Parental and School Correlates of Binge Drinking Among Middle School Students

Vincent Guilamo-Ramos, PhD, James Jaccard, PhD, Robert Turrisi, PhD, and Margaret Johansson, PhD

There is a large body of research on the binge-drinking activities of older adolescents. Among high school seniors, approximately 80% reported that they had used alcohol, and almost one third reported at least 1 binge-drinking incident. Binge drinking among older adolescents has been linked to adverse outcomes, including decreased performance in school, alcohol-impaired driving, illicit drug use, and sexual aggression. Although college and high school binge drinking have been studied in depth, there are few studies of binge drinking among middle school students. This is despite the fact that about 50% of eighth graders reported having used alcohol, and 23% reported having been drunk at least once in their lives. A sizeable number of these students also reported binge drinking. Most studies of alcohol use among young adolescents have focused on general alcohol consumption. The research shows that lifelong drinking patterns often begin far sooner than high school and frequently can be traced to alcohol-related experiences during middle school.

Entry into middle school from elementary school is a watershed event for most children. They enter a school that usually is physically larger, farther from home, and populated by older students. Accustomed to being in the same classroom with familiar classmates and a teacher who knows them well, middle school students encounter departmentalized teachers, didactic pedagogy, ability-based curricular tracking, and more competitive classroom settings. Concomitant with these school changes are dramatic physical changes that youths undergo as they move toward pubertal maturation. These physical changes are accompanied by significant hormonal and social changes.

Adolescents rely on numerous coping strategies for dealing with these demands, including turning to alcohol and binge drinking. Among older adolescents, researchers acknowledge the connection between binge drinking and the negotiation of adolescent life passages, such as entering a new educational setting. It thus makes sense to explore the dynamics of binge-drinking behavior among middle school students who themselves are undergoing such transitions. Despite this, little is known about gender, racial/ethnic, or grade differences among middle school students with respect to binge drinking.

We examined binge-drinking rates among a national sample of adolescents aged 12 to 14 years in the United States. We then considered the effect of school differences on binge-drinking rates, and we tested whether these differences vary systematically as a function of school characteristics. College and high school studies have shown that drinking rates differ as a function of school-level variables, such as student perceptions of permissive norms, private versus public status, and, in colleges, the presence of fraternity drinking traditions, easy access to alcohol (e.g., legs of beer on campus), and on-campus alcohol advertising. However, across-school studies of binge drinking among middle school students are relatively rare.

We hypothesized that public schools and schools with larger numbers of students would show higher rates of binge drinking than private schools and schools with smaller student bodies. This hypothesis was based on the assumption that the larger public schools with larger class sizes pose greater challenges because individual students receive less attention from adults (e.g., teachers, counselors) and thereby produce a less supportive and potentially stressful environment. We also hypothesized that schools with stricter policies for punishing alcohol-related offenses would have lower rates of binge drinking because of a greater deterrence factor. Moreover, we hypothesized that schools that actively engaged parents, as indexed by the presence of a parent organization, would have lower rates of binge drinking. This was based on the assumption that school–parent partnerships lead to more effective school programs for helping students adjust to the demands of middle school. Finally, we hypothesized that schools with a general climate of teacher concern for students would show lower rates of binge drinking than schools with climates of teacher apathy. This was based on the assumption that students benefit from the involvement of adult role models and expressions of teacher support.

In addition to school-based influences, we also explored family influences on binge drinking. Parental influence on binge drinking has not been studied much among college students. Among Middle School Students

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students, primarily because of the assumption that parents have minimal influence on their children when they move out of the home. Among middle school students, however, it is well known that parents play a central role in adolescent development. School outreach efforts aimed at parents of students represent a viable intervention option for middle school officials. The design of such programs is facilitated by the identification of practical parenting strategies that parents can learn and then use to reduce binge-drinking tendencies.

