia took the approach of meeting with staff at a shop to ascertain how young people were accessing affected products. It emerged that retail staff were concerned that denying young Aboriginal people's requests to purchase spray paints would leave them vulnerable to charges under racial discrimination

legislation. Retailers were assured that if the store had a written policy regarding sale of VSM products to people believed likely to use these substances as intoxicants, had signs displayed to this effect, and treated Aboriginal and non-Aboriginal customers equally, then no legislation would be breached (Helfgott & Rose, 1994). Staff were provided with training and a list of verbal responses to assist them in refusing to sell volatile substance products.

A similar project was initiated by police in Werribee in Victoria during 2000 (see Drugs and Crime Prevention Committee, 2002, pp. 263–5). Local police officers visited traders, advising them how to recognise the symptoms of VSM, and asking them to place VSM products in places where they would be difficult to steal and not to sell these products to youth at risk. Although a clear drop in VSM in public places occurred in the area concerned, staff could not be confident that users had not simply moved elsewhere and concluded that future campaigns should have a broader reach. The Sunshine Chroming Awareness Project (see section 6.2.1) found writing to major chains rather than visiting local outlets to be the most effective means of reducing VSM product sale (Parliament of Victoria Drugs and Crime Prevention Committee, 2002, p. 391).

During recent years education kits have been distributed by state governments to retailers in Victoria, Queensland, the Northern Territory and Western Australia advising them to display such products securely and of their right to refuse sales of products they suspect may be misused (see, for example, State Government of Victoria, 2002). The effectiveness of these campaigns has not been evaluated. Nonetheless young people in one study conducted in 2005 reported that VSM products had become harder to access, thus curtailing but not stopping the practice. A 17 year old man advised researchers that paint could not be purchased in larger chains, but that it was still possible to acquire these substances from smaller outlets or automobile product outlets:

You sniff what you can get. It's harder to get now. You need an 18 year old to get it [paint]. They [shop assistants] know now and ask what you are doing. Car shops are easy to get the paint from (rural participant cited in MacLean et al., 2005, p. 44).

## 5.5 Summary

- Supply reduction measures have been part of many apparently successful anti-VSM strategies, although few such measures have been evaluated.
- Because many current inhalant users are poly-drug users, there is a risk that supply reduction may lead to other, possibly more harmful, drugs. This has occurred in some instances.
- Three broad approaches to VSM supply reduction can be distinguished: product modification; locking up supplies of petrol; and statutory and voluntary measures restricting sales of inhalants.

*Product modification*

- Three ways of modifying volatile substances in order to deter VSM have been identified: replacement of harmful or psychoactive components of inhalants; addition of deterrent chemicals; and package modification.
- The limited evidence available suggests that the most successful of these is the first—that is, reformulating products by replacing particularly harmful chemical components with more benign alternatives. However, not all products can be reformulated in this way.
- One well documented example of product modification has been the use of a non-sniffable, low-hydrocarbon vehicle fuel, known as Opal, in more than 70 Australian Aboriginal communities. Anecdotal evidence suggests that, since the introduction of Opal early in 2005, it has led to a reduction in petrol sniffing. No formal evaluation of the scheme has yet been undertaken.
- The Opal scheme (which in September 2005 was officially renamed the Petrol Sniffing Prevention Program) was successor to an earlier scheme, under which Aboriginal communities received a subsidy from the Australian Government to enable them to retail aviation fuel (known as Avgas) at price parity with unleaded petrol. Avgas, being low in aromatics, was also un-sniffable, but was phased out from 2004 because of its high lead content, and therefore environmental implications. Evaluation of this initiative showed that its introduction was associated with reduced petrol sniffing and associated harms, particularly when implemented alongside other measures.
- Product substitution measures for volatile substances commonly misused in urban areas should be further investigated, for instance restricting spray paint sales to relatively low-toxicity products.
- The two remaining ways of modifying inhalants—by adding deterrent chemicals or altering packaging so as to deter misuse—have both been tried in various settings, without evidence of success.
- Evidence suggests that product modification has maximum effect on early and/or occasional users, rather than chronic users.

*Locking up petrol supplies*

- Although many attempts have been made to prevent petrol sniffing by restricting access to supplies, especially in remote communities, evidence suggests that such efforts are almost invariably unsuccessful.

*Statutory and voluntary restrictions on sales of VSM products*

- Most Australian jurisdictions prohibit the sale of specified VSM products where the vendor could reasonably be expected to know the goods are intended for misuse.
- A number of jurisdictions have introduced statutory restrictions on supply of specified VSM products to persons under 18 years. The effects of legislating to restrict sales of volatile products are unclear. In the UK, the introduction of legislation targeting sales of glue products was followed by an increase in deaths from butane and aerosol misuse (Esmail et al., 1992; Taylor et al., 2000). Also in the UK, regulations introduced in 1999 banning the sale of cigarette lighter refills to persons under 18 years have been followed by declines in deaths associated with lighter fuel VSM in some years, but not in other years.
- Several local attempts to reduce VSM prevalence have entailed efforts to reduce supply through voluntary agreements with retailers. The limited evidence indicates that targeting retailers has been an effective strategy when introduced through a local community development process entailing retailer education.