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Epidemiologic differences in drug dependence**A US–UK cross-national comparison**

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■ **Abstract** *Background* Published epidemiologic survey statistics do not allow direct cross-national comparison of drug dependence in the US and the UK, primarily because of a lack of uniformity across case definitions and methods of case ascertainment. *Aims* The current study sought to re-estimate these prevalence values after calibration of case definitions (i. e., imposing methodological constraints to unify case definitions), to identify suspected determinants, and also to investigate symptom profiles among active cases. *Method* Analyses of data from the US National Household Survey on Drug Abuse and the UK Survey of Psychiatric Morbidity were conducted. Prevalence of active drug dependence symptoms was estimated. Logistic regression analysis was used to estimate the magnitude of the association between suspected socio-demographic variables and drug dependence. *Results* The prevalence of drug dependence was an estimated 1.4% in the US and 0.5% in the UK. This difference was somewhat attenuated when the effect of living in an urban setting was controlled. Symptom profiles among active cases were very similar. In both countries, being male, non-married, of a low socio-economic status (SES), and living in an urban setting were associated with an increased occurrence of drug dependence. *Conclusion* There are US–UK differences in prevalence of active drug dependence beyond what available statistics imply

and some of this difference can be explained by variations associated with living in urban and rural conditions.

■ **Key words** epidemiology – drug use – urban-rural differences – GEE

Introduction

This study of possible United States–United Kingdom (US–UK) differences in prevalence of active drug dependence builds upon a foundation of cross-national research laid by other investigators in the field of psychiatric disturbances. The foundation includes past work by European scholars such as William Farr (1885), and extends to more recent investigations such as the US–UK cross-national study of schizophrenia and affective psychoses, described by the late Professor Morton Kramer (Kramer 1961 and 1969). Through investigations such as these, it has been possible to identify suspected determinants of disease and psychiatric illnesses cross-nationally and to distinguish some aspects of disease that are relatively invariant from place to place, and other features that differ geographically or across national boundaries.

Previous studies

Work such as the aforementioned pointed to the problem of uniformity of case definitions and measurement strategies in psychiatric epidemiology and set the stage for the classic US–UK study (Cooper et al. 1972). Many studies have addressed the prevalence and correlates of drug dependence in the United States (e.g., Wang et al. 1997; Martin et al. 1996; Fishbain 1996; Klerman et al. 1996; Scherrer et al. 1996b). Other studies have probed psychosocial determinants and correlates of drug dependence in Great Britain (e.g., Edwards and Goldie 1987; Strang et al. 1990; Squires et al. 1995; Smart

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1985). Close inspection of case definitions and measurement strategies used in these studies provides an indication of fundamental differences in both the measures and methods used to ascertain drug dependence cases. For example, an annual survey of drug use among US non-institutionalized residents conducted in 1993 found the prevalence of drug dependence to be 2.2% (SAMHSA 1995). In the UK, the prevalence during roughly the same time period was estimated at 2.1% (Meltzer et al. 1994). While these estimates seem to be similar, they are actually based on different case definitions. In the US, the research team based its summary estimates on five standardized questions about the clinical features of drug dependence. To qualify as an active case, a participant had to affirm at least three of these features. In the UK survey, the same five questions were asked, but participants needed only to endorse one to qualify as a drug dependence case. This study seeks to sharpen the focus on this possible similarity in US-UK prevalence of drug dependence, by imposing methodological constraints on case definition and assessment procedures. The aim is to make a direct test for differences in the prevalence of drug dependence between the US and the UK, and also to illuminate factors that might account for observed variation, if any. In a subsidiary analysis, attention is focused on differences in the relative profiles of drug dependence symptoms among active drug users, employing previously used methods in epidemiologic research on disturbances of mood and anxiety (Andrade et al. 1994; Andreski et al. 1998).

Subjects and methods

The data under study in this investigation were derived from two separate nationally representative sample surveys, one conducted in the US in 1993, and the other completed in the UK during the same year. The US National Household Survey on Drug Abuse and the UK National Survey of Psychiatric Morbidity ascertained data on a variety of psychiatric illnesses, including drug dependence. Both employed comparable survey methods and produced public use datasets that made the present investigation possible.

