

Review of Evidence Relating to Volatile Substance Abuse in Scotland

Substance Misuse Research

Substance Misuse Research: Review of Evidence Relating to Volatile Substance Abuse in Scotland

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Executive Summary

In 1999, the Scottish Executive set out its plans for tackling drug misuse in Scotland – *Tackling Drugs in Scotland: Action in Partnership*. A core strand of the strategy focuses specifically on young people, actions to be taken and the messages that need to be conveyed to ensure that young people make healthy lifestyle choices, free from drugs.

The subsequently published *Drugs Action Plan: Protecting our Future* (2000), set out the need for a joined up approach to tackling drug misuse, including effective education, better understanding of the epidemiology of drug misuse and provision of appropriate treatment and interventions. Key to the plan is the need to develop the evidence base on what is known about the nature and prevalence of drug misuse in Scotland so that effective interventions can be appropriately targeted.

This report presents the findings of a review of the evidence that is currently available regarding volatile substance abuse (VSA) in Scotland, with a particular focus on young people aged under 18. The review included analysis of existing statistical data relating to the prevalence and nature of VSA in Scotland and elsewhere. It also included a review of research carried out to explore user profiles, the causes, consequences and nature of VSA, representations of solvent abuse in public media and the educational and other resources that have been developed to raise awareness of VSA among young people, their carers and professionals.

The research shows that the abuse of volatile substances has, in the last 20 years, become a secondary research agenda and is often poorly understood as a drug misuse problem among care professionals. A lack of contemporary research is coupled with low levels of media reporting on the issue, and a lack of obvious presence of VSA in drug education programmes, professional training packages and treatment services. Instead, the evidence suggests that 'glue sniffing' is often portrayed as a historical problem (tied to the 1970s and 1980s) and that illegal drugs, such as ecstasy and heroin, have become the favoured focus of research and care professionals working in the drug misuse field.

Whilst the statistical evidence does show a decline in the prevalence of solvent abuse in Scotland and other parts of the UK over the last 35 years, the abuse of volatile substances continues to be practised by a significant minority of young people and adults in Scotland.

Estimates of the prevalence of VSA come, in the main, from school based self-report surveys of secondary school children. In Scotland, the main survey that collects information on use of solvents in the last year, and in the past month, is the Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS), a biennial survey of 13 and 15 year olds that collects data on smoking, drinking and drug use. In 2004, 2% of 13 year olds and 4% of 15 year olds reported use of gas, glue or other solvents in the last year. This reduces to 1% in both age groups for use in the last month.

The main European survey that monitors solvent abuse among young people – the European School Survey Project on Alcohol and Other Drugs (ESPAD) – shows that the UK prevalence for lifetime use of inhalants is 12%, slightly higher than the average for Europe (10%).

The main data relating to adults in Scotland come from the Scottish Crime (and Victimization) Survey. Data from the latest survey in 2003 showed a prevalence of 3% for lifetime use of glue, gas or aerosols, (an increase from 1% in 2000 and 2% in 1996).

In general, surveys show no gender differences in prevalence of solvent abuse and, relative to other drugs (especially cannabis and stimulants, including cocaine, ecstasy and amphetamines), abuse of glues, gases and aerosols is low.

The reliance on self-report survey data has been criticised in the research literature and schools surveys, in particular, have been criticised for failing to capture those who are often most vulnerable or at risk of engaging in VSA, because they are often not present in the school environment. Indeed, research suggests that VSA is more prevalent among young people who are housed in young offenders institutions and among looked after and accommodated children. It is also difficult to make comparisons between school based

surveys in different jurisdictions due to lack of consistency in survey approaches, survey design and different definitions of solvent abuse.

Whilst the practice of glue sniffing, specifically, has declined, there is evidence to suggest that this has been replaced by abuse of an array of alternative products, including aerosols and other household products, and, in particular, gas lighter refills. The evidence suggests that the range of products that can be used, the availability of products, the low cost and ease of hiding products and the short term visible effects of use, make VSA easy to engage in and easy to hide. This makes it difficult to identify and adds to the problems associated with self-report measures of solvent use in achieving accurate estimates of solvent or inhalant abuse.

A number of scientific texts exist that provide coverage of psychological and physiological risks associated with solvent abuse, but much of this work stems from the US and other countries, rather than being UK based.

Literature relating to professional approaches to VSA, and referral pathways in particular, suggests that there are no dedicated services for the treatment for VSA and that many staff lack knowledge of appropriate referral routes for solvent users.

The Scottish Drug Misuse Database (SDMD), which collects current drug use data from adults presenting to treatment services for all local authorities and health boards across Scotland, showed that, in 2004/05, a total of 78 people presented to services with current solvent abuse problems, accounting for just over 1% of all adults with presenting drug misuse. The number of people presenting to services for whom solvent abuse was the main drug of abuse was just 32, most of whom were under 18. These comparatively low figures (when compared to other types of drug misuse), are often presented in the literature as being the main reason that additional resources have not been targeted at VSA in recent years.

Given the difficulties of estimating prevalence of solvent abuse, it is unclear if the level of training among professionals, and the provision of dedicated care services, is adequate. In any case, consultation with some of the key stakeholders involved in raising VSA awareness suggests that there may be a need for front-line workers, especially social work services and the police, to receive more routine VSA education and training. What does seem apparent is the lack of empirical research that has tested current levels of understanding and awareness of VSA among professionals.

A wealth of information/guidance documents exist which are, for the most part, produced and distributed by a small number of voluntary agencies working in the field in VSA or drug misuse.

The key message presented in the literature is that there is no safe way to use volatile substances since use can be fatal on first experimentation. Indeed, in the 10 year period from 1995 to 2004 inclusive, there were 78 deaths associated with VSA in Scotland (St George's University, of London, 2006). Although the number may appear low, Scotland has the fourth greatest standard mortality ratio for the last 10 years of all jurisdictions in England, Wales and Northern Ireland, sitting at 134, lower only than the North East of England at 158, the East Midlands at 137 and Northern Ireland at 136. There is evidence in the literature that a proportion of VSA associated deaths may occur in first time users.

The death risks associated with VSA appear to present unique challenges to the drug education agenda. The drug education literature shows that scare tactics do not work well with young people and that stories of first time death risks are often not believed. Fear of raising awareness of VSA methods is also cited in the literature as a reason that VSA has not, in recent years, been targeted specifically as part of drug education in the UK. Whilst some of those working in the field have argued for specific VSA education, including primary school children, traditional drug education debates regarding suggestibility of younger children may continue to act as a barrier to VSA education.

Across all the data sources, the area of VSA receiving the least attention is what works in preventing volatile substance abuse. Whilst fears about encouraging VSA through education

may account for a general lack of awareness about what works, it presents an obvious gap in the evidence base that can be used to reduce VSA in the future. Research shows mixed levels of response to public awareness raising campaigns, a resistance among professionals in raising the profile of VSA and logistical difficulties in implementing product modifications to reduce VSA. There is also a lack of fieldwork to test the effectiveness of legislative provisions to ban the sales of age-restricted good to under 18s in Scotland. Despite this, a number of harm minimisation approaches that are based on making VSA more visible can be identified from within the range of documents available.

In general, it is apparent from the existing literature that little direct consultative work has been carried out with those who have previously abused, or are currently abusing solvents. Such consultations may represent a way forward in achieving a better understanding of the reasons for initial experimentation with solvents, and the reasons for transition between solvents and illegal drug use. Cross-jurisdictional work may also be necessary to further explore why the mortality rates associated with VSA for Scotland, and those living in Northern Ireland and the North of England, are higher than for other areas of the UK.

In sum, there appears to be little research that focuses specifically on VSA in the Scottish context and a general tendency in the drugs misuse literature towards illegal drugs including cannabis, ecstasy and heroin. Much of the research work that does exist is quite old with very little work post 2000. A number of core sources of evidence are routinely cited, and some of these appear, *prima facie*, to be out of date with regards to recent trends in types of products that are used and legislative developments. Variable levels of effectiveness in the different strategies that have been employed to tackle VSA have perhaps acted as a barrier to wider efforts in the area. Whilst a body of guidance is available from a small number of agencies the lack of evaluation of these sources, or at least the hidden nature of this work in the grey literature, makes it difficult to achieve an accurate gauge of the effectiveness of current VSA communications.

Chapter 1: The Review in Context

Introduction

In early 2006, the Scottish Executive Justice Department commissioned a review of the available evidence on volatile substance abuse (VSA) among young people in Scotland, particularly, in relation to the prevalence and nature of VSA, successful prevention of VSA and effective communication of VSA information and messages.

This report details the findings of that review and makes recommendations for the way in which the review of evidence can be used to take forward the volatile substance abuse agenda in Scotland.

Policy Context

In 2000, the Scottish Executive published the *Drugs Action Plan: Protecting our Future*, which set out the various measures being implemented by the government to tackle drug abuse in Scotland.

One of the core strands of the plan is the need for targeted work with young people to reduce the prevalence of substance misuse among this group, to decrease the likelihood of VSA-related harm, and to prevent young people from entering into chaotic lifestyles often associated with drug misuse. This includes improved education and awareness of the risks and outcomes associated with substance misuse, as well as reducing the social pressures often associated with entry into abuse and other antisocial behaviour.

The Scottish Executive Plan highlights the nature of joint responsibility for ensuring that young people resist drugs, including greater awareness raising among the population *per se*, and carers in particular, with regards to the dangers of drugs and emphasising the legal responsibilities of retailers and others in restricting access to age-restricted goods to children and young people.

More recently, a specific VSA framework document published in England by the Department of Health (*Out of Sight?... not out of Mind: Children, young people and volatile substance abuse*, DoH, 2005) set out a number of recommendations for implementation by a range of stakeholders in reducing child and youth involvement in volatile substance misuse including:

- providing effective education on VSA to all children and young people, including the most disadvantaged
- providing effective targeted interventions for children and young people abusing or at risk of abusing volatile substances
- reducing the availability and accessibility of volatile substances, with a focus on butane gas lighter refills
- building the capacity of parents, carers and practitioners to identify and work effectively with children and young people who are abusing or at risk of abusing volatile substances
- increasing the evidence base with regard to what works in reducing deaths and harm from VSA.

This framework makes clear the collaborative approach that is required to address VSA and also highlights the role of research in ensuring that policies are targeted and evidence based.

The research reported here provides one strand of this coordinated approach to targeting VSA in Scotland.

The Review Strategy

The search strategy was designed to allow coverage of a range of publication outlets including policy/research reports, books, journals, public media and online resources. The strategy was also designed to access specialist knowledge of VSA held by organisations, including both those that target solvent abuse (for example, Re-Solv) and those with a broader remit with regards to drug use.

Search Terms

Five key search terms were used based on the common recurrent terms appearing in the core texts identified in the research specification. In order of use, these were:

- volatile substance abuse.
- inhalant abuse/inhalants.
- solvent abuse.
- glue sniffing/sniffing solvents.
- substance abuse.

The volume of data generated by the first four of these terms was significant. There was also considerable overlap in the evidence identified using these discrete terms, with different searches identifying the same references as the work progressed. This was used as a measure of the extent to which the exercise had reached saturation.

Data Sources

The data search began with a search of the National Library of Scotland for each of the five main search terms above. This provided the basic list of references which were entered into a spreadsheet along with the texts identified in the specification. Additional evidence was added following subsequent searches.

The databases that were interrogated for the review were:

- National Library of Scotland - Main Catalogue.
- British Medical Journal.
- Metapress Journals.
- PsychInfo.
- Science Direct.
- ProQuest Newspapers UK (12 publications).
- Scottish Executive and Scottish Parliament Webpages.
- Websites for Re-Solv, EducaRI, SOLVE IT, Scottish Drugs Forum, DrugScope, Scotland Against Drugs, Drug Misuse Information Scotland, Fast Forward and Know the Score.

Other ad hoc publications were identified using the Google search engine. Additional evidence already known to the researchers was also automatically included in the review.

A generic drug education search was also carried out. This produced a wealth of documentation relating to formal drug education in Scotland and elsewhere. The volume of this evidence was too great for inclusion in this review.

Consultation

Volatile substance abuse is a niche area and there are a number of core agencies and data holders working in this field who have invaluable expertise and well established knowledge that was necessarily gleaned for this exercise.

To complement the review of documentary and statistical evidence, a number of informal interviews were carried out with core stakeholders. These included charity representatives, other researchers with specialist interests in this field, Local Authority representatives and government researchers in England, Wales and Northern Ireland. Essentially, this contact explored if there were any core documents or research that they could contribute to the review and, importantly, any data that had not been identified by the research team.

As well as accessing the valuable collective knowledge held by others, this acted as a quality control exercise to minimise omission of core documents known in the field. It provided an indication of gaps in the evidence identified and also provided an opportunity for people to pass on details of literature that may be difficult to identify from the searches proposed (especially 'grey literature').

Research Boundaries

The specific focus of the work was to review evidence on the nature and prevalence of VSA among young people in Scotland, especially among 12-18 year olds. The review also required analysis of contemporary evidence, with an emphasis on the 10 year period from 1995.

