Regional Variation in Drug Purchase Opportunity Among Youths in the United States, 1996–1997

Kirk E. James, Fernando A. Wagner, and James C. Anthony

ABSTRACT *This study was designed to examine geographic variation in illegal drug purchase opportunity among young people living in the United States; there was a subfocus on age, sex, and urban/rural residence. Data from the 1996–1997 National Household Surveys on Drug Abuse were analyzed; the nationally representative sample of community residents included 21,531 participants aged 12–24 years old. Respondents were asked if someone had approached them to sell them an illegal drug during the past 30 days. To protect respondents' confidentiality, there is no fine-grained geographical coding of data in the National Household Surveys on Drug Abuse public use data files, but nine geographical divisional indicators are provided (i.e., West North Central, New England, etc.). Results indicated males were an estimated 1.8 times more likely than females to have had a recent illicit drug purchase opportunity, and urban residents were 1.5 times more likely than rural residents to have had a recent drug purchase opportunity. As for geographic divisions, the Pacific division surpassed all other divisions: Its residents were 1.5 times more likely to have recent drug purchase opportunities than the West North Central division (used here as a reference category). After controlling statistically for age, sex, and urban/rural residence, residence in four divisions was found to be associated with greater likelihood of an illicit drug purchase opportunity. The observed patterns of drug purchase opportunity add new features to our understanding of illicit drug involvement across the United States.*

KEYWORDS *Adolescence, Adult, Neighborhood, Street Drugs, Substance-Related Disorders, Urban-Rural.*

INTRODUCTION

This study sought to describe geographical variation in opportunities to purchase illegal drugs among young people living in the United States. Prior studies in a closely related area of inquiry focused on the initial opportunity to try illegal drugs and the subsequent transition to actual drug use; there was no attempt to discriminate whether the illicit drug had been offered for purchase or simply traded or offered as a gift.¹ To the best of our knowledge, the only past study of illegal drug purchase opportunity is that of Rosenberg and Anthony.² In that study, delinquent

The authors are from Johns Hopkins University, Bloomberg School of Public Health, Department of Mental Hygiene, Electronic Collaboratory for Investigations about Drugs (ELCID), Baltimore, Maryland; Dr. Wagner also is from Instituto Nacional de Psiquiatría, Dirección de Investigaciones Epidemiológicas y Psicosociales, Departamento de Investigación en Servicios de Salud, Mexico.

Correspondence and reprints: Professor James C. Anthony, PhD, Johns Hopkins University, Bloomberg School of Public Health, 624 North Broadway, ELCID Room 893, Baltimore, MD 21205. (E-mail: janthony@jhu.edu)

and aggressive youths were more likely to be offered illegal drug purchase opportunities compared to nondelinquent and nonaggressive youths. However, the prior study matched on neighborhood and did not examine geographic variations in drug purchase opportunities, which was the primary focus of the current investigation.

Besides shedding light on geographical variation in drug purchase opportunities across the United States, this study also included an attempt to identify population subgroups with an especially high or low level of drug purchase opportunity. Special attention was given to geographic divisions of the country (e.g., New England, South Atlantic, Mountain, Pacific), urban/rural residence, age, and sex. One might expect greater opportunity to purchase drugs in urban locales and in geographical areas traditionally associated with greater drug involvement, as in the Pacific division.³ Young males were expected to have more purchase opportunities than females, consistent with the theory that male-female differences in prevalence of illegal drug use might be traced to variation in drug exposure opportunities, for which there is recent empirical support.⁴

METHODS

This study's data were collected from the 1996–1997 National Household Surveys on Drug Abuse (NHSDA), for which public use data sets were available at the time of study completion.^{5,6} This national survey measures prevalence and correlates of drug use in the community-dwelling population of the United States aged 12 years and older. The multistage area probability sample excludes persons in the Armed Forces, prisons, hospitals, and residential drug treatment programs; most respondents are household residents.

Areas of the country and households within these areas are selected for the NHSDA via probability sampling, as are residents within households. Survey response rates in 1996 and 1997 averaged 93% at the household level and 78%–79% at the individual level.

For focus, this analysis was restricted to young people in the age range when illicit drug taking most often is initiated, namely, 12–24 years of age. In 1996, the survey sample included 8,281 young persons in this age range; in 1997, the number was 13,250. A total of 412 individuals responded to the drug purchase opportunity question by answering “don't know” or by leaving the answer blank. Including or excluding these 412 respondents from the analysis or categorizing them as not having a drug purchase opportunity did not lead to material change in the study conclusions.

