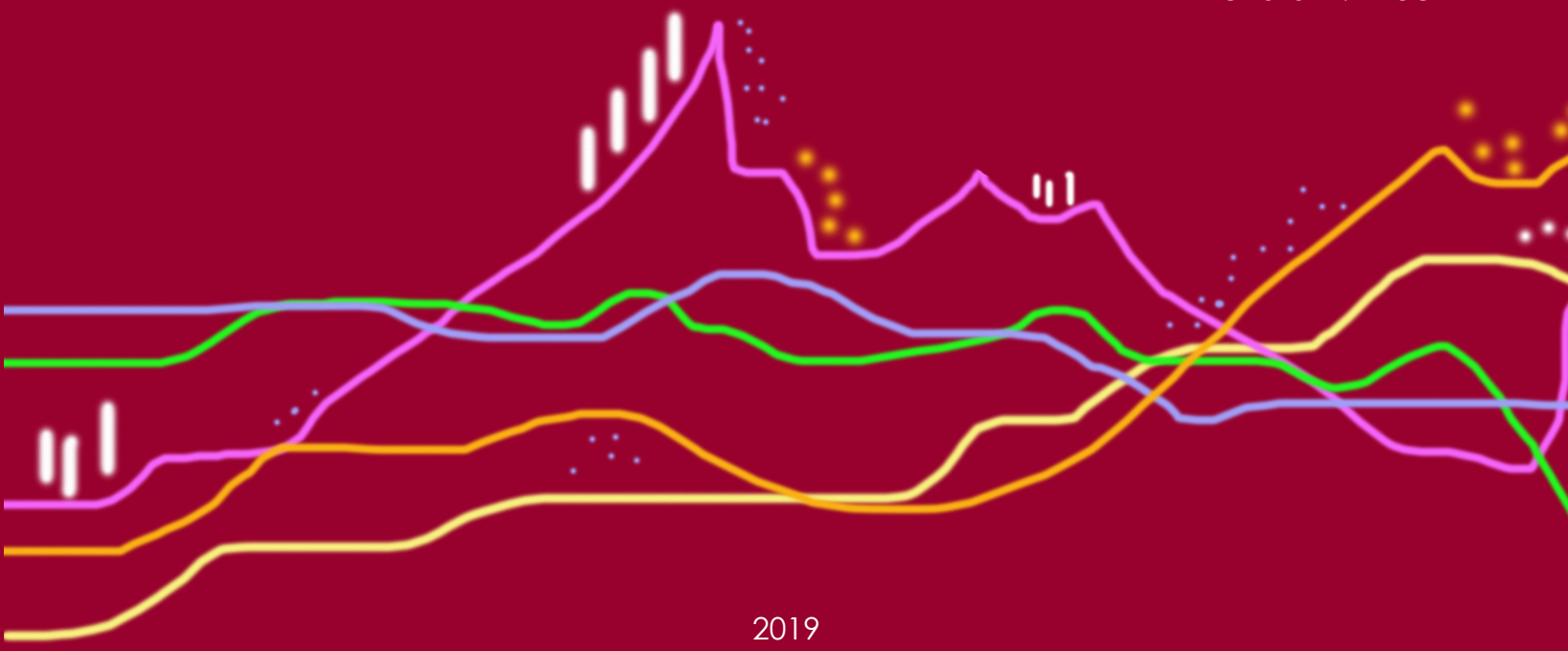
MONITORING
THE FUTURE
National Survey Results

HIV/AIDS

Risk & Protective Behaviors among Adults Ages 21 to 30 in the U.S. 2004 - 2018

Lloyd D. Johnston
Patrick M. O'Malley
Jerald G. Bachman
John E. Schulenberg
Megan E. Patrick
Richard A. Miech



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Lloyd D. Johnston, Ph.D.
Patrick M. O'Malley, Ph.D.
Jerald G. Bachman, Ph.D.
John E. Schulenberg, Ph.D.
Megan E. Patrick, Ph.D.
Richard A. Miech, Ph.D.

Institute for Social Research
The University of Michigan

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Chapter 1

INTRODUCTION

Monitoring the Future (MTF) is a long-term study of American adolescents, college students, and adult high school graduates through age 60. The study is supported under a series of investigator-initiated, competing research grants from the National Institute on Drug Abuse and has been conducted annually by the University of Michigan's Institute for Social Research since 1975.

The present monograph focuses on a range of behaviors, including certain forms of substance use, related to the spread of the human immunodeficiency virus (HIV), which is responsible for acquired immunodeficiency syndrome (AIDS). The populations under study here includes high school graduates in the general population ages 21-30. High school graduates who fall into this age range each year have been surveyed annually since 2004. Through the previous monographs in this series we also reported on respondents age 35 (surveyed annually since 2008), and age 40 (surveyed annually since 2010). The data on those two older ages were contained in this series of monographs through the last one, reporting on 2017 results. However, it became clear that the biannual data on 35 and 40 year olds contained insufficient numbers of cases to produce reliable trends—trends like those provided in Chapters 9 and 10 in the present volume on 21-30 year olds. Therefore, the questions dealing with HIV/AIDS were removed from the annual follow-up questionnaires given to 35 and 40 year olds starting in 2018. The reader who wishes to see results for those two older age groups may view them on the 2018 volume. While the trend data based on 2-year moving averages were somewhat unreliable, the estimates of the prevalence and intersection of the various risk and protective behaviors were based on all years of data collection combines and, therefore, for the most part have sufficient numbers of cases.

HIV infection is clearly a serious public health concern. Worldwide, about 36.9 million people were living with AIDS at the end of 2017 (UNAIDS, 2018). In the United States, about 1.245 million people were diagnosed with HIV stage 3 (AIDS) between 2012 and 2017, and 1 in 7 were unaware of their infection (CDC, 2017). The rate of new HIV infections has been decreasing, albeit very gradually, in recent years; between 2011 and 2015, the rate of new HIV infections dropped by 5% (CDC, 2018). However, progress has been uneven, and some segments of the population continue to show increases in infections (CDC, 2018). The present monograph addresses some of the factors that may be preventing greater progress against HIV/AIDS.

The ages covered in this study contain the two age bands with the highest rates of newly diagnosed HIV infection in the United States: namely, ages 20-24 and 25-29 (CDC, 2017. Table 1a).

In this monograph, we track key behaviors related to the spread of HIV/AIDS in the United States. In 2016, about 40,000 individuals became newly infected with HIV in the United States (CDC, 2017). MTF surveys assess both sexual risk behaviors and injection drug use (including needle sharing), which are two main sources of HIV infection.

The present volume is the fourth monograph in the MTF series of annual reports, all available online from the MTF website. The first monograph, *Overview of Key Findings*, is published near the beginning of each year; it provides early findings on the levels and trends in use of various

substances by the nation's 8th, 10th, and 12th grade students surveyed in the previous year (Johnston et al., 2019). *Volume I*, available at the beginning of June, provides more detailed and complete findings on the same population (Miech et al., 2019). *Volume II*, available at the beginning of August, provides similar prevalence and trend information on the substance-using behaviors of adult high school graduates through age 60, based on a series of follow-up surveys of representative samples of students from each high school graduating class (Schulenberg et al., 2019). *Volume II* has provided findings specific to college students since 1980. HIV/AIDS risk and protective behavior measures were introduced into the MTF follow-up surveys in 2004; findings based on these measures were reported in a chapter in *Volume II* from 2004 through 2008, after which they were published in a series of separate volumes including the present one.

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Chapter 2

BACKGROUND

HIV/AIDS remains an important and ongoing threat to public health. Behaviors of the general population, especially among young adults, are an important part of the problem. Questions about known risk and protective behaviors (i.e., needle sharing, multiple sex partners, men having sex with men, condom use, getting tested for HIV) were added to MTF in 2004. Then in 2018 we introduced questions about the use of PrEP, pre-exposure prophylaxis, a highly effective medicine which can be taken by people at high risk of becoming exposed to HIV to prevent becoming infected.

Prior to this year, this monograph reported levels of these behaviors among three age bands: young adults 21–30 years old, adults 35 years old, and those 40 years old. As noted earlier, questions on HIV/AIDS risk and protective behaviors were dropped from the questionnaires for the two older ages beginning in 2018 because the numbers of cases available each year were insufficient to produce reasonably steady trend lines. However, chapters dealing with the prevalence of risk and protective behaviors, and their intersection, are based on much larger numbers of cases and provide many useful findings. See the previous volume in this series for findings about these older respondents.

The degree to which the various risk and protective behaviors intersect is also reported here in Chapters 5, 7, and 8.

In Chapters 9 and 10 we examine the time trends in these HIV/AIDS-related risk and protective behaviors (e.g., multiple sex partners, condom use) among respondents 21–30 years old. Over the years, we have found that their risk and protective behaviors were relatively stable early in the interval from 2004 to 2015, and at far from optimal levels. We had previously written that stability in these behaviors helped to explain the CDC finding that the reported incidence of new HIV cases was level from 1991 to 2014 (CDC, 2008; CDC, 2015a; CDC, 2015b; CDC, 2015c) with an estimated 50,000 new HIV infections per year, and with new diagnoses recently increasing among young adults (CDC, 2015c; CDC, 2015d). More recently, however, we are beginning to see some changes in some of the risk and protective factors that we track, as will be documented later in this monograph.

The CDC more recently issued revised analyses of the trends, estimating that there actually was a 12% decline in new HIV infections between 2010 and 2015 (CDC, 2018a). This is a limited improvement over a five year period, but nonetheless an important one. The improvement has been greater among certain subgroups such as females, African Americans, and heterosexuals. However, new HIV infections were found to increase among other groups, particularly those aged 25–34 (CDC, 2018a).

The National HIV/AIDS Strategy (White House Office of National AIDS Policy, 2015) listed widespread testing and linkage to care as one of its four key areas of critical focus. Being tested for HIV/AIDS and securing the results have been shown to be protective behaviors for individuals testing positive as well as others (HIV.Gov, 2018). Obtaining testing results for those testing

positive can enable (1) earlier treatment to reduce the progression of the disease and the likelihood of dying from it; and (2) reduced exposure of others to the disease by abstaining from sexual contact, using condoms, and not sharing needles. Obtaining results for those not testing positive is also protective, because it helps provide an opportunity for re-evaluation of current risks and prevention strategies (HIV.gov, 2018).

Importantly, the CDC attributes the improvement to the number of people who know they are HIV positive and have their infection under control, making them less likely to spread the disease. This has been due largely to the use of antiretroviral medications which "dramatically reduce a person's risk of transmitting the virus to others" (CDC, 2017, p.1). Also, they mention the use of PrEP, a pre-exposure prophylaxis for which the CDC issued interim clinical guidelines in 2012. It is a pill that, when taken daily by someone who does not have HIV, can reduce his or her risk of becoming infected by more than 90%. Obviously, people who are at particular risk of infection are the ones most in need of PrEP.

Despite these improvements, attributable largely to medical advances, there remains a need for the continued monitoring of the other known risk and protective behaviors in the general population. Several national studies provide important epidemiological data regarding HIV/AIDS, as is described in the Appendix to this volume; but none duplicate all of the contributions of MTF to understanding the epidemic. Thus, MTF is an important component of the nation's efforts to monitor and understand HIV/AIDS-related risk and protective behaviors in the general population and how they are changing.

Some of the behaviors that put people at heightened risk of contracting and spreading HIV are connected to drug abuse—in particular, drug use by injection when it involves needle sharing. Other behaviors related to heightened risk involve sexual practices, including having multiple sex partners, which itself is a behavior correlated with drug use. Further, both drug use and having multiple sex partners tend to be more prevalent among young adults than other age groups (Anderson & Dahlberg, 1992; Gavin et al., 2009; Lefkowitz & Gillen, 2006). Another major risk behavior is men having unprotected sex with men (CDC, 2018a).

Using MTF data, Patrick et al. (2012) documented that the number of sexual partners is positively correlated with binge drinking, marijuana use, and other illicit drug use, and that these relationships vary across age. In addition, more frequent use of marijuana and other illicit drugs was associated with less frequent condom use. There was a moderation effect, indicating that the positive correlation between binge drinking and number of sexual partners was stronger for younger individuals (i.e., aged 21–24) than somewhat older individuals (i.e., aged 25–30).