Despite these boundaries, an initial scoping study was undertaken with a view to identifying all relevant literature in the field of VSA, which could then be streamlined for the second stage of the work - an in-depth review of the evidence identified. Therefore, the search included:

- all research identified using the above search terms as key words, irrespective of the date that the evidence was collected/published
- all evidence relating to both adult and juvenile VSA (although the majority of evidence identified was inherently biased toward young people)
- evidence relating to VSA internationally and not restricted to the UK.

At the early planning stages, it was anticipated that the review would include evidence relating to substance abuse more generally. As the initial search progressed, however, it was apparent that such searches were generating little new evidence relating specifically to VSA than earlier, more specific search terms. This may indicate that VSA is generating less research interest compared to other drugs (such as ecstasy, for example). This itself may provide an area for future research, for example, to test if trends in the volume of research mirror trends in VSA prevalence or, alternatively, if new drugs simply provide more interesting research material than glues, gases and solvents for research professionals. For this exercise, however, a decision was made to abandon this search term as it was felt that it was having little benefit in terms of identifying relevant new material.

Research Caveats

It became clear as the research progressed that volatile substance abuse is a niche interest area and much of the information relating to VSA is hidden within wider substance misuse information materials. This may mean, therefore, that some evidence was missed as a result of being hidden within wider substance misuse texts.

Further, the review findings suggest that much of the work that does specifically explore VSA can be classified as 'grey literature.' This includes information from across different sectors (government, academia, business, and industry), that is both printed and in electronic formats, but which is not controlled by commercial publishing interests and which is, therefore, often missed by public domain searches. Access to such literature is often only possible following direct consultation with the literature's authors or distributors. Whilst this research included consultation with a small number of 'core stakeholders', it was not

sufficiently comprehensive to allow us to claim with confidence that all relevant material was identified. It is anticipated, therefore, that a small minority of newsletters, reports, working papers, Ph.D. theses, government documents, bulletins, fact sheets, conference proceedings and other such publications may have been missed, due to their absence in the search engines used.

In general, there is a lack of consultative work that has been carried out with people who have experience of abusing solvents. Of the empirical research that is available, much of it appears to have been carried out with small numbers of participants. With much of the work being carried out by specific drug agencies, this could be reflective of the numbers of people they deal with directly. In itself, this may be problematic insofar as research being based on biased samples i.e. only those who are known to services and who have sought or are seeking support. Research with these groups may not be transferable to more hidden VSA participants or those at an early stage in VSA use or experimentation.

A great deal of the research that is available also stems from Australia and the US. Whilst this fills some of the gaps in the UK evidence base, it remains to be fully explored as to whether cultural differences would affect the findings or transferability of this work to the Scottish context.

Finally, the identification of evidence was carried out in the 4 weeks between 9th January 2006 and 3rd February 2006. With this in mind, it is important to note that the results of this review are time-restricted and can only be considered as representative of the evidence available at the time that the searches were carried out. This is especially important for some of the more regularly updated publication databases that were searched (i.e. newspaper and journal listings) and is noted here as a caveat since information appearing after the time period specified above will not be included.

Whilst we have indicated in this report some known research that is currently underway or awaiting publication, in order for the evidence pool to be considered truly comprehensive in terms of contemporary relevance, regular searches would need to be carried out and this is beyond the scope of the research being reported here. What this research does provide, however, is a template for further searches to be carried out quickly and efficiently.

Presentation of the Review Findings

The following chapters present the findings from the review. Chapter 2 provides an introduction to the core definitional issues around volatile substance abuse, and describes the available evidence relating to known substances of use and methods of abuse. It also provides information on user profiles and the consequences and correlates of solvent abuse, including death associated with VSA.

Chapter 3 summarises the available evidence relating to VSA prevalence, both in the UK and internationally.

Chapters 4 and 5 address issues of education, awareness raising and training in relation to VSA and strategies for preventing VSA, evaluation, interventions and treatment alternatives.

Finally, Chapter 6 summarises the main themes to emerge from the data and identifies gaps in the evidence, as well as positing recommendations for future research and other activity.

Chapter 2: Nature of Volatile Substance Abuse

Definitional Issues

The core features of VSA definitions across the research literature, are **intentionality**, the desire to **alter one's consciousness** and the aim to do so by **inhaling** a volatile substance.

Essentially, volatile substance abuse may be considered as such if it involves **deliberate** or **intentional inhalation** of **gases or solvents** for the sole purpose of achieving mental excitation or getting a 'buzz'. Indeed, there has been much research evidence that has explored occupational exposure to volatile substances, especially among medical professionals working with dangerous and toxic solutions, and which falls outwith the remit of VSA, but which may present an exaggerated view of the amount of work in the area of inhalant effects.

Another specific niche area, namely, 'poppers', was excluded from the review. These are often classified separately within the research literature.

Across the research literature, there is also conflict in the terms used to describe volatile substance abuse. These include 'volatile substance abuse', 'solvent abuse' and 'inhalant abuse', all of which are used interchangeably in this report.

Abused Products

The research evidence suggests 4 main categories of substances that are abused, these being gas fuels (butane gas), aerosols, solvents and glues.

The 2003 Know the Score publication, 'Volatile Substance Abuse', asserts that the most commonly used substances are:

"Butane gas, used as a propellant for aerosols or as fuel gas for products such as lighters"

and

"Solvents, which are used in many products to keep the ingredients in a liquid state within a canister or bottle."

St George's, University of London, which reports on deaths associated with VSA, has also shown that glue continues to account for a small proportion of VSA deaths, (10% of all substances for deaths recorded in 2004), although its popularity has decreased since the 1970s and 1980s. The actual distribution of substances across all VSA associated deaths recorded by St George's, for the period 1971-2004 are gas fuel (46%), aerosols (18%) and glues (16%). The low use of glue, as compared to other volatile substances, appears to be consistent across all age groups.

Within these 3 substance categories, a plethora of products that can be abused have been identified in the literature. Again, St George's, University of London (2006) provides details of the products associated with death used within each of the three core categories. The data shows that:

- cigarette lighter fuel is the most popular gas fuel product used (accounting for 38% of all substances)
- deodorant/antiperspirants account for 8% of all aerosols used, and are the most popular aerosol product used
- contact adhesives make up almost half of the products used for the glue category, accounting for 7% of all substances used and 47% of all glue types abused (other glues include bicycle tyre repair glue and model glue).

Evidence from the US shows similar trends in popularity between different substances and products. Spiller (2004) reports that, of all cases of solvent abuse recorded by poison control centres across the US for the period 1996-2001 (n=11,670), the three products responsible for most deaths were gasoline (45%), air fresheners (26%) and propane/butane (11%). The precise cause of death is not made clear.

Whilst gas (cigarette lighter refills) and household aerosols clearly account for a large proportion of substances used, there is also evidence to suggest that the array of products being used for inhalation purposes is expanding. In 2004, substances other than gas, aerosols and glues accounted for 10% of all substances associated with VSA deaths (St George's, University of London, 2006). Products in this category (for 2004) include anaesthetic agents, alkyl nitrite and petrol. The use of products outwith the main 3 categories has remained reasonably consistent between 1995-2004, accounting for between 9-18% of all substance use recorded against VSA deaths for that period. There was a low of 2% in 2001, when a corresponding peak in gas fuel usage can be observed.

Although not apparent in more formal research outlets, popular reporting of VSA suggests that recent trends in inhalant abuse include burning of bus shelters to get high and burning of plastic wheelie bins to inhale the fumes (Scotsman, 25 September, 2002). Such observations should, however, be treated with caution since alternative motives, such as vandalism, may also account for such behaviours. St George's, University of London (2006) also note that, in recent years, there has been an increase in the number of deaths resulting from the inhalation of helium.

Given the broad nature of products that can be used, the evidence suggests that VSA is popular, especially among young people, for a number of reasons, including:

- **availability** – products that can be used are readily available in the home and the school (Kurtzman et al., 2001; Blake and Butcher, 2004)
- **cost** – the cost of products that can be used is less than the cost of alcohol, cigarettes and other substances (Kurtzman et al., 2001; Blake and Butcher, 2004)
- **easy to hide** – inhaled products are easy to conceal since they are mostly everyday household items. It is also easy to hide use of volatile substances since inhalation has a short term outwardly visible effect on participants (Kurtzman et al., 2001)
- **legality** – many of the products that can be used can be legally purchased and do not arouse suspicion among retailers (for example, nail-varnish remover, deodorants and glues)
- **low addiction risks** – unlike other substances, many of the products used are non-addictive and there is a low risk of dependency. This could, however, be compounded by adolescents simply outgrowing VSA and moving on to other drugs before habitual use of solvents occurs.

Essentially, the evidence shows that volatile substance abuse has a broad profile in terms of products used. Appendix 1 provides a list of substances that are cited in the various sources of evidence reviewed for this research.

Methods of Abuse

A range of inhalation methods are reported in the research literature, including:

Sniffing: "involves the inhalation of vapours directly from an open container or a heated pan" (Kurtzman et al., 2001, p.173)

bagging: "refers to inhalation of vapours from a plastic or paper bag containing the desired substance" (Kurtzman et al., 2001, p.173)

huffing: "implies the oral inhalation of vapours by holding a piece of cloth that has been soaked in the volatile substance against the nose and mouth" (Kurtzman et al., 2001, p.173)

The term **tooting** is also used in relation to VSA and refers more generally to inhalation of drugs. **Buzzing** used in this context refers to the sensations experienced through substance abuse.

Volatile substances (in particular aerosols) can also be abused by directly spraying them into the mouth (Kurtzman et al., 2001, p.173). Indeed, St George's, University of London (2006) report that, of all deaths recorded between 1971-2004, the method of administration in 32% of cases was directly into the mouth (this is assumed to be the method of abuse of butane gas lighter refills unless there is evidence to the contrary). Other methods of administration (including sniffing from containers, from cloths/sleeves, plastic bags or from placing plastic bags over the head) show varying levels of accountability since records began, accounting for roughly 2-21% each of administration methods.

Kurtzman et al., (2001) report that habitual users often progress through different inhalation methods from sniffing to huffing then bagging, since the intensity of inhalation increases incrementally using these different methods, producing heightened levels of excitation. This could arguably demonstrate 'tolerance'. That is, using more/stronger solvents to get the same effects, having developed physical/psychological tolerance to the substance.

Variation in abuse methods may also be linked to substance of choice. St George's, University of London (2006) report that direct discharge into the mouth is the most common method of butane lighter refill abuse, whereas aerosols are more likely to be ingested by being sprayed through a cloth and glues inhaled from plastic bags.

Environments of Abuse

Historically, research reported that recreational VSA was essentially a group activity (Richardson, 1989). More recently work from the UK and the US has supported this idea of social solvent abuse with common sites of use being friends homes (McGarvey et al., 1999; St George's, University of London, 2006) and parties (McGarvey et al., 1999). The 2004 St George's, University of London School data for deaths associated with VSA also shows that in 17% of VSA deaths recorded in 2004, the place of abuse was a public place.

Despite this, the evidence shows that the majority of individuals, especially young people, abuse solvents in the home. St George's, University of London provides data relating to place of abuse for VSA death cases recorded from 1995-2004. Consistently, the data shows that most volatile substances are being abused in the home, accounting for 55% of recorded places of death in 2004, and 72% of places of abuse. There has also been a slight increase in the number of cases where the abuse environment is recorded as being the home in the last 10 years.

St George's data also suggests that home abuse accounts for a greater proportion of abuse among over 18s compared to under 18s. Among younger people, the homes of friends and other public places account for around half of reported environments of abuse (compared to <25% among over 18s).

Other environments of use that occur in both the UK and American literature include school and the workplace. These consistently account for only a small number of VSA cases.

Qualitative research commissioned by the Department for Health (MORI, 2006) explored in more depth the occasions and locations where VSA takes place. It reports that young people engage in solvent abuse in a number of locations including school (both during lessons and recreational time), at home or at friends' houses and other public places. Again, it notes that children's homes may also be locations of abuse.

Essentially, from the evidence that is available, it appears that the high incidence of use in the home highlights the inherent difficulty of identifying VSA and tackling the problem at the social level. It also highlights the need for parental (and guardian) awareness of indicators of VSA (for example, changes in sleep patterns, changes in appetite and drinking patterns, tiredness, irritability and aggressiveness, changes in school performance and changes in general health) to be able to combat VSA. Again, however, the problem exists that many of

these vital signs of solvent abuse are similar to those demonstrated among adolescents who are not using solvents.

User Profiles

Age

The research evidence suggests, overwhelmingly, that young people are most likely to be those who abuse solvents (Kurtzman et al., 2001; Spiller, 2004). Further, the research concurs that solvent abuse is likely to be experienced earlier than other forms of drug misuse (Ives, 1999).

The earliest recorded age of death associated with VSA in the UK is 7 years old, ranging to deaths observed for people over 75 (although these are usually suicides). Recent American research has reported VSA among people aged as young as 5 years old (Spiller, 2004).

