Prevalence and profiles of substance and multi-substance use among adolescents:

UK and International perspectives.

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Introduction

This report describes three aspects of substance use patterns among adolescents. Section one describes variation in regular smoking and drinking, drunkenness and recent cannabis use among adolescents in Europe and North America, focusing on the relative position of UK countries with respect to each other and within a wider international perspective. The second section focuses on geographic and demographic variation within a single country, Scotland, and the associated patterns in prevalence of adolescent substance use. The final section profiles regular adolescent substance users with respect to a variety of demographic, family, school and peer related factors, focusing on adolescents exhibiting particularly risky patterns of substance use such as those using multiple substances regularly.

Data Sources

Two data sources were used throughout the report, the Health Behaviour in School aged Children (2001/2)[1] survey and the Scottish Schools Adolescent Lifestyle and Substance Use Survey 2002 (SALSUS)[2]. In 2002 these two surveys were carried out concurrently, to reduce survey fatigue in schools, by the Child and Adolescent Health Research Unit, The University of Edinburgh. Some background and methodological details for each survey are provided below.

1. Health Behaviour in School-aged Children (HBSC) study.

The HBSC study is cross-national research conducted by an international network of national research teams in collaboration with the WHO Regional Office for Europe. The study was initiated in 1982 and included 35 countries and regions in 2001/2. Data from 33 countries are included in this report (See Appendix A). The study carries out a survey every four years to monitor health and health behaviour in young people, including aspects of the wider context of health such as family, school and peer settings, and the socio-economic environment in which young people live. The target population for the study comprises young people attending school, aged 11, 13 and 15 years.

HBSC Survey Instrument.
 A standard questionnaire, developed by the international research network, is used in all countries and data are collected according to the international research protocol[3]. The questionnaire consists of a set of mandatory items that each country must use, including items on substance use. This provides a rich source of data on trends and international patterns in smoking, drinking and cannabis use in Europe and North America. In a few countries, due to sensitivity, collection of data on Cannabis use was not carried out.

HBSC 2001/2 Sampling Methodology
The HBSC survey is a class based multistage cluster sample. Approximately 1500 respondents in each of the three age groups were targeted in every country. The timing of the survey in each country is designed to produce samples of mean age 11.5, 13.5 and 15.5 years respectively. Pupils are selected using a clustered sampling design, where the initial sampling unit was the school class or the school when class lists were unavailable. Each pupil in the selected classes was asked to complete a confidential questionnaire, the survey instrument. The full research protocol for the 2001/2 survey[3] is available from the HBSC web site at www.hbsc.org.

2. Scottish Schools Adolescent Lifestyle and Substance Use Survey 2002 (SALSUS)

The SALSUS 2002 survey continued a series of biennial surveys carried out in Scotland, covering smoking from 1982, use of alcohol since 1990 and use of drugs since 1998. The SALSUS survey in 2002 had an increased sample size relative to previous surveys to permit local estimates of prevalence to be presented at Education Authority, Drug and Alcohol Action Team and Health Board level. In order to present robust local level estimates the target age range was restricted to only two school years, S2 and S4, average age 13 and 15 (previous surveys in the series surveyed four school years, S1 to S4, age range 12-15).

SALSUS 2002 Survey Instrument
The questionnaire included items on smoking, drinking and drug use, many of which had been present in previous surveys and were used to measure trends in substance use. However, in 2002 the survey also included a substantial increase in questions about the context of young people's lives within which any substance use behaviour was occurring. Some of these questions were sourced from the HBSC study cited above.

SALSUS 2002 Sampling Methodology
The SALSUS survey was a class based multistage cluster sample, stratified by school year, Education Authority, and school funding. The survey sampled pupils from S2 and S4 school years (average age 13.6 and 15.6 respectively). Pupils were selected using a clustered sampling design, where the initial sampling unit was the school. All independent and education authority schools were eligible to take part in the survey with the exception of special schools. In total 314 schools participated and a final sample of 23000 pupils achieved (approximately 18% of the total Scottish population in this age group). Further details of the sampling methodology and questionnaire content of the SALSUS 2002 survey can be found in the SALSUS 2002 Protocol[5]. The main report from the SALSUS 2002 survey, and local level reports for each participating Education Authority, Drug and Alcohol Action Team and Health Board are available from the Drug Misuse Information Scotland website[4].

SECTION 1: Prevalence of smoking, drinking and drug use among Adolescents – UK and International patterns.

This first section of the report presents maps and interpretation of international patterns in prevalence of regular smoking and drinking, drunkenness and recent cannabis use among 15 year olds living in Europe and North America in 2001/2. The data are derived from the 2001/2 Health Behaviour in School-aged Children (HBSC) study: a World Health Organisation collaborative cross-national study, and were previously published in a different format in the HBSC 2001/2 international report '*Young people's health in context*[1]. Appendix A provides tables of prevalence from which the maps were derived and a map providing a key for country identity.

Regular Smoking among 15 year olds.

Smoking in adults has been identified by WHO as the leading cause of premature illness and death in developed countries[5]. Smoking behaviour is very often established in adolescence however, and it is known that earlier onset of smoking is more likely to lead to addiction. In addition to the long-term health impact of initiating smoking in adolescence smoking can give rise to a range of short-term health problems in young people, including reduced respiratory function and physical fitness, and increased asthmatic problems and susceptibility and severity of respiratory illness. Regular smokers are at the highest risk of these long- and short-term health problems.

Definitions
Regular smoking was defined from responses to a single item on current smoking frequency. Pupils were asked 'How *often do you smoke tobacco at present?* '. Response categories were: *I don't smoke, Every day, At least once a week but not every day, Less than once a week*. For this report regular smoking is defined as currently smoking once a week or more often. A further two items measured the prevalence of having ever smoked, and age of initiation of cigarette smoking.

Prevalence of weekly smoking in the UK nations
Prevalence of weekly smoking varied between the participating UK nations (Table 1.1). Weekly smoking in this age group is more common in England where 28% of girls and 21% of boys and are weekly smokers. Prevalence among boys is significantly lower in Scotland and Wales at 16%, and prevalence in girls is the lowest of the three UK countries in Scotland at 23%. The three countries all exhibit the same gender pattern with respect to weekly smoking, with girls reporting higher rates than boys. This gender difference is greatest in Wales where girls are 70% more likely to report being weekly smokers than are boys.

Table 1.1: Prevalence of weekly smoking in the UK nations (HBSC 2001/2)

NATION	PREVALENCE OF WEEKLY SMOKING	
	Boys (%)	Girls (%)
England	21	28
Scotland	16	23
Wales	16	27
HBSC Average	24	23

HBSC average is the average across all participating HBSC countries.

International prevalence and patterns of regular smoking.

On average across all HBSC participating countries 23% of girls and 24% of boys aged 15 reported smoking regularly. There is considerable variation in prevalence of weekly smoking between countries in Europe and North America (Maps 1 and 2). Exceptionally high levels were found in Greenland, with 67% of girls and 57% of boys reporting weekly smoking. In all other countries weekly smoking prevalence was less than 45% for either gender. This varied among girls from around 12% in the USA to 37% in Austria, and among boys from 11% in Sweden to 45% in the Ukraine. Rates of weekly smoking among 15 year old boys in Scotland and Wales are in the lowest quartile of countries.

In more than half the countries, mainly in northern and Western Europe, girls are more likely to be weekly smokers than boys, as in the UK. However the reverse gender relationship is seen in some eastern European countries, most extremely in Lithuania and Ukraine where weekly smoking is twice as high in boys as girls.

Age at initiation of smoking is generally earlier among boys than girls, this difference being as great as two years in some eastern European countries. The UK nations do not show this pattern. Scotland is one of only two countries within the HBSC survey showing the reverse pattern, with earlier initiation among girls, and in England and Wales age at initiation is similar in both genders (Table 1.2).

Since 1998 daily smoking has increased in a few eastern European countries and stabilised or fallen by less than 5% in most European countries. Scotland and Wales were among only 4 countries where daily smoking fell among boys by at least 6% since 1998[1].

Table 1.2: Age at onset of smoking in current weekly smokers in the UK nations (HBSC 2001/2)

Nation	AGE AT INITIATION OF SMOKING (CURRENT REGULAR SMOKERS AGE 15)	
	Boys	**Girls**
England	12.2	12.2
Scotland	12.4	11.7
Wales	11.9	12.0
HBSC Average	11.9	12.6

HBSC average is the average across all participating HBSC countries.
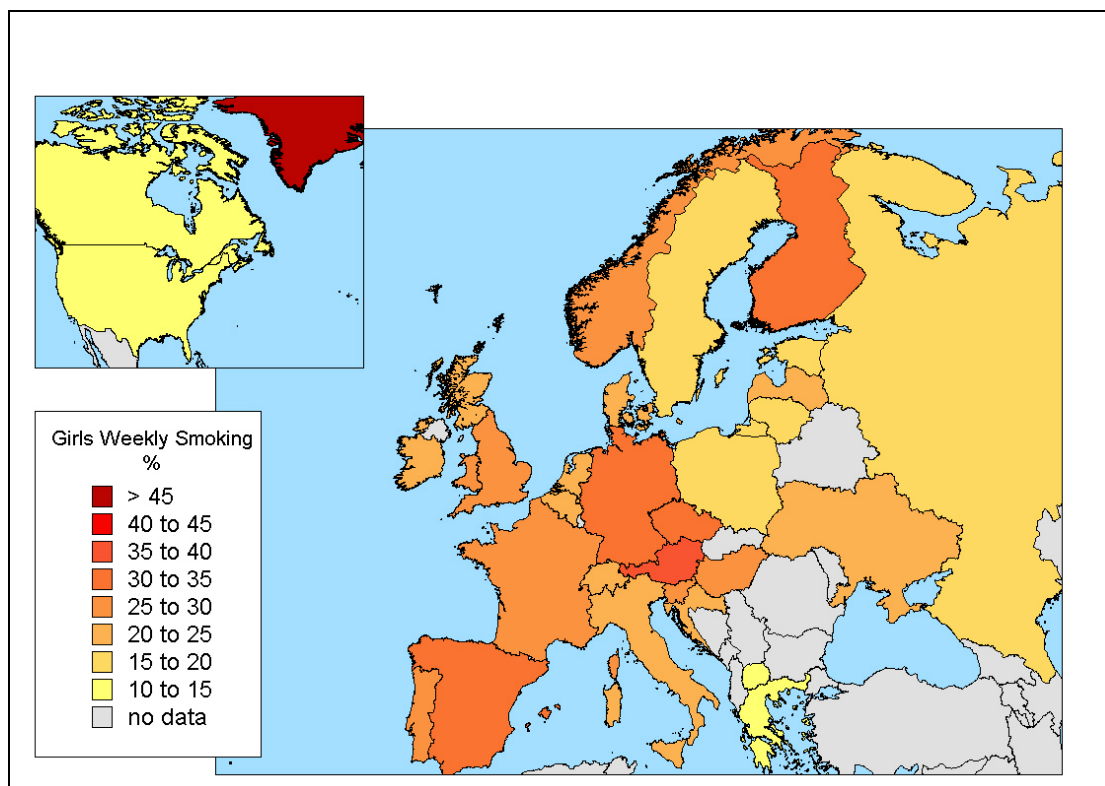
Map1: Percentage of 15 year old boys who are weekly smokers   (HBSC 2001/2)
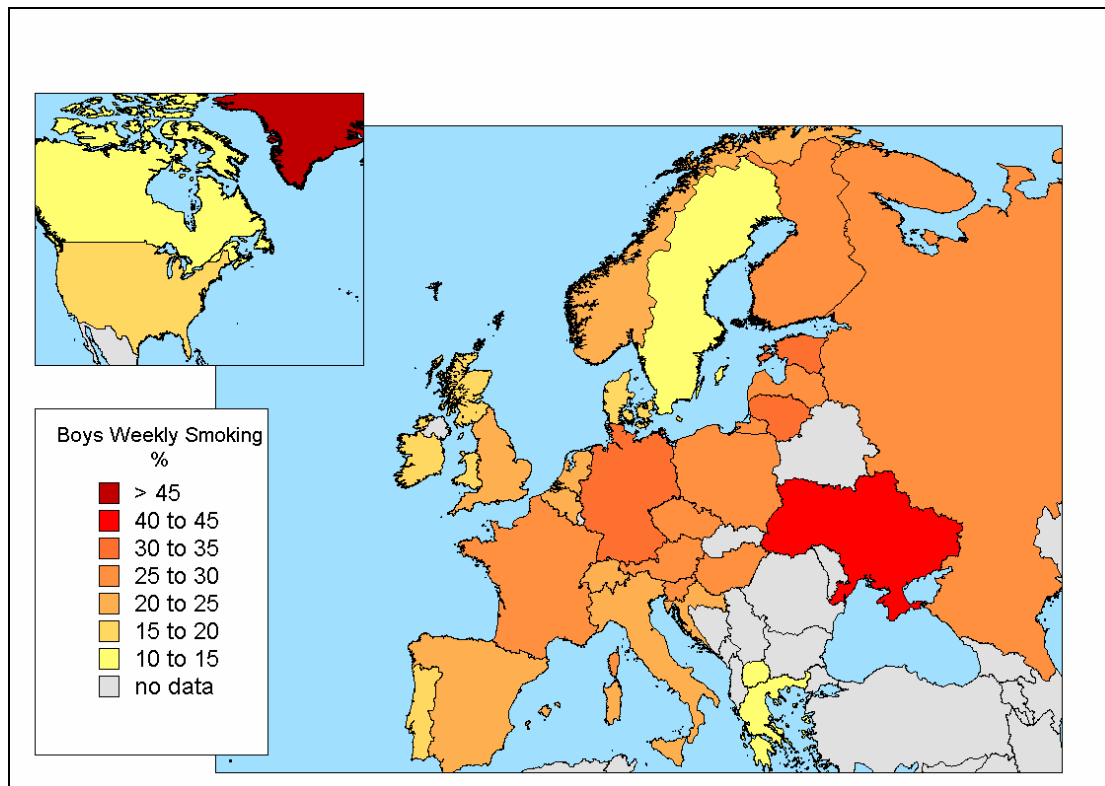
Map2: Percentage of 15 year old girls who are weekly smokers   (HBSC 2001/2)

Weekly drinking among 15 year olds

Drinking alcohol is a culturally accepted behaviour in adults in most countries participating in HBSC, and within the UK the role of alcohol in the lives of young people has been increasing over the last 12 years[6]. Heavy drinking is associated with a variety of adverse social and health outcomes for young people, including missing school, having unprotected sex, destructive behaviour, increased likelihood of injury and even alcohol related deaths in adolescence[7,8,9]. However much of this research has been based on small-scale studies, and WHO noted in 1999 that there is very little evidence from large representative surveys of the drinking patterns and consequences of drinking in young people[10].