We evaluated 4 such variables, all of which have a theoretical and empirical base in the broader literature on adolescent development. First, we hypothesized that parents who supervise and maintain control over their adolescents will have children who are less likely to engage in binge drinking. This is based on the assumption that control and supervision (1) minimize opportunities for adolescents to engage in binge drinking and (2) convey a sense of concern and involvement on the part of the parent. Second, we hypothesized that parents who have good communication with their children will be less likely to have children who engage in binge drinking. This is based on the assumption that open communication between parent and child helps children solve problems and maintain a sense of connection with parents. Third, we hypothesized that parents who reason with their children and explain the bases of their actions when children transgress will have children who are less likely to engage in binge drinking. This is based on the assumption that such activities help children internalize morals and develop a value structure to guide behavior when authority figures are not present. Finally, we hypothesized that parents who set high academic standards will have children who are less likely to engage in binge drinking. This is based on the assumption that keeping students involved in their schoolwork and oriented toward academics lessens both the opportunities and the motivation for binge drinking.

METHODS

We used data from Add Health, a nationally representative school-based study of students in grades 7 to 12 conducted in 1995. The sample was composed of approximately 5300 students who were of African American, Asian American, European American, and Latino descent in grades 7 and 8 and who represented a stratified random sample of 86 middle schools throughout the United States. A school administrator was interviewed at each school about school characteristics; a parent of each student, typically the mother, also was interviewed.

Data Collection

Data were collected separately from both parents and adolescents during interviews in their homes. The data were collected on laptop computers; for sensitive questions, respondents wore headphones, listened to prerecorded questions, and entered responses directly into the computer. Add Health had a 2-wave panel design, which yielded data at 2 time points with a 1-year interval. Attrition was about 10%.

Measures

Binge drinking was measured by asking adolescents to indicate how many days they had consumed 5 or more drinks in a row during the past 12 months. The respondents indicated the frequency of binge drinking on a 7-point rating scale, where 1 = never, 2 = 1 or 2 days in the past 12 months, 3 = once a month or less, 4 = 2 or 3 days a month, 5 = 1 or 2 days a week, 6 = 3 to 5 days a week, and 7 = everyday or almost everyday. An index of parental control was derived from 7 items. Adolescents were asked questions such as “Do your parents let you make your own decisions about (1) the time you must be home on weekend nights, (2) the people you hang around with, (3) how much television you watch,” and so on. A composite score was determined by scoring “no” responses as 1 and “yes” responses as 0, averaging across items, and then multiplying the result by 100 to yield the percent of “controlling” responses endorsed. Scores could range from 0 to 100, with higher numbers indicating greater levels of parental control. A more psychologically based index that emphasized independence (the opposite of control) asked adolescents to respond to the following question on a 5-point agree–disagree scale: “My mother encourages me to be independent.” Higher scores indicated greater parental emphasis on independence. For communication satisfaction, adolescents were asked to respond to the statement “I am satisfied with the way my mother and I communicate with each other” on a 5-point agree–disagree scale (higher scores indicated greater satisfaction). To measure maternal use of reasoning, adolescents were asked to agree or disagree on a 5-point scale with the statement “When I do something wrong that is important, my mother talks about it with me and helps me understand why it is wrong.” Higher scores indicated higher levels of agreement. Parents’ educational aspiration was measured by asking if they would be “very disappointed,” “somewhat disappointed,” or “not disappointed” if their child did not attend college. The scale was scored from 1 to 3, with higher scores indicating greater disappointment.

School-level variables were assessed by interviewing principals or key staff of the principals. In addition to answering questions about the size of the student body (small = fewer than 400 students, medium = 400–1000 students, and large = 1000 or more students) and the typical class size, principals reported the school’s policies regarding students being caught with alcohol in school (consequences for first and second offenses). A measure of the overall school climate in terms of teacher apathy was obtained by calculating the average response of all students interviewed in a given school to the question “How much do you feel that your teachers care about you?” Students responded on a 5-point scale; higher scores indicated greater teacher apathy.