■ The National Household Survey on Drug Abuse

The National Household Survey on Drug Abuse (NHSDA) was designed to measure the prevalence and correlates of drug use and to monitor drug use trends over time in the United States non-institutionalized population aged 12 and older. The 1993 data used in this report are from the thirteenth survey in a series of surveys that began after 1970. A total of 26,489 respondents were assessed in 1993. In that year, the number of completed interviews reflects an overall survey response rate of 74.4%. Assessment was based primarily upon self-administered questionnaire or direct face-to-face interview when the respondent opted for this mode (e.g., due to literacy problems). The NHSDA employed a multi-stage probability design and also over-sampled six metropolitan areas and two population sub-groups (Hispanics and 12–17 year olds). Variations in sample selection probabilities were taken into account using weighting protocols as part of the analysis strategy. A separate report describes the NHSDA methods in detail (SAMHSA 1995).

■ The National Survey of Psychiatric Morbidity in Great Britain

The UK National Survey of Psychiatric Morbidity (NSPM) was conducted by the Department of Health for England and the Office of Population Censuses and Surveys (OPCS) in response to concerns about the possible magnitude of mental illnesses in the community and the need for services in Great Britain (Department of Health of England 1992, 1993). This study's sample included 10,108 adults aged 16–64 residing in England, Wales, and Scotland. The overall response rate was 80%. Assessments were made via face-to-face interviews during a period of fieldwork lasting from April 1993 to September 1993. As in the NHSDA, the NSPM employed a multi-stage probability sample design. A Postcode Address File (PAF) was chosen as the sampling frame for the survey because it was thought to provide an adequate list of private households in Great Britain. The methods used in the NSPM are described in detailed reports published in the UK (Meltzer and Jenkins 1994; Meltzer et al. 1995).

■ Variables

As described earlier, active drug dependence was assessed by self-report methods in both the NHSDA and the NSPM surveys, akin to the Diagnostic Interview Schedule method (Robins et al. 1985). The standardized questions tapped identical clinical features: daily use of a drug for 2 weeks or more, feeling dependent on a drug, the inability to cut down on use of a drug, tolerance, and withdrawal – assessed with respect to the 12 months prior to the day of the survey. For this re-analysis of the survey data, a positive response to three or more of these clinical features was required to designate a participant as an active drug dependence case. While DSM criteria call for the presence of three of seven symptom groups within the past year, both the NHSDA and the NSPM assess only five of the seven symptom groups. This study, therefore, employed the convention used in past investigations (e.g., Cottler et al. 1991), and required at least three of the five clinical features to be present within the 12-month assessment interval. In a subsidiary analysis, the threshold for case criteria was altered, i.e., the number of features required to qualify as a case was changed to require only one or two clinical features, but no significant differences were found with respect to the degree of variation between the populations in comparison to the conventional three-symptom model (e.g., lowering the threshold for case ascertainment resulted in a net increase in the number of dependence cases but this procedure did not change the direction of estimated associations or account for a significant degree of observed differences between the US and the UK).

Analyses specific to individual drugs (e.g., cocaine vs. cannabis) could not be performed in this investigation due to the relatively small number of cases in the study sample. Hence, dependence cases for all drugs were combined into a single group and aggregate analyses were performed. The specific drugs included in the aggregate drug dependence group were analgesics, hallucinogens, marijuana, stimulants, cocaine, heroin, and other opioids. In both samples, nearly 75% of the active drug dependence cases qualified for marijuana dependence.

Socio-demographic variables of interest in this investigation included age, sex, and race. Race was classified as White vs. non-White due to the relatively small number of non-Whites in the UK sample (6%). Also of interest was socio-economic status (SES) defined by the intersection of mean family income and education. This is a typical convention used in investigations of this type and is considered to be proxy measure of social inequality linked with heavy substance use (e.g., Wohlfarth and van den Brink 1998). SES was divided into tertiles with the most highly educated and income-earning families constituting the high SES group. Urban and rural residency was also included in statistical analyses. In the US NHSDA, urban and rural status was based on US Census Bureau procedures. The convention employed by the Bureau designates urbanicity based on population density within a defined geographical region (US Census Bureau 1990). In the UK NSPM, urban and rural designations were based on postal sectors and interviewer codings of the area around the home. The decision to use this convention rather than population density allowed some consideration for recent developments in postal sectors.