An important protective behavior is getting tested for HIV/AIDS, particularly given the advent of effective retroviral treatments for the disease (Fauci & Folkers, 2012; Steinbrook, 2013). Early detection can alert the infected individual to the potential of infecting others, particularly others with whom he or she is sexually active and/or shares needles. Early and sustained treatment can not only protect the treated individual but also reduce the odds of transmitting HIV to others. Many individuals do not know that they are infected, especially young people; it is estimated that 51% of adolescents and young adults who have HIV do not know that they are infected (CDC, 2018b). In order to reduce the number of new HIV infections, infected individuals need to be identified

and then receive effective care (Gardner et al., 2011) as well as guidance in informing their sex or needle-sharing partners.

A second main protective behavior is condom use. According to the CDC, "latex condoms, when used consistently and correctly, are highly effective in preventing the sexual transmission of HIV" as well as other sexually transmitted diseases (CDC, 2011). However, consistent condom use is not widespread. According to the CDC (2010), only 23% of women aged 15–44 who have never been married and are not cohabiting with a partner choose condoms as their method of contraception. Rates of dual-method contraceptive use (e.g., using the male condom plus an oral or other contraceptive method) to prevent both STDs and unintended pregnancy is low in the United States; recent estimates indicate that only 17% of contraceptive users combine two or more methods (Sonfield, 2017). Condom use is an important way to prevent HIV and other STDs among sexually active individuals, and is a clear focus of HIV prevention efforts.

Other Relevant Studies of the General Population

A considerable literature has evolved based on studies of particular high-risk populations, such as injection drug users and men who have sex with men, but there are fewer studies on the prevalence of risk and protective behaviors in the general population. To our knowledge, there are currently six data collection efforts in addition to the present one that provide some information on HIV/AIDS risk behaviors based on nationally representative surveys of the general population. These studies are described and compared to MTF in the Appendix to this volume. Each of these surveys provides some key HIV/AIDS risk behavior data; however, as discussed in the Appendix, none fully duplicates the type of HIV/AIDS-related information produced by the MTF study.

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Chapter 3

RESEARCH DESIGN

MTF is uniquely suited to address key gaps in the literature concerning HIV/AIDS-related risk and protective behaviors. Most of the features that make MTF an important epidemiologic and etiologic study of drug use also apply to tracking and studying HIV/AIDS-related behaviors. MTF is population-based, prospective, cohort-sequential, and has especially rich measures of drug use with which to study how drug use relates to HIV transmission directly (through injection drug use and needle sharing) and indirectly (through engaging in risky sexual and other behaviors).

The MTF research design is described in detail in *Volume I* (Miech et al., 2019), *Volume II* (Schulenberg et al., 2019), and in MTF Occasional Paper 82 (Bachman et al., 2015), so we limit the description here to a brief overview.

Samples

The MTF design has included a representative subsample of each 12th-grade class sample since 1976, with 2,450 participants from each class selected in a stratified random procedure for follow-up. The 2,450 are randomly split into two half samples of 1,225 each, one to be surveyed on even numbered years and the other surveyed on odd numbered years up to six times, through modal age 29 or 30. After that, they are followed at five-year intervals, starting at age 35, and currently continuing up to age 60.With this design, it is possible to present data for each graduating class every year while surveying each respondent only every other year through age 30; this schedule was judged to be less demanding, less repetitive and, therefore, more conducive to retention in the panels than an annual follow-up of each individual. In order to increase the numbers of drug users in these panels, certain groups are selected for the follow-up samples with a higher probability (by a factor of 3.0) than the remaining 12th graders. Those over-sampled include high school seniors who report 20 or more occasions of marijuana use in the prior 30 days (i.e., "daily or near-daily users") in 12th grade and/or any use of other illicit drugs in the prior 30 days. Corrective weighting is then used in all subsequent analyses to adjust for these differential sampling probabilities. Those in the drug-using stratum receive a weight of 0.33 in the calculation of all statistics to correct for their overrepresentation in the selection stage. As a result, the *actual* numbers of follow-up respondents are larger than the *weighted Ns* given in the tables.

The respondents included in the analyses presented in this volume were drawn from participants in the MTF follow-up surveys of 21-30 year olds in 2004–2018 (representing graduates from the high school classes of 1992–2015.

The present monograph reports findings from respondents of modal ages 21 to 30 for whom there are fifteen years of data (collected in 2004 through 2018; weighted N = 31,802 observations), but there are fewer *individuals*, because most provided two or more observations over multiple data collections (N=10,496 individuals, as is discussed below). Because of the limited sample sizes, certain subgroup estimates are not reliable and therefore are not reported.

Measures

Each 12th-grade respondent in recent years has been administered one of six different questionnaire forms randomly distributed in equal proportion in their senior year—a procedure adopted in order to cover much more material than would have been possible in one class period using a single form. Each individual selected for the young adult follow-up surveys receives a form of the questionnaire matching the one he or she completed in 12th grade; much of the content is the same, though some content is replaced with more age-appropriate topics such as family formation, experiences in higher education, and work history.

In 2004, new questions covering risk and protective behaviors for HIV/AIDS were included in two of the questionnaire forms being mailed to people of modal ages 21–30. Beginning in 2007, this set of questions was added to a third questionnaire form in order to increase sample size. One reason for limiting the new HIV/AIDS-related questions to two forms initially was to determine whether the inclusion of the sensitive items on sexual practices would adversely affect follow-up response rates. Fortunately, no decrement was observed, so the same set of questions was added to an additional questionnaire form in the 2007 survey of young adults, raising the annual case count by half again what it had been in 2004–2006.[1]

In 2008 the same set of questions was added to the single questionnaire form that went to a random half of the 35-year-olds, and response rates were compared that year between the half sample receiving the revised form and the half sample that received the original form. The response rates again were comparable for the two half samples, so the new set of questions was included in surveys of all 35-year-olds in 2009 and later. Because of concerns about whether the impact on response rates might rise with increasing age, we surveyed the age-35 stratum first, and finding no clear adverse effect, added the question set to the age-40 stratum beginning in 2010. Unfortunately, the numbers of cases derived from the surveys of 35- and 40-year old proved not sufficient to generate sufficiently smooth trend results to permit reliable interpretation, which is why these two age groups were no longer given the HIV/AIDS questions. The trend results may be seen in last year's version of this monograph.

Risk behavior variables include lifetime and 12-month frequency of injecting drugs without a doctor's order; lifetime and 12-month prevalence of using a needle that the respondent "knew (or suspected) had been used by someone else" before they used it; number of sex partners during the 12 months prior to the survey; and whether those partners had been exclusively opposite sex, same sex, or both male and female.

Protective behavior variables include lifetime and 12-month prevalence of being tested for HIV; obtaining the results of the most recent HIV test; and frequency of condom use in the prior 12 months.[2] The exact questions measuring these different variables are included in the tables in this monograph. This year for the first time we included a new question asking whether the respondent

[1] When we added this new form to the set containing questions on risk and protective behaviors for the transmission of HIV, we compared its results with those from the other two forms to make sure that there were no systematic differences across forms in the estimates derived. The results proved highly comparable across forms, which is reassuring for trend estimation based on the increasing number of forms used.

[2] In earlier surveys we also asked about lifetime and 12-month prevalence of donating blood or blood plasma, not because it is a behavior that puts the respondent at risk, but because it is a behavior that—depending on the risky behaviors of the respondent—could have posed a very small chance of putting others at risk. Because that risk is now estimated to be extremely small, we no longer report on blood donation in this series of monographs.

was taking PrEP to aviod acquiring HIV. The results on this behavior will be given in Chapter 6 along with the results on the other protective behaviors.

Field Procedures

The initial data collection from panel members occurs at 12th grade; they complete a self-administered questionnaire in a group setting, usually their normal classroom but sometimes in larger groups. They are asked to complete the questionnaires during a usual class period (about 45 minutes) and to complete a tear-off card providing contact information, which permits subsequent communication with the subsample selected for panel study follow-up. After the card is separated from the questionnaire, the identifying information on it can be matched to the questionnaire only by using a computer file at the University of Michigan, because the numbers printed on the back of the questionnaire and the card are long, randomly matched numbers. This, plus the facts that the questionnaires are machine-readable and that they are administered (and the cards are collected) separately by a field representative from the University of Michigan, helps to assure respondents that their confidentiality will be protected.

The respondents subsequently selected into the panels were followed by mail through 2017. In 2018 a random half were followed by mail while the other half were followed through online procedures, as described below. Both are highly cost-effective methods of data collection that help make large sample sizes possible. In the mail procedure, each respondent receives an MTF newsletter with an address correction card enclosed; each target respondent up to age 29/30 also receives an invitation letter sent prior to the questionnaire. A subsequent letter is printed on the front of the questionnaire. The questionnaire is sent with a check made out to the subject, currently in the amount of $20 in the case of the older panels (age 35 or over); the payment was raised to $25 per occasion for half of the class of 2006 and for all high school graduating classes thereafter to help offset the effects of inflation. Extensive efforts are made to secure location information on previous participants whom we are unable to locate by mail. Reminder postcards are sent about two weeks after the questionnaires, and telephone calls are made to attempt to contact those who have not responded after a reasonable interval in order to again request their participation. No answers to the questionnaire are obtained by telephone; responses are obtained only by mail.

The 2018 data collections among young adults (19-30) mark the first use of *web-based* surveys with our panel participants. In 2018, one random half of the sample received our typical mail surveys described above, and the other half received the “web-push” condition (i.e., first pushed toward web-based surveys and then given the opportunity to complete paper surveys). This splitting of the sample (which is replicated in 2019 data collections) allows us to calibrate our historical and developmental trends. Starting in 2020, we plan to use web-push data collection with all young adults, and to offer paper surveys only on request and to non-respondents. Because it is possible that the data collection procedures can affect responses, we have been deliberate in this process of moving to web-based data collections. For the past several years, we have been conducting experiments with extra panel samples of young adults, examining feasibility and comparing our typical mail-only surveys to other designs pushing web-based surveys. Findings suggest that there are not many mode differences in responses, as detailed in our recent peer-

reviewed publications.[3] In the 2018 data presented in this volume, data gathered with a paper and pencil questionnaire, but not online, are presented. As we show in Volume II, there were only a few significant differences between those who were randomly assigned to mail-only and web-push conditions in prevalence estimates of the many substances we covered; similarly, there were few significant differences between those who completed mail versus web-based surveys.

Panel Retention

We summarize below the nature of the panel attrition problem generally, the response rates for MTF panel surveys in recent years, and evidence relevant to assessing the impact of attrition on the study's research results.

Response Rates. Virtually all longitudinal studies—including MTF—experience attrition, which is often differential with respect to health risks, including substance use (e.g., Booker et al., 2011; Brook et al., 2009; Galea & Tracy, 2007; McCabe & West, 2015; McGuigan et al., 1997). In addition, survey response rates in general have been declining in recent decades (e.g., Dillman et al., 2009; Groves, 2006; Groves et al., 2002; Massey & Tourangeau, 2013; Pew Research Center, 2012; Wechsler et al., 2002), highlighting an important challenge in the conduct of all population-based research.

A vital feature of the MTF panel studies is the very low cost per respondent. There are many advantages to collecting panel data through low-cost surveys. Indeed, given the number of MTF questionnaires sent each year (roughly 18,000) across the entire coterminous U.S., we have viewed low-cost mail and web surveys as our best cost-effective options. One disadvantage of data collection by mail or web surveys is that attrition rates tend to be higher than those that might be obtained with much more expensive methods, such as intensive personal tracking and face-to-face interviewing. There are a few large epidemiological/etiological surveys that have better retention rates, but their procedures are extremely expensive and not realistic for an ongoing effort of the scale of MTF. Our retention rates compare favorably with those of most longitudinal studies reported in the field, including interview studies. We are working to increase response rates (or at least stem the general response rate erosion mentioned below) based on results from an experiment in which we offered respondents the option of responding online to determine the extent to which web-based data collection affects response rates, data quality, respondent composition, and cost per respondent. The early results looked promising (Patrick et al., 2018). In an extension of that experiment, we have optimized the web surveys for mobile devices such as smart phones, which may be more convenient for responding for certain groups (Patrick et al., 2019).