Definitions

Regular drinking was derived from the answer to an item on frequency of drinking. Pupils were asked *'How many times a week do you usually drink any alcoholic drink'*. Response categories were: *Never, Less than once a week, Once a week, 2-4 days a week, 5-6 days a week, Once a day every day, Every day more than once*. A further item measured self-reported drunkenness. Pupils were asked 'Have *you ever had so much alcohol that you were really drunk?* Response categories were: *No never, Yes once, Yes 2-3 times, Yes 4-10 times, Yes more than 10 times*.
In this report regular drinking is defined as drinking alcohol once a week or more often and the prevalence of being drunk 4 or more times is used as an indicator of drunkenness.

Prevalence of weekly drinking and drunkenness in UK nations

There is considerable variation in prevalence of regular drinking between the three UK nations. The highest prevalence is found in Wales where 58% of boys and 54% of girls report drinking weekly, and the lowest prevalence is reported in Scotland (44% of boys and 42% of girls) (Table 1.3). However, rates in all UK countries are substantially higher than the HBSC average. Within the UK countries boys reported weekly drinking more often than girls, though the gender difference is not significant in Scotland. Even in England, where the gender difference is greatest, boys are only 15% more likely to be weekly drinkers than girls, a relatively small gender gap compared with that for smoking.

Prevalence of drunkenness is relatively high in all three participating UK nations, with about a third of young people reporting having been drunk 4 or more times (Table 1.4). All three nations have a similar prevalence for girls (33%, 33% and 32% for England, Scotland and Wales respectively), with Scotland having a slightly lower prevalence among boys (36%, 30% and 37% in England, Scotland and Wales respectively). Gender differences in drunkenness in the UK are relatively small and inconsistent, in contrast with the international pattern commented on below. In England and Wales more boys report being drunk 4 or more times than girls, whereas in Scotland slightly more girls than boys report drunkenness (though this is not statistically significant).

International prevalence and patterns of drinking alcohol

Across Europe and North America drinking among young people is fairly common, with almost a quarter of girls (24%) and more than a third of boys (34%) reporting that they drink alcohol weekly. There is substantial variation between countries in frequency of weekly drinking (Maps 3 and 4). Among girls, figures range from 10% in Poland to 54% in Wales, and among boys from 18% in Finland to 58% in Wales. The three participating UK nations report some of the highest rates of drinking in all HBSC countries. Wales and England rank 1st and 2nd for weekly drinking, with Scotland ranking 6th. Boys are more likely to report drinking weekly than girls in all countries, with Scotland and Wales being among the countries with the smallest gender gap.

On average, among the countries in the HBSC study, 15% of girls and 23% of boys of this age reported that they had been drunk 4 or more times. There is considerable variation in drunkenness, from TFY Macedonia where only 2% of girls and 6% of boys report being drunk more than 4 times, to Denmark (41% and 49% for girls and boys respectively) (Maps 5 and 6). UK nations report some of the highest prevalence of drunkenness at all ages, ranking 3rd, 4th and 5th (Wales, England and Scotland respectively). There is a general pattern that northern European nations and Canada are more likely to report drunkenness, with Mediterranean countries reporting the lowest levels. In almost all countries boys are more likely to report being drunk 4 or more times than are girls, and in many countries this gender difference is quite dramatic (in 10 countries more than twice as many boys as girls report drunkenness). The UK nations have relatively small gender differences.

There are no fixed relationships between drunkenness and weekly drinking. Some countries, such as Italy and Malta, report relatively low levels of drunkenness, yet regular drinking is common, whereas Finland has high rates of drunkenness and fairly low levels of weekly drinking. In the UK nations high rates of both weekly drinking and drunkenness are reported.

Table 1.3: Prevalence of weekly drinking in the UK nations (HBSC 2001/2)

Nation	PREVALENCE OF WEEKLY DRINKING (AGE 15)	
	Boys (%)	Girls (%)
England	56	49
Scotland	44	42
Wales	58	54
HBSC Average	34	24

HBSC average is the average across all participating HBSC countries.
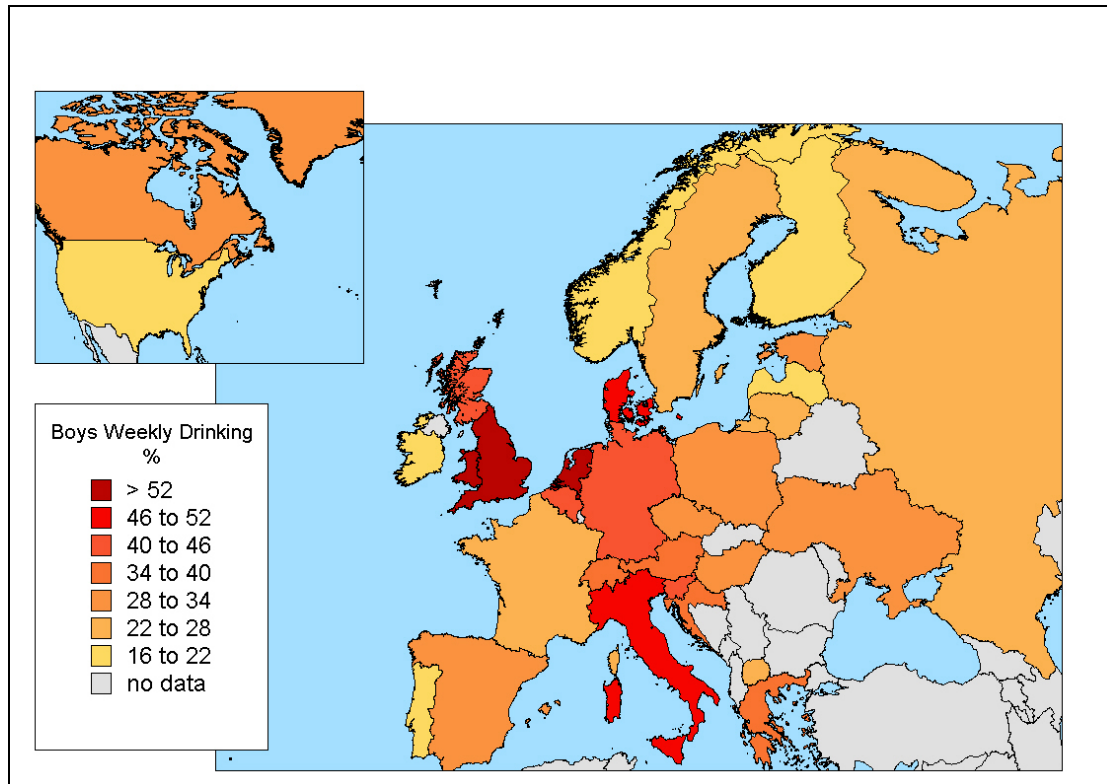
Table 1.4: Prevalence of being drunk 4 or more times in the UK nations (HBSC 2001/2)

Nation	PREVALENCE OF BEING DRUNK 4 OR MORE TIMES (AGE 15)	
	Boys (%)	Girls (%)
England	36	33
Scotland	31	33
Wales	37	32
HBSC Average	23	15

HBSC average is the average across all participating HBSC countries.
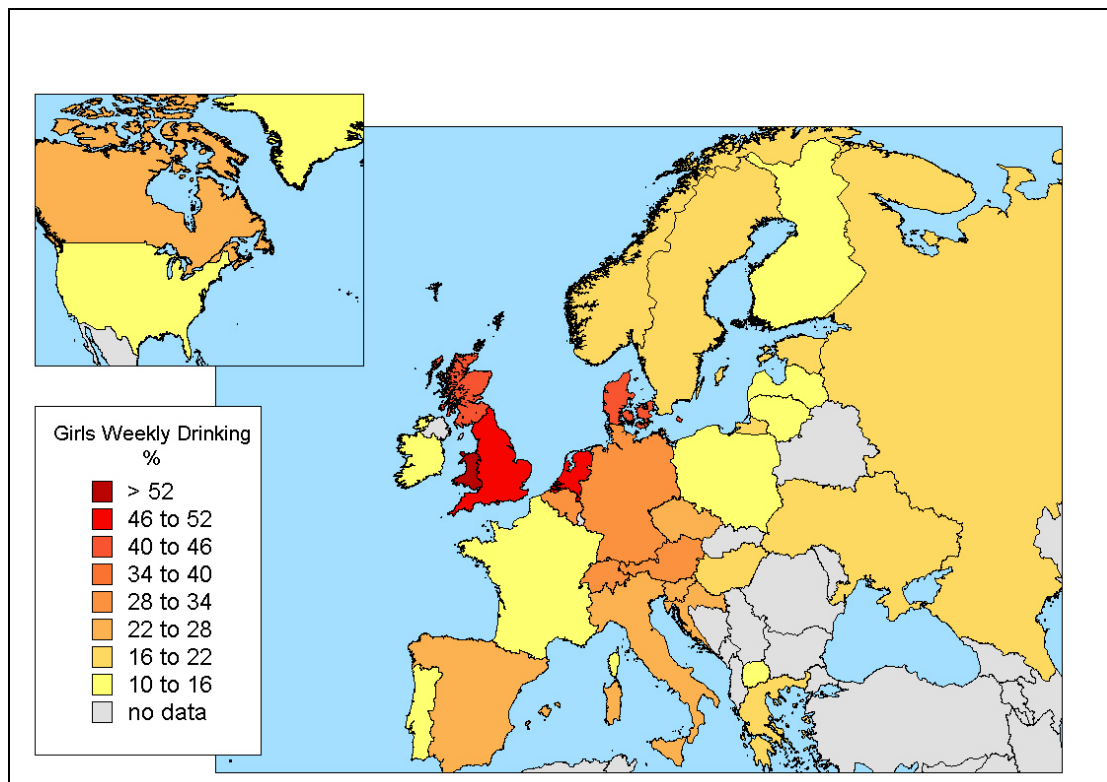
Map3: Percentage of boys aged 15 who are weekly drinkers   (HBSC 2001/2)
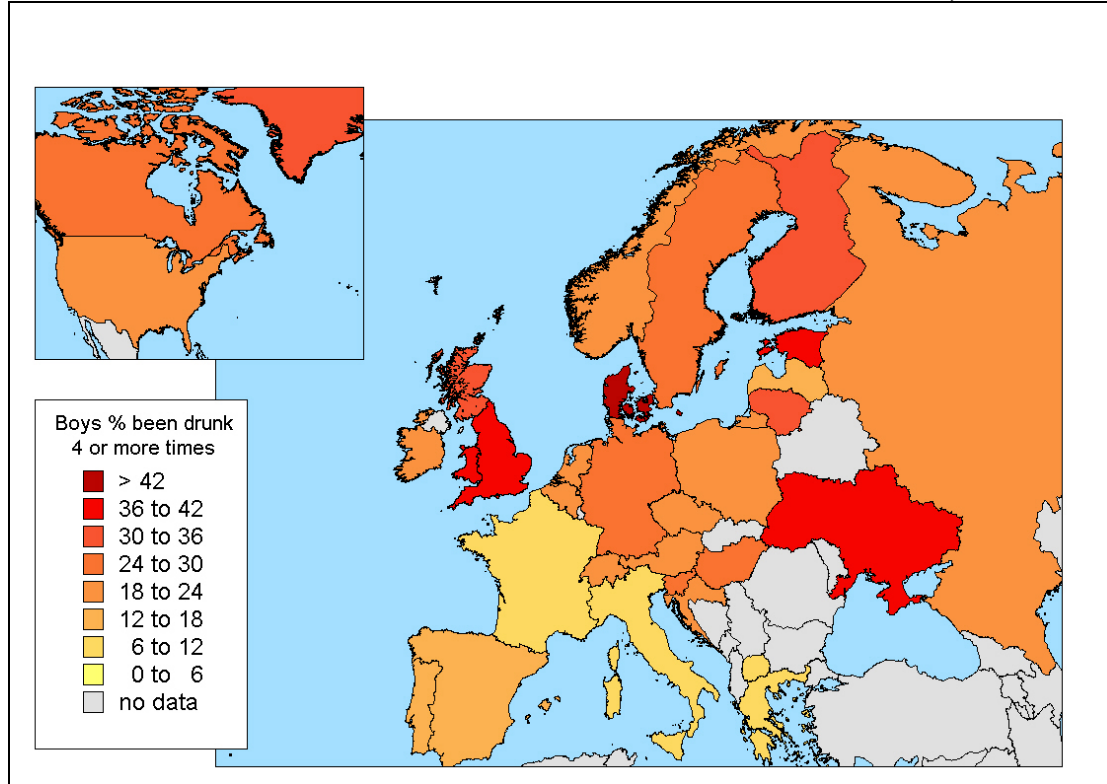