While this system is subject to some degree of inter-rater bias, previous OPCS surveys have employed this convention after validation studies of pilot samples (Paykel et al. 2000; Meltzer and Jenkins 1994).

■ Data analysis

Demographic characteristics and variance estimation

Complexity in the sample design necessitated use of standard survey procedures to account for variations in probabilities of selection as well as clustering of respondents within US area segments and UK postal sectors. These procedures involve an application of survey sample weights and the use of Taylor series linearization methods for variance estimation implemented via STATA software (Statacorp 1990).

Drug dependence prevalence comparisons

To take into account possibly imbalanced distributions of socio-demographic and other personal characteristics, the data from the two surveys were pooled, and the odds of being an active case of drug dependence were expressed as a function of US/UK residence, age, sex, and residence in an area designated by the surveyors as 'rural' or 'non-rural/urban'. Here, the rural/non-rural distribution is based upon standard conventions used in the NHSDA and NSMP surveys.

Symptom profile comparisons

In the analysis of symptom profiles, the prevalence of each clinical feature of the drug dependence syndrome was estimated for the US and the UK separately. A generalized estimating equation (GEE) method was used to assess variation in the relative symptom profiles of US and UK drug users. This method was used primarily because the individual symptom reports were not independent of one another, and the GEE approach accounts for non-independence of symptoms by adjusting for symptom correlations via analysis of error structures. Three hierarchical models were constructed. The first was an unadjusted baseline model that compared the log odds of each symptom relative to the first symptom in the profile, which was pre-selected to be the inability to cut down. The second model extended the baseline model by including statistical adjustment for age and sex. The third model included product terms used to assess whether differences existed in these profiles for US vs. UK respondents. The GEE approach used in this investigation has been described in more detail in technical appendices for other published investigations (Andrade et al. 1994; Andreski et al. 1998).

Suspected determinant and logistic regression analysis

Regression models were used to check whether the magnitude of association between drug dependence and US/UK residence might be an artifact of socio-demographic differences between the two populations. Odds ratios were used to convey the strength of association. The variables included in these models were age, sex, race/ethnicity, marital status, SES, and rural or non-rural/urban place of residence. Confounding was assessed by appreciable changes in the odds ratio estimates when confounding terms were included in initial unadjusted models. The logistic regression model goodness-of-fit tests with $\alpha = 0.10$ were used to assess whether product terms should be added to these models (Rothman 1985).

Results

■ Sample characteristics

Table 1, columns 1 and 2, show selected characteristics of the two study samples, prior to any weighting to compensate for variation in sample selection probabilities. Before weighting, it is possible to see manifestations of

over-sampling in the US sample. For example, the mean age in the UK sample is about 10 years older than the corresponding mean age for the US sample. This is an artifact of over-sampling 12- to 17-year-olds in the US study. As shown in columns 3 and 4, age differences are much attenuated once the sample data have been weighted by the inverse of sample selection probabilities. To some extent, other sample differences seen in Table 1 reflect over-sampling of other types (e.g., with respect to racial/ethnic minorities). Application of appropriate sample weights dampens these differences somewhat, but these features of a US-UK contrast may have some substantive importance, as mentioned in the Discussion section.

■ Drug dependence prevalence comparisons

In contrast with published estimates that provoked this study (SAMHSA 1995; Meltzer et al. 1995), after calibration of the case definitions using methodological constraints discussed earlier there were differences in the prevalence of currently active drug dependence in the adult household populations of the US and the UK. The prevalence of active drug dependence in the US was an estimated 1.4% and in the UK it was an estimated 0.5%. Among recent drug users, the estimated probability of being a case of drug dependence was 7.2% in the US and 9.1% in the UK. These estimates are presented in Table 2.