NHSDA measurements in 1996–1997 were based on self-reports during an interview; to promote privacy, the respondent generally marked replies on an answer sheet in lieu of giving an oral response. A minority of participants chose to have the interviewer read the questions and mark the answers as in a traditional face-to-face interview (i.e., for reasons of illiteracy). All respondents gave consent in accord with guidelines governing an informed consent process approved by the institutional review board. For minors, active parental consent was obtained as well.

The occurrence of a recent drug purchase opportunity was assessed by one standardized question: “In the past 30 days, has anyone approached you to sell you an illegal drug?” The NHSDA gathers no other data on drug purchase opportunity that might help clarify these issues (e.g., age at first drug purchase opportunity, lifetime count of drug purchase opportunities).

We first inspected variation in drug purchase opportunity for all young people, with subgroups formed in relation to geographic division, sex, and urban/rural residence. To constrain the influence of drug-seeking behavior, we then excluded young people who reported illicit drug use in the past 30 days (i.e., the recent drug purchase opportunity was not the result of recent drug-seeking behavior if the young person had no recent drug use). To constrain the possibility that drug dealers look for known customers, we then repeated the analysis after excluding young people who reported using illicit drugs in the year prior to assessment (i.e., dealers might seek out “known past customers” and offer them an opportunity to buy again).

There was a reason to make this extra effort to constrain the influence of drug-seeking behavior and the separate influence of dealers seeking out known customers. Namely, our goal was to shed some new light on areas of the country (and population subgroups) where it is more common to have a drug dealer seek out drug users, even when the potential customers are not necessarily in the market for purchasing drugs. A better appreciation of this population-level variation (if any exists) might lead us to a better understanding of why some areas of the country (and population subgroups) have more illegal drug use and drug dependence than others. The importance of this understanding has been discussed in prior work by Anthony et al.⁷

Federal concerns about data confidentiality have precluded geocoding of the NHSDA public use data. Nonetheless, the data set encodes variables that reflect divisions of the United States in which a survey respondent’s residence is located. Here, nine divisions were under study: West North Central, New England, East North Central, Mid-Atlantic, Mountain, East South Central, South Atlantic, West South Central, and Pacific. Age (in years), sex as observed (male/female), and residence (urban/rural) also have been studied.

Our designation of areas as urban or rural was based on NHSDA conventions, which follow US Census Bureau procedures.⁸ The nine divisional codes and values for sex and urban/rural residence were used to generate 36 subgroups ($9 \times 2 \times 2 = 36$). Each of the 21,531 participants 12–24 years of age was sorted into one of the 36 different combinations.

Prevalence of recent drug purchase opportunity was estimated for each of these 36 combinations. The prevalence proportions were estimated using STATA version 6 “svymean” procedures, which take into account the variation in sample selection probabilities across strata and use Taylor series linearization to yield approximate confidence intervals and *P* values.⁹ Multiple logistic regression via STATA “svylogit” procedures was used to study variation in drug purchase opportunities across the subgroups, with estimation of the “prevalence odds ratio” along with significance testing used as an aid to interpretation ($\alpha = .05$, also with Taylor series linearization).^{9,10} Each multiple regression model included a term or terms for age (in years) or age groups due to the possibility of nonlinear relationships between the occurrence of drug purchase opportunities and the age of the respondents. However, because there were no pronounced age differences across divisions of the country, the inclusion of these age terms had no appreciable influence on the division-specific differences reported in this paper. Other covariate terms included in these regression models were sex, geographic division, and urban/rural residence.

RESULTS

Figure 1 illustrates how the United States is divided into four geographical regions and nine divisions according to the US Census Bureau. Results depicted in Fig. 2

FIGURE 1. The four geographical regions and nine divisions of the United States according to the US Census Bureau.

FIGURE 2. Prevalence (%) of drug purchase opportunity among youths 12-24 years. Data from the US National Household Surveys on Drug Abuse, 1996-1997.

indicate that, when reviewing the following subgroups in a sequential manner (e.g., rural females, urban females, rural males, and urban males), there is a notable general gradient in prevalence of drug purchase opportunity. With respect to prevalence of drug purchase opportunity and geographical division, the subgroups falling in the lowest tier of prevalence (i.e., prevalence of 3%–9%) were rural females in the Pacific, West South Central, West North Central, East North Central, New England, and South Atlantic divisions. The subgroups corresponding to the highest tier of prevalence (i.e., 20%–25%) included rural males in the East South Central and urban males in the Pacific, West South Central, East South Central, and South Atlantic divisions.