Retention rates in the biennial follow-ups of respondents modal ages 19–30 (corresponding to the first six follow-ups) decline with the length of the follow-up interval. For the five surveys from 2014 to 2018, the response rate in the first follow-up (corresponding to one to two years past high school) averaged 38%, and for the sixth follow-up (corresponding to 11–12 years past high school)

[3] Patrick, M. E., Couper, M. P., Laetz, V. B., Schulenberg, J. E., O'Malley, P. M., Johnston, L. D., & Miech, R. A. (2018). A sequential mixed mode experiment in the U.S. National Monitoring the Future study. *Journal of Survey Statistics and Methodology, 6*(1), 72-97. Patrick, M. E., Couper, M. P., Jang, B., Laetz, V. B., Schulenberg, J., Johnston, L. D., Bachman, J., O'Malley, P. M. (2019). Two-year follow-up of the sequential mixed-mode experiment in the U.S. National monitoring the future study. *Survey Practice, 12*(1).

response rates averaged 39% of the originally selected panels. (Among long-term respondents—the 35, 40, 45, 50, 55, and 60 year olds—retention rates are quite good, apparently because some of the decline over time in retention rates reflects cohort differences.) In sum, the response rates attained under the current design range from respectable to quite good, especially when the low-cost nature of the procedure, the long time-intervals covered, the modest payment, and the substantial length of the questionnaires are taken into account. More importantly, the evidence discussed next leaves us confident that the data resulting from these follow-up panels are reasonably accurate, which brings us to our adjustments for panel attrition and the comparison of our results with those from other sources.

The Impact of Panel Attrition on Research Results. An important purpose of the MTF panel study is to allow estimation of drug prevalence levels among American high school graduates at various ages. Thus, we have always been concerned about making the appropriate adjustments to account for panel attrition. In essence, our standard adjustment process is a post-stratification procedure in which we reweight the data obtained from the follow-up samples in such a way that, when reweighted, the distribution of their *12th-grade answers* on a given drug matches the original distribution of use observed for that drug based on all participating high school seniors in their graduating class. This procedure is carried out separately for cigarettes, alcohol, and marijuana, as well as other illicit drugs (combined). As expected, it produces prevalence estimates in the follow-up data that are somewhat higher than those uncorrected for attrition, indicating a positive association between drug use and panel attrition. However, the adjustments are relatively modest.

Attrition rates by levels of 12th grade substance use differ some, but less than one might expect. For example, in the classes of 1978–2008, among all respondents who had never used marijuana by 12th grade, an average of 74% participated in the first follow-up. The proportion responding was somewhat lower among those who had used marijuana once or twice in the last 12 months (67%). This proportion decreased gradually with increasing levels of marijuana use; but even among those who used marijuana on 20 or more occasions in the last 30 days in 12th grade, 60% participated in the first follow-up. The corresponding participation rates for the same drug use strata at the fourth follow-up (i.e., at modal ages 25/26) were 64%, 57%, and 51%, respectively.

Thus, even among those who were active heavy users of marijuana in high school, response rates at the fourth follow-up were only 13 percentage points lower than among those who had never used marijuana by 12th grade. That is not to say that we assume all types of drug users remain in the panels at comparably high rates. We believe that people who become dependent on or addicted to illicit drugs such as heroin, cocaine, or methamphetamine are less likely to be retained in reasonable proportions. That is why we are careful not to quantify or characterize these special segments of the population; but we note that they constitute very low proportions of the adult population.

As a validation of our panel data on drug use, we compared MTF prevalence rates with those from the National Survey on Drug Use and Health (NSDUH); this survey provides the best available comparison data because it is also based on national samples and uses cross-sectional surveys that do not have panel attrition. Using the NSDUH data from 2014 (Center for Behavioral Health Statistics, 2015), we compared the prevalence rates on a set of drugs—cigarettes, alcohol, marijuana, and cocaine—for which there was reasonable similarity in question wording across the

two studies. These comparisons showed a high degree of comparability in the prevalence estimates of the two studies, particularly with the post-stratification procedure applied to the MTF data (Miech et al., 2019; Schulenberg et al., 2019).

In addition, attrition in the MTF panel is not necessarily as great a problem as nonresponse is in a cross-sectional study. In the MTF panel we know a great deal about each of the follow-up non-respondents, including their prior substance use, based on a lengthy questionnaire administered in 12th grade (and, for many, in subsequent years as well). Thus, adjustments can be made utilizing data that are highly informative about the missing individuals.

Effects on Relational Analyses. While differential attrition (uncorrected) may contribute to some bias in point estimates and other univariate statistics, a considerable amount of empirical research has shown that such attrition tends to have less influence on associations among variables (Cordray & Polk, 1983; Galea & Tracey, 2007; Goudy, 1976; Groves, 2006; Groves & Peytcheva, 2008; Martikainen et al., 2007; Nohr & Olsen, 2013; Peytchev, 2013; Van Loon et al., 2003). With MTF samples, we have found that correlations among variables at base year are very similar across groups who remain in the longitudinal study and those who do not (Jager et al., 2013; Merline et al., 2008; Schulenberg et al., 1994; Schulenberg et al., 2005; Staff et al., 2010).

Limitations

Sample Coverage. There are certain limitations to the present study for attempting to quantify HIV/AIDS-related risk and protective behaviors in the general population. Perhaps the major limitation derives from the sample under study, because MTF does not include the 7% to 15% or so of each high school class cohort that leave high school without graduating (i.e., drop outs). Although our coverage includes the great majority of the population of interest (young adults who recently entered their 20s), an important and on average somewhat more deviant segment of the population—high school dropouts—is not covered. In addition, panel attrition is a limitation, but techniques have been used here to help compensate for the effects; they are described below.

These limitations likely lower the estimates of risk behaviors from what their values would be if the entire population of 21-30 year olds in the United States could be surveyed, but it is difficult to quantify by how much. (We believe that we do a better job of characterizing the original target population, which is high school graduates.) However, because the school dropout rates and panel retention rates tend to change very slowly, we believe that they changed the trend estimates only modestly for the questions on HIV/AIDS risk and protective factors, which were added to the study in 2004. And our procedures for compensating for panel loss should remove much of that bias.[4]

Validity. The sensitive nature of questions about certain risk behaviors may affect the validity of the data reported. Recognizing this, we provide an introduction to the section of the questionnaire dealing with HIV/AIDS risk and protective factors explaining why these questions are important in helping us to increase our understanding of the HIV/AIDS epidemic. The protections of confidentiality are re-emphasized by reminding respondents that their answers are never connected

[4] According to U.S. Census data, high school completion rates had been quite constant at 85% between 1972 and 2002 for persons 20–-24 years old. (Younger age brackets are less appropriate to use because they include some young people who are still enrolled in high school.) However, since 2002 there has been a very gradual increase in completion rates, reaching 91.9% by 2016. U.S. Census (various years). Current population reports, Series P-20, various numbers. Washington, DC: U.S. Government Printing Office.

with their names and by inviting respondents to leave blank any questions that they "do not wish to answer." The decrement in response rates between the preceding non-sensitive questions and those in this section is very small—on the order of about one percentage point for five questions, and about 2 percentage points for two other questions—suggesting that the great majority of respondents feel willing and able to answer the potentially sensitive questions.

Sample Sizes and Trend Estimation for Young Adults (Ages 21–30)

The prevalence and, when available, the frequency of HIV/AIDS-related behaviors in the general population can now be established for the years of 2004 through 2018 combined. Having multiple years of data is valuable because they can be combined to increase the precision of low-prevalence estimates (in particular, for the intersection of some low prevalence behaviors). Because the intersection of some of the behaviors is of particular importance, we report the bivariate associations among them, though the low numbers in some cases still limit the conclusions that can be reached. Over time the case counts continue to grow and allow more detailed analyses.

Because individuals are surveyed every two years, some individuals complete multiple questionnaires across the years, and thus we draw a distinction between the number of observations and the number of unique individuals surveyed. For estimates based on one or two sequential years of data, the number observations is equivalent to the number of individuals surveyed. However, for estimates based on all years combined, the number of unique individuals is lower than the number of observations. Thus, for estimates using data from 2004 through 2018, a single individual can contribute up to five waves of data containing information of relevance to these analyses. The total number of weighted observations of young adults for 2004 through 2018 is 31,802, but the total number of unique individuals is only a little more than one-third of that number at 10,496. *The weighted Ns reported in each table refer to observations, and in the case of the young adults, that is not the same as individuals.*

It should be noted that we also examine the data for each of the fifteen years (2004–2018) separately to look for signs of change in prevalence levels, and find only limited evidence of systematic trending in any of the risk or protective behaviors under study during this interval, as will be addressed in later chapters. It is encouraging, though, that the univariate distributions replicate quite well across years, which provides powerful evidence of estimate reliability.

Adjusting for the Effects of Panel Attrition

In chapter 3 of Volume II (Schulenberg et al., 2018) we described the procedures used to adjust the substance use estimates to reduce (insofar as possible) the effects of panel attrition. In the case of substance use estimates, we have data on the prevalence and frequency of the same behaviors among all respondents when they were in 12th grade. This permits a *post-stratification* procedure in which we reweight the obtained follow-up samples such that the reweighted distribution of their *senior-year* responses reproduces the original distribution obtained from the entire 12th-grade sample for the behavior under consideration.

However, the measures of non-drug-using variables under consideration in this monograph (primarily related to sexual behavior) were not included in the 12th-grade surveys, so this form of post-stratification is unworkable. Instead, we have implemented a different post-stratification reweighting procedure for the follow-up respondents, one in which we attempt to correct for their

differential retention in the panels as a function of demographic and other characteristics that *were* measured in 12th grade. For example, males have a somewhat lower retention rate than females, which means that their proportion in the attained follow-up sample is lower than it was in the original 12th-grade in-school survey. We are able to correct for that difference by up-weighting the data from all males who *did* continue in the panel study, so that males will remain in the same proportion in the reweighted panel as they were when the panel was first selected.

Using this strategy, we *simultaneously* correct for differential attrition using multiple variables identified as being related to attrition. To do so, we calculate the retention rate for the various cells defined by the intersection of these variables and then weight the respondents in each cell by the reciprocal of the retention rate found for the people who belong in that cell. These adjustments generate a newly weighted panel with frequency distributions on the variables used in this reweighting procedure (e.g., gender or grade point average in high school) that reproduce the distributions observed in the original 12th-grade sample. As a practical matter, the number of variables used simultaneously in this procedure must be limited to some extent by the total sample size, lest certain cells become too small to be reliably reweighted.

The variables that we use for defining the cells are as follows: gender (male/female), ethnicity (White/non-White), grade point average in 12th grade (low/medium/high), and past 12-month illicit drug use reported in 12th grade (none/marijuana only/any other illicit drug). The first two variables were pre-specified, while the latter two were chosen from a larger set entered into a regression analysis in which they emerged as the strongest predictors of retention rate.

These four variables generate 36 non-overlapping categories (or cells) of individuals that can be reweighted to adjust for differential rates of attrition. Retention rates in each of the 36 cells are then calculated based on the number of people in each cell in the *original* panel and the number who subsequently provided data at the follow-up; the participating members of each cell are assigned a new weight that is the reciprocal of the retention rate in that cell—that is, one divided by the retention rate. (For example, if White males with low grades and illegal drug use other than marijuana are represented in the retained panel at a 50% retention rate, each of the respondents in that cell would be given a weight of two.) This new weight is then multiplied by a separate individual weight that corrects for any differential probability in being selected into the panel originally. A particular advantage to using this procedure is that it takes into account any interactions among the predictor variables, such as an interaction between gender and race/ethnicity.

With the resulting weight, we have a total weighted *N* (sample size) equal to the *original* panel size, not the actual *retained* panel, which means that we would be overstating the accuracy with which we are making prevalence estimates. Thus, in a final step, all individual weights are then multiplied by the overall sample retention rate to bring the weighted sum of cases down to match the actual total number of individually weighted cases still in the panel. This entire correction procedure is carried out separately for each year of follow-up data collection.