Most survey evidence relating to self-reported VSA points towards a decrease in popularity among older teens compared to those aged 12-13. The research literature frequently reports reasons for this including low 'street credibility' attributed to VSA among older teens, it being considered only suitable for people who do not have the means to access illicit drugs and the curiosity wearing off among older youths who have already tried VSA. Recently published Department of Health research (MORI, 2006) also suggests that young people 'at risk' of VSA often perceive it as dirty, dangerous and unglamorous. Indeed, young people interviewed as part of this work reported perceived associations between VSA and becoming a 'junkie'.

Despite this general trend, the Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS) 2004 survey results suggest that, for use of solvents in the previous month, VSA was 2 times more prevalent among 15 year old boys than 13 year old boys (2% and 1% respectively). The results also showed a greater prevalence of use in the previous year for 15 year olds (4%) compared to 13 year olds (2%).

Further, a shift in proportionality toward older groups has been observed as a general trend in VSA associated deaths, with under 18s accounting for a large proportion of the overall fall in deaths since 1990 (St George's, University of London, 2006).

Gender Differences

The research evidence consistently suggests that prevalence rates for VSA are similar for both males and females. It has also been shown that there are minimal variations in age of onset, lifetime frequency, use in the past year or preferred methods of inhaling between boys and girls (McGarvey et al., 1999). There is also no evidence to suggest that substance of choice is different between males and females (McGarvey et al, 1999) or that environments of abuse differ between the sexes (St George's, University of London, 2006).

In Scotland, the SALSUS 2004 showed no significant differences in the proportion of boys and girls reporting solvent use in the previous year for either 13 year olds (males=2%, females=3%) or 15 year olds (males=4%, females=4%). There were also no differences in reported use in the previous month by gender, or whether pupils had been offered glue, gas or other solvents.

This reflects similar patterns from previous SALSUS surveys with the exception of a high number of 13 year old females in the 2000 survey reporting that they had ever been offered gas, glue or solvents (17% compared to 13% of boys).

In America, data from the National Household Survey on Drug Abuse for 2002 and 2003 showed similar gender patterns of use between males and females (9% compared to 8% prevalence), (NHSDA, 2005).

One of the only reports to provide evidence counter to this argument is an unpublished report by the Centre for Drug Misuse Research (McKeganey, unpublished) that showed that

females taken from a sample of Scottish secondary schools were more likely than their male counterparts to engage in VSA (in school years S1-S3).

Data from the Smoking, Drinking and Drugs Use Survey in England and Wales also shows that, in 2001, 2003 and 2004, females aged 11-15 were marginally more likely to report taking glue, gas, aerosols or solvents in the last year than male peers. In all years, prevalence was 1% greater for girls than boys with rates for girls of 8%, 8% and 6% for the 3 years.

Data from the European School Project on Alcohol and other Drugs (ESPAD) 2003 survey also reported gender differences in a small number of countries (Belgium, Cyprus, Greece, Portugal and Ukraine), with boys showing higher prevalence rates for lifetime use compared to girls. In only one country did the prevalence rate of lifetime use of inhalants for girls exceed that for boys, this being Ireland.

Whilst the research does, in the main, demonstrate no gender differences, what is clear is that males are more likely to be represented in cases of volatile substance abuse that result in medical attention (Kurtzman et al., 2001.) This is supported by Scottish data reported in the Drug Misuse Statistics Scotland Report (ISD, 2005) which showed that, of all general acute inpatient discharges with a diagnosis of volatile solvent abuse for the period 2004-05 (n=6), five were male and only one was female.

St George's, University of London also reports that deaths from VSA are more common among males than females, irrespective of age group (St George's, University of London, 2006). In the past 10 years, 81% of deaths in the UK from solvent abuse have been males. The authors do note, however, that although the ratio of female to male deaths has been increasing over this period, this has been due to a decrease in male deaths rather than an increase in female deaths. The proportion of female deaths in 2004 (19%) was lower than in 2003 (28%).

Whilst it seems that there may be an apparent contradiction in the equal prevalence of VSA use between the sexes, but a notably high ratio of male to female VSA related deaths, it is perhaps worth noting that most of the reported prevalence figures relate to 'whether' young people have *used* VSA, and do not necessarily take into account frequency of use, or combining VSA with other drugs such as alcohol. It may be that solvents are used more recklessly by some groups than others and this could be explored in future research as a possible contributory factor in understanding gender differences in VSA deaths and serious accidents.

Minority Ethnic Groups

Only limited data exists in the UK that explores ethnic differences in solvent abuse and much of this is anecdotal (Worley, 2001). Analysis of British Crime Survey data conducted by Ives (1999) does show that under 16s in minority ethnic groups are less likely to engage in VSA than white peers, and anecdotal evidence from consultation with practitioners working with vulnerable young people has also shown that they consider it to be more prevalent among white young people (Boylan et al., 2001 cited in Worley, 2001).

In the US, there is evidence to suggest that solvent abuse is more prevalent among white children than black and Hispanic youths. Data from the American school and college survey, Monitoring the Future, shows that senior African American students consistently report lower levels of inhalant abuse than white or Hispanic peers (Johnston et al, 2005). Similarly, data from the National Household Survey on Drug Abuse carried out in the US showed that non-Hispanic black adolescents are less likely than white and Hispanic peers to engage in inhalant abuse (Neumark et al., 1998).

Data from the 2003 National Youth Risk Behavior Surveillance System (YRBSS) also indicates greater inhalant abuse among Hispanic females (5%) than black females (2%). A 1999 questionnaire survey of 285 juveniles in a young offenders institution in the US also showed that white youths (36%) and youths from other ethnic background (44%) were significantly more likely than black youths to have previously used inhalants.

The common finding in all US studies is lower levels of VSA among black youths compared to white and Hispanic peers.

Socio-Economic Differences

There is a noticeable dearth of research evidence that specifically explores inhalant abuse as related to socio-economic status.

Research by the Centre for Drug Misuse Research (CDMR), based on a survey of young people in Scotland aged 11-16 (McKeganey, unpublished) reported that VSA was present across all social strata. Findings from the 2003/04 British Crime Survey for glue use also show no notable differences by ACORN group or tenancy type.

With the exception of this unpublished CDMR research, there is little identifiable evidence which explores this relationship and more may be needed to explore any direct association.

Epidemiology and Other Drug Use

In general, prevalence data shows a link between VSA as a 'gateway drug' (along with cigarettes, marijuana and alcohol) to other forms of illegal drug and alcohol abuse. Much of the literature in the field shows that solvents are initially tried through curiosity, out of boredom or to provide a means of escapism. Once tried, the curiosity element diminishes and use can in itself become boring such that other drugs are tried which can provide a greater 'buzz' or higher degree of escapism.

Whilst these reasons for VSA are widely reported in the guidance and information materials available to professional and lay-readers, it appears that much of the empirical research underpinning these assumptions stems from the 1980s. Work by O'Connor, (1983) continues to be cited in contemporary reviews of VSA literature and there appears to be a dearth of more recent consultative work that explores young people's reasons for abusing solvents.

Research commissioned by the Department of Health (MORI, 2006), and based on self-reported histories of young people who were abusing or had previously abused solvents (or were considered 'at risk' of abusing substances), offers some insight into pathways into VSA. It indicates that many young people learn about VSA through peer networks, often where one or more of their peers is already experimenting and encourages others to do so. The research also shows that many young people try solvents as a group at first, and then progress on to more private use, only after long-term engagement. The 'social' aspects of VSA include sharing of tips between peers about how to achieve maximum excitation and sharing the 'buzz' was seen as being akin to sharing a joint of cannabis.

The Department for Health research also suggests that young people who have previously engaged in VSA may be classified into one of 3 groups, these being experimental users, those who use VSA as a stepping-stone to other drug use or combine it with other drugs and problematic users for whom VSA is long-standing and chaotic.

What is more obvious from recent literature is the link between VSA and other drugs.

Data from the 2003 Smoking, Drinking and Drug Use Survey showed that young people who reported having taken volatile substances by the age of 13 were more likely than those who had not to have taken Class A drugs in the last year (16% compared to 7% respectively).

The 2005 US National Survey on Drug Use and Health (NSDUH) report states that just over a third (35%) of young people aged 12-13 who have used inhalants at least once in their lifetime have also used another illicit drug. This compares to 7.5% of young people who have never tried inhalants.

The NSDUH report also shows that a greater proportion of adults who reported using inhalants at, or before the age of 13, were more likely to be classified as alcohol/drug dependent or abusers in later life than those whose first inhalant abuse occurred at age 14 or older.

Based on an interview survey with young offenders in a Canadian young offenders institution, Young et al. (1999) report a significant relationship between inhalants and cocaine, with a mean age of initial experimentation for inhalants of 9.7 years and a mean age of first use for cocaine of 14.4. Whilst only 14% of the 212 participants said that they had ever used inhalants, among those who had, solvent abuse had preceded all other substance abuse. Of those who had not used solvents, the drug use progression pattern was consistently found to be alcohol and cigarettes, marijuana, cocaine, hallucinogens and opiates.

An early study by Davis, Thorley and O'Connor (1985), involving case study analysis of four young adult glue sniffers, showed a number of factors that were common to the transition from solvent abuse to illicit drug/alcohol abuse. These included parental deprivation, rejection in childhood and associated mental ill health consequences as well as inhalation of heroin, "snorting" and injecting heroin. American research from the same era showed that solvent abuse among children and juveniles could lead to opiate addiction given a certain set of social circumstances (Altenkirch and Kinderman, 1986).

In Scotland, however, data from the Scottish Drugs Misuse Database shows that, in the year ending 31 March 2005, less than 1% of service users who presented to Scotland's local authorities or health boards, for whom their main drug of misuse was heroin, also reported using solvents.

Further, qualitative data from the Department of Health research (MORI, 2006) suggests that, for many young people, abuse of volatile substances in conjunction with other drugs tends to be uncommon among 'new' users. It also suggests, however, that more established users may combine VSA with cannabis to improve the effects and, among older users, VSA may be used interchangeably with harder drugs or as a way to enhance the effects of harder drugs.

The evidence would suggest that, whilst the relationship between different types of drug use is not causal, the frequency with which progressive patterns of substance abuse occur may indicate that solvent abuse is a risk factor for subsequent illegal drug use. In this respect, early identification of solvent abuse may indicate 'at risk' groups and act as a trigger for implementing interventions.

As with other epidemiological studies, the reasons for transition from volatile substance abuse to misusing other substances is not clear, and this might suggest a need for more consultative work with solvent users to develop a clearer picture of drug use histories.

Psycho-Social Correlates of Volatile Substance Abuse

VSA has been linked in the evidence to a number of psychosocial problems and associated risk behaviours. Perhaps the 2 strongest themes to emerge from the research evidence are the heightened risks of VSA among young people involved in the criminal justice system and looked after and accommodated children.

Crime and Delinquency

There is a strong body of evidence that links substance use more generally with criminal and antisocial behaviours, especially among young people (Melrose, 2000). The evidence linking VSA and youth offending is less visible since much of the work in this field focuses on illicit drugs, alcohol and tobacco.

Part of the reason for the lack of research exploring direct links between VSA and crime may be that, compared to other drugs, there are relatively few crimes associated with the acquisition of volatile substances due to their ready availability (McVey, unpublished).

Although VSA is not an offence, the Children (Scotland) Act 1995 states that young people can be referred to the Children's Reporter for the abuse of solvents. Referral data from the Scottish Children's Reporter Administration (SCRA) shows that 44 children were referred to the Children's Reporter on grounds of misused solvents for the period 2003/04. In 2004/05 this number decreased by 34% with 29 children referred in the reporting year. SCRA hold data that shows the nature of previous and subsequent referrals for young people referred on grounds of misused solvents but this data is not readily available.

In England, research by the Home Office suggests that VSA is particularly prevalent among serious persistent offenders and lifetime minor offenders, and also reported associations between VSA, truancy, being excluded from school and being homeless or sleeping rough (Goulden and Sondhi, 2001).

Later research by the Home Office (Pudney, 2002), based on an analysis of behavioural sequences observed in the 1998 Youth Lifestyles Survey, also showed that the average age of onset for volatile substance abuse was broadly the same as the average age for the onset of criminal behaviour.

Studies from America provide stronger evidence for an association between VSA and delinquency. In the US, a special report from the NSDUH, focusing on inhalant abuse and delinquent behaviours, reported that young people aged 12-13 who reported having used inhalants at least once in their lifetime were more than twice as likely to have been in a serious fight at school or at work in the past year than those youths who had never used inhalants (NSDUH, 2005b). The data show that inhalant users were also 6 times as likely to have attempted to steal.

Other recent American research involving interviews with incarcerated juveniles reported that the majority of young offenders had tried inhalants before the age of 13 (Prinz and Kerns, 2003). Earlier work by Howard and Jenson (1999), involving interviews with young people on probation found prevalence rates of 3% for current inhalant abuse, 20% for use in the last year and 34% for lifetime use. The research also found that convicted youths with current or previous inhalant experience reported significantly less family support and cohesiveness than non-inhaling peers, as well as demonstrating lower self-esteem, lifetime thoughts of suicide and suicide attempts, neighbourhood gang activity, peer and parental substance abuse, intentions to engage in illegal behaviour, substance-related criminality, and substance abuse (Howard and Jenson, 1999).