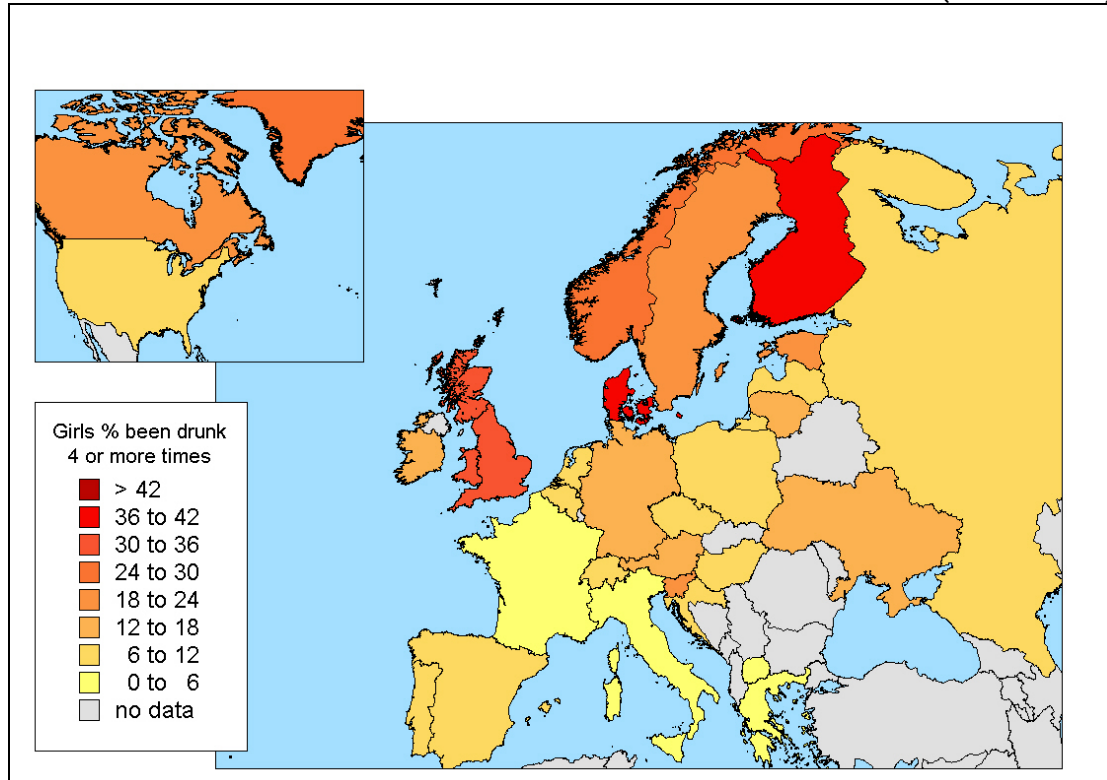**Map4**: Percentage of girls aged 15 who are weekly drinkers   (HBSC 2001/2)

Map5: Percentage of 15 year old boys who have ever been drunk 4 or more times

(HBSC 2001/2)

Map6: percentage of 15 year old girls who have ever been drunk 4 or more times

(HBSC 2001/2)

Regular Cannabis use among 15 year olds

Cannabis is the most widely used substance after tobacco and alcohol in the majority of HBSC countries including the UK, despite being illegal in most of these countries. Occasional cannabis use has been associated with increased social adjustment and social skills in adolescents[11,12]. However, frequent or heavy cannabis use at an early age is associated with a variety of negative outcomes such as dropping out of school, having unprotected sex, depression and physical ill-health[13,14].

Definitions
Young people aged 15 were asked *'Have you ever taken cannabis in the last twelve months?'*. Response categories were : *Never, Once or twice,3 to 5 times, 6 to 9 times, 10 to 19 times, 20 to 39 times, More than 39 times*. In this section of the report cannabis use of 10 times or more in the last year is used as a marker for regular use.

Prevalence of regular cannabis use in the UK nations
The participating UK countries have relatively high prevalence of regular cannabis use (Table 1.5). England has the highest prevalence within the three UK countries, particularly among boys (11% and 17% in girls and boys respectively), with Wales having the lowest rates in both genders (7% and 12% in girls and boys respectively). In all three participating UK nations boys are more likely to be regular cannabis users than girls, with the largest gender gap seen in Wales where boys are 60% more likely to report regular cannabis use than girls.

## International prevalence and patterns of regular cannabis use.
On average among the HBSC study countries, Cannabis use of 10 times or more in the last year is reported by 5% of girls and 8% of boys. The extent of this regular use varies substantially between countries, from less than 1% of either gender in Lithuania and TFYR Macedonia to Canada where almost a quarter (24%) of boys and 13% of girls used cannabis with this frequency (Maps 7 and 8). There is a clear east-west geographic trend in cannabis use. Western European and North American countries report relatively high rates of cannabis use, declining to very low rates in Eastern Europe. Switzerland is geographically atypical, having high levels of cannabis use compared to neighbouring countries. The UK nations rank within the top quartile of HBSC countries for regular cannabis use, ranking 4th, 6th and 9th respectively in England, Scotland and Wales. In almost all countries boys were more likely to report regular cannabis use than were girls.

Table 1.5: Prevalence of regular cannabis use in the last 12 months in UK nations (HBSC 2001/2)

NATION	PREVALENCE OF USING CANNABIS 10 TIMES OR MORE IN THE LAST 12 MONTHS (AGE 15)	
	Boys (%)	Girls (%)
England	17	11
Scotland	13	10
Wales	12	7
HBSC Average	8	4

HBSC average is the average across all participating HBSC countries.

Map7 : Percentage of 15 year old boys who Used Cannabis 10x or more in Last Year

(HBSC 2001/2)
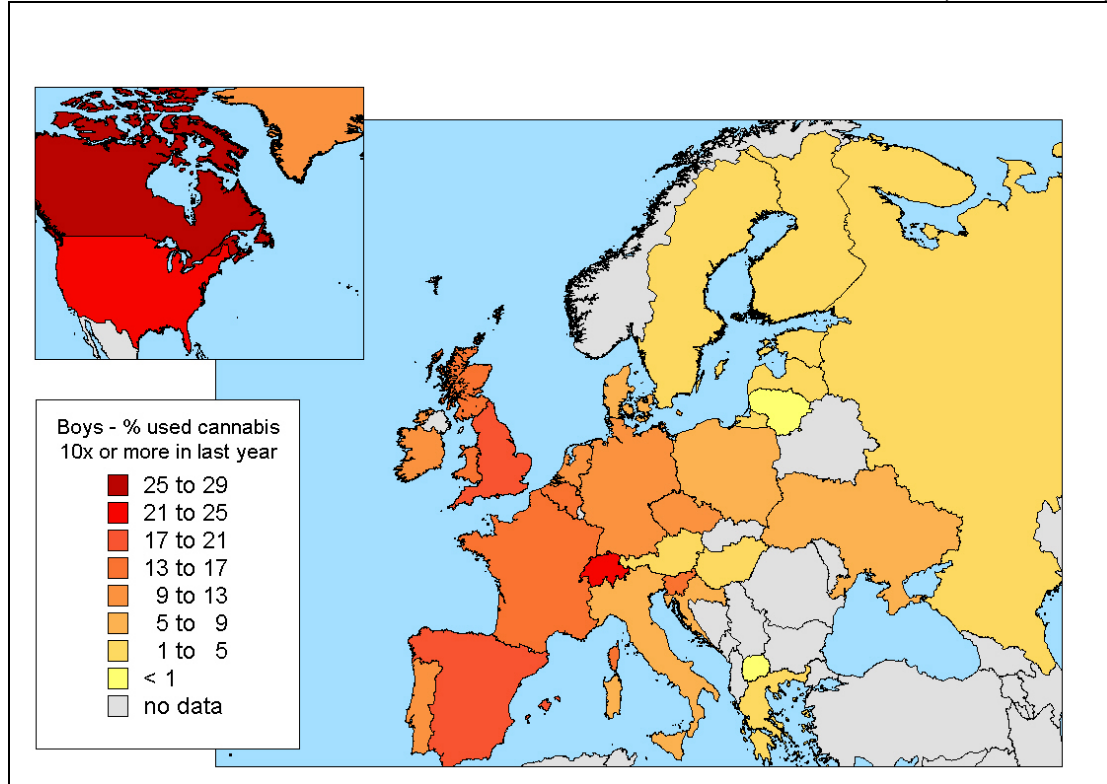
Map8 : Percentage of 15 year old girls who Used Cannabis 10x or more Last Year

(HBSC 2001/2)

13
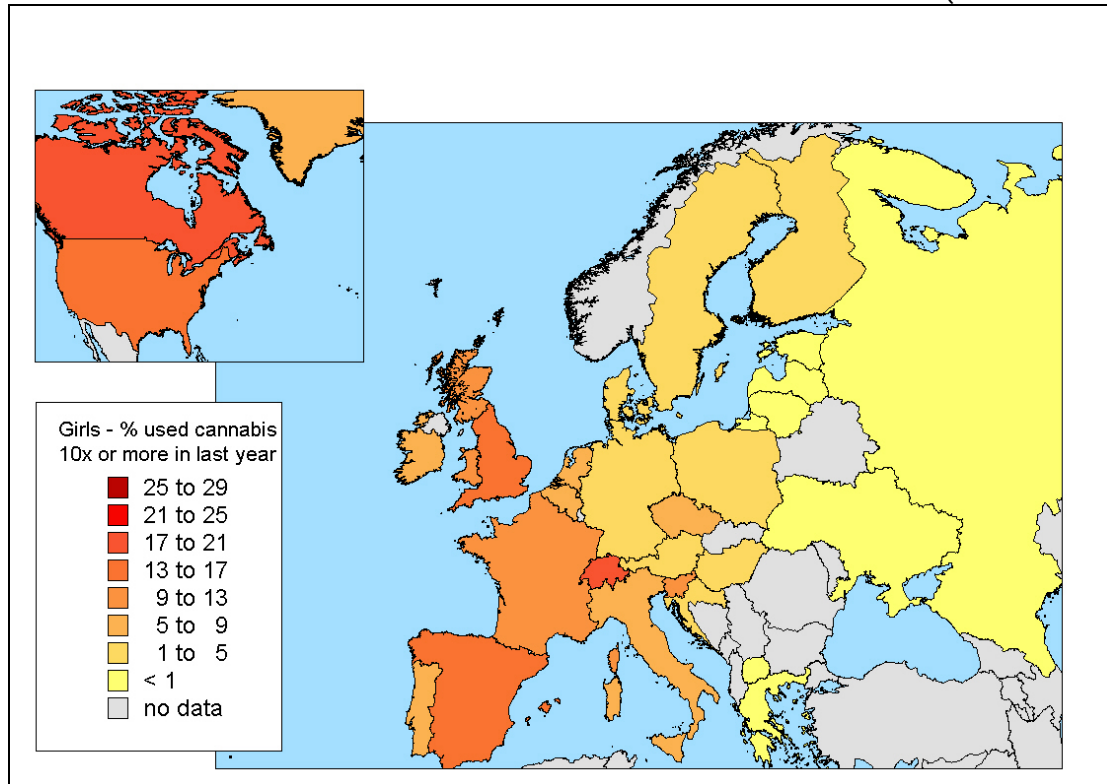
Summary of UK substance use within an International Context

Although there are differences in prevalence of substance use among 15 year olds between the UK nations these differences are small when considered in a wider, international, context where the three participating UK countries tend to cluster together with respect to substance use patterns.

 UK countries have some of the highest rates of recent cannabis use, regular drinking and drunkenness in Europe and North America, but prevalence of smoking in boys is among the lowest in Europe, with Scotland and Wales being two of only 4 countries where smoking has declined since 1998.

The pattern of high cannabis prevalence is found in other Western European countries, and high prevalence of drinking and drunkenness is found in other Northern European countries.