A supplementary logistic regression analysis was performed to estimate the strength of association between US/UK residence and being an active case of drug dependence. Here, the goal was to examine whether adjustments for age, sex, and rural residence might eliminate the initially observed prevalence differences between the US and the UK. The estimates from this analysis are presented in Table 3. In the initial logistic regression analysis (without statistical adjustment for covariates), the odds of being a case of drug dependence in the US were an estimated three times greater than the odds of being a case in the UK. This observed association was of moderate strength and was statistically significant by conventional standards [odds ratio (OR) = 3.07, $p < 0.01$]. The strength of association was somewhat attenuated, but remained stable, when the model was elaborated to include covariate adjustment for age and sex, and for rural residence (OR = 2.00, $p < 0.01$; Table 3).

These analyses prompted a look at possible rural/non-rural differences not originally conceived as a part of this investigation. After stratifying the US and UK samples on the basis of the surveys' designation of rural residence, the largest drug dependence prevalence estimates were in the urban and other non-rural segments of the US sample. By comparison, the odds of being an active case of drug dependence were an estimated 70% smaller in the rural US, an estimated 50% smaller in the non-rural UK, and an estimated 36% smaller in the rural UK, as shown in Table 4. As reflected in the p-

Table 1 Weighted and unweighted population distributions of the 1993 US National Household Survey on Drug Abuse and the UK Survey of Psychiatric Morbidity sample data

	Unweighted		Weighted					
	UK n = 10,108		US n = 21,115		UK (SPM)		US (NHSDA)	
Mean and Standard Deviation	mean	SD*	mean	SD*	mean	SD*	mean	SD*
Age (years)	38.3	13.5	29.7	9.9	38.3	13.5	37.7	13.2
Estimated prevalence		%		%		%		%
Age Categories****								
16–24		13.5		33.4		19.2		19.5
25–34		25.9		42.9		24.9		24.8
35–44		21.8		14.6		21.2		25.1
45–54		19.6		6.8		18.9		16.3
55–64		19.2		2.4		15.7		14.4
Sex****								
Female		53.4		55.3		49.8		51.3
Male		46.6		44.7		50.2		48.7
Race								
White		93.8		47.5		94.0		74.6
Non-White		6.2		52.5		6.0		25.4
Marital status								
Married		55.8		39.5		59.8		60.0
Widowed		3.6		1.1		2.2		2.3
Divorced		11.5		12.5		7.0		11.1
Single		29.1		46.9		31.0		26.6
SES*** /****								
High		33.0		24.4		33.6		33.9
Medium		25.2		30.9		25.5		33.2
Low		41.8		44.7		40.8		32.9
Area****								
Rural		33.2		9.6		34.0		21.5
Urban**		66.8		90.4		66.0		78.5
Recent drug use****								
		4.7		19.5		5.2		13.6

* Standard deviation; ** Urban and other non-rural areas; *** Measured by combined education and income; **** $p < 0.05$

Table 2 Estimated prevalence of drug dependence in the US and UK samples*

Drug dependence in total population			
US (n = 21,115)		UK (n = 10,108)	
n	% (95% CI**)	n	% (95% CI**)
299	1.4 (1.06, 1.87)	48	0.5 (0.26, 0.67)
Drug dependence among recent drug users			
US (n = 4,114)		UK (n = 525)	
n	% (95% CI**)	n	% (95% CI**)
299	7.2 (5.87, 9.32)	48	9.2 (7.15, 12.37)

* $p < 0.03$ for each US, UK comparison; ** CI Confidence Interval

values and overlap of 95% confidence intervals in this analysis, there were statistically significant differences between non-rural UK residents and non-rural US residents, and between rural UK residents and rural US residents. The remaining contrasts were not statistically significant by conventional standards (i. e., $p < 0.05$).

■ Symptom profile comparisons

Prevalence comparisons

The most prevalent symptom in the US and the UK was daily use of a drug for 2 weeks or more, typically marijuana. An estimated 2.9% of study respondents in the US reported daily use of a drug; 1.8% in the UK. Among recent drug users, an estimated 15% of the US sample reported daily use of a drug and 34.2% of recent UK drug users reported daily use of a drug. That is, the recent drug users in the UK study population were more than twice as likely to be daily users. The prevalence of each symptom reported by recent drug users is shown in Table 5.