Finally, research by Malesevich and Jadin (1995) estimates the lifetime prevalence of inhalant abuse among juveniles in US correctional facilities as being around 45%.

Findings such as these highlight the vulnerability of young people at future risk of offending, and perhaps indicate a need for more targeted research to explore ways of preventing VSA as a possible preventative mechanism for future offending.

No data was identified that specifically reported levels of inhalant abuse in young offenders institutions in the UK. Certainly, it appears that this data is not routinely collected either for young people or older prison populations. The Scottish Prison Service Prisoner Survey does not, for example, include questions relating to inhalants, only to illegal drug misuse.

The only evidence relating to levels of inhalant abuse among UK prisoner and young offender populations is an ad hoc unannounced short inspection of HM Young Offender Institution Werrington by HM Chief Inspector of Prisons (Home Office, 2000). It reported that:

"a large number of children who enter young offender institutions have been involved in substance abuse. It is expected that many will have changed from abusing volatile substances, to drugs."

A questionnaire survey of around 100 juveniles within the establishment, of which 77 were returned, showed that 42% of respondents had (at some time) sniffed solvents before entering the institution (n=32). Among these respondents, the product that was used most often was gas, followed by petrol and glue.

The report also revealed that young people had access to a number of substances within the establishment, including petrol, glue, paint stripper, gas, aerosols and paint cigarette lighter refills, some of which had been accessed through classes/workshops in which the young people were involved. Whilst only one respondent said that they had personally abused these substances whilst in the establishment, 29% said that they thought inhalants were currently being used by their peers. The report recommends that:

"staff should be made aware of the issue in protecting juveniles from solvent abuse, and the importance of keeping substances in a secure place." (p.13)

Whilst limited, the research suggests that young people in criminal justice care organisations may be at high risk of solvent abuse, either prior to entry or, in some cases, whilst in custody.

Looked After and Accommodated Young People

Another group that have been shown to be at high risk of solvent abuse is looked after and accommodated children (Social Services Inspectorate, 1997; Melrose, 2000).

Worley (2001) provides a comprehensive review of literature in the area of volatile substance abuse and looked after young people. She describes work by Guirgus and Vostanis (1998) and the Social Work Inspectorate (1997) both of which show that alcohol and solvents are the 2 main substances of choice for looked after young people. In general, her resume of research shows that those in residential care are more likely to fall into vulnerable groups for whom VSA risk is high, including those with histories of familial separation, poor school attendance, or with previous offending histories.

A 2001 Scottish based Local Authority survey of residential children's units also suggested that social care establishments for young people may be high risk environments for VSA. The survey, carried out by the Local Authority social work services team, explored staff awareness of types of products that might be inhaled, access to products and protocols in place to control access to risky substances, estimated prevalence of use in the establishment, referral mechanisms for problematic users, staff awareness of the risks and dangers associated with VSA and residents' perceived awareness of the risks of VSA. This unpublished document suggests that VSA is known to occur within residential homes in Scotland and that staff and residents may benefit from education/training in the area. This survey provides an example of good practice in relation to VSA monitoring in residential care homes for young people, and may provide a template for more regular and systematic Scotland wide research.

In her concluding observations regarding the link between VSA and social housing for young people, Worley asserts that more research is needed in the area of 'vulnerable' young people and substance abuse, in particular focussing on looked after young people, those excluded from mainstream schools and young offenders (Worley, 2001). Our review suggests that this gap still remains unfilled.

Physiological and Psychological Correlates of Volatile Substance Abuse

Research that directly explores the physiological and psycho-social correlates of VSA is not extensive, partly because, for the most part, experimentation with solvents is short term, non-addictive and non-chronic (Shu and Tsai, 2003).

There does appear to be much information about consequences of VSA in the educational and information materials produced by a number of drugs organizations, however, this evidence is presented anecdotally and is rarely linked to empirical or scientific research.

Physiological Risks

Essentially, solvents are used in order to achieve intoxication. The effects of inhalant abuse are short lived and last around 15-45 minutes (BBC, undated; Know the Score, 2003), depending on the product used. Early physiological effects from inhalation, as reported in the literature, include:

- euphoria
- lowering of inhibitions
- feelings of drunkenness
- disorientation
- blurred vision
- dizziness
- slurred speech
- drowsiness
- hallucinations
- nausea
- blackouts.

Mid-term effects include drowsiness and feeling hung-over. Again, nausea, blackouts and severe headaches can occur after the initial 'buzz'. Spots and rashes can also appear around the nose and mouth (Know the Score, 2003).

A common injury associated with VSA is burns caused by flammable products or exploding canisters (Cox, Hwang, Himel and Edlich, 1996; Kurbat and Pollack, 1998; Oh et al., 1999).

Most of the research literature concerns the longer-term effects of VSA, including:

- brain damage
- kidney failure
- liver failure
- lung damage
- bone marrow damage
- damage to ears and eyes
- damage to reproductive organs.

Evidence also suggests that petrol sniffing can lead to a progressive decline in cognitive function and, after prolonged use, permanent neurological change (Cairney, Maruff, Burns and Currie, 2002).

Whilst the physiological dangers of VSA are widely reported, anecdotal evidence gleaned during consultations with key stakeholders suggests that more scientific work may be required to better understand the dangers of VSA. In particular, it was suggested that there may be a need for research into the properties of the separate butanes contained in 'butane' (i.e. n-butane, or 'normal' butane, and iso-butane) to explore which gives the greater "buzz" and which is the more dangerous in a fuel canister.

Potential impurities in fuel grade 'butane' may also be important. The risk of harm from chronic exposure to butane is not well researched – or at least published. Mechanism of death (cardiac arrhythmia) is also not well researched.

Consultations also indicate that the current internationally recognised procedures for resuscitating patients with heart attacks or arrhythmias involves injection of adrenaline. This could potentially be fatal where arrhythmia/fibrillation is caused by solvent abuse and it was suggested that this issue may need to be brought to the urgent attention of medics and other professionals working with VSA admissions.

Psychological Risks

Although there appears to be recent research exploring the psychological correlates of inhalant abuse, much of this work is non-UK based.

Most recently, data from the 2004 US National Survey on Drug Use and Health showed that people experiencing major depressive episodes (MDE) in the past year were more likely than those without MDE to have used inhalants in the past year (NSDUH, 2005a). This supports earlier work that showed that significantly more solvent abusers were depressed than non-solvent abusers among 47 admissions to a regional assessment center for adolescent boys in the US (Jacobs and Ghodse, 1987).

Work carried out in Taiwan, involving analysis of cognitive tests and psychiatric symptoms of six long-term glue sniffers admitted to a psychiatric ward showed that long term abuse was linked to violent behaviour and/or self mutilation (Shu and Tsai, 2003). Psychosis and deteriorating intelligence were also noted after long term use of glue. This research was, however, carried out with a small sample recruited from a psychiatric population and the results should, therefore, be treated with caution.

The National Children's Bureau (2004) report that solvent abuse among young people is often linked to their experience of emotional health and well being and experiences of abuse and violence.

Instances of VSA associated suicide have also been noted (St George's, University of London, 2006).

Deaths Associated with VSA

The most significant risk of VSA is sudden death. Indeed, the most common cause of death among solvent abusers is sudden failure of the heart (DoH, 2005). The Framework Report explains that 'sudden sniffing death' refers to "*cardiac arrhythmia or a sudden catastrophic event*" (p.5) which is distinct from other forms of heart failure that are progressive and are not usually associated with VSA.

Adgey, Johnston and McMehan (1995) provide a tripartite analysis of cardiac arrest including: cardiac arrhythmia; anoxia, respiratory depression and vagal stimulation; and aspiration of vomit or trauma. All 3 of these may be associated with VSA.

Evidence from other literature suggests that VSA related death can occur as a result of choking on vomit whilst intoxicated, or suffocation if bags are used to assist inhalation (Know the Score, 2003). Death might also occur as a result of drowning, jumping from buildings or other high risk behaviours whilst intoxicated (ibid).

The risk of sudden death means that VSA can be fatal if tried only once. St George's, University of London (2006) reports that, in 2004, in 77% of VSA associated deaths (n=36), there was evidence of a previous history of solvent abuse. For the remaining 23% there was no evidence of their having indulged in VSA before, or the previous history was unknown. The authors point out, however, that this does not conclusively mean that these people died from first time VSA.

Analysis of St George's data from the previous ten years shows a steady increase in numbers of deaths in the UK between 1994-1998 (from 67 to 80 deaths), and a downward trend for the period 1999-2004 (from 75 to 47). The drop in deaths between 2002 and 2003 is the biggest decrease in this period, with deaths falling from 65-53. These numbers compare to peaks of 152 in 1990, 137 in 1988 and 122 in 1991. The lowest ever recorded number of deaths was 2 (in 1971 and 1974). However, the data collection methods in use at that time were inconsistent with current methods.

Data for Scotland in the 10 year period 1995-2004, as provided by the Crown Office and General Register Office for Scotland, shows that it has the fourth highest VSA mortality ratio of all UK jurisdictions. The mortality ratio for Scotland for this period is 134 compared to 158 in the North East of England, 137 in the East Midlands and 136 in Northern Ireland. The 'all England' figure for the same period is 96 and for Wales is 89. There was a drop in the SMR for Scotland between the 10 year periods of 1994-2003 (143) and 1995-2004 (134).

Cause of death can vary depending on the type of product abused. For example, use of adhesives are more likely to be linked to death by trauma, butane cigarette lighter refills are most likely to be linked to death by cold burns to the throat and lungs, causing vagal stimulation and cardiac arrest (Adgey et al.,1995). These authors also report that resuscitation from sudden death due to cardiac arrhythmia associated with volatile substance abuse is rarely successful (ibid).

The St George's, University of London data provides an example of good practice in terms of trend monitoring and evidence gathering for VSA prevalence. Consultation with some of the key stakeholders working in the field of VSA suggest that it is unrivalled by other countries. In the US, the Toxic Exposure Surveillance database (TESS) of the American Association of Poison Control centres does provide similar data on cases reported to poison centres across the country of intentional inhalation of non-pharmaceutical substances. The database also records medical outcomes of inhalation including death resulting from exposure. These centres cover 95% of the US population and this database therefore provides reasonable coverage of deaths associated with solvent abuse for the nation. The TESS was the only data source identified for VSA death monitoring outside of the UK.

That said, however, St George's, University of London note a number of limitations to the data that is available and reported. These include:

- deaths classified as VSA related sometimes emerge after the reporting year. These are subsequently added to later reports but numbers reported may be subject to change as deaths are investigated and re-classified.
- changes in the data collection methods from the period 1971-1982 mean that accurate trend analysis of the whole dataset cannot be carried out. This may not, however, be relevant 24 years on.
- the database includes cases where there is no toxicological proof of inhalant abuse but where circumstantial evidence dictates that the death is classified as being VSA related.

Chapter 3: Estimating the Prevalence of VSA

Introduction

Due to the hidden nature of VSA, it is a difficult task to provide an accurate estimate of VSA prevalence. This is reflected in the lack of available data that report on the prevalence of VSA, both in Scotland, and at the wider level.

Most of the evidence that is available comes from prevalence surveys, including household surveys and mainstream schools based surveys and from reported cases of individuals attending drug treatment centres. Both methods rely on self-reported drug use.

Prevalence Surveys and Statistics

In the last 15 years, there has been an emergence of school and household based surveys that explore experience of a number of illegal drugs, cigarettes and alcohol and solvents. For the most part, questions focus on;

- **lifetime use:** whether respondents have ever taken the drug
- **recent use:** whether they had taken the drug in the last year
- **current use:** whether they had taken the drug in the last month.

This section provides an overview of the main surveys and their findings from recent survey sweeps.

UK and Ireland

The majority of survey data relating to drug use in Scotland has focussed on young people and has been collected using in-school surveys. Less data exists for drug use in general, and specifically VSA, among adults.

The Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS) survey, previously undertaken by the Edinburgh University Child and Adolescent Health Research Unit (CAHRU), is in its third sweep, with previous surveys having been carried out in 2002 and 2004. The survey, which is commissioned by the Scottish Executive, collects data from secondary school students aged 13 and 15 on smoking, drinking and drug use. Substance use is considered in the wider context of other lifestyle, health and social factors. It was preceded by a number of UK wide surveys carried out by the Office for National Statistics (ONS), 1982-1998, and National Centre for Social Research (NCSR) and the National Foundation for Educational Research in 2000.