We consider this correction procedure to be appropriate in this circumstance, but we caution the reader that it is not possible to correct entirely for the effects of panel attrition for two reasons. First, specific to our relatively small sample for these measures, we cannot adjust for all measured

variables that might predict retention, because we are limited as to the number of cells that can reasonably be generated to which to assign weights. Second, and more generally, even with a prediction model that accounts for nearly all of the variance in retention, there still could be some unmeasured characteristics that differentiate the people in each cell who do and do not remain in the study. As we stated earlier, one of the most important uses of these data will be to track historical *changes* in the major HIV/AIDS risk and protective behaviors in the general population, a purpose for which these data are well suited, because such uncorrected factors are likely to be fairly constant across time.

Significance Testing Protocol

All significance tests referred to in this monograph are based on standard testing procedures that do not take account of the complex clustered sampling design used in the initial sampling of 12th-grade students who were selected by school. Because the follow-up samples represent only a small sub-sample of the original clustered samples, design effects are quite small and generally ignorable. Significance tests on trends do account for multiple responses from individuals. Also, nominal significance levels are used with no correction for multiple tests. Thus, nominal levels may be overstated; however, we take care to ascertain that any findings cited as statistically significant appear valid by examining multiple years, multiple cohorts, and general internal consistency.

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Chapter 4

PREVALENCE/FREQUENCY OF FOUR RISK BEHAVIORS

In this chapter we report the prevalence and frequency of four HIV/AIDS-related risk behaviors among respondents aged 21 to 30 in the MTF follow-up surveys *combined across all available survey years.*[1] Results are presented in Tables 4-1 and 4-2. The tables provide the data for young adults aged 21 to 30 based on data from the 2004–2018 period.

We present data on the combined samples for males and females separately within each age group. The young adult sample from 2004 through 2018 has a total weighted *N* of 31,802 observations. As noted earlier, the number of *observations* in the young adult (ages 21-30) sample is larger than the number of different *individuals* because some participants were surveyed more than once and thus account for more than one observation.

Results are included for four behaviors related to HIV risk to the respondent (and potentially to others[2]):

Injection drug use
Needle sharing
Having sex with multiple partners
Men having sex with men (MSM).

Injection Drug Use

While not itself a vector of HIV transmission, the amount of illicit injection drug use determines the pool of eligible persons from which the high-risk behavior of needle sharing is drawn. The question to respondents reads, "On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) in your lifetime? Do not include anything you took under a doctor's orders." Note that this refers to more than just heroin use. A sequel question asks about such behavior in the prior 12-months. Trends in the prevalence of these behaviors would be indicative of changes in the pool of persons at risk.

- In the fifteen-year (2004–2018) combined samples of young adults aged 21–30, 1.5% report having ever used any drug by injection not under a doctor's orders, and 0.5% reported doing so on 40 or more occasions (Table 4-1a). Thus, about 1 in every 67 respondents has ever used an illicit drug by injection, and about 1 in every 200 respondents reports an extended pattern of use as indicated by use on 40 or more occasions. There are appreciable gender differences—2.2% of males vs. 0.9% of females indicate ever injecting a drug ($p<.001$), and the percentages saying they injected on 40 or more occasions are 0.7%

[1] Combining all available years of data provides a much needed increase in total numbers of cases, compared with reporting just the most recent year or two. As will be seen in the later section on trends, the results are sufficiently stable to warrant combining the data across years. In Chapters 9 and 10, trends across years are shown.

[2] According to recent statistics from CDC (http://www.cdc.gov/hiv/library/reports/surveillance/), the estimated number of cases of new HIV infections in the U.S. in 2017 (34,955) by transmission category was as follows: 29,529 (67%) for MSM, 10,578 (24%) for heterosexual contact, 2,644 (6%) for injection drug use, 1,322 (3%) for both MSM and injection drug use, and 276 (< 1%) for other transmission routes including blood transfusion, hemophilia, and perinatal exposure. CDC estimates the death rate per 100,000 people in the general population to have been quite level at between 6.0% and 6.3% from 2012 through 2016, though they estimate that it came down some from 6.7% in 2010 and 6.5% in 2011 (Table 6b).

for males and 0.3% for females (p<.001). The percentages of young adults who have injected drugs during the *past 12 months* without medical supervision are considerably smaller: 0.5% overall—1 in every 200 respondents—including 0.8% of males and 0.3% of females (p<.001). The percentages using 40 or more times in the past 12 months are 0.2% overall—0.3% for males and 0.1% for females

Needle Sharing

The risk of catching or transmitting a number of blood-borne diseases, including HIV, emerges when injection drug use is combined with the sharing of needles. Immediately following the MTF survey questions about injecting drugs not under a doctor's orders, just discussed, the question about needle sharing is asked: "Have you ever taken such drugs using a needle that you knew (or suspected) had been used by someone else before you used it?" Response alternatives are "Yes, in the last 12 months", "Yes, but not in the last 12 months", and "No, never." The first response provides an estimate of annual prevalence of needle sharing, and the sum of the first two responses provides an estimate of lifetime prevalence.

- The proportions of 21- to 30-year-olds who say they have ever shared needles in this way during their *lifetime* are 0.5% overall—0.6% of males and 0.4% of females (bottom of Table 4-1). As noted in the previous section, 1.5% of the full samples say they have *ever* injected a drug, so this indicates that a minority—but still a third (0.5%/1.5%)—of the people injecting any of the several drug classes mentioned in the question (heroin, cocaine, amphetamines, and/or steroids) shared a needle at some time.

- The proportion of 21- to 30-year-olds who reported that they shared needles in the prior *12 months* is 0.2%, with no significant gender difference. This compares to 0.5% who said that they have injected a drug in the prior 12 months, so about two fifths of past year injectors shared a needle at least once during the year.

- Of respondents age 21-30, almost half of females who have injected in their lifetime reported having shared needles (0.4%/0.9%), compared to a little more than one-fourth of male injectors (0.6%/2.2%), suggesting that young adult female injectors are more at risk due to needle sharing. It seems likely that the rates are underestimates for the entire population in this age group due to the omission of high school dropouts, the likelihood that drug-addicted users would be more likely than average to leave the study, and the possibility of some underreporting of this behavior. But while the prevalence of needle sharing is low, it can still translate to sizable numbers of people engaging in shared needle use. An estimated 45 million Americans were between ages 20 and 29 in 2017 (US Census Bureau, 2018); just 0.5% of this group would be approximately 225,000 individuals.

- To summarize, while young adult men are more likely to inject drugs than their female counterparts, they are only slightly more likely to share needles.

Sex with Multiple Partners

Having sex with multiple partners is another behavior that increases the risk of HIV transmission and infection. The question to respondents is, "During the last 12 months, how many sex partners have you had? (This includes vaginal, oral, or anal sex.)" All three types of sexual activity are specifically mentioned in this question because all can involve the transmission of HIV, though they vary in the degree of risk involved.[3] Results are provided in Tables 4-2.

- Roughly one quarter (24%) of the sample of young adults aged 21 to 30 reported that they have had multiple (two or more) sex partners in the prior 12 months—26% of males and 22% of females (Table 4-2).

- About one-sixth (16%) of 21-30 year-old respondents reported having *no* sex partners during the prior 12 months (i.e., sexual abstinence)—18% of males and 14% of females.

- The most common answer by far to this question was having one partner during the year (60% overall); a lower proportion of males (56%) than females (64%) gave this answer.

- While having even one sex partner is not without risk, the risk of acquiring or transmitting HIV clearly rises with an increased number of partners. About 10% of young adults reported that they had a total of two partners during the past 12 months (9.2% of males and 9.8% of females); 5.5% reported three partners (5.8% of males and 5.3% of females); and about one in eleven (8.7%) reported having four or more partners (11% of males and 6.6% of females). Very few reported having more than 20 partners in the prior 12 months (0.7% of males and 0.1% of females). *Overall, while males were slightly more likely to be abstinent than females, males were more likely to have multiple sex partners and substantially more likely to have had a large number of partners during the year.*

- We previously reported that numbers of sex partners among 35- and 40-year-olds were substantially lower than they were among young adults (Johnston et al., 2018). The proportion reporting having had more than one partner during the past 12 months was 24.0% among young adults (ages 21-30; 2004-2018 combined), 12.0% among 35-year-olds (2008-2017 combined), and 10.6% among 40-year-olds (2010-2017 combined). The proportions reporting four or more sex partners during the year fell from 8.7% among young adults to 4.2% among 35-year-olds and 3.4% among 40-year-olds. These numbers strongly suggest that potential exposure to HIV infection through multiple sexual contacts declines sharply between ages 21 and 35—a finding that replicates a similar one from the National Survey of Family Growth (Chandra et al., 2012; Chandra et al., 2011).

- In these older age strata, males continued to be more likely than females to report multiple sex partners (14.0% vs. 10.3%, respectively at age 35, and 12.4% vs. 8.8% at age 40). They also remained more likely to report four or more partners in the prior year (6.1% vs. 2.5% at age 35, and 5.0% vs. 2.0% at age 40).

[3] The CDC reports that there is little to no risk of getting or transmitting HIV through oral sex. https://www.cdc.gov/hiv/risk/oralsex.html

Men Having Sex with Men; and People Having Sex with Both Men and Women

Because males who have sexual contact with other males have been at particular risk of contracting and transmitting HIV, we also looked at subgroups by the different gender combinations. We distinguished six configurations: males with females exclusively, males with males exclusively, males with partners of both genders, females with males exclusively, females with females exclusively, and females with partners of both genders. For both male and female respondents, the case counts are fairly limited in the two categories that involve sexual contact with partners of the same gender, as will be detailed below, so the reader is cautioned to pay particular attention to the numbers of observations for these groups (Table 4-2). Only people reporting that they have had sexual contact with one or more partners in the prior 12 months were asked the question: "During the last 12 months, have your sex partner or partners been . . . ." The answer alternatives are: "exclusively male," "both male and female," and "exclusively female." (See Table 4-2 for the proportions in each of the three categories.) Recall that these findings are based on data combined across years.

- Of the young adult respondents reporting one or more sex partners in the prior 12 months (representing 84% of the total sample, 82% of all males, and 86% of all females), about 1 in 18 (5.5%) males indicated some sexual contact with other males during the last 12 months—4.6% saying that their partners were males exclusively and 0.9% saying that they had both male and female partners (Table 4-2a).

  Note that because of the low prevalence for these behaviors, the weighted number of cases is limited: a total of 637 observations from male respondents who reported having sexual contact with other males—533 observations of men having sex exclusively with other males and 104 observations of men having sex with both genders.

- Among young adult females, 4.6% reported having any female sex partners—2.5% indicated female partners exclusively and 2.1% indicated that their partners were of both genders—almost an even split, unlike the case for males (Table 4-2a). Thus bisexual behavior is more common among females in this population—about twice as common, in fact (2.1% vs. 0.9% for males), and having sex only with the same gender is about twice as common among men (4.6% vs. 2.5%).

  Again, note that the numbers of reports available for study are limited: 636 reports of females having any sexual contact with other females, 346 reports of females having sexual contact exclusively with other females, and 290 reports of having sex with both female and male partners.

- Of the young adult respondents reporting one or more sex partners in the prior 12 months, 95% of males reported that their partners were exclusively female, and 95% of females indicated that their partners were exclusively male (Table 4-2).

- As noted previously, males with same-gender sexual contact are at greater risk of acquiring or transmitting HIV than females because male-to-male sex carries a greater likelihood of HIV transmission than female-to-female (or heterosexual) sex.

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TABLE 4-1
Injection Drug Use and Needle Sharing
Total and by Gender
among Respondents of Modal Ages 21–30
in 2004–2018 [a] Combined

(Entries are percentages.)