RESULTS

Binge Drinking Rates

Table 1 shows the percentage of students who reported binge drinking during the past 12 months. Overall, approximately 8% of seventh graders and 17% of eighth graders reported that they had engaged in binge drinking during the past 12 months. There were racial/ethnic differences in binge-drinking rates, with Asian American (7%) and African American (10%) students showing somewhat lower levels of binge drinking than European American (13%) and Latino students (15%). However, these differences were not statistically significant when controls for multiple
contrasts were invoked. There were no statistically significant gender differences.

Table 1 also shows indices of the frequency of binge drinking. These data focus only on those adolescents who reported that they had engaged in binge drinking during the past 12 months. Sample sizes were as follows: seventh-grade European American males n = 724, females n = 824; eighth-grade European American males n = 750, females n = 761; seventh-grade African American males n = 334, females n = 351; eighth-grade African American males n = 347, females n = 364; seventh-grade Latino males n = 165, females n = 176; seventh-grade Asian American males n = 55, females n = 56; and eighth-grade Asian American males n = 56, females n = 49.

School Differences in Binge Drinking

To examine school differences in binge drinking, we conducted analyses with the hierarchical linear model (HLM) strategy described by Raudenbush and Bryk. We first conducted a 1-way random effects analysis of variance on a measure of binge drinking frequency scored from 0 to 6 by using the frequency variable described in the previous paragraph with the addition of a 0 category for those individuals who reported they had not engaged in binge drinking. Analyses were conducted with sampling weights and with a consistent estimation strategy that was based on the generalized estimating equation as implemented in the HLM computer program.

The intraclass correlation for this analysis was 0.03, which indicated that only 3% of the variation in binge drinking scores could be attributed to differences in school environments. Thus, the vast majority of variation in binge drinking was caused by factors that varied within schools rather than across schools.

Table 2 shows, as a function of school variables, the mean binge-drinking rates for the dichotomous outcome variable (engaged in vs did not engage in binge drinking during the past 12 months) and the mean frequency of binge drinking as determined only for those students who reported having engaged in binge drinking. Significance tests used a linear probability model for the dichotomous outcome and linear regression for the continuous outcome, both with consistent standard errors (to accommodate non-normality and heteroscedasticity) and sampling weights. For the dichotomous outcome, the binge-drinking rates reflected the proportion of students in the school who had engaged in binge drinking during the past 12 months. The rate was statistically significantly higher for public versus private schools (P<.05). None of the other school variables in Table 2 yielded statistically significant effects. The effect of pub-

### Table 1—Binge-Drinking Rates by Gender, Grade, and Race/Ethnicity

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Gender</th>
<th>7th Grade</th>
<th>8th Grade</th>
<th>7th Grade</th>
<th>8th Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>European American</td>
<td>Male</td>
<td>9</td>
<td>19</td>
<td>2.67</td>
<td>2.75</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>8</td>
<td>16</td>
<td>1.93</td>
<td>2.16</td>
</tr>
<tr>
<td>African American</td>
<td>Male</td>
<td>5</td>
<td>12</td>
<td>2.76</td>
<td>3.57</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>5</td>
<td>16</td>
<td>3.68</td>
<td>2.49</td>
</tr>
<tr>
<td>Latino</td>
<td>Male</td>
<td>10</td>
<td>13</td>
<td>3.33</td>
<td>2.47</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>16</td>
<td>22</td>
<td>2.10</td>
<td>1.95</td>
</tr>
<tr>
<td>Asian American</td>
<td>Male</td>
<td>6</td>
<td>5</td>
<td>2.91</td>
<td>3.16</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>8</td>
<td>10</td>
<td>2.92</td>
<td>2.16</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8</td>
<td>17</td>
<td>2.47</td>
<td>2.50</td>
</tr>
</tbody>
</table>

Note. Engaged in binge drinking is a dichotomous measure that refers to students who reported that they had engaged in binge drinking during the past 12 months. Sample sizes were as follows: seventh-grade European American males n = 724, females n = 824; eighth-grade European American males n = 750, females n = 761; seventh-grade African American males n = 334, females n = 351; eighth-grade African American males n = 347, females n = 364; seventh-grade Latino males n = 165, females n = 176; seventh-grade Asian American males n = 55, females n = 56; and eighth-grade Asian American males n = 56, females n = 49.