Table 1 shows that, in 2004, 2% of 13 year olds and 4% of 15 year olds reported use of gas, glue or other solvents in the last year (compared to 10% and 28% for cannabis, and 3% and 10% for stimulants including cocaine, ecstasy and amphetamines). This reduced to 1% in both age groups for use in the last month (compared to 6% and 19% for cannabis and 2% and 4% for stimulants including cocaine, ecstasy and amphetamines).

| Drug Use | 13 Year Olds | 15 Year Olds |
|--|---------------------|---------------------|
| Use of gas, glue or other solvents in the last year | 2% | 4% |
| Use of cannabis in the last year | 10% | 28% |
| Use of stimulants, including cocaine, ecstasy and amphetamines | 3% | 10% |

Analysis of survey results from the previous sweeps (Table 2) shows that, for older students, there was a decrease in having been offered gas, glue and other solvents, from 24% in 2000 to 14% in 2002 and 13% in 2004. This compares favourably to other drugs. For example, in 2000, 28% of students reported having been offered cannabis, compared to 26% in 2002 and 26% in 2004. In 2000, 16% of respondents said that they had been offered stimulants compared to 11% in 2002 and 11% again in 2004.

| Drugs Offered | 2000 | 2002 | 2004 |
|--------------------------------------|-------------|-------------|-------------|
| Offered gas, glue and other solvents | 24% | 14% | 13% |
| Offered cannabis | 28% | 26% | 26% |
| Offered stimulants | 16% | 11% | 11% |

Equivalent data for England and Wales from the 2004 Smoking, Drinking and Drug Use (SDD) Survey showed that, 6% of 13 year olds and 6% of 15 year olds reported use of glue, gas, aerosols or solvents in the last year (compared to 7% and 26% for cannabis, and 4% and 12% for stimulants including cocaine, crack, ecstasy, amphetamines and poppers). These figures are notably higher than those reported for Scotland, especially the figure for solvent use among the younger age group.

In 2003, a Justice Department buy in to the MORI Scotland omnibus survey - State of the Nation - provided data regarding use of solvents and other drugs among children and young adults. Face-to-face interviews with 972 17-25 year olds, who also completed self-completion surveys, revealed that 11% of respondents had, at some time in their lives, tried glues, gas or aerosols to sniff or inhale. Further, 2% said that they had been offered these substances in the previous 12 months and 1% said that they had been offered them in the previous month.

The National Crime Surveys of England and Wales, and Scotland, have also collected data relating to drug use and awareness.

In Scotland, there have been 4 crime surveys, in 1993, 1996, 2000 and 2003, each of which has collected data on drug use. Findings from the 2003 Scottish Crime (and Victimisation) Survey showed that, of all adults who responded (n=3,168), 2.7% said that they had ever used glues, gases or other solvents (an increase compared to 1.4% in 2000 and 2.1% in 1996). Less than 1% (0.1%) said that they had used solvents in the previous month (similar to 0% and 0.2% reported in 2000 and 1996 respectively).

A closer analysis of the profiles of those who said that they had used glues, gases or other solvents at least once before showed that prevalence was greater among those aged under 30 than over 30, with no notable differences between male and female use (2.9% and 2.6% respectively). Analysis of solvent use by gender and age shows that self-reported use 'ever' decreased with age for female respondents, (ranging from 7.1% for females aged 16-19 to 1.3% for females aged 40-59) whilst, for males, there appeared to be peaks in self-reported solvent use 'ever' for those in age bands 16-19 (4.7%), 25-29 (5.8%) and 35-39 (5.4%). The finding for females is consistent with earlier surveys and the 2000 survey also showed a peak for males aged 25-29 of 7.5% usage 'ever'.

Data for England and Wales regarding use of glues among adults aged 16-59 is also available from the British Crime Survey. The latest survey report regarding substance misuse for this age group (Chivite-Matthews et al., 2005) shows a decrease in the use of glue between 1998 and 2004. The recorded prevalence of glue use in the last month and last year reported by this survey is less than 1% in both cases, with reported lifetime use among 2% of respondents. Among 16-24 year olds, prevalence of lifetime use was noted among 3% of respondents.

Northern Ireland

Drug use in general has been recognised as a growing issue in Northern Ireland and, as a result, there has been much research activity in the previous 10 years. A comprehensive overview of drug research in Northern Ireland can be found in the Register of Drug and Alcohol Related Research in Northern Ireland (DAIRU, 2004).

The European School Project on Alcohol and other Drugs (ESPAD) surveys in 1995 and 1999 showed that Northern Ireland had the highest rate of reported inhalant abuse of all participating European countries. In 1995, 26% of 15 and 16 year olds who took part in the survey reported ever having used inhalants, whilst 25% of respondents in 1999 reported

lifetime use. In 1999, this figure was 11% higher than the rate for England, 8% higher than for Scotland and 6% higher than Wales. The rate for the Republic of Ireland was 22% (Higgins, Percey and McCrystal, 2004).

That said, however, the 2000 and 2003 modules on drug use taken from the Young Persons Behaviour and Attitudes Survey in Northern Ireland show that the proportion of pupils saying that they had ever used solvents fell from 16% in 2000 to 10% in 2003.

Further, findings from the 2002/03 Drug Prevalence Survey which provides a breakdown of drug use for Health Boards in Ireland, and Health and Social Services Boards for Northern Ireland, showed a lifetime prevalence of solvent use of less than 5% in all regions for people aged 15-64.

Despite this, there continues to be a high standard mortality ratio for VSA associated deaths in Northern Ireland. The standard mortality ratio for all ages, for the period 1995-2004, was 136 deaths in Northern Ireland – the third highest after the North East of England (158) and the East Midlands (137), (St George's, University of London, 2006).

European

The European School Project on Alcohol and other Drugs (ESPAD) provides standardised prevalence estimates of rates of alcohol, tobacco and other drug use among school children for participating countries across Europe, including the UK. Previous sweeps have been carried out in 1995, 1999 and 2003.

Data from the 2003 summary report (involving 35 countries) showed that the highest prevalence rates of lifetime inhalant use among young people in Europe were recorded for Greenland (22%), Cyprus, Greece, Ireland, Isle of Man, Malta and Slovenia (all with rates between 15-19%). The prevalence rate for the UK was 12%.

A more detailed analysis of findings from the 2003 ESPAD survey, specifically in relation to VSA, is due to be published later this year (Ives, in press).

America

In the US, data relating to inhalant abuse is collected via 3 principal surveys of the nation's youth.

The University of Michigan's Monitoring the Future study surveys around 50,000 American secondary school students and young adults on an annual basis regarding behaviours, attitudes, and values. The nationwide survey has been running since 1975 and provides data relating to the prevalence and frequency of drug use among American secondary school students and historical trends in use.

The 2005 survey report, covering the period 1975-2004, shows an increase in the US of inhalant use among secondary school students in the early 1990s, which reversed after 1995.

Despite this, in 2004, among 12 year old students, inhalants emerged as the second most frequently used drug in terms of prevalence of use in the previous year (marijuana being the most prevalent). For this age group, one in 6 (17%) reported that they had at one time used inhalants, and 1 in 24 (4.5%) said that they had used them in the past month. In the 2004 survey, inhalants were the drugs on the questionnaire index for which use was substantially higher among younger students compared to older students.

Importantly, when asked about drugs ever used, inhalants ranked first on lifetime use. The authors report that this finding may be skewed by high levels of reporting among younger participants. That is, in 2004 the proportion of 8th grade students reporting any illicit drug use in their lifetime, exclusive of inhalants, was 22%, compared to 30% when inhalants were included. In comparison, inclusion of inhalants on the index of drugs used makes relatively little difference to the prevalence rates of older students. The authors speculate

that that this may be as a result of reluctance of older students to report ever having used inhalants since they may be considered as immature.

The report also notes that one specific class of inhalants, namely amyl and butyl nitrites, has shown a significant decrease in popularity falling from a peak prevalence rate among 12th grade students in the late 1970s of 6.5% compared to only 0.8% of survey respondents in 2004.

Also in the US, the National Survey on Drug Use and Health (formerly called the National Household Survey on Drug Abuse (NHSDA)), has collected data relating to inhalant abuse since 1985. Conducted by the Substance Abuse and Mental Health Services Administration, the survey is an annual survey of the civilian, non-institutionalised population of the United States aged 12 years old or older.

The most recent survey results show that, in 2004, approximately 857,000 persons had used inhalants for the first time in the previous 12 months. This number was relatively static compared to figures from 2002 and 2003. The majority of those reporting first time use (75%), were aged under 18 at the time that they first used inhalants. In 2002 and 2003, an annual average of 718,000 (8.6%) of young people aged 12 or 13 reported that they had used inhalants at least once in their lifetime.

A detailed analysis of inhalant abuse for different sectors of the US population is provided in a series of tables that can be found at <http://oas.samhsa.gov/>

Finally, data from the 2003 National Youth Risk Behavior Surveillance System (YRBSS) supports the finding that inhalant abuse is more prevalent among early teens compared to older teenage students. The survey, which monitors six categories of priority health-risk behaviors among youth and young adults, including alcohol and other drug use, showed that, nationwide, 3.9% of students had used inhalants one or more times during the 30 days preceding the survey administration (ranging from 2.4% to 5.5% in different States).

The prevalence of current inhalant use was higher among 10th grade male (4.3%) and 11th grade male (4.1%) than 10th grade female (2.6%) and 11th grade female (2.0%) students, respectively. The authors note a general trend for male use to be higher than female use as well as greater reporting of abuse by younger students compared to older students.

Survey Limitations

Although, generally, survey data provides indicative prevalence information, and has become the standard means by which drug misuse information is collected both in the UK and elsewhere, this method of estimating prevalence is not without problems.

For school surveys, there may be a degree of under-reporting of VSA, especially given the perceived lack of credibility of reporting solvent abuse among older children, compared to younger peers. Some survey authors have argued that this has been evidenced by lifetime prevalence of older children being lower than lifetime prevalence of younger respondents. The lack of longitudinal tracking based surveys makes this difficult to show conclusively.

Some authors have also commented that the school based approach is inherently flawed since those who engage in VSA are, arguably, amongst those most likely to be absent from school at the time that such surveys are undertaken, through truancy or other health or social reasons. In Romania, for example, research has shown that VSA is high among street children. This limitation is compounded by a lack of comparable surveys in residential and secure schools.

Also, there is considerable variation in the sampling criteria, sample size and classifications of drug misuse across different surveys which makes comparison between jurisdictions difficult. This is especially true in relation to age of respondents, with much variation in the age groups targeted. Surveys such as ESPAD do provide some solution to this problem.

At the general level, the response to VSA questionnaires is known to be very sensitive to the wording of questions used, and the confidence intervals for social research data can be quite wide.

Finally, the SALSUS survey in Scotland, which perhaps provides the core data in relation to VSA prevalence among young people in Scotland has, for the 2006 sweep, experienced a change in the time period at which data is collected. This may impact on any future reporting of trends in VSA between previous and subsequent sweeps of the survey.

Other Scottish Data

As part of the review, a number of local authorities were contacted to explore if information was held locally about VSA across Scotland. In most cases, the only data available is that reported to the ISD Scottish Drug Misuse Database (SDMD). This national database provides drug use prevalence information based on recorded attendance by problem drug users at treatment services across Scotland.

The Scottish Drug Misuse Statistics 2005 publication (which reports on National Statistics data from the SDMD, General Acute Hospital Inpatient Statistics and Prescriptions Relating to Drug Misuse, for the year ending 31st March 2005) shows that:

- 78 people (<1%) who attended services and reported illicit drug or alcohol use had (at some time in the previous year) used solvents
- the local authorities reporting the highest numbers of solvent users attending drug services were Fife (n=23, 29%), Edinburgh City (n=9, 12%) and North Lanarkshire (n=8, 10%)
- the health boards reporting the highest number of solvent users attending drug services were Fife (n=23, 29%), Lothian (n=11, 14%) and Greater Glasgow (n=10, 13%)
- of all those who provided information about **main** illicit drug use (=2868), solvents accounted for just over 1% (n=32)
- Fife NHS Board and Fife Local Authority recorded the highest number of service users from whom solvents were the main illicit drug (n=7, 22%).

In relation to general acute inpatient discharges with a diagnosis of drug misuse, the report shows that:

- six people were diagnosed as using volatile solvents (<1%)
- two of these were aged under 16, 3 were aged 30-40 and one was aged 20-24 years
- five were male and one was female.

Of all those admitted, and diagnosed as using volatile solvents, all were discharged within one week.

The report also shows that the number of inpatient discharges for VSA in 2004/05 (n=6) was at its lowest in the last 5 year period with previous numbers being 15, 26, 20 and 25 for 2000/01.

It is worth noting, again, that the numbers reported here are low and any generalisation of these findings, based on such small sample sizes, should be made with caution.

Chapter 4: Effective Communication of VSA Messages

Introduction

Across the literature, there is a general acknowledgement that VSA is hidden within wider concerns about substance abuse and, in many cases, attention to VSA is neglected at the expense of spreading messages about the risks associated with illegal drug misuse.

The main channels of communication of VSA messages appear to be popular media and dedicated information packs and resources developed by specialist drug agencies. A review of research relating to school drug education suggests that VSA is perhaps also somewhat overlooked in the formal drug education curriculum.

There is an absence of any contemporary widespread public awareness raising campaigns and, an initial exploration of the information outlets that are available in Scotland suggests that these are also sparse.

Given the lack of available material, especially at the local level, it is difficult to assess the effectiveness of VSA communications. Instead, this chapter provides an overview of the main resources developed for target groups affected by VSA (young people, parents and carers, professional care workers and retailers) and explores some of the reasons why VSA messages appear currently to be hidden.