GEE analyses

Based upon age and sex standardized symptom profile analyses that use GEE methods to accommodate within subject interdependencies, recent drug users in the US were an estimated 50% less likely than UK residents to report any symptom [OR = 0.51; 95% Confidence Interval (CI) = 0.43, 0.61]. However, after accounting for vari-

Table 3 Estimated strength of association between being an active case of drug dependence and being a US resident, based on multiple logistic regression

	Odds Ratio* (OR)	Standard Error (SE)	p-value	95% Confidence Interval
Unadjusted	3.07	0.48	< 0.01	(2.26, 4.19)
Adjusted (for age and sex)	2.16	0.35	< 0.01	(1.57, 2.98)
Adjusted (for age, sex, and residence)	2.00	0.33	< 0.01	(1.44, 2.77)

* The reference category for this association consists of UK residents: as compared to US residents, the US residents are an estimated 2–3 times more likely to be active cases of drug dependence

Table 4 Estimated strength of association between location of residence and drug dependence in the US and the UK relative to US non-rural residence: results of multiple logistic regression analysis with tests for interaction

	Adjusted Odds Ratio*	p-value	95% Confidence Interval
US non-rural (reference)	1.00	–	–
US rural	0.71	0.15	(0.44, 1.13)
UK rural	0.36	< 0.01	(0.19, 0.68)
UK non-rural	0.50	< 0.01	(0.35, 0.72)

* With statistical adjustment for age, sex, and marital status, UK rural and non-rural residents are 0.36–0.50 as likely to be active cases of drug dependence, with US non-rural residents as the reference category

ations in the relative profiles, depicted in Fig. 1, drug users in the US and the UK had the same likelihood of reporting symptoms (OR = 1.00; 95% CI = 0.71, 1.40). In fact, initially observed variations can be attributed in large part to differences in the proportion of one specific symptom, i. e., having used a drug daily for 2 weeks or more. The solid line in Fig. 1 shows the log odds of each drug dependence symptom among all recent drug users (both US and UK), relative to the inability to cut down use of drugs, for the entire sample. These estimates include statistical adjustment for age and sex. The other lines show this information for the US and the UK separately. The observed trends for the symptom profiles are relatively consistent except for a sharply greater value in the previously mentioned odds of daily drug use among UK residents.

Table 5 Frequency of drug dependence symptoms: data from the 1993 National Household Survey on Drug Abuse and the UK Survey of Psychiatric Morbidity

Symptoms	Symptom profiles							
	Total sample				Past year drug users			
	US N = 21,115		UK N = 10,108		US N = 4,114		UK N = 525	
	n	%	N	%	n	%	n	%
Daily use 2 weeks+*	621	2.9	180	1.8	621	15.0	180	34.2
Stated dependence	471	2.2	78	0.8	470	11.3	78	14.8
Inability to cut down	356	1.7	42	0.4	356	8.6	42	8.0
Tolerance*	407	1.9	71	0.7	406	9.8	71	13.4
Withdrawal*	268	1.3	29	0.3	268	6.5	29	5.6

* p < 0.05

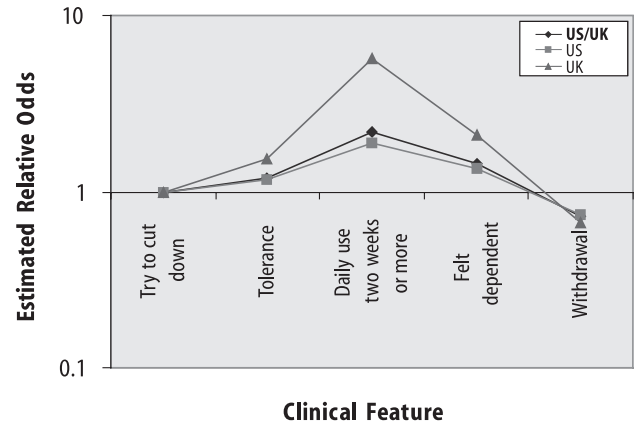


Fig. 1 Symptom profile analysis: Results of GEE analysis

Suspected determinants of drug dependence

Results of logistic regression analyses

Tables 6 and 7 display results of the logistic regression analyses for the US and the UK, respectively. Age (in years) was associated with being a case of drug dependence in both the US and the UK, though statistical adjustment for covariates led to some attenuation in the strength of association. In both countries, males were more likely to be drug dependent than females, but this association was statistically significant only in the US. Non-Whites had a lower prevalence of drug dependence than Whites in both the US and the UK, but these estimates were not very stable due to the small number of non-white cases in the UK sample.