### Table 2—School Predictors of Binge-Drinking Rates

<table>
<thead>
<tr>
<th>Type of school</th>
<th>Proportion Engaged in Binge Drinking During Past 12 Months</th>
<th>Mean Frequency of Binge Drinking in Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>.123</td>
<td>2.35</td>
</tr>
<tr>
<td>Private</td>
<td>.081</td>
<td>2.16</td>
</tr>
<tr>
<td>Size of school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>.130</td>
<td>2.23</td>
</tr>
<tr>
<td>Medium</td>
<td>.112</td>
<td>2.41</td>
</tr>
<tr>
<td>Large</td>
<td>.128</td>
<td>2.24</td>
</tr>
<tr>
<td>First-offense policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-school suspension</td>
<td>.126</td>
<td>2.03</td>
</tr>
<tr>
<td>Out-of-school suspension</td>
<td>.121</td>
<td>2.42</td>
</tr>
<tr>
<td>Expulsion</td>
<td>.110</td>
<td>2.20</td>
</tr>
<tr>
<td>Second-offense policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out-of-school suspension</td>
<td>.118</td>
<td>2.38</td>
</tr>
<tr>
<td>Expulsion</td>
<td>.120</td>
<td>2.28</td>
</tr>
<tr>
<td>Parent organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>.113</td>
<td>2.33</td>
</tr>
<tr>
<td>No</td>
<td>.118</td>
<td>2.11</td>
</tr>
</tbody>
</table>

*Note. For school policies, the option of “minor action” was not included because only 1 school had such a policy. For the second offence, the options of “minor action” and “in-school suspension” were omitted because only 1 school had each policy. The estimates are unadjusted for any covariates. Analyses also were conducted with quantitative predictors of class size and perceived teacher caring, the results of which are discussed in the text. Values for public schools and private schools are statistically significantly different from one another (P < .05).
lic versus private school became marginally nonsignificant ($P<.06$) when the other school variables in Table 2 were included as covariates in the model.

In addition to the variables in Table 2, we tested for the effects of class size and teacher apathy. There were no statistically significant class size effects for either the analysis of rates (coefficient = $-0.0006$; $P>.74$) or the analysis of the frequency of binge drinking among those who had already engaged in binge drinking (coefficient = $-0.008$; $P>.63$). This also was the case when we fit a quadratic model that allowed for curvilinear relationships between class size and binge drinking for both outcomes. In contrast, teacher apathy proved to be a consistently significant predictor across different model estimation strategies. In general, schools that were characterized by a climate in which students felt that teachers cared about them had lower rates of binge drinking and lower frequencies of binge drinking. In the linear probability model with no covariates, the regression coefficient for this predictor was $-0.07$ ($P<.01$). On the 5-point scale that assessed how much teachers were perceived as caring about students ($1=$ not at all, $2=$ very little, $3=$ somewhat, $4=$ quite a bit, and $5=$ very much), almost all of the mean ratings fell between scores of 3 and 5. The predicted binge-drinking rate for a mean of 3 was 0.17, for a mean of 4 it was 0.10, and for a mean of 5 it was 0.03.

The effect of teacher apathy remained statistically significant when models were estimated that included the covariates of all the school variables in Table 2 and the school-level indicators of the grade, gender, and racial/ethnic composition of the schools. For the model that predicted frequency of binge drinking among those who had engaged in binge drinking, the coefficient for the apathy predictor was $-0.64$ ($P<.06$) when no covariates were included in the model and $-0.55$ ($P<.06$) when all covariates were included.