Based on results from 3,468 youths with recent drug purchase opportunities versus the other 18,063 youthful respondents, males were more likely than females to have experienced a drug purchase opportunity (estimated 19.3% versus 11.8%; Table 1). Residents of urban areas were about 50% more likely than rural residents to have a recent drug purchase opportunity (estimated 16.7% versus 12.1%; Table 1). The estimated proportion of American young people with a recent drug purchase opportunity ranged from a low of 12.4% for residents of the West North Central division to a high of 18.4% for those living in the Pacific division (Table 1). The magnitude of these associations can be conveyed using the prevalence odds ratio statistic from multiple logistic regression. The regression results indicate statistically significant associations between having a recent drug purchase opportunity and being male, residence in four geographic divisions of the country: East South Central, South Atlantic, West South Central, and Pacific ($P < .05$), as shown in

TABLE 1. Estimated proportion of American youths with a recent (past month) drug purchase opportunity*

	Unweighted number with a recent drug purchase opportunity	Estimated proportion (%)*	95% Confidence interval*
Sex			
Female	1,437	11.8	10.9–12.8
Male	2,031	19.3	18.0–20.6
Residence			
Rural	436	12.1	10.6–13.5
Urban	3,032	16.7	15.7–17.7
Division			
West North Central	124	12.4	9.7–15.2
New England	72	14.5	11.0–18.0
East North Central	368	14.7	12.5–16.8
Mid-Atlantic	314	14.8	12.8–16.7
Mountain	714	14.8	10.8–18.9
East South Central	181	15.9	14.4–17.3
South Atlantic	427	16.1	14.1–18.2
West South Central	396	16.2	13.8–18.6
Pacific	872	18.4	16.2–20.6

Data from 1996–1997 National Household Surveys on Drug Abuse (NHSDA).

*Based on analyses of weighted data; confidence intervals approximated for complex survey design using Taylor series linearization.

Table 2. There also was a modest statistically significant association between recent drug purchase opportunity and age. For example, an estimated 13.9% of 12 year olds had a recent drug purchase opportunity versus 17.5% of 24 year olds (data not shown in tables).

Before our effort to constrain the influence of “drug-seeking behavior” and “known customers,” being a resident in four divisions (East South Central, South Atlantic, West South Central, and the Pacific) was found to be associated with greater likelihood of having an illegal drug purchase opportunity as compared with the reference division: West North Central (see Table 3, column 1). In the analysis intended to constrain possible drug seeking, a total of 2,759 youths who used illicit drugs in the past month were excluded. The exclusion produced no appreciable change in the study conclusions (Table 3, column 2). In the analysis to constrain the influence of known customers, a total of 4,685 youths with illicit drug use in the past year were excluded. The result was a marked change in the conclusions: There was an excess prevalence of recent drug purchase opportunities in the Pacific division, but not in the other divisions (Table 3, column 3). The associations for the East South Central and the West South Central divisions were at the margin of conventional statistical significance ($P = .06$).

TABLE 2. Estimated strength of association between recent drug purchase opportunity and selected characteristics*

	Recent drug purchase opportunity (n = 3,468)	No recent drug purchase opportunity (n = 18,063)	Estimated odds ratio*	P
Sex				
Female (reference)	1,437	10,019	1.00	—
Male	2,031	8,044	1.81	<.001
Residence				
Rural (reference)	436	3,039	1.00	—
Urban	3,032	15,024	1.45	<.001
Division				
West North Central (reference)	124	845	1.00	—
New England	72	476	1.24	.262
East North Central	368	1,927	1.26	.099
Mid-Atlantic	314	1,822	1.24	.120
Mountain	714	2,898	1.16	.465
East South Central	181	1,111	1.41	.006
South Atlantic	427	2,697	1.38	.016
West South Central	396	2,247	1.35	.032
Pacific	872	4,040	1.54	.001

Data from 1996–1997 National Household Surveys on Drug Abuse (NHSDA).

*Based on multiple regression analyses of weighted data, with statistical adjustment for all covariates listed above, plus age; P values approximated via Taylor series linearization for complex survey design with West North Central as the reference division, selected because it had the lowest prevalence value.

TABLE 3. Estimated odds ratio for drug purchase opportunity among 12–24 year olds with constraint for drug seeking and known customer conditions*

Division	All youths (n = 21,531)		Analysis to constrain influence of drug-seeking†		Analysis to constrain influence of known customers‡	
	Estimated odds ratio	P	Estimated odds ratio	P	Estimated odds ratio	P
West North Central	1.00	—	1.00	—	1.00	—
New England	1.25	.257	1.29	.157	1.07	.755
East North Central	1.26	.089	1.24	.160	1.28	.164
Mid-Atlantic	1.25	.109	1.36	.064	1.29	.198
Mountain	1.17	.420	1.19	.488	1.22	.550
East South Central	1.44	.004	1.64	.002	1.48	.059
South Atlantic	1.39	.013	1.50	.008	1.35	.114
West South Central	1.36	.030	1.59	.004	1.42	.058
Pacific	1.54	.001	1.84	<.001	1.67	.004

Data from 1996–1997 National Household Surveys on Drug Abuse (NHSDA).