Gender differences in prevalence of drinking, drunkenness and age at initiation of smoking are smaller in UK countries than is found generally in Europe and North America. Within Europe and North America boys are more likely to drink or exhibit drunkenness, and to report earlier initiation of smoking. However among the UK countries gender differences in drinking or drunkenness are small, as is the difference in age at initiation of smoking.
Gender differences within UK countries in prevalence of smoking (where girls report higher prevalence than boys) and cannabis use (where boys report a higher prevalence than girls) are in line with the pattern in Northern Europe.

SECTION 2 : Prevalence of smoking, drinking and drug use among adolescents – Variation within Scotland.

This second report section explores the extent of any variation in prevalence among adolescents associated with geographic areas, both administrative areas and those defined by demographic attributes such as settlement size and accessibility (urban/rural classification), area deprivation, and the related individual characteristics of family socio-economic circumstances. The data used is derived from the SALSUS 2002 survey, covering patterns of substance use within a single UK nation, Scotland.

Definitions

Regular smoking and drinking are defined as in the previous section, smoking at least one cigarette per week and drinking at least once a week. Recent cannabis use is defined as having used cannabis in the last month before the survey. Administrative areas are defined as the 30 Scottish Education Authorities participating in the SALSUS 2002 survey. Rural/urban classification is based on the Scottish Household Survey Urban Rural Classification 2001/2[15], using a 6 point scale combining settlement size and remoteness, and was obtained from the SEED schools data base 2001. The urban/rural classification is that of the area around each pupil's school, not pupils' home. Area deprivation is defined as the deprivation of a pupil's home postcode sector. Deprivation is measured by the Carstair's deprivation Index 2001[16], and is split into deciles. Socio-economic status is derived from self-report of parent's occupation, and is coded by a variation of the 1991 Registrar General's occupational coding. Family SES is defined as the highest socio-economic status within a family unit. Family affluence is derived from three self-report questions about car ownership, bedroom occupancy and family holidays (Family Affluence Scale – FAS[1]). Pupils are categorised as low, medium or high affluence.

Extent of variation in substance use among Local Authorities in Scotland

Prevalence of regular smoking in Scotland in 2002 was 8% among 13 year olds and 20% among 15 year olds. Smoking is more common among girls of both ages, 9% of 13 year old girls smoke regularly compared with 6% of 13 year old boys. Among 15 year olds the gender gap is much larger with 24% of girls being regular smokers compared with 16% of boys. The prevalence of regular smoking among different local authorities ranged from 11% to 27% among 15 year olds.

Prevalence of regular drinking is much higher than that of smoking with 17% of 13 year olds and 38% of 15 year olds drinking weekly. There is very little gender difference in regular drinking among Scottish adolescents, 17% of boys and 16% of girls aged 13 are regular drinkers with corresponding figures for 15 year olds of 37% and 40%. The prevalence of regular drinking ranged, between local authorities, from 31% to 48% among 15 year olds.

Prevalence of recent cannabis use was 6% among 13 year olds and 21% among 15 year olds. Boys were more likely to report cannabis use in the last month than girls in both age groups (8% of girls and 13% of boys aged 13, and 19% of girls and 23% of boys aged 15 reported recent cannabis use). The prevalence of recent cannabis use across local authorities ranged from 15% to 31% among 15 year olds.

The range of prevalence estimates obtained may indicate that the level of regular substance use varies across local authorities, or may merely be the results of chance fluctuations in estimates around some 'true' national prevalence. Local estimates of prevalence may vary from the national estimate by chance alone, since only a sample of the eligible 15 year olds was used to calculate local prevalence estimates. The uncertainty of these estimates increases as the sample size, or proportion of the eligible population sampled, decreases. Survey design (e.g. stratification or clustered samples) also affects the uncertainty of estimates. Sample sizes varied between local authorities and confidence intervals around individual estimates vary between +/- 2% and +/- 10%.
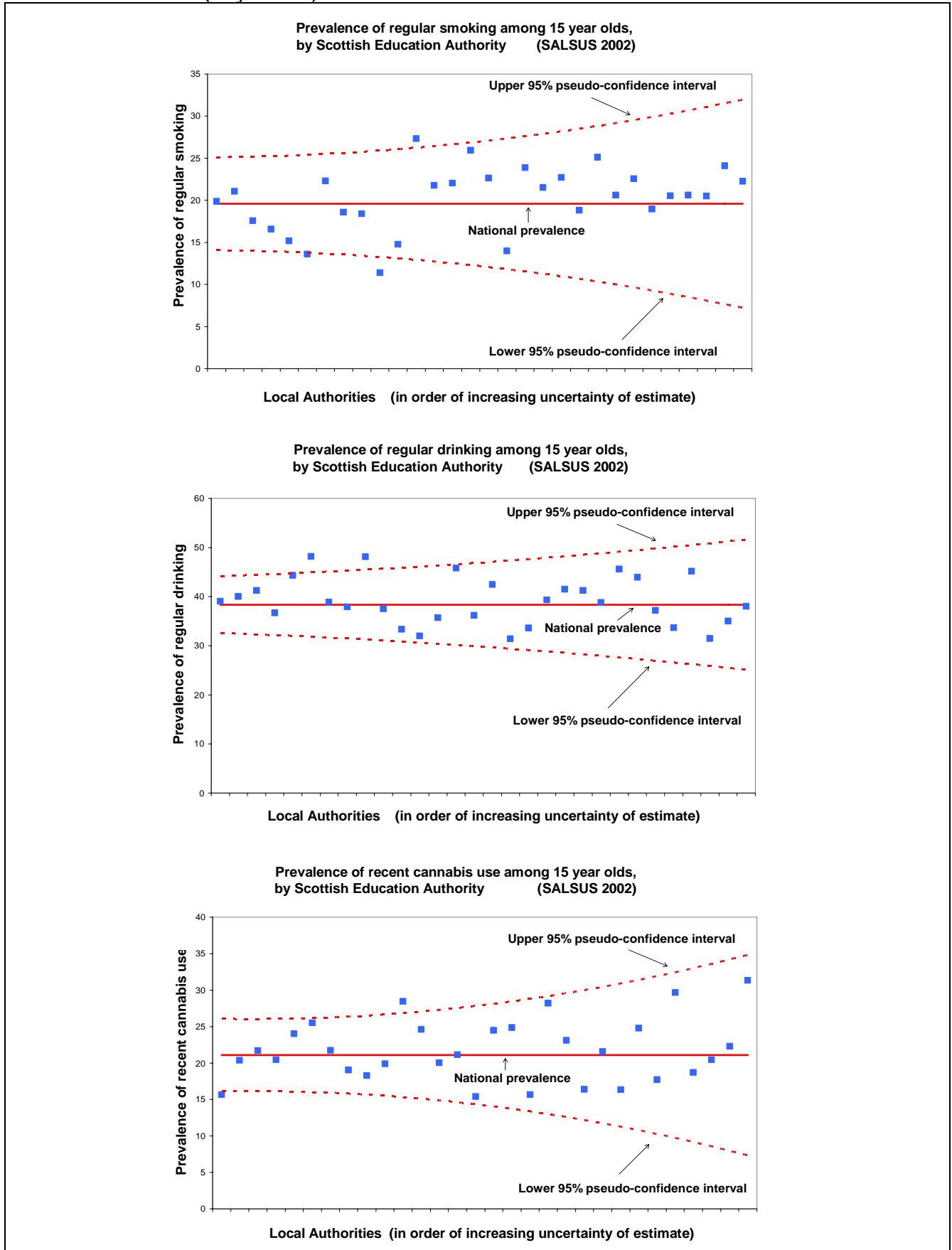
To assess whether there is any 'true' variation between local authorities, i.e. that is unlikely to be just a consequence of sampling, the extent to which local estimates vary from the national estimate of prevalence must be explored.

The figure below shows prevalence estimates within each Local Authority among 15 year olds (Figure 2.1). The figure also shows the national estimate of prevalence and 'pseudo 95% confidence intervals'. These indicate the uncertainty of estimates given the local sample size, sampling fraction and survey design. The width of these confidence interval increases as sample size or proportion of pupils sampled decreases. Only Local Authority estimates lying outside the 95% pseudo-confidence interval are considered to be significantly different from the national prevalence. The 95% pseudo-confidence intervals have been adjusted to take account of multiple testing (in this case testing the significance of differences from national prevalence for 30 local authority estimates).

There is little evidence of substantial variation in prevalence of regular smoking, drinking or recent cannabis use between local authorities. The majority of local authorities lie within the 95% pseudo-confidence intervals (corrected for multiple testing). However, there does seem to be some variation in prevalence between local authorities which is not accounted for by chance. In general the identity of local authorities with significantly high or low prevalence (compared with the national figure) varies by substance. There is a single exception to this, in one local authority prevalence of both regular smoking and recent cannabis use was significantly lower than the national prevalence, and regular drinking prevalence was also relatively low.

Figure 2.1: Variation in prevalence of regular smoking, drinking and recent cannabis use among education authorities in Scotland (15 year olds).

Prevalence of regular smoking among 15 year olds, by Scottish Education Authority   (SALSUS 2002)

Prevalence of regular drinking among 15 year olds, by Scottish Education Authority   (SALSUS 2002)

Prevalence of recent cannabis use among 15 year olds, by Scottish Education Authority   (SALSUS 2002)

Rural and urban school location and substance use

Moving from geographic areas defined by administrative boundaries to those defined by demographic characteristics, the association between rural/urban area classification and prevalence of substance use was explored. Schools were classified on a 6 point scale that takes into account size of settlement in which the school is located, and accessibility to a large settlement[16]. The classification ranges from large urban settlements to remote rural settlements.

Prevalence of regular smoking and drinking and recent cannabis use was higher among pupils attending schools in more rural areas. This relationship was clearer for smoking and cannabis use than for regular drinking, and stronger among boys than girls, but in general this relationship is quite weak. (The analyses were repeated removing the large urban local authority with prevalence significantly lower than national estimates commented on in the previous section. This did not change the relationships between substance use and Urban/Rural area classification). The figure below shows the proportion of pupils who were regular smokers, drinkers or recent cannabis users by Urban/Rural classification of school location (Fig. 2.2).

Figure 2.2: Prevalence of substance use by Urban/Rural classification of school location
(SALSUS 2002)
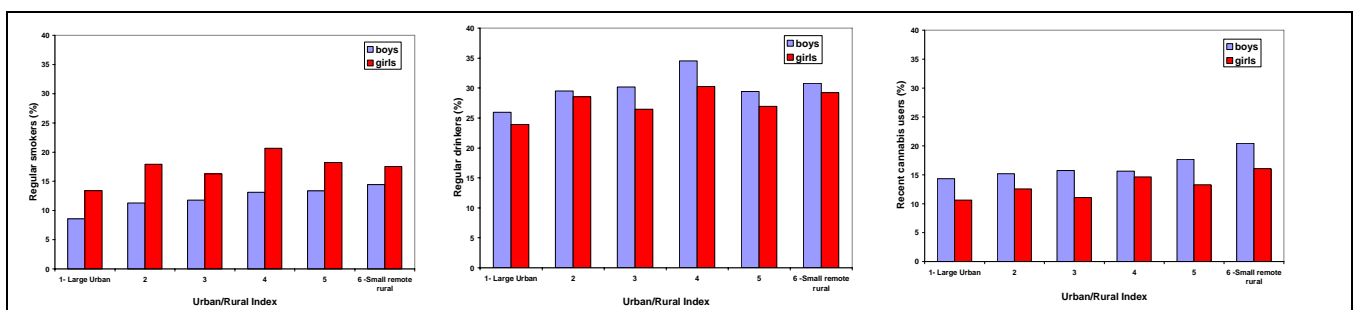
Substance use and local area deprivation

Over 81% of pupils were able to give a recognizable postcode sector. From this a measure of deprivation (Carstair's 2001) was assigned to each individual indicating the deprivation score of their postcode sector of residence. Deprivation was categorized by postcode sector decile of deprivation, from 1 to 10, 1 indicating that a postcode sector is among the 10% of least deprived postcode sectors in Scotland, and 10 indicating that a postcode sector is among the 10% of most deprived postcode sectors in Scotland.

Among boys there was no association between deprivation of local area and weekly smoking, drinking or recent cannabis use. This contrasts with area Urban/Rural classification which was associated with substance use within both genders, and was strongest in boys. However, among girls prevalence of weekly smoking, drinking and recent cannabis use was higher with increasing deprivation of home postcode sector. The strength of this association was similar for all three substances (Fig 2.3).