Media Representations of VSA

All of the available evidence suggests that VSA has received variable levels of attention over the last 40 or so years, with a peak in the 1970s and 1980s. However, since then, it appears that the focus has declined (Blake and Butcher, 2004), and has shifted to other forms of drugs misuse. In particular, research suggests that the focus in the 1990s was on ecstasy (DoH, 2005) or 'dance scene' drugs (Hammersley, R., Khan, F., and Ditton, J., 2002) and, more recently, on heroin and cocaine use.

A comparative study carried out by Manning (2002) of media reports relating to both VSA and ecstasy deaths in 1999 (the year with the highest VSA associated deaths in the previous 10 years) showed that ecstasy received 4.6 times more press coverage than VSA. Manning concludes that:

"Although not quite invisible, the problem of VSA is certainly hugely over-shadowed by the national press fascination with ecstasy" (p.2).

As a benchmark, he cites that VSA deaths in the UK are around 4 to 5 times greater than deaths from ecstasy (Manning, 2002).

Manning (2002) reports that:

"organisations and parents particularly concerned with VSA have long suspected that journalists are more interested in ecstasy, and similar 'spectacular' drugs, rather than the mundane substances to be found in every home" (p.2).

McKeganey (unpublished) suggests that solvent abuse has:

"acquired something of the feel of 'yesterday's epidemic' to it" (McKeganey, unpublished).

This lack of reporting does, however, mask a continuation of the practice of VSA and of deaths associated with VSA. Indeed, since 1990, there have been a total of 1138 deaths associated with VSA in the UK.

A tentative analysis of media reports for the present study from 12 major popular newspapers in the UK shows that there was a peak in reporting of VSA issues and letters on the subject in 2002, with 36 articles identified for this period. Among these articles are a number relating to the deaths of a young father and a father-to-be in this year.

Similar highs can be observed for 1998 and 1999, with 31 articles identified in each year. Much of the reporting in 1999 related to the ban on sales of lighter refill gas and in 1998 reports focussed on the death of a teenage boy from inhaling deodorants and reports of the youngest VSA associated death in the UK, a 7 year old boy.

In all other years, dating back to 1996, there were less than 20 reports relating to solvent abuse in the selected newspapers.

Key Stakeholders and Target Audiences

Whilst media coverage of VSA reaches a wide readership, more formal educational and information materials have been developed in the area of VSA for specific audiences. The main materials identified from this research targeted children and young people, parents and other unpaid carers, professional care workers, the police and retailers. An overview of the resources developed for these target audiences is presented below, with many of the messages inherent in these materials being transferable to other audiences.

Young People

A number of flyers, information leaflets and advice booklets are available for young people from a variety of providers. The main documents identified from the review include:

- **Safe is Sound:** a video and parents' booklet for use with 11-16 year olds focussing on the dangers of abusing household and other readily available products (<http://www.re-solv.org/publications.asp>)
- **Chicken:** a video and workbook aimed at 11-15 year olds which uses a case study of a young person's experience of VSA and the consequences for him and his family (<http://www.re-solv.org/publications.asp>)
- **Hazard Crew:** a series of humorous cartoon style leaflets, posters and trump cards targeted at 10-14 year olds and designed by the creators of Wallace and Gromit (<http://www.re-solv.org/publications.asp>)
- **Polishing Your Nails:** a 6 page comic strip produced by Lifeline publications. The document aims to "*provide information and advice on the use of volatile substances in a care setting. It outlines the dangers associated with volatile substance use, how to deal with overdose and the problems associated with using drugs to cope with life.*" (<http://www.lifelinepublications.org/>) The document is designed for use by young people in care with support and guidance from social services
- **Tooting Gas:** an 8 page comic strip produced by Lifeline publications. The documents aims to:

"make clear just how dangerous using volatile substances is and to deal with misconceptions. It also details the effects of misusing gas and solvents, including passing out, long-term damage and the high fatality rate of solvent users."

(<http://www.lifelinepublications.org/>) The target audience is adults and young people engaged in the recreational use of drugs and its use is advised with support for under 16s.
- **Take a Sniff:** a comic style leaflet giving factual information and advice about solvent abuse, designed for younger children (<http://www.hopeuk.org/>)
- **Solvents - Stuff on Series:** a 16 page booklet covering solvents, including:

"what the drug is, brief history of use, effects, dangers, the law, top 10 safety tips, what the young characters think of the drug and where to find more and get help if needed."
(<http://www.hit.org.uk/publications/>)

At the time of writing, a pilot of a dedicated solvent awareness pack is being implemented in North East Fife. The pack was developed by the Drug and Alcohol Project Levenmouth

(DAPL) in conjunction with the Drug Education Liaison Training Agency (DELTA) and Fife Constabulary, and was initially targeted at Primary 7 students. It included a leaflet which was written by young people, a booklet including a story detailing the risks of buzzing solvents and gases, weighing up the risks, a true false quiz, information on how to get out of sticky situations and contact numbers of people who could help. This was trialled in 9 primary schools, as well as a number of community based projects (including the Girls Brigade, Boys Brigade and other youth organisations) and received favourable feedback from participants. The pack was modified following a request from one school to be used with Primary 4-7 pupils and additional interactive tasks, a poster, a DVD and tutor resource were added to enhance the pack and make it more flexible and appeal to a wider audience. Initially, 10 schools will receive this revised pack and DAPL are due to provide a report evaluating the effectiveness of the resource later this year.

Despite the development of such resources, and the ready availability of the leaflets and other resources listed above, there is evidence to suggest that young people may not consider VSA to be high risk behaviour.

Findings from the 2000 Scottish Crime Survey Young Persons' Survey show that 45% of 12-15 years olds surveyed felt that trying glue or solvents once or twice was a 'great risk'. A sizeable proportion (27%) of respondents said that they thought there was only moderate risk associated with this behaviour.

When asked to consider regular use of glue or solvents, the proportion of young people who said that this held great risks increased to 71% with 15% saying that it was moderately risky.

Data from the 2003 State of the Nation Survey also showed that, of the 972 people aged 17-25 who were surveyed, 58% said that they thought trying glue or solvents once or twice was a great risk with a further 19% saying that it was only moderately risky. Again, 73% of respondents felt that more regular use was high risk and an additional 15% thought it was moderately risky.

In England, a 1996 Health Education Authority National Drugs Campaign Survey of 11-16 years olds reported that awareness of glue sniffing risks was high (80% of respondents were aware of the dangers), however, only around 50% of respondents demonstrated awareness of the intoxication potential of aerosols, butane gases and correction fluids.

This data, among others, suggests that there may be a need for greater awareness raising and education in this field. It is also not clear from the research evidence the extent to which the information materials listed above have been evaluated, although such work may be hidden in the grey literature.

Importantly, recent research published by the Department of Health (MORI, 2006) suggests that, for some young people, discovery of VSA (and future experimentation) occurs via school or youth groups where awareness raising sessions that are designed to deter young people actually encourage experimentation. There is a need, perhaps, for more research to be undertaken to explore this association.

Parents and Carers

The main guidance documents for parents that are widely cited in the literature include:

- **A Bombshell?:** a video and work booklet for parents which provides guidance on how to respond to young people presenting with VSA (<http://www.re-solv.org/publications.asp>).
- **The Greatest Danger for your child is your home:** a free leaflet /poster designed for parents which details the dangers of domestic products and their potential for inhalant abuse (<http://www.re-solv.org/publications.asp>).
- **Keep Your Child Safe and Sound:** a free guide for parents that explicitly focuses on the risks associated with VSA (<http://www.re-solv.org/publications.asp>).

Information is also available to parents focussing on identifying symptoms of VSA and advice on seeking professional help via the 2003 Know the Score publication – Volatile Substance Abuse. The main messages contained in the leaflet (which are reported elsewhere in other similar leaflets) are:

- communicating with children non-aggressively and reassuring them of parental care and support
- making sure that young people know the dangers associated with VSA
- encourage participation in alternative behaviours to alleviate boredom often associated with VSA, and ensure that their peers are also distracted from VSA so as to prevent recreational use in groups.

As with young people, there is a lack of research in Scotland that specifically engages with parents to discuss attitudes towards VSA and the potential risks presented to their children. In Northern Ireland, a survey carried out for the Health Promotion Agency (2002) showed that parents tended to think that their child would not be 'foolish' enough to try solvent abuse and they were, instead, more concerned with other drug experimentation. Few had discussed VSA with their children and most found discussions about drug misuse a challenge.

Care Professionals

The most frequently cited resource for carers of solvent abusers is the 2000 publication by Richard Ives and the Health Education Board for Scotland (HEBS) – Volatile Substance Abuse: Guidance for Professionals. Despite now being more than 5 years old, this is still cited in number of scholarly and informal reports on VSA and provides guidance on the effects of VSA, how to respond to VSA, the roles of professionals and sources of further information and support.

Other widely cited guidance documents include:

- **The Adolescent Epidemic:** an introductory video for professionals that provides frank and detailed descriptions of VSA and associated risks (<http://www.re-solv.org/publications.asp>)
- **Tackling VSA:** a training pack specifically designed for social services staff who work with vulnerable young people (<http://www.re-solv.org/publications.asp>).

In Scotland, Scottish Drugs Forum also offer training seminars for professionals and a free online VSA training resource for health professionals is also offered by the charity Re-Solv.

Guidance documents and training packages specifically appear to target social work services staff as the main stakeholders in VSA.

In general, however, the evidence suggests that VSA is no longer prioritised by some social care professionals working in the field due to demands being placed on resources from other forms of substance misuse.

Work by Jagger (1997), which involved surveys of social workers responses to glue sniffing, showed that some workers simply perceived the practice to be 'normal' adolescent behaviour, whilst others categorised it as being pathological and, therefore, outwith their remit, instead requiring psychiatric expertise.

Research by Staffordshire University Institute of Social Work and Applied Social Studies (Boylan et al., 2001) suggests that social work services typically demonstrate greatest concern about cannabis among young people in social care (Boylan et al., 2001). This prioritising of other drugs over solvents comes from a perceived lower prevalence of VSA among children by care professionals and a generally low level of awareness of the hidden nature and other risks associated with VSA among professionals. Boylan et al. conclude that there is a clear need for better training regarding VSA among this group.

Research recently commissioned by the Scottish Executive, and being carried out by Re-Solv, the national charity dedicated to the prevention of solvent and volatile substance abuse, aims to address the low prioritisation and perceived marginality of VSA in the lives of young people in contact with social work departments. This project, which aims to develop a resource targeted at professionals working in Scottish social work domains, will seek to address the information needs that exist among this group at the strategic, managerial and operational levels. The work is being carried out to build on and complement existing good practice guidance and play a role in teaching professionals about effective interventions which can reduce death and other ill-effects of VSA.

Police

Although there is little evidence that relates directly to VSA training and awareness among the police, discussions with stakeholders suggests that this is necessary. Davidson and Walkinshaw (1997) also report low levels of awareness among the police of the inherent risks associated with VSA.

One of the main reasons for this is a perceived lack of awareness among the police of appropriate responses to interactions with solvent abusers. Anecdotal evidence suggests that police response to discovering solvent abusers in action is to attempt arrest for anti-social behaviour or public disorder offences and this may, in some cases involve chasing and pursuing the user. This poses significant risks to the health of solvent abusers since over-excitement of the heart in someone who has inhaled solvents, glues or aerosols can cause death. As Adgey, Johnston and McMehan explain:

“volatile substance abuse sensitises the heart to circulating catecholamines, such that sudden alarm or exercise (for example fright or running) may precipitate sudden death” (p.219).

A police briefing sheet was developed by Re-Solv and is available to police forces throughout the UK. It specifically offers advice on not chasing or pursuing solvent sniffers, however, the extent of circulation of this document is not clear.

The argument for ensuring effective training of police officers in relation to VSA is strengthened by the observation that the most common external provider of school drug education is the police (Lowden and Powney, 2000) accounting for 71% of secondary schools included in their survey and 68% of primary schools.

Historically, the police have also been shown to be the main referral agency of young people to the Children’s Reporter (Jagger, 1996; HEBS & Ives, 1999).

Retailers

The main guidance documents available to retailers are:

- **A loaded gun:** a video for retailers aimed at raising awareness of their legal responsibilities in relation to sales of solvents (<http://www.re-solv.org/publications.asp>)
- **Retail Awareness Kit:** produced by Re-Solv and the Health Education Authority, this pack also provides details on retailers’ legal responsibilities regarding sales of volatile substances (<http://www.re-solv.org/publications.asp>).

Again, survey evidence from the Northern Ireland Health Promotion Agency survey (2002) showed that retailers did not perceive or understand the risks of VSA, and were not always aware of relevant laws affecting sales.

Drug Education

In addition to the various resources developed for the above target groups, a review of existing drug education research was carried out to explore the extent to which VSA is specifically addressed in the formal curriculum.

The literature around drug education is vast, and a review of this material was too great for the current research programme. Previous research (Stead and Angus, 2004), commissioned by the Scottish Executive Education Department (SEED), does, however, provide an overview of the main lessons that can be gleaned from the drug education literature.