**Binge Drinking and Family Variables**

Individual-level analyses of student binge drinking were performed with logistic regression for the dichotomous outcome and with linear regression for the continuous outcome. The analyses used sampling weights and adjusted for school clustering effects with estimation algorithms in SUDAAN (Research Triangle Institute, Research Triangle Park, NC). Table 3 shows the results of the logistic regression that included all the family-based variables and the demographic covariates of gender, race/ethnicity, and grade. Model diagnostics suggested that modeling the log odds of binge drinking as a linear function of the control and supervision variable was misspecified and that a curvilinear function was appropriate. For this reason, we included a squared predictor to accommodate a nonlinear quadratic function. With a few exceptions, the coefficients yielded by the model were consistent with predictions. For the control and supervision variable, binge-drinking rates were highest when the variable was at its observed minimum (i.e., a score of 0, where the binge-drinking rate, in probability units, was approximately 0.22). These rates decreased as control and supervision increased up to a point. When the control and supervision variable reached a value of approximately 65, the binge-drinking rate started to increase as control and supervision increased. These data show that relatively moderate levels of control and supervision are optimal. As expected, higher levels of communication satisfaction were associated with lower rates of binge drinking, as was the use of reasoning and explanation on the part of the parent. Positive encouragement of independence and parental educational aspirations were not significantly associated with binge drinking.

In terms of frequency of binge drinking, where the focus was only on adolescents who had engaged in binge drinking, none of the parenting variables yielded statistically significant regression coefficients. For both sets of analyses, a wide range of interaction models was tested to determine whether the aforementioned trends varied by gender, grade, and race/ethnicity. No notable interaction effects were observed.

**Transitions to High School**

At Wave 2, the students in eighth grade who had transitioned to ninth grade and started high school. Binge-drinking status during middle school was related to binge-drinking status during high school 1 year later. Among eighth graders who were not binge drinkers during middle school, only 11% became binge drinkers during their first year of high school. By contrast, of those adolescents who were binge drinkers during middle school, 59% of them continued to engage in binge drinking during their first year of high school. These differences were significant ($P<.01$). Framed in terms of an odds ratio, the odds for a student engaging in binge drinking during high school were 11 times higher among students who engaged in binge drinking during middle school compared with students who did not engage in binge drinking during middle school. All of the parenting variables

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**TABLE 3—Logistic Coefficients for Family-Based Variables**

<table>
<thead>
<tr>
<th>Model Term</th>
<th>Coefficient</th>
<th>P</th>
<th>Exponent (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental control (PC)</td>
<td>-0.013</td>
<td>&lt;.01</td>
<td>0.99 (0.98, 0.99)</td>
</tr>
<tr>
<td>PC²</td>
<td>0.0003</td>
<td>&lt;.01</td>
<td>1.00 (1.00, 1.001)</td>
</tr>
<tr>
<td>Communication satisfaction</td>
<td>-0.381</td>
<td>&lt;.01</td>
<td>0.68 (0.59, 0.79)</td>
</tr>
<tr>
<td>Independence</td>
<td>-0.061</td>
<td>.46</td>
<td>0.94 (0.80, 1.10)</td>
</tr>
<tr>
<td>Reasoning</td>
<td>-0.167</td>
<td>.03</td>
<td>0.85 (0.73, 0.99)</td>
</tr>
<tr>
<td>Parental educational aspirations</td>
<td>0.103</td>
<td>.25</td>
<td>1.11 (0.93, 1.32)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.052</td>
<td>.69</td>
<td>1.05 (0.82, 1.36)</td>
</tr>
<tr>
<td>Grade</td>
<td>0.618</td>
<td>&lt;.01</td>
<td>1.85 (1.43, 2.41)</td>
</tr>
<tr>
<td>African American</td>
<td>-0.484</td>
<td>&lt;.01</td>
<td>0.62 (0.43, 0.89)</td>
</tr>
<tr>
<td>Latino</td>
<td>0.157</td>
<td>.42</td>
<td>1.17 (0.80, 1.72)</td>
</tr>
<tr>
<td>Asian</td>
<td>-0.543</td>
<td>.16</td>
<td>0.58 (0.27, 1.25)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-2.400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Exponent = exponent of the logistic coefficient; 95% CI = 95% confidence interval for exponent of the logistic coefficient. Latino, African American, and Asian American are dummy variables, with European American serving as the reference group. All variables (except the power term) are mean centered.
that were implicated in binge drinking during middle school had an impact on binge drinking during high school indirectly through their effects on binge drinking during middle school. We tested whether the parenting variables measured at Wave 1 had effects on binge drinking during high school that were independent of the mediating influence of binge drinking during middle school. Only the communication satisfaction variable showed such an effect; therefore, good communication between parent and child can have a carryover effect on future binge drinking that is independent of its immediate influence on current binge drinking.