Figure 2.3: Prevalence of regular smoking, drinking and recent cannabis use by deciles of Carstair's deprivation index 2001   (SALSUS 2002)
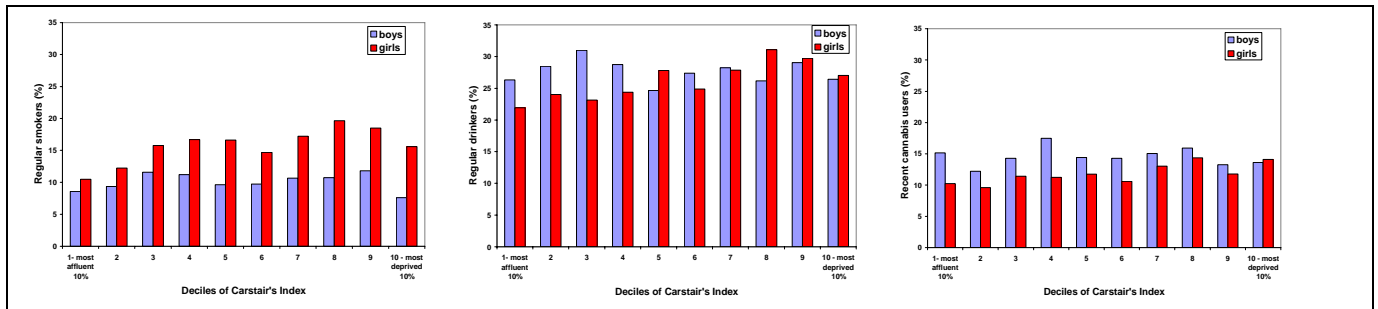
Family circumstances and substance use

Moving from area deprivation to related, individual level, factors, the relationship between family socio-economic status (SES), family affluence and substance use was explored.

Family circumstances vary greatly between young people. Families differ in parental income and socio-economic status, and also in the individuals which comprise a family unit. All these factors have been associated to a greater or lesser extent with substance use[2]. Within Scotland the SALSUS 2002 survey collected information on the socio-economic status of parents and family affluence. This captures a snap-shot of the family economic circumstances of young people as they report them and how these factors are associated with an individual's substance use patterns.

Socioeconomic status
Socio-economic status (SES) was assessed from 2 items asking whether a respondent's mother or father worked, and asking for a written description of any job. A total of 89% of pupils were successfully coded for SES. Family SES was determined as the highest SES given. For example, Father's SES was used in a single parent family with only a Father, but Mother's SES was used in a family with both parents at home where maternal SES was higher than Paternal.

Generally the relationship between substance use and socio-economic status is stronger among girls (Fig. 2.4).

Prevalence of regular smoking was higher among pupils from families with lower socio-economic status, with this relationship being stronger among girls (Fig. 2.4). Among girls, prevalence of regular drinking was higher among pupils from families with lower socio-economic status. Among boys there was no relationship between socio-economic status and regular drinking (Fig. 2.4). Cannabis use was higher among girls from families with lower socio-economic status. There was no relationship between family socio-economic status and cannabis use among boys (Fig. 2.4).

Figure 2.4: Prevalence of substance use by family socio-economic status.
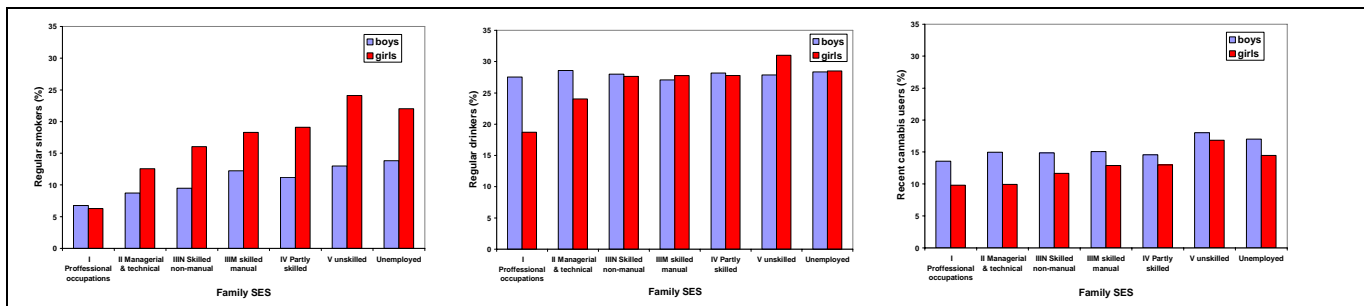
Family affluence and substance use

Economic circumstances vary between families, and are difficult to measure in young people. Socio-economic status as defined by GRO is very difficult to measure from self-report data. Even using the simplified 1990 GRO measure of SES above many pupils cannot be coded accurately (11%). To combat these problems the Family Affluence Scale is an alternative measure of affluence within families which can easily be captured in self-report data. The scale comprises 4 questions covering car ownership, bedroom sharing, family holidays and computer ownership. Within Scotland at present computer ownership is very gender biased and a simplified scale without computer ownership is used. FAS is correlated with socio-economic status, but is more related to family wealth, and in particular, patterns of consumption, not the social-standing of parental occupations. Almost all pupils (97%) have a FAS score.

The relationship between FAS and substance use is clear and strong among girls, particularly for smoking and cannabis use. Prevalence of regular smoking, drinking and recent cannabis use is higher among girls from families with lower affluence (Fig. 2.5 and Tables B10-B12).

Among boys the relationship between family affluence and substance use is very different from that found among girls. Among boys there is no association between regular smoking or recent cannabis use and family affluence, despite this relationship being strong among girls. Prevalence of regular drinking is slightly higher among boys with *higher* family affluence, the opposite direction from that found among girls (Fig. 2.5).

Figure 2.5: Prevalence of substance use by Family Affluence (FAS)
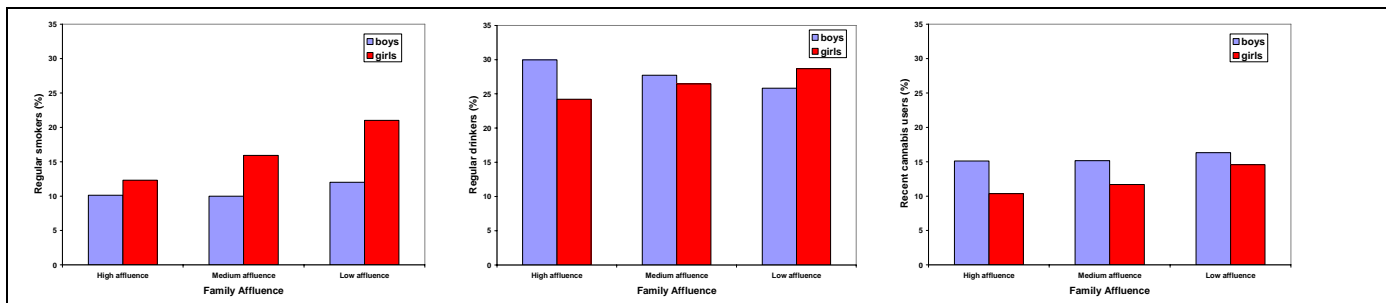
Summary of variation in substance use within Scotland

There is little evidence that there is much variation in prevalence of regular smoking, drinking or recent cannabis use between local authorities in Scotland. There are a few local authorities where prevalence of an individual substance is significantly higher or lower than the national prevalence. Generally a local authority having an extreme prevalence in one substance does not necessarily have an extreme prevalence of other substances. A single local authority breaks this generalization, having significantly lower prevalence of regular drinking and recent cannabis use, and relatively low prevalence of regular smoking compared with national prevalence estimates.

A geography more closely related to substance use was that of the relative settlement size and accessibility, the Urban/Rural classification, of areas in which schools lie. More rural areas (smaller settlement size and more remote settlements), were associated with increased prevalence of regular smoking (particularly among boys), drinking and recent cannabis use. This relationship was strongest for smoking, but in general was quite weak.

Increasing area deprivation was associated with increased prevalence of regular smoking, drinking and recent cannabis use, but only among girls. The strength of this relationship was similar for all three substances.

Girl's substance use behaviour appears to be more closely related than boys to family socio-economic circumstances.

Lower family socio-economic status was associated with increased prevalence of regular smoking among both genders and associated with regular drinking and recent cannabis use only among girls.

Lower family affluence was associated with increased prevalence of regular smoking and recent cannabis use only among girls. The association between regular drinking and family affluence was more complex. Among girls, lower family affluence was associated with increased prevalence of regular drinking. Among boys, the direction of the relationship is reversed, with higher family affluence associated with higher prevalence of regular drinking.

SECTION 3: Prevalence of smoking, drinking and drug use among adolescents - Profiles of single and poly-substance users among Scottish adolescents

Previous sections have focused on patterns of regular use of individual substances internationally and nationally and patterning by geographic and demographic characteristics. In this final section the focus is on specific types of regular substance users- those who are particularly at risk because they combine regular use of more than one substance or because their pattern of regular use is extreme.

Regular substance use and early initiation of use are associated with increased use in adulthood. However, regular use of more than one substance exposes young people to even greater physical and mental health risks both as adolescents, and potentially later in life.
Here we attempt to profile young people's substance use patterns with respect to demographic characteristics and contextual factors such as family circumstances, peer socialisation, and school experience. Patterns of substance use among young people are also likely to be influenced by wider cultural factors including acceptability of substance use, as well as legislative factors, neither of which is directly studied in the SALSUS survey, the data source for these analyses.

Comparisons will be made of the profiles of non-users, regular users of a single substance, regular poly-substance users and particularly extreme users.

Data source and definitions

Data used are from the SALSUS 2002 survey[2], a nationally representative survey of lifestyle and substance use behaviour among 13 and 15 year olds in Scotland.
As in the previous section regular smoking is defined as smoking at least one cigarette per week, regular drinking as drinking at least weekly, and recent cannabis use is defined as having used cannabis in the last month.

New to this section is the definition of binge drinkers as those who report that they have drunk 5 or more drinks on the same occasion more than 2 times in the last 30 days. This is recognised as one of a number of indicators of particularly risky behaviour, being associated with increased negative consequences such as fighting, vomiting and admission to hospital A&E departments[2].

Current multi-substance use patterns within Scotland

Most 13 and 15 year olds in Scotland in 2002 were not regular users of any substance (66%). However, it is indicative of the social norm of substance use in these age groups that one in three pupils (34%) were regular users of at least one substance, and among 15 year olds 22% of used at least two substances on a regular basis and 9% used all three substances regularly.

Regular drinking was the most common substance use behaviour among Scottish 13 and 15 year olds, 27% of pupils reported that they drank alcohol at least weekly. This is perhaps the most socially acceptable substance to use within this age group in Scotland. Regular smoking and recent cannabis use were less common, 13% of pupils reported smoking regularly and 14% reported using cannabis recently. Around half of those who drink regularly also smoke regularly and/or used cannabis recently. However, among regular smokers and cannabis users more than three quarters also report regular use of another substance. Only a small proportion of this age group smoke regularly without also using another substance regularly (3%), or use cannabis regularly without regular use of another substance (3%) (Figure 3.1 and Table 3.1).

Figure 3.1: Patterns of regular substance use among Scottish 13 and 15 year olds
(SALSUS 2002)
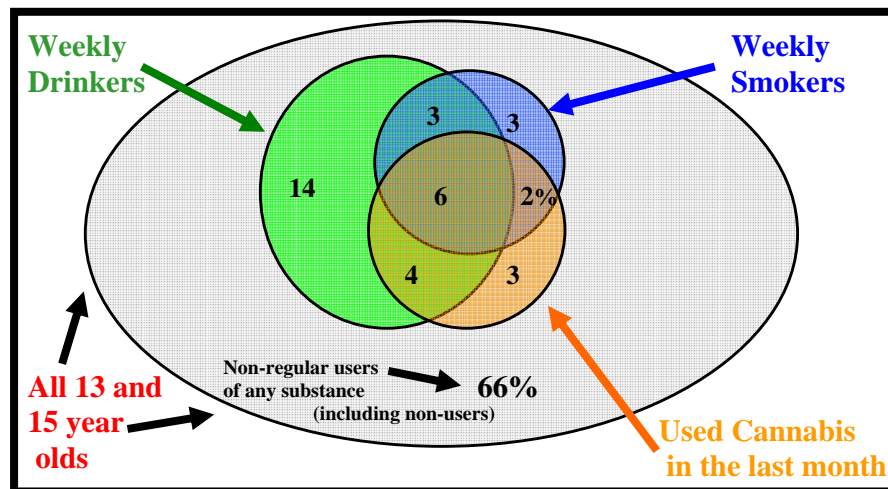
Table 3.1: Substance use groups by age and gender (SALSUS 2002)

|		Male %	Female %	Total %
13 year olds	Drink regularly only	11	10	10
	Smoke regularly only	1	3	2
	Use cannabis regularly only	3	1	2
	Drink and smoke regularly	2	3	2
	Drink and use cannabis regularly	3	1	2
	Smoke and use cannabis regularly	1	1	1
	Drink and smoke and use cannabis regularly	2	2	2
	Total Regular substance users	**22**	**20**	**21**
	Smoke, drink and use cannabis less than regularly	78	80	79
15 year olds	Drink regularly only	20	16	18
	Smoke regularly only	2	4	3
	Use cannabis regularly only	5	3	4
	Drink and smoke regularly	3	6	5
	Drink and use cannabis regularly	8	4	6
	Smoke and use cannabis regularly	3	3	3
	Drink and smoke and use cannabis regularly	8	10	9
	Total Regular substance users	**48**	**46**	**47**
	Smoke, drink and use cannabis less than regularly	52	54	53
13 and 15 year olds	Drink regularly only	16	13	14
	Smoke regularly only	1	4	3
	Use cannabis regularly only	4	2	3
	Drink and smoke regularly	2	5	3
	Drink and use cannabis regularly	5	3	4
	Smoke and use cannabis regularly	2	2	2
	Drink and smoke and use cannabis regularly	5	6	6
	Total Regular substance users	**35**	**33**	**34**
	Smoke, drink and use cannabis less than regularly	65	67	66

Profile of substance users

Patterning of substance use group membership is associated with a variety of individual and contextual factors such as age, gender and physical development, family circumstances and influences of peers and school[1,2]. In this section of the report this patterning is illustrated for individual variables. Following this multinomial regression models will be used to assess the relationship between membership of particular substance or poly-substance use groups and these individual and contextual factors when adjustment for all other variables has been made. Appendix B details variables used in the models.