Research from the National Children's Bureau (NCB) (Blake and Butcher, 2004, p.2) also asserts that the most effective teaching and learning occurs when:

- there is a safe learning environment
- pupils are involved in planning and take responsibility for their learning; the education involves elements of knowledge, skills and values and explores emotion
- active learning methods are used (including brainstorming, pair and small group discussions, case studies, simulation and role play)
- learning about diversity and difference is integral
- adults (especially those with previous personal experience) act as facilitators
- activities are differentiated to allow pupils to achieve their own level
- assessment forms part of the process
- the education is linked to other sources of confidential information and support such as peers, school counsellors and community drug service.

The notion of peer education is, in particular, supported by the national voluntary health promotion agency Fast Forward in Scotland who provide evidence and guidance for effective delivery of drug education between young people who, they suggest, are:

"more likely to listen and respond to information given by their peers than to a 'lecture' delivered by adults." (Fast Forward, undated).

Blake and Butcher (2004) also note that children and young people respond well to education delivered by people who have first hand experience of a specific topic or issue. This is supported by unpublished work carried out in Wellingborough Prison in England, wherein a team of ex-prisoners were involved in providing drug education in schools, remand homes and other youth organisations warning of the dangers of VSA.

There is evidence to show that formal drug education is retained by students. The 2004 SALSUS survey report states that:

"The majority (78%) of pupils in both age groups recalled having lessons on drugs in general in the last twelve months. Around half of all pupils recalled lessons on specific drugs (heroin, crack or cocaine, solvents or glue or ecstasy)." (CAHRU, 2005, p.xiv)

The ability to recall educational content has not, however, necessarily been demonstrated to result in decreased drug experimentation. Indeed, earlier research exploring the impact of school-based drug education in Scotland found no effects of drug education on drug-related behaviour or drug-related attitudes (Coggans, Shewan, Henderson and Davies, 1991). Instead, there was evidence only that drug education raised the levels of young people's drug related knowledge (ibid).

Again, as with the lack of readily accessible evidence relating to young people's feedback on information education/information sources, there is a notable lack of research that specifically explores young people's perceptions of the effectiveness of drug education.

Further, tentative observations by the National Children's Bureau (2004) also suggest that children and young people are doubtful of messages delivered to them about the extreme dangers of drug misuse, especially when they witness others using the drugs and suffering no obvious short term consequences. In particular, scare tactics about death associated with trying drugs are seen as non-credible by young people.

Further research commissioned by SEED, and due to be published later this year, does go some way to redressing this imbalance and reports on qualitative research undertaken with Scottish school children regarding the effectiveness of drug education in schools. Early reported findings support the notion of interactive learning styles and the use of external visitors as a means of achieving effective drug education.

Finally, for the most part, drug education literature focuses on illegal drugs, alcohol and tobacco and there is less evidence that focuses specifically on VSA. A report by the National Children's Bureau (NCB), (Blake and Butcher, 2004) designed to provide guidance on teaching and learning about VSA in schools asserts that:

"it is important that issues to do with teaching and learning about VSA are explicitly addressed" (p.3).

They also assert that VSA education must begin at primary school age, a message that is supported by other campaigners in the field, especially in light of occurrences of VSA deaths among under 10s in the last decade. That said, however, evidence also exists in the drug education literature that teaching young people about drug misuse at too young an age can be dangerous since younger children can be more suggestible. Given the ready availability of abuseable products for VSA, this precaution may be especially relevant here.

The Department for Education and Skills in England published *Drugs: Guidance for Schools* (2004) in which they assert that effective VSA teaching and learning occurs when it is incorporated into wider education programme but also receives dedicated time to explore the peculiarities of VSA compared to other forms of drug misuse.

Awareness Raising Campaigns

Internationally, there has been a dearth of public awareness raising campaigns that have tried to communicate messages regarding the dangers of VSA.

In the UK, a Department of Health (DoH) television advertising campaign, launched in the 1990s and specifically aimed at VSA, was hailed a success following subsequent decreases in recorded deaths among young people across the UK (DoH, 1993). The direct relationship between this campaign and the levels of VSA practice are, however, questionable since the decrease was also noted in UK jurisdictions where the advertisements had not been broadcast.

The National Youth Anti-Drug Media Campaign that was launched in the US in 1998 received bad press for failing to impact on drug misuse among young people and, in fact, it was argued by some that the campaign may have resulted in some young people being more inclined to try drugs as a result (Drug and Alcohol Findings, 2005).

Local Communications

Two dedicated information outlets exist in Scotland. In 2003, the Scottish Executive published the Know the Score document – Volatile Substance Abuse, aimed at a broad readership. The Scottish Drugs Forum also publish a quarterly newsletter - VS Focus – which focuses exclusively on VSA. This has been running since 1998 with regular issues dating up to May 2005 but is only available to members of the forum.

Information regarding the circulation, use and effectiveness of the 2 measures is not available.

Chapter 5: Successful Prevention of VSA

Introduction

In many ways, VSA is a 'hidden' problem. The inconspicuous nature of the products used, the short term outwardly visible effects of VSA and the high incidence of use within the home (and also, and perhaps more importantly, use in 'hidden' outdoor locations), all combine to make tackling VSA a challenge.

Whilst effective communication regarding VSA clearly plays a key role in the prevention of VSA, the evidence suggests that this needs to be complemented by awareness of harm minimisation strategies, raising the profile of VSA among professionals so that the risks are better understood, providing suitably targeted services and trained staff, legislative provision for restricting sales of dangerous substances and modifying products to minimise opportunity to abuse. All must be undertaken, however, with caution not to raise awareness of 'how' to abuse solvents which might, potentially, encourage more young people to experiment.

This chapter discusses some of the practical measures that have been used in an attempt to target VSA.

Harm Minimisation

The risk of instant death from solvent abuse, even on first time use, makes it difficult to offer advice on 'safe use' or harm minimisation for volatile substance users. In sum:

"Whilst the harm reduction type of evidence, provided in relation to a wide range of other drugs, may consist of information on how specific drugs may be used with less risk, in the case of VSA the preferred message is one of discouraging any use of volatile substances whatsoever. The reason for this is the recognition that serious health risks can result from even one-off instances of VSA." (McKeganey, unpublished, p.2).

Indeed, most research asserts, without reservation, the need to communicate the high risk nature of VSA and fact that it can never be carried out safely (HEBS and Ives, 1999).

Despite this, the Advisory Council on the Misuse of Drugs (ACMD) in their 1995 overview of VSA suggests that there are some methods of administration and environments of abuse that may present greater risks to users than others. For example, spraying substances directly into the mouth or inhaling by placing a plastic bag over the head are especially high risk, and environments that are close to water and railway lines may be especially dangerous.

Research carried out with a sample of Aboriginal volatile substance users also provides some indication of harm minimisation strategies. Interviews with users revealed that sniffing in groups, and in public, were considered to be 'safer' ways of practising VSA (Sandover, Houghton and O'Donoghue, 1997). Having contact with family members and being a social user were also cited and interviews revealed that effective strategies for reinforcing the risks of VSA included witnessing other sniffers suffering major facial burns, sickness or death (ibid).

Whilst the NCB, among others, encourages educators to be realistic and truthful about the real harms of drug misuse, in the case of VSA, the possibility of sudden death, even on first use, is realistic. This presents a unique challenge to VSA education.

Effective Interventions

The guidance for professionals produced by HEBS and Ives (1999) summarises the types of treatment available to volatile solvent participants as including:

- psychotherapeutic approaches
- individual or group counselling
- family therapy or counselling
- self-help groups
- temporary removal of young people from risk environments.

Discussions with stakeholders suggest that these services are currently offered to VSA participants as part of wider drug treatment programmes.

The Scottish Drugs Misuse Information Strategy Team (DMIST) collect, maintain and disseminate data from drug treatment agencies across Scotland. This data is held in the Scottish Drug Misuse Database (SDMD) and includes data relating to solvent abuse referrals by Local Authority and health board area.

In 2004/05, a total of 78 people presented to services in Scotland with current solvent abuse problems, accounting for just over 1% of all adults with presenting drug misuse. The number of people presenting to services for whom solvent abuse was the main drug of abuse was just 32, most of whom were under 18. These comparatively low figures (when compared to other types of drug misuse), are often presented in the literature as being the main reason that additional resources have not been targeted at VSA in recent years.

The majority of support for users, carers and others who encounter VSA is currently provided via telephone help-lines or specialised drug charities and other organisations (including those offered by Re-Solv, SOLVE IT, Scottish Drugs Forum and LOST).

Excepting these services, a search of the various websites of agencies with an interest in solvent abuse, and discussions with key stakeholders, suggests that there are no dedicated services for working with volatile substance abuse. Anecdotally, those consulted in the research suggested that this means that there is no obvious referral routes for cases of VSA that are alerted to social services and others professionals.

The lack of services specifically working with inhalant or solvent abusers is not a new observation. Merrill (1985) noted a lack of treatment centres for young people with chronic solvent abuse problems.

Anecdotally, it seems that one reason for VSA not being taken seriously is the view that VSA is, for the most part, a 'fad' that most young people grow out of. The perceived short-term nature of VSA means that resources are often targeted at more serious and prolonged forms of alcohol, tobacco and illegal drug misuse. This does not help those older users, as the St Georges data shows, over 18s account for a notable proportion of all deaths. Also, the view that VSA is a 'youth problem' means that there is often less material for those aged over 18 and no obvious referral route.

Given the evidence that suggests that VSA is not taken seriously (because young people grow out of it and because illegal drug use has become a clearer priority), and alcohol and tobacco have long been recognised as significant factors in drug-related problems, there may be opposition to the setting up of such dedicated services. Any consideration of future service introductions would require a closer analysis of the potential demand for such services and their effectiveness.

Availability and Sales of Substances

There are 2 crucial pieces of legislation that affect the availability of volatile substances and which may play a part in preventing future emergence of VSA to the high levels previously recorded.

The first of these is the Intoxicating Substances (Supply) Act 1985 (which applies to England and Wales only) and which makes it illegal for retailers to sell volatile substances to anyone under the age of 18 if there is reason to believe that they will use it for inhalation and intoxication purposes.

Whilst this places the onus on retailers to sell responsibly, the legislation has been criticised by VSA campaigners as failing to specify which products should be restricted (Ives, 1999) and does not effect the widespread availability of abuseable solvents in the public domain (for example, in the home, schools and workplace). Further, it has been reported that the legislation has failed to bring many cases to court, most probably due to complications with establishing proof that retailers knowingly acted irresponsibly.

In 1999, the Cigarette Lighter Refills (Safety) Legislation was introduced as means of specifically controlling sales of the most widely used solvent among young people. Since this time, it has been illegal to sell lighter fuel to anyone under 18 in England and Wales, and retailers found breaking the law can receive penalties of a fine of £5000 or 6 months in prison.

Whilst the register of VSA deaths held by St George's, University of London may suggest that the introduction of such legislation reduced abuse of butane gas (with a drop in deaths associated with cigarette lighter refills among under 18s in 2000) a return to similar numbers of pre-legislation deaths for this group in 2001 and 2002 suggest that this relationship may not be robust. There is also anecdotal evidence to suggest that such legislation has simply changed the nature of VSA, rather than reducing its prevalence.

Scotland is covered under the UK-wide Regulations which make it illegal to sell lighter fuel refills to anyone under 18. It is a common-law offence if solvents are supplied to people of any age in the knowledge that they are to be used for the purpose of abuse. Enforcement is the responsibility of local trading standards and local authorities.

In addition, the Solvent Abuse Scotland Act (1983) was introduced with the aim of reducing the incidence of solvent abuse amongst children. This Act and the subsequent Children (Scotland) Act (1995) make VSA a ground for referral to the Scottish Children's Reporter Administration.

In 2001 in Scotland, the Lord Advocate granted permission for a pilot scheme to assess test purchasing in Scotland to help achieve more effective enforcement of the law prohibiting the sale of tobacco products. In 2003, this was complemented by the launch of a Fife-based initiative specifically to tackle the illegal sales of potentially lethal butane gas to under 18s.

A survey carried out on behalf of Re-Solv in England and Wales (LACORS, unpublished), following Test Purchasing Campaigns to Enforce Cigarette Lighter Refill (Safety) Regulations 1999 showed reasonable concurrence with the 1999 Cigarette Lighter Refills (Safety) Legislation. Similar research, carried out on a systematic basis, may be required in Scotland to test more local levels of concordance following the Lord Advocate's moves to allow test purchasing.

Product Modifications

The Department for Trade and Industry has responsibility for monitoring the packaging and modification of products to make sure that they do not present risks to consumers. By modifying products such as aerosols, producers can also play a part in the successful prevention of VSA.

In 2004, the British Aerosol Manufacturers' Association (BAMA), a trade association that represents the interests of all sections of the aerosol industry, from the suppliers of

components and chemicals to fillers and marketers of aerosol products, presented an overview of BAMA's efforts towards making solvents safe to the Scottish Drugs Forum conference. These include promotion of the use of the 'SACKI' warning on many commonly abused products ('Solvent Abuse Can Kill Instantly') and the appearance of skull and crossbones warning signs on bleach and other products.

Other modifications to solvents include the possible addition of Bitrex to solutions to make them less appealing to consume and this was taken forward by Shell for inclusion in lighter gas refills, but is not possible for aerosol products.