Table 6 Estimated strength of association between selected socio-demographic characteristics and active drug dependence: results of multiple logistic regression. Data from the National Household Survey on Drug Abuse, 1993

Characteristic	Unadjusted model			Adjusted model*		
	Odds Ratio	p-value	95% Confidence Interval	Odds Ratio	p-value	95% Confidence Interval
Age (in years)	0.96	< 0.01	(0.95, 0.98)	0.98	0.06	(0.97, 1.00)
Sex						
Female	1.00	–	–	1.00	–	–
Male	1.78	< 0.01	(1.41, 2.25)	1.78	< 0.01	(1.40, 2.25)
Race						
White	1.00	–	–	1.00	–	–
Black	1.02	0.89	(0.77, 1.35)	0.78	0.09	(0.58, 1.04)
Hispanic	0.83	0.20	(0.62, 1.10)	0.63	< 0.01	(0.47, 0.85)
Other	0.82	0.57	(0.42, 1.62)	0.71	0.34	(0.36, 1.42)
Marital status						
Married	1.00	–	–	1.00	–	–
Widowed**	–	–	–	–	–	–
Divorced/Separated	2.40	< 0.01	(1.62, 3.54)	2.28	< 0.01	(1.54, 3.40)
Single	2.75	< 0.01	(2.06, 3.69)	1.91	< 0.01	(1.36, 2.69)
SES						
High	1.00	–	–	1.00	–	–
Medium	1.70	0.01	(1.15, 2.50)	1.59	0.02	(1.07, 2.35)
Low	2.62	< 0.01	(1.85, 3.73)	2.40	< 0.01	(1.65, 3.49)

* Adjusted for all characteristics in the table; ** No cases in this group

Table 7 Estimated strength of association between selected socio-demographic characteristics and active drug dependence: results of multiple logistic regression. Data from the 1993 UK survey of Psychiatric Morbidity

Characteristic	Unadjusted model			Adjusted model*		
	Odds Ratio	p-value	95% CI	Odds Ratio	p-value	95% CI
Age (in years)	0.94	< 0.01	(0.92, 0.97)	0.96	< 0.01	(0.93, 0.99)
Sex						
Female	1.00	–	–	1.00	–	–
Male	1.20	0.54	(0.67, 2.12)	1.38	0.29	(0.76, 2.49)
Race						
White/European	1.00	–	–	1.00	–	–
W.Indian/African	2.54	0.20	(0.61, 10.58)	1.63	0.51	(0.39, 6.89)
Asian/Oriental	1.54	0.56	(0.37, 6.37)	1.39	0.67	(0.32, 5.94)
Other**	–	–	–	–	–	–
Marital Status						
Married	1.00	–	–	1.00	–	–
Widowed**	–	–	–	–	–	–
Divorced/Separated	8.83	< 0.01	(2.95, 26.40)	8.37	< 0.01	(2.78, 25.27)
Never married	11.62	< 0.01	(4.50, 29.98)	6.52	< 0.01	(2.33, 18.23)
SES						
High	1.00	–	–	1.00	–	–
Medium	2.72	0.02	(1.16, 6.36)	2.25	0.06	(0.95, 5.31)
Low	2.22	0.05	(1.00, 4.97)	2.78	0.01	(1.23, 6.31)

* Adjusted for all characteristics in the table; ** Too few cases to produce an estimate

Married people had a lower prevalence of drug dependence; the never married and 'separated/divorced' persons had a higher prevalence of drug dependence in both the US and the UK. The association between marital status and drug dependence was statistically significant by conventional standards (i. e., $p < 0.05$) as shown in Tables 6 and 7.