Individual physical characteristics, single and multiple substance use patterns

Individual characteristics such as age and gender are closely related to regular substance use, although the exact relationship varies between countries as has been seen in section 1. In addition to chronological age the timing of physical maturation associated with puberty has been linked with a variety of risk-taking behaviours[1]. Relatively earlier maturation has been associated with increased socialisation with peers, increased levels of smoking and early sexual activity.

Among the Scottish adolescents surveyed, year group, gender and self reported physical maturation[17] were associated with substance use patterning. Substance use, (single or multiple substance use) is more prevalent among 15 year olds compared with 13 year olds, and among those young people who report more advanced physical maturation than their peers (i.e. above the median for their age and gender). Prevalence of single or multiple substance use is higher among boys. However, girls are more likely to be regular smokers than boys, and this gender difference is reflected within the poly-substance use groups which include smoking such as those who are regular drinkers and smokers, and those who are regular users of all three substances. A higher proportion of boys than girls are regular drinkers or regular cannabis users either as users of each of these substances singly or in combination. Only among the group of pupils who smoke and use cannabis regularly is there no gender difference (Figure 3.2).

Figure 3.2: Substance use patterns by year group, gender and physical maturation.
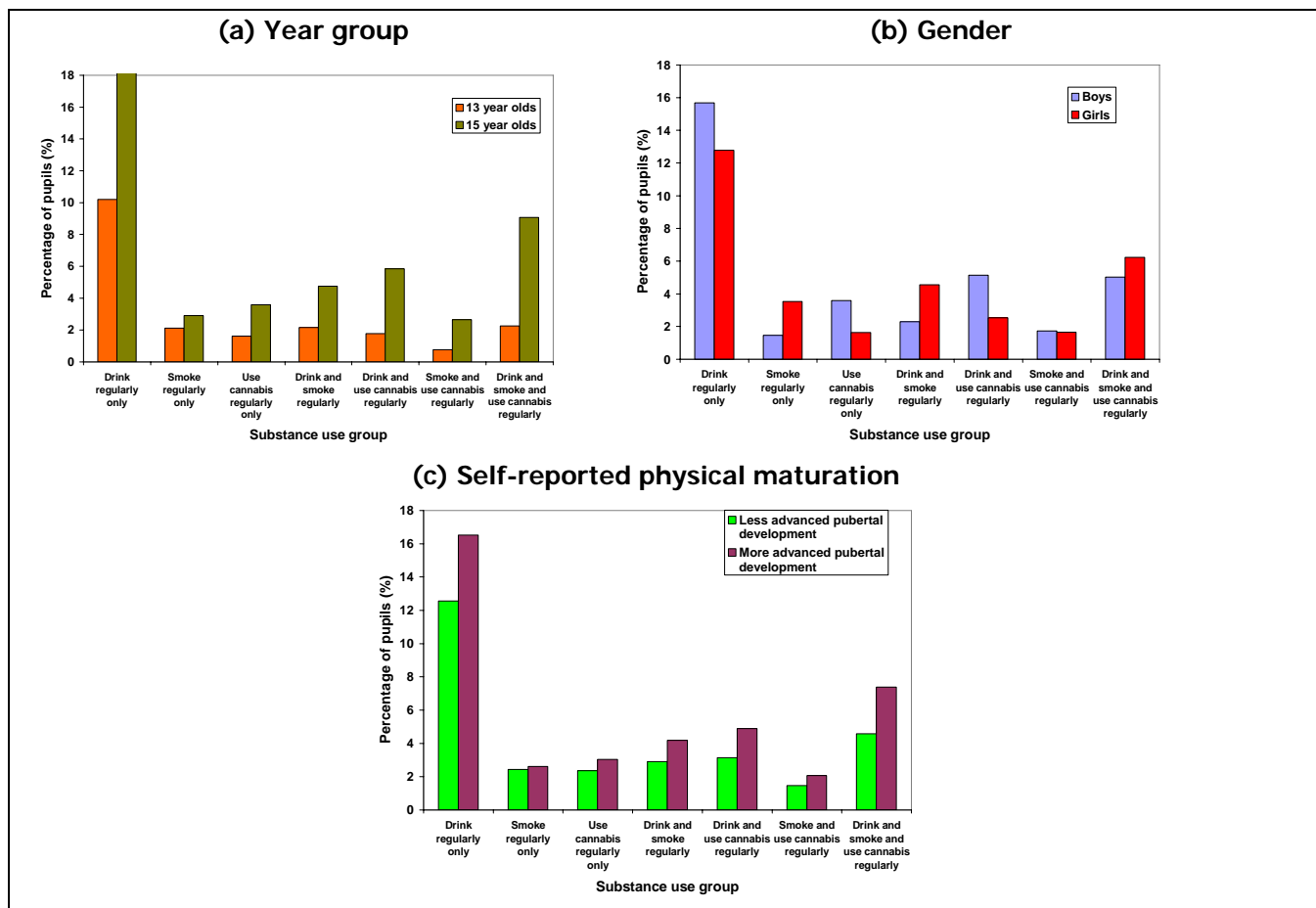
Family circumstances, single and multiple substance use patterns

Adolescence is a time of transition from childhood to adulthood, but at this time the family can still be a strong influence in young peoples' lives, with strong family bonds and moderate amounts of monitoring by parents acting as protective factors against harmful substance use[1]. The association between membership of single and multiple substance use groups and three variables relating to family circumstances is illustrated below.

Prevalence of using at least one substance regularly was higher among pupils from families without both parents at home, that is either single parent families or step-families. However, prevalence of regular drinking, in the absence of any other regular substance, did not vary with family structure (Figure 3.3a).

A higher proportion of pupils from families with non-manual SES were regular drinkers only or recent cannabis users only. In contrast a higher proportion of pupils from families with manual SES were regular smokers, either alone or in combination with other substances (Figure 3.3b).

Within the Scottish adolescents in this study degree of parental monitoring was strongly associated with substance use patterns. Pupils from families with relatively low perceived levels of parental monitoring (perceived to be below the norm for the pupil's age and gender) were more likely to be single or multiple regular substance users (Figure 3.3c).

Figure 3.3: Patterns of regular substance use by family structure, family socio-economic status and perceived parental monitoring.
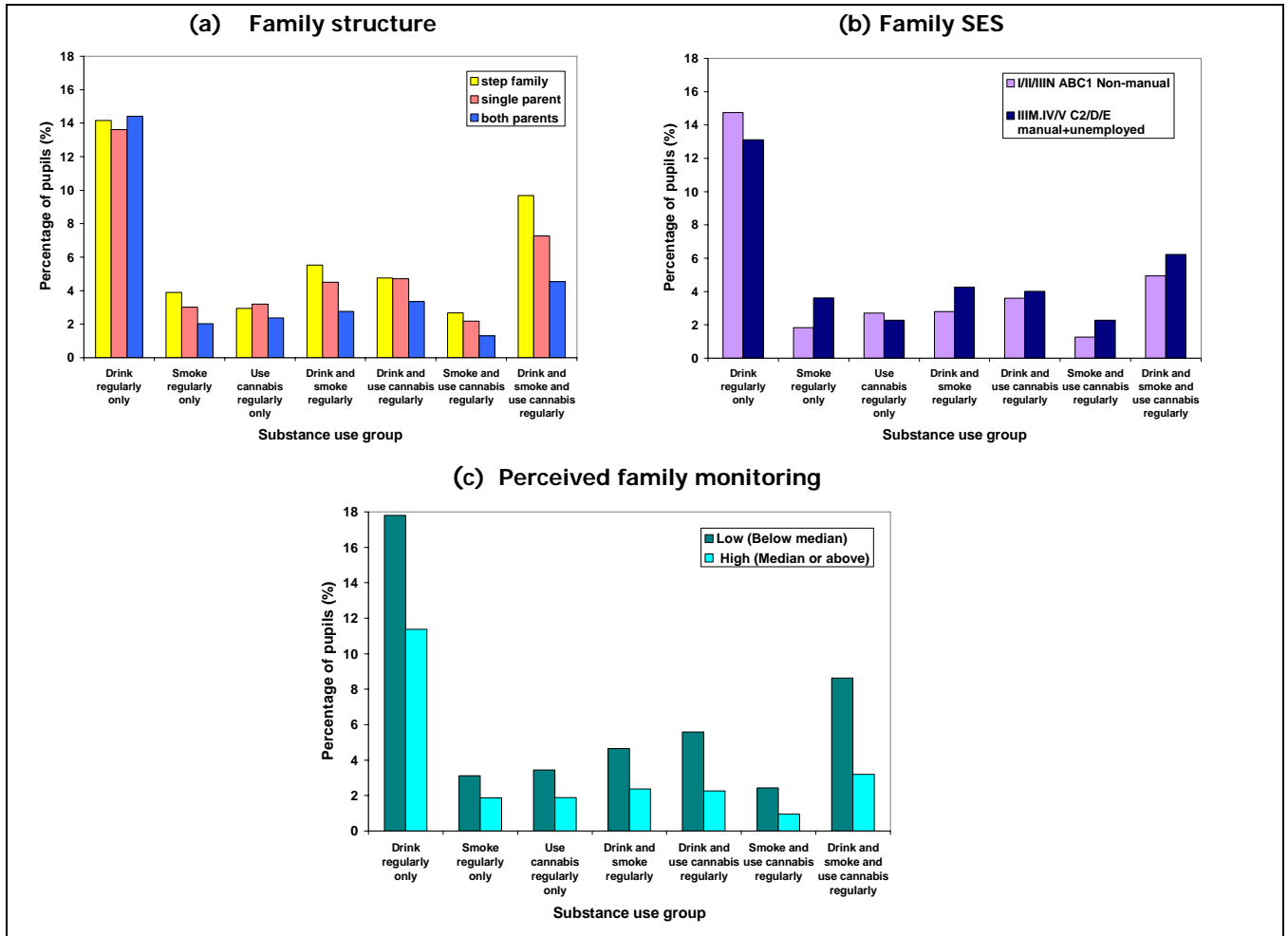
Peer and school influences, single and multiple substance use patterns

A large part of young people's lives are spent away from the immediate family, either at school or, increasingly, with friends.   These spheres can also be a source of influence on substance use choices. Here we consider the relationship between a high degree of socialising with friends, perception of school experience, pupil's aspirations on leaving school and patterns of substance use.

Pupils with aspirations to go on to further or higher education after school were less likely to be regular users of single or multiple substances. However, pupils who reported a more negative experience of school than their age and gender peers were more likely to be single or multiple substance users (Figure 3.4a & 3.4b).

Socialising with friends in the evening is common among this age group, however those who spend a relatively high number of evenings with friends (3 or more) have a higher prevalence of regular single and multiple substance use (Figure 3.4c).