	Total	Male	Female
Lifetime Frequency of Injecting Drugs			
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) in your lifetime? Do not include anything you took under a doctor's orders.			
0 Occasions	98.5	97.8	99.1
1–2	0.4	0.5	0.3
3–5	0.2	0.3	0.1
6–9	0.1	0.2	0.1
10–19	0.2	0.3	0.1
20–39	0.1	0.2	*
40+ Occasions	0.5	0.7	0.3
Weighted N =	*30,406*	*14,216*	*16,190*
Annual Frequency of Injecting Drugs			
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) during the last 12 months? Do not include anything you took under a doctor's orders.			
0 Occasions	99.5	99.2	99.7
1–2	0.1	0.2	0.1
3–5	0.1	0.1	*
6–9	0.1	0.1	*
10–19	*	0.1	*
20–39	0.1	0.1	*
40+ Occasions	0.2	0.3	0.1
Weighted N =	*30,417*	*14,220*	*16,197*
Lifetime and Annual Needle Sharing			
Have you ever taken such drugs using a needle that you knew (or suspected) had been used by someone else before you used it?			
Yes, in the last 12 months	0.2	0.2	0.1
Yes, but not in the last 12 months	0.3	0.4	0.3
No, never	99.5	99.4	99.6
Weighted N =	*30,153*	*14,093*	*16,061*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' * ' indicates a prevalence rate of less than 0.05%.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

TABLE 4-2
Number of Sex Partners and Gender of Sex Partners
Total and by Gender
among Respondents of Modal Ages 21–30
in 2004–2018 [a] Combined

(Entries are percentages.)

	Total	Male	Female
Number of Partners in Last 12 Months			
During the LAST 12 MONTHS, how many sex partners have you had? (This includes vaginal, oral, or anal sex.)			
None	16.1	18.3	14.3
One	60.1	55.7	64.0
Two	9.5	9.2	9.8
Three	5.5	5.8	5.3
Four	3.6	4.0	3.3
5–10	4.0	5.3	2.9
11–20	0.7	1.2	0.3
21–100	0.3	0.5	0.1
More than 100	0.1	0.2	*
Weighted N =	*30,347*	*14,184*	*16,163*
Gender of Partners in Last 12 Months [b]			
During the LAST 12 MONTHS, have your sex partner or partners been …			
Exclusively male?	54.0	4.6	95.4
Both male and female?	1.6	0.9	2.1
Exclusively female?	44.4	94.5	2.5
Weighted N =	*25,415*	*11,584*	*13,832*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' * ' indicates a prevalence rate of less than 0.05%.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

Chapter 5

INTERSECTION OF RISK BEHAVIORS

One goal of the MTF panel study is to determine to what extent the various HIV-related risk behaviors overlap with one another, and to determine what proportion of the population is at heightened risk of HIV transmission as a result. In this chapter, we report several pair-wise combinations of risk factors: needle sharing by gender of sex partners, injection drug use and needle sharing by number of sex partners, and number of sex partners by gender of sex partners.

Needle Sharing by Gender of Sex Partners

Needle sharing and male-to-male sex are known to be among the most important risk behaviors for the spread of HIV.

- Table 5-1 provides information on young adults' (age 21−30) injection drug use and needle sharing by the six categories of gender of partners in the prior 12 months (combined across 2004-2018)—men who had sex exclusively with females, exclusively with males, or with both males and females; and women who had sex exclusively with males, exclusively with females, or with both males and females. As noted earlier, the limited numbers of cases in the groups reporting same-gender or both-gender sexual contact make any results somewhat tentative. See Table 5-1 for numbers of cases in each of the six categories.

- Keeping in mind the small cell sizes, it appears that among young adults the annual prevalence of *injecting drugs* and of *needle sharing* both tend to be highest among those who engage in sex with both genders. This holds true for both male and female respondents, but especially among males (Table 5-1).

- Young adult males who report having exclusively male partners have nearly the same lifetime prevalence of *injection drug use (2.8%)* as males having exclusively female partners (2.4%) but an annual prevalence that is somewhat, though not significantly, higher at 1.5% vs. 0.8% (Table 5-1). However, those with exclusively male partners have a significantly higher lifetime and annual prevalence of *needle sharing* (1.3% vs. 0.4% lifetime [$p<.01$]; 0.8% vs. 0.1% annual [$p<.001$]). *So, among young adult males there is some compounding of these two types of risk—needle sharing and men having sex with men.*

- Among young adult females the lifetime but not annual prevalence of *injecting drugs* is significantly higher for those having exclusively female partners than for those with exclusively male partners (3.3% vs. 0.8% for lifetime [$p<.001$], and 0.6% vs 0.2% for annual [ns]). More importantly, their lifetime prevalence of *needle sharing* is also significantly higher (2.3% vs. 0.3% [$p<.001$]). Interestingly, there is no significant difference between these two groups in the prevalence of injecting drugs or needle sharing in the prior 12 months, so much of the heightened risk from needle sharing for women who have exclusively female partners appears to have occurred when they were younger.

Injection Drug Use and Needle Sharing by Number of Sex Partners

- Among young adults, the prevalence of having injected drugs either over a lifetime or in the prior 12 months rises considerably with the number of sex partners reported in the prior 12 months combined across 2004-2018 (Table 5-2). For example, those who report zero, one, or two partners during the prior 12 months report a prevalence of injecting a drug in the prior 12 months of 0.3%, 0.3%, and 0.5%, respectively, whereas those reporting five or more partners have a prevalence of 2.9%. Although the association holds for both males and females, it is much stronger for males: 6.2% of males reporting five or more sex partners in the prior 12 months have injected drugs at some time in their lifetime compared with 2.5% of females. A similar relationship exists for annual prevalence of injecting drugs.

- At ages 35 and 40 (Tables 5-2b and 5-2c) a similar positive association holds between number of sex partners in the prior 12 months (combined across 2008-2017 and 2010-2017, respectively) and both lifetime and annual injection drug use; this association is due largely to males. Females report little injecting in the prior 12 months and in their lifetime. See the previous year's volume for findings on these two older ages.

- Among the young adults, the dangerous practice of sharing needles relates positively to the number of sex partners; prior-12-month sharing was 0.1% or less among those who had two or fewer partners in the prior 12 months, and 0.9% among those reporting five or more partners in that period (Table 5-2, bottom panel). *This means that needle sharers, who are at particular risk of contracting HIV, are more likely than others to have been exposing somewhat larger numbers of partners to that risk through sexual contact; this is true for both genders. Likewise, those who may have contracted HIV by having multiple partners risk spreading it to others through needle sharing.*

Number of Sex Partners by Gender of Sex Partners

- We examined the number of sex partners reported by the genders of those partners (Table 5-3). Among sexually active young adult males, of those who had sex exclusively with other males during the 12 months prior to the survey (N = 528 observations), about half (53%) reported that they had more than one sex partner, compared to 30% among those males who reported that they had sexual contact exclusively with females. About one-fifth (22%) of males with exclusively male partners reported sexual contact with five or more partners, compared to 8% of males with exclusively female partners. The proportions of the two groups having more than ten sex partners during the year were 10.2% vs. 1.7%, respectively. *Thus, although their proportion of the total population is small, and these particular findings are thus based on a limited subsample, it appears that appreciable numbers of young adult males are potentially placing themselves and others at greater risk by having multiple sex partners, and this is especially true for males who have had sex exclusively with other males during the year*. These two risk behaviors—men having sex with men and having a large number of sex partners—are positively correlated, as others also have found (Ashenhurst et al., 2017; CDC, 2013).

- Among sexually active young adult females who had sex exclusively with other females during the year combined across 2004-2018 (N = 349), 75% reported having only one

partner, indicating a considerably higher level of monogamy than among males having sex exclusively with other males. This rate of monogamy is about the same (76%) as it is among females who had male partners exclusively. Again, these estimates are only suggestive, given the limited sample sizes involved. *However, the results suggest that females who have sex exclusively with other females are at lower risk of contracting or transmitting HIV than are males who have sex exclusively with other males or females who have sex with males, based on the number of sex partners they have as well as on the relatively lower risks associated with female-to-female sex.*

- Individuals who have sex partners of both genders carry the risk of spreading HIV across genders, making their behavior of particular importance. The numbers of cases collected to date are limited; young adult weighted *N*s = 286 observations for females and 109 for males reporting sex partners of both genders in the prior 12 months (combined across 2004-2018). Given these small numbers, the results can be considered only tentative and suggestive. Nevertheless, based on the 395 cases that report partners of both genders, the proportions reporting five or more sex partners appear to be quite high for both genders—39% for males and 30% for females (Table 5-3).

- Last year's monograph in this series has related information for age 35 and age 40 respondents.

References

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TABLE 5-1
Injection Drug Use and Needle Sharing by Gender of Sex Partners in Last 12 Months among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

	MALE RESPONDENTS			FEMALE RESPONDENTS		
	Gender of Partner(s)			Gender of Partner(s)		
	Female Only	Male Only	Male and Female	Male Only	Female Only	Male and Female
Lifetime Frequency of Injecting Drugs						
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) in your lifetime? Do not include anything you took under a doctor's orders.						
0 Occasions	97.6	97.2	88.2	99.2	96.7	93.8
1–2	0.6	0.5	1.8	0.3	1.0	2.3
3–5	0.3	0.9	1.2	0.1	1.1	1.0
6–9	0.2	0.3	2.6	0.0	*	0.6
10–19	0.3	0.5	*	0.1	*	0.3
20–39	0.2	0.1	1.1	*	*	*
40+ Occasions	0.7	0.5	5.1	0.3	1.2	1.9
Weighted N =	*10,899*	*523*	*107*	*13,144*	*349*	*286*
Annual Frequency of Injecting Drugs						
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) during the last 12 months? Do not include anything you took under a doctor's orders.						
0 Occasions	99.2	98.5	89.9	99.8	99.4	96.6
1–2	0.1	0.5	2.4	0.1	*	1.5
3–5	0.1	0.3	0.6	*	0.1	0.3
6–9	0.1	*	2.2	*	*	*
10–19	0.1	0.4	1.1	*	0.3	0.1
20–39	0.1	*	0.9	*	*	0.2
40+ Occasions	0.3	0.4	2.8	0.1	0.2	1.2
Weighted N =	*10,904*	*523*	*107*	*13,149*	*349*	*286*
Lifetime and Annual Needle Sharing						
Have you ever taken such drugs using a needle that you knew (or suspected) had been used by someone else before you used it?						
Yes, in the last 12 months	0.1	0.8	2.9	0.1	0.3	1.5
Yes, but not in the last 12 months	0.3	0.5	2.9	0.2	2.0	1.5
No, never	99.5	98.7	94.2	99.7	97.8	97.0
Weighted N =	*10,813*	*521*	*102*	*13,049*	*348*	*284*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' * ' indicates a prevalence rate of less than 0.05%.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

TABLE 5-2

Injection Drug Use and Needle Sharing by Number of Sex Partners in Last 12 Months among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

	Number of Partners in Last 12 Months				
	None	One	Two	Three or Four	Five or More
Lifetime Frequency of Injecting Drugs *On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) in your lifetime? Do not include anything you took under a doctor's orders.*					
Total					
0 Occasions	99.3	98.8	98.3	97.0	95.1
1+ Occasions	0.7	1.2	1.7	3.0	4.9
Weighted N =	*4,872*	*18,165*	*2,876*	*2,751*	*1,549*
Male					
0 Occasions	98.9	98.3	97.7	95.6	93.8
1+ Occasions	1.1	1.7	2.3	4.4	6.2
Weighted N =	*2,577*	*7,866*	*1,296*	*1,368*	*1,007*
Female					
0 Occasions	99.7	99.2	98.7	98.4	97.5
1+ Occasions	0.3	0.8	1.3	1.6	2.5
Weighted N =	*2,295*	*10,299*	*1,580*	*1,383*	*542*
Annual Frequency of Injecting Drugs *On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) during the last 12 months? Do not include anything you took under a doctor's orders.*					
Total					
0 Occasions	99.7	99.7	99.5	98.7	97.1
1+ Occasions	0.3	0.3	0.5	1.3	2.9
Weighted N =	*4,875*	*18,172*	*2,878*	*2,751*	*1,549*
Male					
0 Occasions	99.6	99.5	99.5	98.1	96.4
1+ Occasions	0.4	0.5	0.5	1.9	3.6
Weighted N =	*2,578*	*7,868*	*1,296*	*1,368*	*1,006*
Female					
0 Occasions	99.8	99.9	99.5	99.3	98.5
1+ Occasions	0.2	0.1	0.5	0.7	1.5
Weighted N =	*2,297*	*10,303*	*1,581*	*1,383*	*542*
Lifetime and Annual Needle Sharing *Have you ever taken such drugs using a needle that you knew (or suspected) had been used by someone else before you used it?*					
Total					
Yes, in the last 12 months	0.1	0.1	0.1	0.5	0.9
Yes, but not in the last 12 months	0.3	0.3	0.4	0.8	0.4
No, never	99.6	99.7	99.5	98.7	98.7
Weighted N =	*4,818*	*18,040*	*2,849*	*2,727*	*1,535*
Male					
Yes, in the last 12 months	0.2	0.0	*	0.6	1.0
Yes, but not in the last 12 months	0.5	0.3	0.4	1.0	0.3
No, never	99.3	99.7	99.6	98.4	98.7
Weighted N =	*2,550*	*7,816*	*1,276*	*1,357*	*995*
Female					
Yes, in the last 12 months	0.1	0.1	0.1	0.4	0.7
Yes, but not in the last 12 months	*	0.2	0.5	0.5	0.6
No, never	99.9	99.7	99.4	99.0	98.7
Weighted N =	*2,268*	*10,224*	*1,574*	*1,370*	*540*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' * ' indicates a prevalence rate of less than 0.05%.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