*With statistical control for age, sex, and urban/rural residence, estimated via Taylor series linearization and application of sampling weights.

†Youths who reported illegal drug use in the month prior to assessment were excluded from the analysis. If a recent drug purchase opportunity occurred in the absence of recent use, we inferred that it was not drug seeking that prompted the purchase opportunity.

‡Youths who reported illicit drug use in the year prior to assessment were excluded from this analysis. If a recent drug purchase opportunity occurred in the absence of illegal drug use in the past year, we inferred that the recent drug purchase opportunity did not represent a drug dealer who was seeking out previously known customers.

DISCUSSION

The main finding of this study is that there is noteworthy divisional, residential, and sex-specific variation in the occurrence of drug purchase opportunities experienced by adolescents and young adults in the United States. More specifically, young people residing in the East South Central, South Atlantic, West South Central, and Pacific divisions were found to have a greater chance of a recent drug purchase opportunity. In general, young females were less likely than young males to have a recent drug purchase opportunity. Urban residents were more likely than rural residents to be approached with an illicit drug purchase opportunity. The Pacific division stands out as an area of the country where drug purchase opportunities are more likely to occur even when a young person is not seeking drugs or a known customer to drug dealers (by virtue of drug use in the year prior to assessment).

Interpretation of these results requires attention to several limitations. For instance, information for this study was wholly based on self-report. This method raises concerns because reports on illicit drug use are subject to underreporting.¹¹ Nevertheless, there is nothing illegal about being on the receiving end of a drug purchase opportunity; this fact should promote response validity in research on these opportunities.¹² Other limitations that merit attention include the crude demarcations made with respect to geographical distribution of illicit drug purchase opportunity according to divisional and residential areas (urban versus rural). In fact, with regard to residence of the respondent, only 3,475 young adult respon-

dents lived in rural areas compared to the remaining 18,056, who were defined as living in urban areas. We also note that the conventional urban versus rural categorization of the NHSDA respondents is relatively crude; more refined approaches can be used in future research. Furthermore, geocoding will be essential to achieve sharper resolution of issues such as these. Last, the lack of data on the age of respondent at first illicit drug purchase opportunity is a limiting factor because, without this information, it is impossible to discern the age or ages of respondents experiencing greatest risk of encountering the illegal drug purchase opportunity for the first time or their place of residence at that time.

Whereas this study's evidence does not have immediately applicable public health significance, these results create a platform for future research to account for the variation observed. For example, why is it that males were more likely to experience drug purchase opportunities in the late 20th century when many traditional sex role differentiations have eroded? This is not an instance of females being offered drugs as gifts whereas males must buy these wares: A prior study by Van Etten et al.⁴ revealed male-female differences in drug exposure opportunities of all types, with a robust male excess observed over a span of time from 1979 to 1994.

The relatively modest urban versus rural difference is also noteworthy. Residence in a rural area has long been viewed as protective against risks of illicit drug use, although some have challenged this notion.¹³ Perhaps America's interstate highway system, a dramatic increase in domestic production of marijuana in rural areas, and possibly the spread of methamphetamine laboratories to rural areas have contributed to an apparent shift in the geographic distribution of drug dealing.¹⁴ New research on drug dealing in rural areas may help clarify this situation.

Variation across subgroups defined within and across divisional residence also merits more attention. For example, the Pacific division on maps in Fig. 2 shows every pattern on the four-pattern key, with rural females at the lowest prevalence of a drug purchase opportunity (3%–9%) and urban males at the highest prevalence (20%–25%). Among males, the New England division and the East South Central division show no urban/rural gradient. At present, there is no good explanation for these observations, and perhaps it would be prudent to wait for replication in more recent national survey data before detailed speculation. Nevertheless, it is possible that the currently available national household survey data could be yoked with drug law enforcement data in these divisions of the country to clarify the observations.

In summary, this report of empirical research on recent drug purchase opportunities raises more questions than it answers, as might be appropriate in the first publication on a new topic. Several facts emerged, including a statistically robust male excess and an urban excess of modest magnitude. The patterns of variation in drug purchase opportunities across and within divisions of the country are somewhat perplexing, but it is noteworthy that the Pacific and the West South Central divisions stand out as areas of the country where recent nonusers of drugs are most likely to be approached with drug purchase opportunities. New research is needed to pursue these leads and to understand this geographic variation in an important health-related phenomena.

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