Figure 3.4: Patterns of regular substance use by school experience, aspirations on leaving school and socialising with friends.
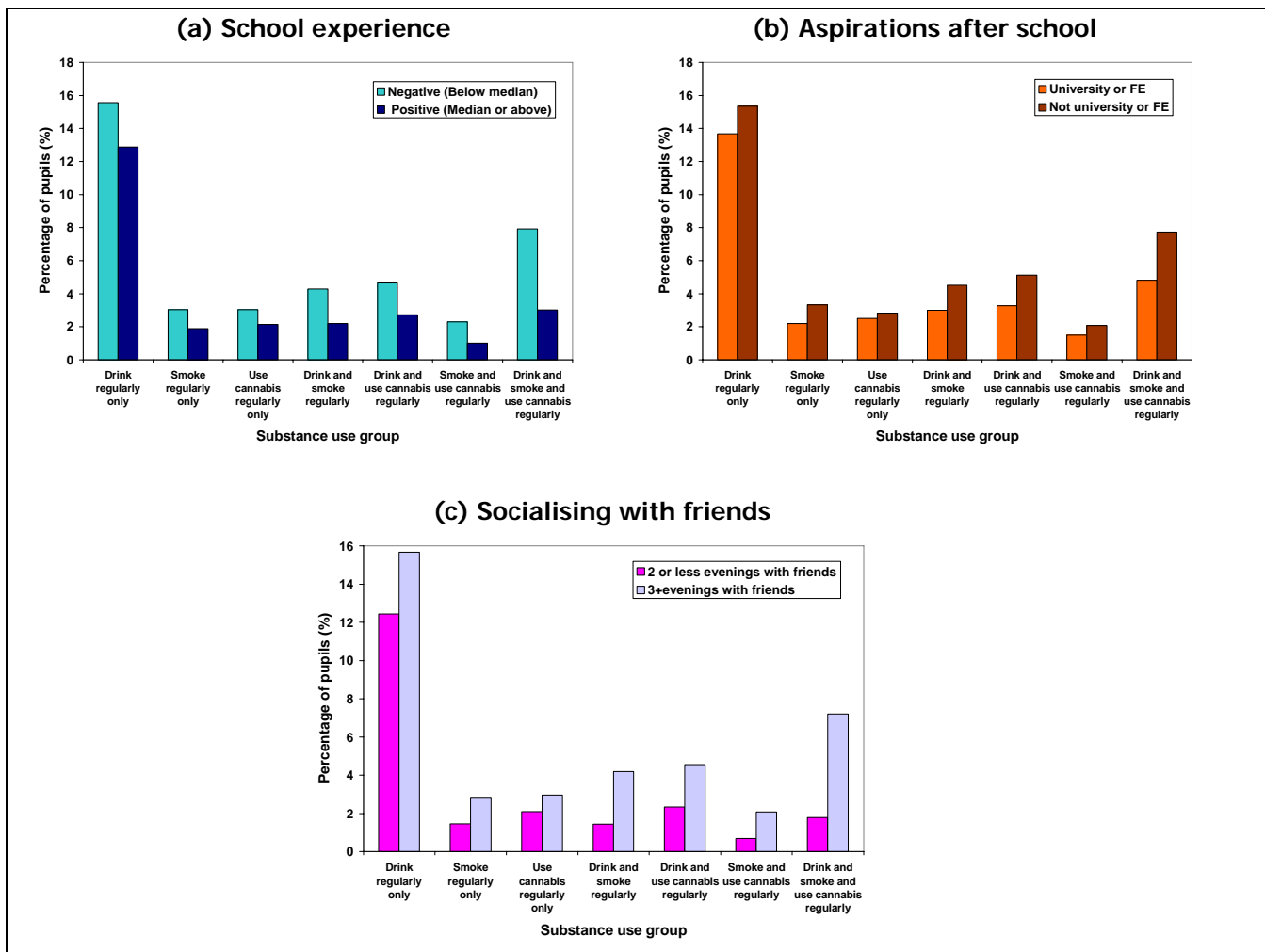
<u>Summary of single and multiple regular substance use patterns</u>

In general boys are more likely to be regular users of one or more substances than girls, and pupils with relatively advanced physical development report higher prevalence of regular substance use than their less developed peers. Regular use of one or more substances is also higher among pupils from single or step-parent families, from families with manual SES and from families with relatively low levels of perceived monitoring. Pupils with negative school experiences, lower aspirations on leaving school and who spend more evenings with friends also report higher levels of single or multiple regular substance use.

For some variables there was not just a general relationship with regular substance use, but with specific types of regular use. A higher prevalence of regular smoking, either alone or in combination with regular use of another substance, was found among girls relative to boys, among pupils from families with manual SES compared with pupils from families with non-manual SES, and among pupils from single or step-parent families compared with pupils from families with both parents at home.

In contrast, a higher proportion of boys than girls were regular drinkers either alone or in combination with another substance. Regular drinking without regular use of any other substance was more prevalent among families with non-manual SES, but prevalence did not vary with family structure.

Multinomial logistic regression models of substance use.

In the following section a series of multinomial logistic regression models are constructed to compare the profile of pupils within different substance use groups with respect to the individual, family, peer and school related variables used singly above. This modelling approach will permit assessment of the strength and direction of the association between individual variables and membership of substance use groups after adjustment for all the other variables.

Model comparator groups

In all models the same base comparison group is used, comprising pupils who did not use cannabis recently or smoke or drink regularly (non-regular substance user). This group is a mixture of non-users of substances and those who use substances, but do not use any on a regular basis. This permits some degree of comparison between the models. However, although the individuals in this base-group remain constant between models, the substance use groups, and therefore the exact individuals, vary between models. A brief description of the models is given below. For ease of description pupils who have used cannabis in the last month will be called 'regular' cannabis users.

Multi-substance use models:

Tobacco + - profiling pupils who are regular smokers but do not use other substances regularly (for this report these are called regular smoker/only), compared with those who smoke regularly and are regular cannabis users (regular smoker/cannabis), and the base- group of non-regular substance users.

Cannabis+ - profiling pupils who are regular cannabis users only (regular cannabis/only), compared with those who are regular cannabis users and also smoke regularly (regular cannabis/smoker), and the base- group of non-regular substance users.

Alcohol+ - profiling pupils who are regular drinkers but do not use other substances regularly (regular drinkers/only), compared with those who drink regularly and use tobacco or/and cannabis regularly (regular drinker/smoke/cann), and the base group of non-regular substance users. In this model it was possible to include a fourth group comprising pupils who smoked or used cannabis regularly but did not drink (smoke/Cann/only).

Risky drinking model:

Drink+ -profiling pupils who are regular drinkers but do not binge drink (regular drinker/ non-binge), compared with those who are regular drinkers who also binge drink (regular drinker/binge), and compared with the base- group of non-regular substance users. It should be noted that within this drinking model smoking and cannabis status is ignored, regular non-binge and regular binge drinkers may use either, both or none of these other two substances regularly.

Results

Results are presented as a series of comparisons, and odds ratios can be interpreted as though they come from a binary outcome. Odds of being a regular smoker/only or regular drinker/only or regular cannabis user/only are relative to being a non-regular user. Odds of being a regular smoker/cannabis, regular cannabis/smoker, regular drinker/smoke/cann , regular smoke/cann/only are those relative to being a member of the respective regular substance/only group. Odds of being a regular non-binge drinker are relative to being a member of the base-group of non-regular users, and odds of being a regular binge drinker are relative to membership of the regular non-binge group (Tables 3.2 – 3.4).

To permit comparison of the strengths of odds-ratios (OR's) the convention is used that OR's greater than 2 are described as strong, OR's greater than 1.5 and less than 2.0 are described as moderate, and OR's greater than 1.0 and less than 1.5 are described as weak. Statistically significant OR's are printed in bold and asterisked.

Each variable remained significantly associated with substance use group membership when adjusted for all other variables. Within the **Drink+** model, where substance use groups only contain pupils who are regular drinkers and non-regular users, there was one exception; family structure was not significantly associated with membership of these substance use groups. Strength and direction of association between each variable and membership of regular single and multi-substance groups are discussed below, and a general summary presented.

Individual Characteristics

- AGE

Older pupils had increased odds of being a regular user/only of each substance rather than a non-regular user, and this relationship was strong for all three substances. Within regular users older pupils had greater odds of being multiple regular substance users. This relationship was strong among smokers and moderate among cannabis users and drinkers. Older pupils had moderately increased odds of being binge drinkers.

- GENDER

The relationship between regular substance use and gender was strong for smoking and cannabis use but weak for drinking. Boys had higher odds of being a regular cannabis/only user, while girls had higher odds of being a regular smoker/only, relative to being a non-regular user. The inter-relationship between cannabis and smoking is clear; among regular smokers boys had higher odds of also being a regular cannabis user, and among regular cannabis users girls had higher odds of also being a regular smoker. Odds of being a regular drinker/only relative to being a non-regular user were higher among boys; however among regular drinkers the odds of also using tobacco or cannabis were higher among girls, reflecting the gender bias in smoking behaviour.

Looking solely at the *drinking+* model there was a moderate relationship between gender and drinking behaviour. Boys had increased odds of being regular non-binge drinkers (as was found with regular drinkers in the alcohol+ model). However, among regular drinkers binge drinking was not associated with gender.

- PHYSICAL DEVELOPMENT

Pubertal development was strongly related to regular smoking, drinking and cannabis use. More physically mature pupils had increased odds of being regular/only users of each substance. The odds given are for a single unit change in a 16 point scale ranging from 1 to 4. The strength of this relationship can be illustrated with an example. Odds of being a regular smoker/only compared with being a non-regular user were approximately 6 times higher for pupils with completed physical development (score of 4) compared with pupils just beginning to mature (score of 1), if all other variables remained constant. This was not physical development acting as proxy for age, but an independent effect which remained important in these models even when adjusted for age and gender.

More physically mature pupils had slightly raised odds of being regular multi-substance users, and among regular drinkers pupils with relatively advanced physical development had increased odds of participating in binge drinking.

Peer Relationships

- EVENINGS WITH FRIENDS

Spending relatively more evenings with friends had a moderate to strong relationship with the odds of being a regular user/only of all three substances rather than a non-regular user, and with being a regular multi-substance user, and a binge drinker.

Family Circumstances and Relationships

- PERCEIVED PARENTAL MONITORING

Perceived parental monitoring had a similar relationship with regular use of all three substances, and with being a more risky substance user (being a regular multi-substance user, or binge drinking). Lower perceived parental monitoring was associated with higher odds of being a regular user/only compared with being a non-regular user. Within regular users perceived parental monitoring was associated with higher odds of using multiple substances regularly, or with being a binge drinker compared with using a single substance regularly or being a regular drinker who does not binge drink. This association is one of the strongest within the models, odds ratios are quoted for a single unit change in a 10 point scale. As an example, the odds of being a regular smoker/only compared with being a non-regular user were approximately 5 times higher for pupils with perceived parental monitoring around 9 compared with perceived monitoring around 5, adjusting for all other variables.

- FAMILY SES

Family SES was moderately associated with regular smoking. Pupils from families with manual SES had increased odds of being a regular smoker/only compared with being non-users. There seems to be little evidence of a relationship between cannabis use and family SES. There was no association between being a regular cannabis user (in absence of regular smoking) and family SES. However, the odds of being both a regular smoker and cannabis user compared with a regular cannabis user alone were higher for pupils from families with manual SES, again reflecting the relationship between smoking and family SES.

There was little evidence for any relationship between family SES and regular drinking, or with being a binge drinker in the absence of regular smoking or regular cannabis use.

- FAMILY STRUCTURE

Family structure was most closely related to smoking use, and to a lesser extent cannabis use. Pupils from single or step families had increased odds of being regular smokers/only or regular cannabis/only compared with being non-regular users, and there was some indication that in step families cannabis users had higher odds of also being regular smokers.

There was no relationship between family structure and regular drinking (in the absence of regular smoking or regular cannabis use) or with binge drinking. However the relationship between family structure and smoking and cannabis use was apparent within the alcohol+ model where, although there was no relationship between family structure and regular drinking alone, among regular drinkers there were higher odds of being a regular multi-substance user (i.e. being a regular smoker or cannabis user as well as a regular drinker) among pupils from single or step families.

School

- ASPIRATIONS

School factors were associated with the odds of being a smoker, and to a lesser extent with the odds of being a regular cannabis user. Those not intending to go on to further or higher education, or who had a negative perceived experience of school had increased odds of being a regular smoker/only, or regular cannabis/only. Negative perceived school experience increased the odds of regular users of one of these substances also being regular users of the other substance. Among regular cannabis users the odds of also being a regular smoker were higher for those with lower aspirations, reflecting the stronger association between school aspirations and smoking.

Aspirations after school, and school experience, were weakly associated with drinking. However, both the alcohol+ model and the drinking+ model must be considered together to fully understand the relationship. There was no relationship between aspirations or perceived school experience and the odds of being a non-binge drinker compared with a non-regular user. Among regular drinkers lower aspirations on leaving school and negative perceived school experience were associated with increased odds of being a binge drinker compared with a regular non-binge drinker. However, within the alcohol+ model a weak relationship was found between aspirations and perceived school experience and odds of being a regular drinker/only. This apparent contradiction may be explained by the fact that within the alcohol+ model regular drinkers/only may be binge drinkers or not, and it may be the presence of binge drinkers within this group that leads to this significant relationship.