In the US, SES was inversely associated with drug dependence, that is, the lower the SES, the greater the prevalence of drug dependence. This estimate included statistical adjustment for potentially confounding characteristics such as age, sex, and race/ethnicity. There was also an inverse association between SES and odds of

drug dependence in the UK. However, in contrast to the gradient seen in the US estimates, UK residents in the middle and low SES had nearly the same estimated excess odds of drug dependence (Table 7).

Discussion

The original aim of this study was to investigate the relative differences in the prevalence of drug dependence between the US and the UK. After re-estimating the prevalence of drug dependence in both countries, the magnitude of difference was greater than available pub-

lished sources have indicated. Based upon standard three-symptom criteria, the prevalence of drug dependence was 1.4% in the US and 0.5% in the UK. An exploratory search for sub-group variation indicated that US urban residents were most likely to be affected by drug dependence, followed by US rural residents, UK urban residents, and then UK rural residents. In essence, US urban residents were more likely than U.K. urban residents to be drug dependent, but there was no US-UK rural variation. It could very well be that some geographical regions defined as rural in the US might be classified as urban in the UK. The categorization of areas as rural or urban is at best a crude distinction, based in large on population density. There was a noteworthy difference between the US and the UK with respect to SES and type of residential area. In the UK, being of a lower SES and living in an urban setting was more strongly associated with drug dependence than in the US. More importantly, the overall inverse association between SES and drug dependence was statistically significant despite adjusting for potentially confounding variables such as age and rural/non-rural residence.

Before additional discussion of these results a few limitations must be addressed. The symptoms used to assess drug dependence were not inclusive of all the DSM-IV diagnostic criteria; two symptom groups were missing from the assessments. These included: (1) decrease in normal activities because of substance-related activities and (2) substance use despite knowledge of physical or psychological problems caused or exacerbated by drug use. This omission most likely suppressed the prevalence estimates or diluted the strength of association between drug dependence and selected socio-demographic characteristics because cases were misclassified as non-cases. Second, the sampling frames for both the NHSDA and the NSPM were household samples that precluded analysis of non-household populations. The UK survey did, however, conduct a separate study of institutionalized populations, and those data are available for public use and analysis. Third, causal models could not be specified because the data did not contain temporal information. While some important associations were detected, such as US-UK urban differences, it is impossible to determine if drug dependence followed these characteristics or caused them.

Notwithstanding these limitations, some interesting leads have been offered for future investigations in this area. Aside from straightforward replication of this work, an obvious next step in this line of research includes a longitudinal investigation to contrast the occurrence and determinants of drug use and dependence cross-nationally. Beyond simply removing the weaknesses of this study, future investigations should include standardized assessments of all DSM and ICD drug dependence criteria, as well as measures of community-level characteristics (e.g., drug availability and police presence). In addition, individual level characteristics such as family history of drug use and personality traits can be measured, and new molecular genetic ap-

proaches can enable tests for specific features of inherited vulnerabilities.

More deliberate investigation is also warranted to clarify the observed urban-rural differences and SES associations. Paykel et al. (2000) found considerable differences in drug and alcohol dependence among rural and urban populations of the National Psychiatric Morbidity Survey of Great Britain, but these differences were much attenuated after adjustment for several socio-demographic characteristics such as social support, age, and employment. Inclusion of a broad array of social factors that influence drug-taking and the progression from drug use to more maladaptive drug dependence might illuminate other factors that account for urban-rural differences and provide a more comprehensive model for understanding the role that SES plays in terms of the occurrence of drug dependence. The current investigation detected an inverse relationship between SES and drug dependence in both the US and the UK despite the crude categorization of social class in both countries. These findings suggest that SES is linked with heavier drug use or other characteristics of drug dependence cases, despite only marginal links with actual drug and alcohol use as found in other published investigations (van Oers et al. 1999; Skager and Fisher 1989).

The results of this study lead to one major conclusion, namely that there are differences in the prevalence of drug dependence in the US and the UK not visible in prior reports. Subsidiary findings support evidence of US-UK rural-urban contrasts, and variations in the expression and reporting of symptoms. These findings offer some interesting leads for future research to help understand and explain cross-national differences in the occurrence of drug dependence.

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