TABLE 5-3

Number of Sex Partners by Gender of Sex Partners in Last 12 Months among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

	MALE RESPONDENTS			FEMALE RESPONDENTS		
	Gender of Partner(s)			Gender of Partner(s)		
Number of Partners in Last 12 Months	Female Only	Male Only	Male and Female	Male Only	Female Only	Male and Female
During the LAST 12 MONTHS, how many sex partners have you had? (This includes vaginal, oral, or anal sex.)						
None	—	—	—	—	—	—
One	69.7	47.5	9.0	76.1	75.2	4.8
Two	11.1	11.8	16.1	11.2	11.4	25.2
Three	6.8	10.0	14.4	5.8	7.5	22.7
Four	4.5	8.7	21.2	3.6	2.8	17.7
5–10	6.1	11.9	24.6	2.9	2.7	23.3
11–20	1.1	6.4	8.0	0.3	*	4.9
21 or more partners	0.6	3.8	6.7	0.1	0.3	1.3
Weighted N =	*10,907*	*528*	*109*	*13,168*	*349*	*286*

Source. The Monitoring the Future study, the University of Michigan.

Notes ' — ' indicates not applicable. ' * ' indicates a prevalence rate of less than 0.05%.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

Chapter 6

PREVALENCE OF PROTECTIVE BEHAVIORS

Various precautions can diminish the likelihood of contracting and/or transmitting HIV. One, of course, is simply to avoid the high-risk behaviors already discussed (e.g., having multiple sex partners, sharing needles). Another is to use condoms during intercourse to protect against viral transmission. A third—getting tested for HIV—increases the likelihood that an infected individual will (a) be identified as infected and receive appropriate treatment that may save his or her life, and (b) refrain from behaviors that put others at risk of contracting the virus or (c) alerting an ongoing partner to take preventive measures. We consider prevalence of these two protective behaviors (i.e., condom use and HIV testing) among: young adults (ages 21−30) combined across years 2004-2018. We also report for the first time on the use of pre-exposure prohpylaxis (PrEP), which is intended for use by people at very high risk of acquiring HIV (such as the sex partners of those with HIV/AIDS or people who share needles).

Condom Use

Respondents who indicate that they have had one or more sex partners during the prior 12 months are asked, "When you had sexual intercourse during the last 12 months, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)" The answer alternatives are: "never, seldom, sometimes, most times, and always." Both genders respond to this question. (Respondents who report no sex partners in the prior 12 months are not included in the data presented here.)

- Just over half (55%) of sexually active young adult respondents report that they "seldom" or "never" used condoms during the past 12 months—with 50% of males and 59% of females giving these answers (Table 6-1a). Indeed, a large proportion (41%) indicate that they did not use condoms at all during the past 12 months—36% of the sexually active males and 46% of the sexually active females. Higher rates of monogamy among females (documented in the previous chapter) may help to explain their lower rate of condom use; however, if their male partners are not monogamous, the risk to women increases, quite possibly without their awareness. Women having sex with other women are unlikely to report condom use.

- Only about one third (32%) of sexually active young adults say that they used a condom "most times" or "always"—37% of males and 29% of females.

- An examination of two-year age groups among 21- to 30-year-olds shows that the annual prevalence and frequency of condom use decline steadily with age (Table 6-1b). Three quarters (75%) of 21- to 22-year-olds report some condom use in the last 12 months, compared to only 46% of 29- to 30-year-olds. And while 45% of the 21- to 22-year-old group report using condoms "most times" or "always," only about half as many (23%) of 29- to 30-year-olds say that. One plausible explanation for these age-related declines in condom use is an increase with age in the proportions who are married, cohabiting, monogamous, and/or trying to conceive children; however, Table 6-1c shows that even among young adults who were not married or cohabiting at the time of the survey, the

proportion reporting any condom use declines with age across the 20s by 11 percentage points (from 81% of 21- to 22-year-olds to 70% of 29- to 30-year-olds). Among those who report being married or cohabiting, the prevalence of condom use is indeed lower at each age level than for those not married or cohabiting, but they also show a 19 percentage point decline with age (from 56% of the married or cohabiting 21- to 22-year-olds reporting any condom use to 37% among married or cohabiting 29- to 30-year-olds) (Table 6-1d). Thus, the decline in condom use with age among 21- to 30-year-olds is only partially explainable by an increased proportion being married or cohabiting up through age 29 or 30.

Getting Tested for HIV

Respondents were asked if they had ever been tested for HIV/AIDS; the question instructed them not to include any testing that may have occurred when they were donating blood. The results may be found in Tables 6-2a.

- Less than half (43%) of all young adults ages 21 to 30 combined across years 2004-2018 indicate that they have ever been tested for HIV outside of blood donation screening (Table 6-2a). Despite the fact that males are at considerably higher risk of contracting HIV (CDC, 2019a), females are more likely to report having been tested than are males (50% versus 34%). The higher rate of being tested among females may be partly due to being tested during pregnancy.

- Lifetime prevalence of HIV testing rises considerably with age among young adults (Table 6-2b). Summing across the surveys from 2004 to 2018 (see the far right hand column), 27% of 21- to 22-year-olds report some testing in their lifetime compared to 48% of 29- to 30-year-olds.

- About one fifth (21%) of young adults say they have been tested in the last 12 months, and as with lifetime prevalence, a higher percentage of females than males report being tested (26% versus 16%, Table 6-2a).

- The great majority (94%) of those who have been tested receive the results of their most recent HIV/AIDS test, with little difference by gender (Table 6-2a).

Taking PrEP to Prevent HIV Infection

- In 2018 we included a new question about the use of Pre-exposure prophylaxis (PrEP) to be used to prevent HIV infection in persons at high risk due to their sexual or needle-sharing practices. It involves taking a pill on a regular daily basis. According to CDC (2019b), "When taken daily, PrEP is highly effective for preventing HIV from sex or injection drug use. PrEP is much less effective when it is not taken consistently…. Studies have shown that PrEP reduces the risk of getting HIV from sex by about 99% when taken consistently. Among people who inject drugs, PrEP reduces the risk of getting HIV by at least 74%, when taken consistently."

- Our question reads, "PrEP (Truvada) is a pill prescribed to help prevent HIV. Have you ever taken PrEP for this purpose?" The answer set is "Yes, in the last 12 months," "Yes,

but not in the last 12 months," "No, never." The percent indicating use in the 2018 survey is very low in this population: 0.1% in the last 12 months, 0.2% yes but not in the past 12 months, and 97.0% saying "no, never" (N=1,057). Judging by what we have documented on the prevalence of having many sexual partners, men having sex with men, and needle sharing, it appears that a very low proportion of those who are at significant risk for acquiring HIV are using the highly effective PrEP at the present time to protect themselves.

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TABLE 6-1a
Frequency of Condom Use
Total and by Gender and Marital/Cohabiting Status among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

Frequency of Condom Use in Last 12 Months[b]	Total Sample			Married or Cohabiting			Not Married or Cohabiting		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
When you had sexual intercourse during the LAST 12 MONTHS, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)									
Never	41.3	36.1	45.6	56.8	53.1	59.5	24.4	20.4	28.3
Seldom	13.7	13.7	13.6	13.6	14.6	12.9	13.7	12.7	14.6
Sometimes	12.6	13.1	12.2	10.8	11.8	10.0	14.7	14.4	15.0
Most times	14.7	16.6	13.1	9.3	10.9	8.2	20.6	21.8	19.4
Always	17.7	20.5	15.4	9.6	9.7	9.5	26.6	30.6	22.7
Weighted N =	*25,219*	*11,520*	*13,699*	*13,094*	*5,518*	*7,576*	*11,961*	*5,918*	*6,043*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

TABLE 6-1b

Use of Condoms in Past Year by 2-Year Age Groups among Young Adults 2004–2018 [a] Combined

(Entries are percentages.)

Frequency of Condom Use in Last 12 Months	Age of Respondent				
	21–22	23–24	25–26	27–28	29–30
Never	25.5	33.8	40.8	49.4	54.4
Seldom	14.5	15.2	13.9	12.9	11.9
Sometimes	14.8	12.8	13.0	11.6	11.3
Most times	19.4	17.3	15.0	12.0	10.6
Always	25.7	20.9	17.2	14.1	11.9
Weighted N =	*4,616*	*5,031*	*5,031*	*5,189*	*5,353*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

TABLE 6-1c

Use of Condoms in Past Year by 2-Year Age Groups among Respondents who Report NOT Being Married or Cohabiting among Young Adults 2004–2018 [a] Combined

(Entries are percentages.)

	Age of Respondent				
Frequency of Condom Use in Last 12 Months	**21–22**	**23–24**	**25–26**	**27–28**	**29–30**
Never	19.3	22.9	26.3	29.5	30.4
Seldom	13.6	14.4	13.5	13.5	12.9
Sometimes	14.9	13.9	15.4	15.0	14.6
Most times	21.5	21.4	20.5	18.6	19.3
Always	30.6	27.5	24.4	23.4	22.8
Weighted N =	*3,444*	*3,015*	*2,308*	*1,768*	*1,427*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

TABLE 6-1d

Use of Condoms in Past Year by 2-Year Age Groups among Respondents who Report Being Married or Cohabiting among Young Adults 2004–2018 [a] Combined

(Entries are percentages.)

	Age of Respondent				
Frequency of Condom Use in Last 12 Months	21–22	23–24	25–26	27–28	29–30
Never	43.9	50.5	53.6	59.9	63.3
Seldom	17.1	16.7	14.2	12.6	11.5
Sometimes	14.9	11.1	11.0	9.8	10.1
Most times	13.2	11.1	10.3	8.4	7.3
Always	11.0	10.7	11.0	9.3	7.8
Weighted N =	*1,140*	*1,973*	*2,680*	*3,398*	*3,903*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

TABLE 6-2a
Test for HIV, Lifetime and Last 12 Months
Total and by Gender
among Respondents of Modal Ages 21–30
in 2004–2018 [a] Combined

(Entries are percentages.)

Test for HIV: Lifetime and Last 12 Months	Total	Male	Female
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)			
Yes, in the last 12 months	21.0	15.8	25.6
Yes, but not in the last 12 months	21.5	18.6	24.0
No, never	57.5	65.6	50.4
Weighted N =	*30,504*	*14,274*	*16,230*
Received HIV Test Results [b]			
Did you receive the results of your most recent HIV/AIDS test? (We don't want to know your test results.)			
Yes	93.5	92.2	94.2
No	6.5	7.8	5.8
Weighted N =	*12,812*	*4,840*	*7,971*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Those respondents who report never having been tested for HIV are excluded from these percentages.

TABLE 6-2b

Percentage of Respondents Who Have Had an HIV Test in Their Lifetime [a]

by 2-Year Age Groups

(Entries are percentages.)