Table 3.2: Odds ratios for multinomial logistic regression models: *Individual characteristics*

Variable	Tobacco+		Cannabis+		Alcohol +			Drink+	
	Regular Smoker/only c.f. non-regular user	Regular smoker/cannabis c.f. regular smoker/only	Regular cannabis/only c.f. non-regular user	Regular cannabis/smoker c.f. regular cannabis/only	Regular drinker/only c.f. non-regular user	Regular smoke/cann/only c.f. regular drinker/only	Regular drinker/smoke/cann c.f. regular drinker/only	Regular Drinker/non-binge c.f. non-regular user	regular drinker/binge c.f. regular drinker/non-binge
Year Group									
15 year olds (S4)	2.3*	2.2*	3.5*	1.5*	2.4*	1.1	1.6*	1.7*	1.7*
13 year olds (S2)	-	-	-	-	-	-	-	-	-
Gender									
female	2.2*	0.6*	0.4*	2.7*	0.8*	1.3	1.3*	0.67*	1.1
male	-	-	-	-	-	-	-	-	-
Perceived Physical Development (4 point scale)									
increasing PDS	2.1*	1.1	1.9*	1.2*	1.5*	1.1	1.5*	1.2*	1.5*

Key to substance use groups used in models:

○ Non-regular substance user

◓ Regular smoker but not regular cannabis user (regular smoker/only)

◓ Regular cannabis user but not regular smoker (regular cannabis/only)

● Regular smoker and regular cannabis user (regular smoker/cannabis and regular cannabis/smoker)

◓ Regular drinker but not regular smoker or regular cannabis user (regular drinker/only)

● Regular drinker and regular smoker and/or regular cannabis user (regular drinker/smoke/cann)

◓ Regular drinker but not binge drinker (regular drinker/non-binge)

● Regular drinker who also binge drinks (regular drinker/binge)

Table 3.3: Odds ratios for multinomial logistic regression models: *Family circumstances and relationships*

Variable	Models (indicating group comparisons to which odds ratios refer)								
	Tobacco+		**Cannabis+**		**Alcohol +**			**Drink+**	
	Regular Smoker/only c.f. non-regular user	Regular smoker/cannabis c.f. regular smoker/only	Regular cannabis/only c.f. non-regular user	Regular cannabis/smoker c.f. regular cannabis/only	Regular drinker/only c.f. non-regular user	Regular smoke/cann/only c.f. regular drinker/only	Regular drinker/smoke/cann c.f. regular drinker/only	Regular Drinker/ non-binge c.f. non-regular user	Regular drinker/binge c.f. regular drinker/non-binge
Family SES									
manual	**1.3***	0.9	0.9	**1.3***	0.9	1.4	**1.2***	0.8	1.2
non-manual	-	-	-	-	-	-	-	-	-
Family structure									
Both parents	-	-	-	-	-	-	-	-	-
single parent	**1.6***	1	**1.35***	1.2	1.0	1.5	**1.5***	1.1	1
step family	**1.9***	1.1	**1.5***	**1.4***	1.1	1.6	**1.6***	1	1.1
Perceived Parental monitoring (10 point scale)									
Increasing knowledge	**0.8***	**0.9***	**0.7***	1.0*?	**0.8***	1.0	**0.9***	**0.8***	**0.9***

Key to substance use groups used in models:

○ Non-regular substance user

◍ Regular smoker but not regular cannabis user (regular smoker/only)

◍ Regular cannabis user but not regular smoker (regular cannabis/only)

● Regular smoker and regular cannabis user (regular smoker/cannabis and regular cannabis/smoker)

◍ Regular drinker but not regular smoker or regular cannabis user (regular drinker/only)

● Regular drinker and regular smoker and/or regular cannabis user (regular drinker/smoke/cann)

◍ Regular drinker but not binge drinker (regular drinker/non-binge)

● Regular drinker who also binge drinks (regular drinker/binge)

35

Table 3.4: Odds ratios for multinomial logistic regression models: *Peer relationships and school*

Variable	Models (indicating group comparisons to which odds ratios refer)								
	Tobacco+		Cannabis+		Alcohol +			Drink+	
	Regular Smoker/only c.f. non-regular user	Regular smoker/cannabis c.f. regular smoker/only	Regular cannabis/only c.f. non-regular user	Regular cannabis/smoker c.f. regular cannabis/only	Regular drinker/only c.f. non-regular user	Regular smoke/cann/only c.f. regular drinker/only	Regular drinker/smoke/cann c.f. regular drinker/only	Regular Drinker/non-binge c.f. non-regular user	Regular drinker/binge c.f. regular drinker/non-binge
Aspirations after school									
University/further education	-	-	-	-	-	-	-	-	-
Other	**1.9***	0.9	**1.2***	**1.3***	**1.2***	1.1	**1.3***	0.9	**1.6***
Perceived school experience									
Negative	**1.9***	**1.3***	**1.8***	**1.4***	**1.3***	1.4	**1.6***	1.1	**1.3***
Positive	-	-	-	-	-	-	-	-	-
Evenings with friends									
3+ evenings	**3.2***	**1.6***	**2.4***	**2.1***	**1.8***	1.3	**2.3***	**1.3***	**1.7***
2 or less evenings	-	-	-	-	-	-	-	-	-

Key to substance use groups used in models:

○ Non-regular substance user

�É Regular smoker but not regular cannabis user (regular smoker/only)

�É Regular cannabis user but not regular smoker (regular cannabis/only)

● Regular smoker and regular cannabis user (regular smoker/cannabis and regular cannabis/smoker)

�É Regular drinker but not regular smoker or regular cannabis user (regular drinker/only)

● Regular drinker and regular smoker and/or regular cannabis user (regular drinker/smoke/cann)

�É Regular drinker but not binge drinker (regular drinker/non-binge)

● Regular drinker who also binge drinks (regular drinker/binge)

## Summary of profiling of single and multiple substance users

Comparing the profiles of members of the multi-substance use models some general comments can be made.

- Regular use of both tobacco **and** cannabis (by the same individual, but not necessarily at the same time) was in general associated with similar factors to use of each substance alone

- Regular smoking, regular cannabis use and regular use of both substances were all associated with increased age, relatively advanced physical development, lower perceived parental monitoring, and spending relatively more evenings out with friends

- Regular smoking was strongly associated with being female and regular cannabis use strongly associated with being male. There was no association between regular use of both substances together and gender

- Regular smoking, regular cannabis use and regular use of both substances together were associated with school factors i.e. having lower aspirations on leaving school and having a negative perceived school experience

- Regular smoking was moderately associated with other family related factors i.e. manual family SES and being in a family without both parents at home. Regular cannabis use was only weakly associated with living in a family without both parents at home, and not associated with family SES

- Regular use of tobacco **and** cannabis was less clearly associated with family factors such as family structure and family SES

- In general, associations with regular drinking were less strong, and for some factors not significant, than those for smoking or cannabis use, perhaps an indication of the 'norm' of this behaviour within Scottish adolescents

- Regular drinking and binge drinking were, like smoking and cannabis use, associated with increased age, relatively advanced physical development, lower perceived parental monitoring and spending relatively more evenings out with friends

- Regular drinking (in absence of binge drinking) was associated with male gender but binge drinking was not associated with gender

- Binge drinking was associated with lower aspirations on leaving school and having a negative school experience, but regular drinking (in the absence of binge drinking) was not associated with these school factors

- Drinking, with or without binge drinking, was not associated with family structure or family SES

The models used to aid profiling of single and poly-substance users are highly inter-related and, as such, have limitations. However, taken together they permit some of the complex associations between membership of particular substance use groups and the context of young people's lives to be examined. Much analysis is traditionally carried out on 'regular' substance users, however ignoring the sub-groups of regular multi-substance users within 'regular' users of one substance may obscure some important relationships with individual, family, peer and school related factors.

Appendix A

Figure A1: Key to HBSC 2001/2 participating countries included in report
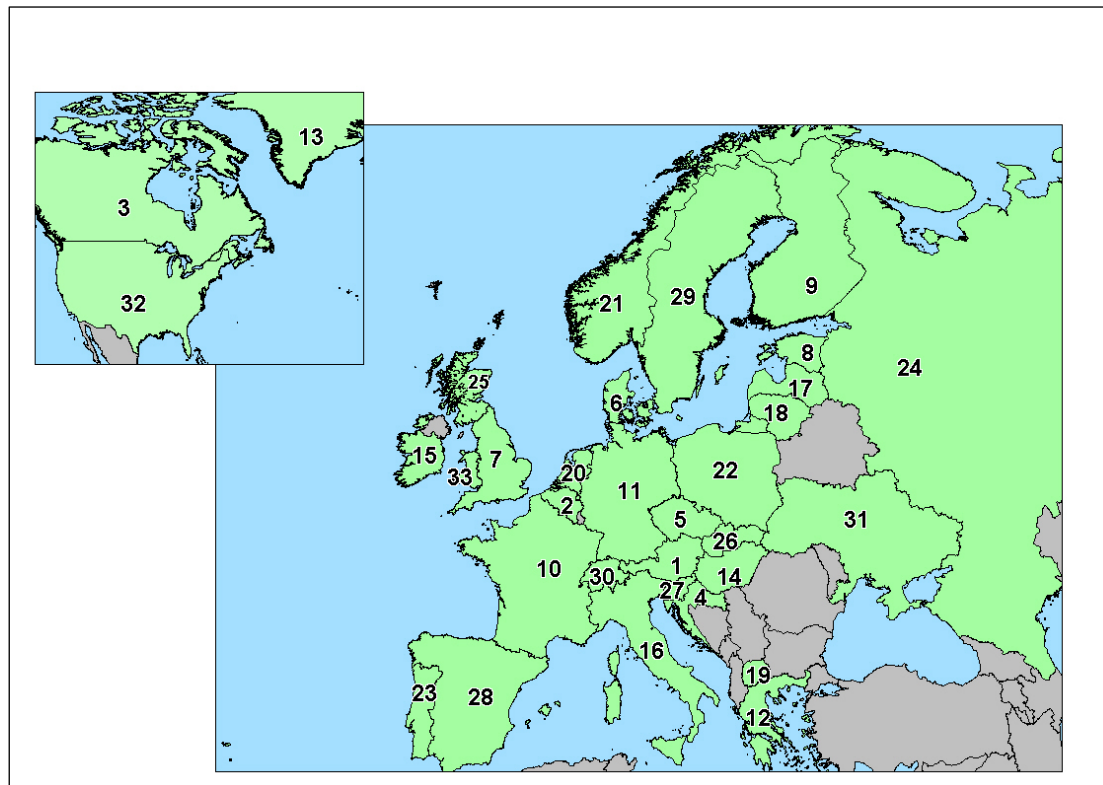
1	Austria	12	Greece	23	Portugal
2	Belgium	13	Greenland	24	Russian Fed
3	Canada	14	Hungary	25	Scotland
4	Croatia	15	Ireland	26	Slovakia
5	Czech Rep	16	Italy	27	Slovenia
6	Denmark	17	Latvia	28	Spain
7	England	18	Lithuania	29	Sweden
8	Estonia	19	Macedonia	30	Switzerland
9	Finland	20	Netherlands	31	Ukraine
10	France	21	Norway	32	USA
11	Germany	22	Poland	33	Wales

Table A1: Proportion of pupils smoking or drinking weekly, using cannabis 10 or more times in the last year or reporting being drunk 4 or more times, by country/region and gender (HBSC 2001/2).

Country/Region	Weekly smoking		Weekly drinking		Cannabis use 10+ times in last year		Drunk 4+ times	
	Girls %	Boys %	Girls %	Boys %	Girls %	Boys %	Girls %	Boys %
England	28	21	49	56	17	11	33	36
Scotland	23	16	42	44	13	10	33	30
Wales	27	15	54	58	12	7	32	37
Austria	37	26	33	36	3	2	16	20
Belgium	24	23	29	41	12	6	10	19
Canada	14	16	23	34	24	14	24	29
Croatia	25	23	25	36	5	2	7	20
Czech Republic	31	29	26	32	9	6	12	19
Denmark	21	17	44	50	6	2	41	49
Estonia	18	30	18	30	3	0	18	37
Finland	32	28	16	18	2	1	36	33
France	27	26	11	23	13	8	5	10
Germany	34	32	33	46	9	3	14	27
Greenland	67	57	11	30	5	5	29	35
Hungary	26	28	19	34	3	1	11	27
Ireland	21	20	16	20	9	4	15	22
Italy	25	22	28	48	6	7	5	9
Greece	14	13	18	38	2	0	4	9
Latvia	21	29	15	19	2	0	7	17
Lithuania	18	35	13	25	1	0	18	33
Netherlands	24	23	47	56	9	6	8	20
Norway	27	20	19	20	-	-	24	23
Poland	17	26	10	29	5	1	9	20
Portugal	26	18	11	21	8	4	7	13
Russia	18	27	17	28	1	1	9	18
Slovenia	30	30	26	42	11	7	18	26
Spain	32	24	25	32	15	10	11	13
Sweden	19	11	17	23	1	1	22	25
Switzerland	24	25	28	39	29	14	11	22
Ukraine	23	45	19	29	4	0	17	37
Macedonia	13	15	11	26	0	0	2	6
USA	12	17	11	21	19	10	10	19

Appendix B

Variables used in multinomial regression analyses

Individual Characteristics

Year-Group   Pupils were from S2 (13 year olds) or S4 (15 year olds)

Gender   Boys or girls

Perceived
Physical Development –   measured by Peterson Developmental Scale[18] (range 1 to 4). This 16 point scale measures the stage of pubertal development reached based on the answers to 4 questions.

Family Context

Family Structure   Divided into families with both parents at home, families where one parent is a step-parent and families with only a single parent at home.

Family Socio-Economic Status   Families were classified as manual or non-manual based on the occupation of the parent with the highest SES. Classification of occupations was carried out using a modification of the Registrar General's 1991 coding[2].

Perceived
Parental Monitoring   Degree of perceived parental monitoring was measured on a scale from 1-10 based on the answers to 5 questions covering pupil's perception of parental knowledge of their lives

School context
Perceived
School experience   Perceived school experience was classified on a scale of 1 to 10, where 1 was a relatively negative school experience, and 10 was a very positive school experience. The scale was derived from items covering whether pupil's liked school, how they perceived their academic performance, pressures of school work and degree of student support.

Aspirations after school   Dichotomous variable derived from 7 possible responses. Aspiration to go on to further or higher education vs. Any other aspiration.

Peer Group

Evenings with friends   Degree of socialisation with peers was based on the number of evenings in a week pupil's reported spending with friends, dichotomised to 3or more evenings vs. 2 or less evenings.

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