**DISCUSSION**

Our study is one of the first systematic analyses of binge drinking among middle school students. There were several notable results. First, binge-drinking rates among seventh graders were about 8%, but this rate increased to 17% among eighth graders. By eighth grade, nearly 1 in 5 adolescents had engaged in binge drinking at least once during the previous year. The classic gender differences so often observed in older adolescents with respect to binge drinking were not apparent among the middle school students. However, once the initial transition to binge drinking had been made, boys tended to engage in binge drinking more often than girls. There was a trend toward racial/ethnic differences in binge drinking that studies suggest will sharpen during older adolescence, with Latino and European American students showing heightened levels of binge drinking. However, these differences were only marginally significant, which suggests that the differential racial/ethnic trajectories may emerge in later years.

We found that binge drinking during middle school was predictive of binge drinking during the transition from middle school to high school, with the odds of high school binge drinking being 11 times higher among middle school binge drinkers than among nondrinkers. This finding shows the importance of early intervention efforts.

We observed differences in binge-drinking rates across schools, and these rates were higher in public versus private schools.

Interestingly, the strictness of school policies for dealing with alcohol-related transgressions were not associated with school-level binge-drinking rates, which puts the deterrence value of adopting harsh sanctions such as school expulsion in question. School expulsion can have significant negative ramifications for a student. Our data suggest that such policies should not be based on assumptions of the deterrence value of harsher policies, but this suggestion requires further study. If schools want to have an impact on binge drinking, our data are consistent with the hypothesis that programs that combat teacher apathy by developing caring and engaged teacher attitudes might be productive.

Another potential strategy for dealing with binge drinking during middle school is parent outreach. Engaging parents as partners and using parent volunteers to reach out to other parents may prove fruitful. School administrators can develop materials for parents that (1) help parents open communication channels with their children, (2) sensitize parents to the need for supervision and control (but not too much control), and (3) encourage parents to use reasoning and explanation when children transgress. Future research is needed to guide the development of such programs and to provide appropriate scientific evaluations of them.

**CONCLUSION**

Although our results are suggestive, they must be interpreted in light of study limitations. The binge-drinking indices relied on self-reports and may have been subjected to some degree of measurement error. The presence of measurement error in this and our other measures may have biased parameter estimates, thereby requiring interpretational caution. Our results were correlational in nature and, of course, do not permit unambiguous causal attributions.

Specification errors can bias parameter estimates, and this also must be taken into account. The measure of binge-drinking frequency might be viewed by some as being "too ordinal" to justify the types of analyses we performed (however, see Jaccard and Turrisi). Despite these caveats, we believe that our research provides insights for better understanding the binge-drinking behavior of young adolescents.

**About the Authors**

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This article was accepted March 30, 2004.

**Contributors**

V. Guilamo-Ramos and J. Jaccard planned the study, analyzed the data, and wrote the article. R. Turrisi and M. Johansson participated in literature reviews, analyzed data, and interpreted results.

**Acknowledgments**

This research is based on data from the Add Health project, a program project designed by Richard Udry and Peter Bearman and funded by the National Institute of Child Health and Human Development (grant PO1-HD31921 to the Carolina Population Center, University of North Carolina at Chapel Hill), with cooperative funding participation by the National Cancer Institute; the National Institute of Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute of Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; the National Institute of Nursing Research; the Office of AIDS Research, NIH; the Office of Behavior and Social Science Research, NIH; the Office of the Director, NIH; the Office of Research on Women's Health, NIH; the Office of Population Affairs, DHSS; the National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Office of Public Health and Science, DHHS; the Office of the Assistant Secretary for Planning and Evaluation, DHHS; and the National Science Foundation.

**Human Participant Protection**

This study was approved by the institutional review at the Morningside Campus of Columbia University.

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