	Year of Administration															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2004–2018
Age 21–22	33.2	29.7	29.5	32.9	28.8	31.2	26.4	27.5	28.8	27.1	26.9	23.5	21.1	28.9	30.7	26.7
Weighted N =	*404*	*360*	*357*	*493*	*531*	*565*	*548*	*506*	*489*	*438*	*450*	*388*	*374*	*375*	*177*	*6,455*
Age 23–24	37.8	38.0	39.3	39.9	39.1	41.2	41.9	41.4	37.6	32.6	31.9	34.0	33.9	35.2	31.5	34.5
Weighted N =	*392*	*373*	*354*	*475*	*490*	*477*	*473*	*495*	*508*	*466*	*453*	*375*	*379*	*375*	*214*	*6,298*
Age 25–26	45.0	46.6	43.0	45.6	43.8	48.0	46.5	46.3	46.2	40.7	37.2	44.7	41.0	38.7	36.7	40.2
Weighted N =	*378*	*349*	*320*	*468*	*468*	*441*	*478*	*420*	*427*	*424*	*435*	*397*	*374*	*343*	*205*	*5,928*
Age 27–28	54.5	50.5	52.6	48.2	53.7	51.3	50.2	45.6	54.4	45.7	52.7	45.1	46.6	47.5	46.5	44.9
Weighted N =	*343*	*366*	*344*	*468*	*467*	*436*	*449*	*414*	*429*	*397*	*372*	*361*	*376*	*398*	*225*	*5,844*
Age 29–30	56.8	54.2	54.3	52.5	54.3	52.1	53.3	52.6	53.3	53.4	56.1	49.0	58.5	48.7	44.5	48.1
Weighted N =	*369*	*330*	*305*	*514*	*509*	*470*	*453*	*422*	*425*	*407*	*418*	*336*	*342*	*359*	*248*	*5,906*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

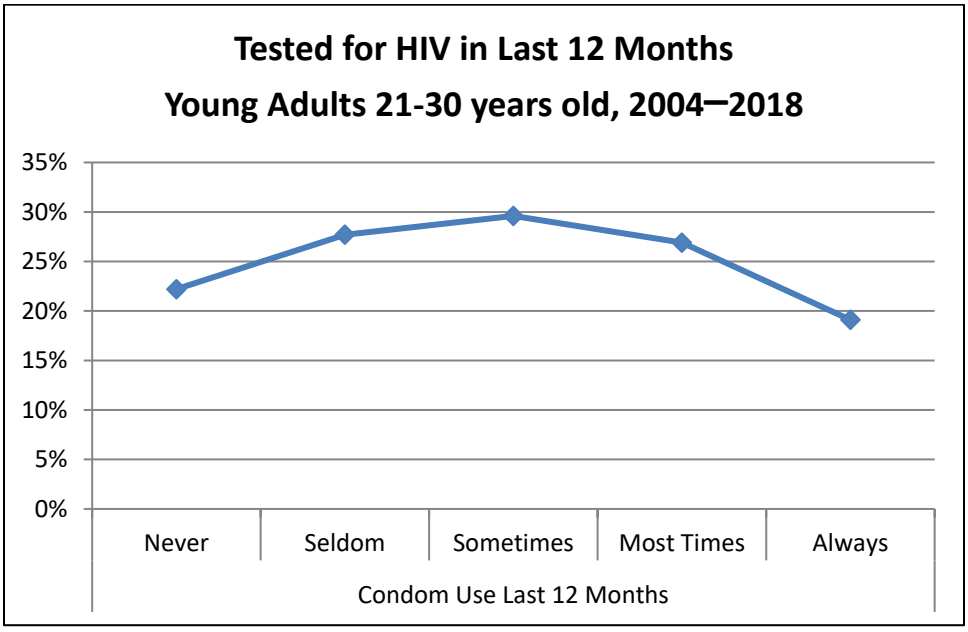
Chapter 7

INTERSECTION OF PROTECTIVE BEHAVIORS

To the extent that people who use one type of protection against HIV transmission are more (or less) likely to use another type, it is useful to consider a broader construct of individual differences in avoidance of HIV infection in general. We look here at the degree of association between the two protective behaviors of getting tested and using condoms in the three age groups including young adults (ages 21-30 years).

Frequency of Condom Use by Getting Tested for HIV

- Are people who take the precaution of using condoms also the ones who are getting tested for HIV? The answer appears to be somewhat complicated (Table 7-1a); the association is slightly curvilinear among both male and female young adults (ages 21-30). Of those who say they "always" used condoms in the last 12 months, 19% indicate getting tested for HIV in that period, compared to the 27%–30% who say they seldom, sometimes, or most times use condoms. Perhaps those who always use condoms consider themselves to be at less risk of contracting HIV. Sexually active respondents who say they never use condoms are also slightly less likely to have been tested in the last 12 months (22%) than the middle groups, perhaps because many of them simply are not concerned about HIV and/or in a monogamous relationship attempting to conceive. The chart below shows the curvilinear association.



Among the 35- and 40-year-olds the same curvilinear relationship between HIV testing and condom use appears to hold combined across 2008-2017 and 2009-2017, respectively. See the previous monograph in this series.

- As noted in the previous chapter, marital status and cohabitation are related to the likelihood of using condoms, and perhaps for some similar reasons (e.g., assumptions of fidelity), marriage is also negatively related to the prevalence of testing in the prior 12 months. A comparison of Tables 7-1b and 7-1c shows that indeed young adults who are married are somewhat less likely to have been tested for HIV in the last 12 months than those who are not married, especially among females; but the relationship between testing and condom use remains curvilinear even after controlling for whether or not the respondent is married.

- The frequency of condom use in the past year is considerably higher among those young adults who are not married (shown in Figure 7-1b) than among those who are married (shown in Table 7-1c), as would be expected.

- There appears to be little association between (a) condom use and (b) the proportion of those getting tested for HIV who actually receive the results of their tests. As Table 7-1a, illustrates, nearly all respondents (93%–95%) receive their test results, regardless of how often they have used condoms in the last 12 months.

- In sum, there is little evidence that the two protective behaviors discussed here—condom use and getting tested for HIV—are positively correlated. Rather, the association is curvilinear; those least likely to get tested are those who never use condoms and those who always use condoms.

TABLE 7-1a
Test for HIV, Lifetime and Last 12 Months by Frequency of Condom Use among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

		Condom Use in Last 12 Months [b]				
Test for HIV: Lifetime and Last 12 Months		Never	Seldom	Sometimes	Most Times	Always
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)						
Total						
Yes, in the last 12 months		22.2	27.7	29.6	26.9	19.1
Yes, but not in the last 12 months		28.0	23.1	22.9	21.8	17.5
No, never		49.8	49.2	47.5	51.2	63.5
	Weighted N =	*10,387*	*3,437*	*3,177*	*3,703*	*4,457*
Male						
Yes, in the last 12 months		15.6	19.6	21.9	21.6	17.1
Yes, but not in the last 12 months		23.9	21.6	21.8	20.7	15.3
No, never		60.5	58.8	56.3	57.7	67.7
	Weighted N =	*4,144*	*1,574*	*1,512*	*1,906*	*2,357*
Female						
Yes, in the last 12 months		26.7	34.5	36.6	32.6	21.4
Yes, but not in the last 12 months		30.7	24.4	23.8	23.0	19.9
No, never		42.6	41.1	39.5	44.4	58.8
	Weighted N =	*6,243*	*1,862*	*1,666*	*1,797*	*2,100*
Received HIV Test Results[c]						
Did you receive the results of your most recent HIV/AIDS test? (We don't want to know your test results.)						
Total						
Yes		93.7	93.1	93.8	94.7	93.2
No		6.3	6.9	6.2	5.3	6.8
	Weighted N =	*5,150*	*1,719*	*1,649*	*1,785*	*1,620*
Male						
Yes		92.6	92.2	91.5	93.3	93.1
No		7.4	7.8	8.5	6.7	6.9
	Weighted N =	*1,619*	*633*	*646*	*794*	*759*
Female						
Yes		94.2	93.6	95.3	95.8	93.3
No		5.8	6.4	4.7	4.2	6.7
	Weighted N =	*3,531*	*1,086*	*1,003*	*991*	*861*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

[c] Those respondents who report never having been tested for HIV are excluded from these percentages.

TABLE 7-1b
Test for HIV, Lifetime and Last 12 Months by Frequency of Condom Use among Respondents who Report NOT Being Married among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

		Condom Use in Last 12 Months [b]				
Test for HIV: Lifetime and Last 12 Months *Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)*		Never	Seldom	Sometimes	Most Times	Always
Total						
Yes, in the last 12 months		24.8	31.4	32.1	29.5	20.5
Yes, but not in the last 12 months		26.4	22.0	22.0	20.5	16.2
No, never		48.8	46.6	45.9	50.0	63.4
	Weighted N =	*5,414*	*2,376*	*2,289*	*3,047*	*3,824*
Male						
Yes, in the last 12 months		16.8	22.6	23.2	23.4	17.8
Yes, but not in the last 12 months		23.7	20.6	21.2	20.3	14.7
No, never		59.5	56.8	55.6	56.3	67.5
	Weighted N =	*2,128*	*1,062*	*1,099*	*1,582*	*2,097*
Female						
Yes, in the last 12 months		29.9	38.5	40.2	36.0	23.8
Yes, but not in the last 12 months		28.2	23.1	22.8	20.8	17.9
No, never		41.9	38.4	37.0	43.2	58.3
	Weighted N =	*3,286*	*1,314*	*1,191*	*1,465*	*1,727*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

TABLE 7-1c
Test for HIV, Lifetime and Last 12 Months
by Frequency of Condom Use
among Respondents who Report Being Married
among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

		Condom Use in Last 12 Months [b]				
		Never	Seldom	Sometimes	Most Times	Always
Test for HIV: Lifetime and Last 12 Months						
Have you ever been tested for HIV/AIDS? (Do not						
Total						
Yes, in the last 12 months		19.2	18.9	23.0	14.6	10.6
Yes, but not in the last 12 months		29.8	25.5	25.0	28.5	25.1
No, never		50.9	55.6	51.9	57.0	64.3
	Weighted N =	*4,916*	*1,039*	*873*	*640*	*612*
Male						
Yes, in the last 12 months		14.2	12.9	17.8	12.1	10.7
Yes, but not in the last 12 months		24.2	23.0	23.6	23.4	20.5
No, never		61.6	64.1	58.7	64.5	68.8
	Weighted N =	*1,994*	*501*	*407*	*314*	*250*
Female						
Yes, in the last 12 months		22.7	24.4	27.6	16.9	10.5
Yes, but not in the last 12 months		33.7	27.9	26.3	33.4	28.3
No, never		43.7	47.7	46.1	49.7	61.2
	Weighted N =	*2,922*	*538*	*466*	*326*	*361*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

Chapter 8

INTERSECTION OF RISK AND PROTECTIVE BEHAVIORS

It is useful to know whether people who are at greatest risk of contracting or transmitting HIV are more likely than others to practice protective behaviors. In this chapter we examine the frequency of condom use as a function of three known risk factors: (1) the number of sex partners the respondent reported having in the last 12 months, (2) the gender of those partners, and (3) a history of sharing needles. We also look at the prevalence of getting tested for HIV/AIDS and obtaining the results as a function of those same three risk factors.

Frequency of Condom Use Related to Number of Partners

- Among sexually active young adults (ages 21-30), both the prevalence and frequency of condom use rise with the number of sexual partners the respondent had in the last 12 months; this holds true for both genders (Table 8-1). The *prevalence* of using a condom at least once in the last 12 months rises from 49% among those having only one partner to 77% for those having two partners, to 85% for those having three or four partners, and to 89% among those reporting five or more partners. The prevalence is slightly higher among males than females (Table 8-1).

- To the extent that consistent condom use is the goal, the results regarding *frequency* are less encouraging. As summarized in Chapter 6, only about one third (32%) of sexually active young adults said that they used a condom "most times" or "always"—37% of males and 29% of females (Table 6-1a). It is encouraging, however, that this statistic rises considerably for both genders as the number of partners reported rises (Table 8-1).