Discussions with stakeholders suggest that, in Australia, consideration is also being given to the addition of isopropyl mercaptan, a smelly compound that is added to piped natural gas and, uniquely to the UK, to piped LPG (a mixture of ethane, propane and butanes) in remote areas of Scotland to butane lighter fuel canisters.

Much of the work carried out by producers and associations such as BAMA remains hidden from public scrutiny, mostly as a means of limiting the awareness of modifications among abusers who might use the information to find alternative solutions to abusing the products. Indeed, research carried by BAMA with chronic glue sniffers showed that they were sufficiently determined that they would find away around most proposed product modifications to ensure that they could continue abusing (Ives, 2001).

Chapter 6: Tackling VSA in the Future

Introduction

The overall objective of the research was to **identify, assess** and **describe** the evidence relating to a number of core issues relating to VSA in Scotland. Within this agenda, it was necessary to explore the **nature, range** and **volume** of evidence available.

Summary of Key Findings

The prevalence and nature of VSA among young people in Scotland, particularly 12-18 year olds

Data available mostly from school surveys suggest that recent solvent abuse has lower prevalence rates among young people in Scotland than cannabis and stimulant use.

It is difficult to conclude with accuracy any trends in VSA among different age groups since the data that is collected targets only specific samples (13 and 15 year olds). European data tends to subsume Scotland within estimates for the UK as a whole and access to the raw data from such surveys would be necessary in order to carry out comparative analysis with locally held data.

Historically, research showed that recreational VSA was essentially a group activity with common sites of use being friends' homes, parties and public places. Despite this, recent evidence shows that the majority of users, especially young people, abuse solvents in the home.

The lack of qualitative work with young people in relation to solvent abuse means that it is also difficult to understand fully the nature of VSA. General research data suggests that VSA is experimental and often precedes other types of drug misuse. The range of products that are available for abuse and which have appeared in the various evidence reviewed suggest that it is a diverse practice.

Why people abuse volatile substances

The main attractions of VSA to young people include:

- **availability** – products that can be used are readily available in the home and the school
- **cost** – the cost of products that can be used is less than the cost of alcohol, cigarettes and other substances
- **easy to hide** – inhaled products are easy to conceal since they are mostly everyday household items. It is also easy to hide use of volatile solvents since inhalation has a short term outwardly visible effect on participants
- **legality** – many of the products that can be used can be legally purchased and do not arouse suspicion among retailers (for example, nail-varnish remover, deodorants and glues)
- **low risk addiction risks** – unlike other substances, many of the products used are non-addictive and there is a low risk of dependency. This could, however, be compounded by adolescents simply outgrowing VSA and moving on to other drugs before becoming drug dependent.

Whether people in specific social groups are more likely to abuse volatile substances than others

A lack of survey work among young people outwith mainstream education means that it is difficult to fully assess the direct relationship between different forms of social vulnerability and likely use of inhalants. In particular, research with looked after and accommodated children and those in secure accommodation may be needed. The lack of consultation work

with young people and older users with solvent abusing histories also makes it difficult to develop a full epidemiological understanding of VSA.

It appears that there is little dedicated evidence that focuses on minority groups, especially in the UK. What is available mostly stems from Australia and the US and suggests that VSA is more prevalent among white people than minority ethnic groups. It remains to be fully explored as to whether cultural differences would affect the findings or transferability of this work to the Scottish context.

Whether people who abuse volatile substances also tend to abuse other substances

The available evidence in this regard is patchy. It seems clear than solvents are used less frequently than other drugs among young people and adults alike but US research with offender populations suggests that VSA may play a part in many substance abuse histories.

In Scotland, data from the Scottish Drugs Misuse Database shows that, in the year ending 31 March 2005, less than 1% of service users who presented to Scotland's local authorities or health boards, where the main drug of misuse was heroin, reported also using solvents.

VSA as a gateway to illegal drug misuse

Much of the literature in the field shows that solvents are initially tried through curiosity, out of boredom or to provide a means of escapism. Once tried, the curiosity element diminishes and use can in itself become boring such that other drugs are tried which can provide a greater 'buzz' or higher degree of escapism. For the most part, this involves transition towards cannabis in the first instance.

VSA communications already developed for use with all age groups, and their effectiveness

Several information resources have been identified, in particular from specialist organisations. There appears to be a variety of different media used for communication and clear differences in the materials developed for different age ranges with, perhaps, a lack of material aimed at older solvent abusers.

Whilst there appears to be no shortage of communication tools, it is less obvious whether independent evaluative work has been carried out to assess the effectiveness of these instruments. Certainly, there appear to be no outcome evaluations with widespread public availability.

Effective communication of VSA messages with young people, both in the UK and internationally

Information packs/advice leaflets have been identified that cover a wide target audience including children and young people, parents, educators, carers and health professionals and retailers. There also appears to be a wide range of communication media in existence including videos, CDs, tapes, workbooks and games for younger children.

There is patchy media reporting of VSA across different newspapers with different readerships and reporting tends to be linked to specific VSA deaths.

Importantly, it appears that there is evidence that reports the lack of recognition or awareness of VSA among the public and professionals alike and this may be indicative of ineffective communication strategies employed to date.

Whether providing education and information has a positive impact in reducing or preventing VSA

The death risks associated with VSA appear to present unique challenges to the drug education agenda. The drug education literature shows that scare tactics do not work well with young people and that stories of first time death risks are often not believed. Fear of raising awareness of VSA methods is also cited in the literature as a reason that VSA has

not, in recent years, been targeted specifically as part of drug education in the UK. Whilst some of those working in the field have urged for specific VSA education, including primary school children, traditional drug education debates regarding suggestibility of younger children may continue to act as a barrier to VSA education.

What works in reducing deaths and harm from VSA, both in the UK and internationally

Across all the data sources, the area of VSA receiving the least attention is what works in preventing volatile substance abuse. Whilst fears about encouraging VSA through education and awareness raising may account for some of this, it presents an obvious vacuity in the evidence base that can be used to reduce VSA in the future. Research shows mixed levels of response to public awareness raising campaigns, a resistance among professionals in raising the profile of VSA and logistical difficulties in implementing product modifications to reduce VSA, as well as a lack of fieldwork to test the effectiveness of legislative provisions to ban the sales of age-restricted goods to under 18s in Scotland. Despite this, a number of harm minimisation approaches that are based on making VSA more visible can be identified from within the range of documents available.

Nature and Volume of Evidence

There are variable levels of fluctuation in the volume of evidence over time between the different types of media. For example, there are peaks in newspaper reporting of VSA for the years 1998, 1999 and 2002. For journals, there is a peak in evidence for the years 1998-2005. The majority of books and reports relating to VSA identified from the national library were published in the 1980s and 1990s.

All analysis of the volume of evidence available over time is, of course, influenced by the date coverage of the databases searched. An increase in the volume of evidence in more recent years may also reflect an increase in the number of different sources available for information output in recent years.

A general observation, however, is that most research is non Scotland based and is somewhat dated.

Gaps in the Evidence

In addition to the specific gaps identified above, it seems that there may be a need for more research to explore:

- Why there are more deaths in Scotland, the north of England and Northern Ireland compared to other UK jurisdictions?
- Why more boys die from VSA (and suffer serious injury) compared to girls, when usage prevalence is the same?
- Reasons for engaging in VSA *per se*. Although anecdotally there is evidence to suggest that VSA is popular because it is cheap, accessible etc, there appears to be a lack of direct consultation work with young people to explore reasons for entering into VSA.

The Way Forward

Raising the Profile of VSA

There is a clear message that VSA is not taken as seriously as other drug use. This is because only a minority of those who try VSA go on to become habitual users and, of those who do continue with their use, only a small number will experience serious health problems associated with their use (Gossop, 1993).

Further, evidence suggests that negative stereotypes associated with solvent abuse may compound problems of hidden use. Lake (2004) suggests that sniffing solvents is considered by young people to be 'filthy', something which in itself may be problematic since it encourages users not to disclose their use and the problem therefore, may remain hidden.

This suggests that sensitive approaches maybe required to making clear the harm minimisation strategies that can be used (i.e. social using), however, this would need to be handled in a way that did not, as a consequence, increase potential for experimentation.

In achieving a better understanding of the views of professionals in Scotland in relation to VSA, an audit of drug agencies, Local Authority social work services and police forces may prove useful.

Understanding the use of VSA alongside other drugs

Although the survey evidence points towards use of VSA as a gateway drug, there may be potential to further explore the relationship between VSA and other concurrent drug use. Specifically, it may be useful to explore whether solvents, in particular, are mixed with other drugs and/or alcohol rather than being used independently.

Further, whilst there may be some resistance to future allocation of resources aimed specifically at VSA, due to its perceived low prevalence and severity compared to other drugs, a better understanding of VSA as a gateway into illegal drug misuse may warrant further attention. Decreasing participation in VSA at a young age may act as an early prevention of entry into the forms of drug misuse that do currently receive attention and resources.

Evaluation of Existing Training and Available Information

It seems that despite a large body of guidance material, there is little that evaluates this material or monitors its use. Whilst discussions with stakeholders suggest that evaluative work is undertaken, this is very much hidden in the 'grey literature'.

Undertaking formal evaluation of the effectiveness of various VSA awareness raising activities/campaigns seems a sensible next step. Until both process and outcome evaluation has been carried out of these interventions, little information is available with regard to their actual impact.

Consultation

The lack of consultation work is also highlighted by the 2005 Department for Health VSA Framework, with a commitment by the DoH that such work will be undertaken. Given regional variations in prevalence rates, and the differing socio-demographic and geographical characteristics of Scotland and the rest of the UK, there may be a need for local consultation work to be undertaken as this seems to be the biggest single gap in the evidence to date.

Appendix 1: Substance and Products of Abuse from the Research

Source of Evidence

Report 19: Trends in Death Associated With Abuse of Volatile Substances 1971 - 2003

Products

Gas Fuels: lighter fuel, butane gas cans, domestic gas (bottled), propane gas cylinder, acetylene, unspecified butane

Aerosols: deodorant / antiperspirant, pain relief spray, air freshener, hair spray, cleaning fluids, insect spray, paint spray, aerosol glue, other aerosols.

Glues: contact adhesives, bicycle tyre repair glue, model glue, other glue.

Other: typewriter correction fluid, chloroform, dry cleaning fluids, petrol, plaster remover, domestic cleaning fluids, industrial solvents / degreasers, anaesthetic agents, carbon tetrachloride, paint thinners and strippers, alkyl nitrites, refrigerant gases, brake cleaner, ether, petroleum spirits (excl petrol), miscellaneous products.

Volatile Substance Abuse: Know The Score (2003), Scottish Executive: Edinburgh
 - deodorants, hairspray, paint spray, furniture products; pain-relieving spray, air freshener, fly spray, carpet cleaner; solvent-based adhesives; petrol; some typewriter correction fluids; nail varnish and nail varnish remover; dry-cleaning fluids; paint thinners and paint removers; UHT cream - whipped cream cans; dyes (for shoes); cleaning agents - degreasing materials, sticking plaster remover; Halon fire extinguishers (no longer sold but still in use in some public building).

National Survey on Drug Use and Health, Substance Abuse and Mental Health Services Administration (SAMHSA) 2005

Inhalant Abuse by Adolescents

Glue, show polish, toluene, gasoline, lighter fluid, spray paints, correction fluid, degreaser, cleaning fluid, lacquer thinner or other paint solvents, aerosol sprays, amyl nitrite, poppers, room odorizers, "rush", butane, propane, nitrous oxide, whippets, halothane, ether or other anesthetics

Propane: bottled gas

Butane: cigarette lighter fuel

Gasoline: automotive fuel

n-Hexane: model glues, rubber cement

Trichloroethylene: dry cleaning agents, degreasing agents, spot remover

Dichloromethane: paint stripper

Benzene: resins, lacquers, varnishes, gasoline

Toluene: adhesives, spray paint, glues, paint thinner

Xylene: wood glues, lacquer thinner

Butyl/ isobutyl nitrate: room air freshener

Amyl nitrite "poppers": coronary vasodilator

Diethyl ether: laboratory solvents

Acetone: nail polish remover

Butanone: adhesives, general solvent

Methyl n-butyl ketone (MBK): various paints

Methyl isobutyl ketone (MIBK): spray paint

Re-solv – Parents Guide to Volatile Substance Abuse

Cigarette lighter fuel, aerosols, hair products, furniture polish, pain relieving spray, solvent based adhesives, petrol, typewriter correction fluid, nail varnish and remover, dry cleaning fluid, paint thinners, paint removers, halon (BCF) fire extinguishers

The American Journal of Drug and Alcohol Abuse Vol.30
Epidemiology of Volatile Substance Abuse (VSA) Cases Reported to US Poison Centre

The top 5 categories of substances abused were: gasoline (41%), paint (13%), propane/butane (6%), air fresheners (6%) and formalin (5%).

Adolescent Inhalant Abuse: Environment of Use

The 5 substances most frequently used as inhalants include: gasoline (57.4%), freon (40.45%), butane lighter fluid (38.3%), glue (29.8%) and nitrous oxide (23.4%)

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