- As might be expected, many of the young adults not using condoms are respondents who had only one partner during the year (Table 8-1). Among those reporting only one partner (and these comprise the great majority of all respondents), 51% said they did *not* use condoms at all in the last 12 months. *In sum, use of condoms, which help prevent transmission of HIV (and many other sexually transmitted diseases), is considerably more prevalent among young adults who are at heightened risk due to the number of sexual partners they have. That is the encouraging part of this finding. However, only 52% of those reporting five or more sexual partners in the last 12 months also report using condoms "most times" or "always," leaving a considerable portion of this population at risk for either transmitting or contracting HIV.*

- The prevalence of condom use declines sharply with increasing age, very likely a result of more respondents being married or in another committed relationship at these later ages.

Frequency of Condom Use Related to Gender of Partners

- Extensive efforts have been made in past years to encourage the use of condoms by men who have sex with men, in an attempt to stem the spread of HIV/AIDS in this high-risk population. The numbers of such cases available for analysis so far are somewhat limited (among the 21- to 30-year olds, the weighted *N* is 517 men who report having sex with

men exclusively; the case count of young adult males who report having sex with both genders is 109). Results suggest that the use of condoms in the last 12 months among men having sex exclusively with men (38% reporting "most times" or "always") does not differ significantly from the use of condoms among men having sex exclusively with women (37% reporting "most times" or "always"). Similar proportions of both of these groups (39% and 36%, respectively, n.s.) report never using condoms (Table 8-2). (The rate of condom use among men having sex exclusively with women is likely suppressed some by the proportion trying to conceive a child.) *Thus, the higher degree of risk among young adult men who have sex exclusively with men is not reduced by more frequent use of condoms. Fortunately, among young adult males who have had sex with <u>both</u> genders in the last 12 months, there do appear to be higher prevalence (80%) and higher frequency (52% saying "most times" or "always") of condom use than are found in either of the other two groups of men ($p<.05$).* Thus, this group's higher risk behavior is being met with more compensatory protective behavior than average against the transmission of the disease, including across genders.

- As would be expected, the great majority of young adult women (ages 21-30) who had sex exclusively with women in the last 12 months' report *not* using condoms during the prior year (84%) vs. 45% of women that age having sex exclusively with men. Among women reporting having sex with both genders during the year, only 26% report no use of condoms in the past 12 months, and they report the highest frequency of using condoms "most times" or "always" of the three female groups, though only 44% report using condoms that frequently. Still, if women for the most part only use condoms when having sex with men, that 44% could represent a much higher proportion of their occasions of having sex with men.

Frequency of Condom Use Related to Needle Sharing

- The association between needle sharing and condom use is not very clear, particularly given the small numbers of cases to date for needle-sharing (Table 8-3). From the very limited data that are available for young adults, it would appear that there is not a large difference in condom use between those who shared needles in the prior 12 months and those who did not: but the data are really only suggestive at this point.

Getting Tested for HIV Related to Number of Sex Partners

- Among young adults, the prevalence of getting tested for HIV rises with the number of sex partners they reported having in the prior 12 months (Table 8-4), suggesting some compensatory behavior for the increased risk associated with having multiple sex partners. While only 6.0% of those reporting no partners in the last 12 months say that they have been tested in the last 12 months, the rate rises to 20% of those reporting one partner, 31% for those reporting two partners, and 41% for those reporting five or more partners.

- The proportion of young adults getting the results of their tests is very high (over 90%) in all groups, but a bit higher among those with multiple sexual partners (Table 8-4).

- *In terms of protective behaviors, young adults who are at increased risk because of a higher number of sexual partners are more likely to get tested and receive the results of the HIV test. However, about two-thirds of those reporting multiple partners did not have an HIV test in the prior 12 months (Table 8-4).*

Getting Tested for HIV Related to Gender of Partners

- Because men who have sex with men are at particular risk for contracting and transmitting HIV, we examined whether HIV testing was more prevalent among those men reporting sex exclusively with men in the past year (Table 8-5). While the number of young adult cases of men who have sex exclusively with men is limited (526 weighted cases), *the results are suggestive of increased vigilance in this population. Two thirds (66%) of males having exclusively male partners in the last 12 months indicated being tested for HIV at some time in their lives, and about four in every ten (41%) said that they had been tested in just the last 12 months. These lifetime and 12-month rates compare to 38% and 17%, respectively, among men who had only female partners during the last 12 months.* Hardly any (2%) of the males reporting relations exclusively with other men in the last 12 months said that they failed to get the results of their most recent test, versus 8% of those who had only female partners.

Getting Tested for HIV Related to Needle Sharing

- Young adults who have shared needles in their lifetime are considerably more likely to report having been tested for HIV both in their lifetime and in the last 12 months, compared with those who have never shared needles. Those who have shared needles in the last 12 months are also more likely to report getting tested for HIV during the last 12 months by a statistically significant amount than the great majority who did not share needles during the last 12 months (Table 8-6). Note, however, that the case counts for needle sharing are still somewhat limited.

Summary

To conclude the intersection of risk and protective behaviors, those who have shared needles—one of the highest risk groups for HIV infection—are among the most likely to exhibit the protective behavior of getting tested for HIV. Men having sex exclusively with men—another very high risk group—use condoms at about the same rate as men having sex exclusively with women; however, they do get tested for HIV/AIDS more frequently and are more likely to secure the results of their tests. Fortunately, those having multiple sex partners—another risk group—are more likely to engage in both of these protective behaviors (using condoms and getting tested).

TABLE 8-1

Condom Use by Number of Sex Partners in Last 12 Months among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

Frequency of Condom Use in Last 12 Months [b]	Number of Partners in Last 12 Months				
	None	One	Two	Three or Four	Five or More
When you had sexual intercourse during the LAST 12 MONTHS, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)					
Total					
Never	—	51.0	22.6	14.6	11.2
Seldom	—	12.6	16.5	17.2	14.8
Sometimes	—	10.1	16.6	19.2	22.5
Most times	—	9.5	20.8	30.8	35.3
Always	—	16.8	23.5	18.2	16.2
Weighted N =	—	*17,996*	*2,855*	*2,746*	*1,551*
Male					
Never	—	46.4	18.5	13.7	10.3
Seldom	—	13.0	15.6	16.1	13.9
Sometimes	—	10.9	15.0	18.0	21.8
Most times	—	10.9	21.3	30.3	35.2
Always	—	18.9	29.6	21.9	18.9
Weighted N =	—	*7,802*	*1,290*	*1,372*	*1,010*
Female					
Never	—	54.5	26.1	15.5	13.0
Seldom	—	12.3	17.2	18.3	16.6
Sometimes	—	9.6	17.9	20.4	23.9
Most times	—	8.4	20.4	31.3	35.5
Always	—	15.3	18.4	14.6	11.1
Weighted N =	—	*10,194*	*1,565*	*1,374*	*541*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

TABLE 8-2

Condom Use by Gender of Sex Partners in Last 12 Months among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

	MALE RESPONDENTS			FEMALE RESPONDENTS		
	Gender of Partner(s)			Gender of Partner(s)		
	Female Only	Male Only	Male and Female	Male Only	Female Only	Male and Female
Frequency of Condom Use in Last 12 Months [b]						
When you had sexual intercourse during the LAST 12 MONTHS, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)						
Never	36.1	39.0	19.9	45.1	84.1	25.8
Seldom	13.8	10.9	14.9	13.9	4.7	12.8
Sometimes	13.1	12.4	13.4	12.3	2.7	17.4
Most times	16.3	18.7	31.3	13.1	2.7	25.6
Always	20.6	19.0	20.5	15.6	5.8	18.5
Weighted N =	*10,863*	*517*	*109*	*13,069*	*329*	*283*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

TABLE 8-3
Condom Use by Needle Sharing
among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

Frequency of Condom Use in Last 12 Months [b]	Needle Sharing: Yes, in Last 12 Months	Needle Sharing: Yes, but not in Last 12 Months	Needle Sharing: No, Never
When you had sexual intercourse during the LAST 12 MONTHS, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)			
Never	33.0	49.3	41.3
Seldom	33.3	23.5	13.6
Sometimes	13.4	10.8	12.6
Most times	19.4	10.6	14.8
Always	0.9	5.9	17.8
Weighted N =	*40*	*85*	*24,803*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Those respondents who report never having sex in the last 12 months are excluded from these percentages.

TABLE 8-4

Test for HIV, Lifetime and Last 12 Months by Number of Sex Partners in Last 12 Months among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

	Number of Partners in Last 12 Months				
Test for HIV: Lifetime and Last 12 Months	None	One	Two	Three or Four	Five or More
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)					
Yes, in the last 12 months	6.0	19.6	30.7	35.9	41.0
Yes, but not in the last 12 months	9.5	25.3	20.8	20.3	18.4
No, never	84.5	55.1	48.5	43.8	40.6
Weighted N =	*4,854*	*18,185*	*2,880*	*2,759*	*1,553*
Received HIV Test Results [b]					
Did you receive the results of your most recent HIV/AIDS test? (We don't want to know your test results.)					
Yes	90.2	93.7	92.0	93.6	96.1
No	9.8	6.3	8.0	6.4	3.9
Weighted N =	*741*	*8,069*	*1,467*	*1,544*	*906*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Those respondents who report never having been tested for HIV are excluded from these percentages.

TABLE 8-5

Test for HIV, Lifetime and Last 12 Months by Gender of Sex Partners in Last 12 Months among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

	MALE RESPONDENTS			FEMALE RESPONDENTS		
	Gender of Partner(s)			Gender of Partner(s)		
	Female Only	Male Only	Male and Female	Male Only	Female Only	Male and Female
Test for HIV: Lifetime and Last 12 Months						
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)						
Yes, in the last 12 months	16.9	41.3	36.5	28.4	24.5	48.7
Yes, but not in the last 12 months	20.8	25.1	17.1	26.3	23.6	24.9
No, never	62.3	33.6	46.4	45.2	51.9	26.4
Weighted N =	*10,919*	*526*	*109*	*13,161*	*348*	*286*
Received HIV Test Results [b]						
Did you receive the results of your most recent HIV/AIDS test? (We don't want to know your test results.)						
Yes	92.3	97.8	81.8	94.3	92.6	95.9
No	7.7	2.2	18.2	5.7	7.4	4.1
Weighted N =	*4,065*	*342*	*57*	*7,131*	*168*	*205*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

[b] Those respondents who report never having been tested for HIV are excluded from these percentages.

TABLE 8-6
Testing for HIV by Needle Sharing
among Respondents of Modal Ages 21–30 in 2004–2018 [a] Combined

(Entries are percentages.)

	Needle Sharing		
Test for HIV: Lifetime and Last 12 Months			
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)	Yes, in the last 12 months	Yes, but not in the last 12 months	No, never
Yes, in the last 12 months	35.9	42.1	20.9
Yes, but not in the last 12 months	23.3	37.5	21.5
No, never	40.8	20.4	57.6
Weighted N =	*45*	*101*	*29,854*

Source. The Monitoring the Future study, the University of Michigan.

[a] In 2004–2006, the HIV questions were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

Chapter 9

TRENDS IN THE PREVALENCE AND FREQUENCY OF RISK BEHAVIORS

There is considerable value in tracking trends in the prevalence of the various risk and protective behaviors related to the spread of HIV. Ongoing annual data collections allow us to monitor the prevalence and frequency of these behaviors over time. While the numbers of cases available remain limited for estimating the intersection of some of the more rare behaviors like needle sharing and men having sex with men, continuing data collection is providing more in-depth consideration of these important subgroups and correlates. The 2018 MTF data collection is the fourteenth to include the set of questions on HIV risk and protective behaviors among young adults ages 21 to 30.[1]

We now find some change in some of the risk behaviors under study from 2005 to 2018 among young adults ages 21–30 (Tables 9-1a, 9-2a, and top panels of Figures 9-1 through 9-5).

Injection drug use

- The prevalence of *past-year injection drug use* (Figure 9-2) has shown little systematic change over the thirteen year interval 2005–2018 among 21-30 year-olds, though among young adult males it showed a slight nonsignificant increase to 1.2% annual prevalence in 2018 (Table 9-1). *Lifetime injection drug use* by young adult males showed some evidence of a peak around 2008 (*past year injection drug use* did not, Figure 9-1). The prevalence of these behaviors has consistently been quite low in this population drawn from high school graduates. The *annual prevalence of injection drug use* has consistently been below 1.0% among males until 2018, and 0.4% among females from 2005 to 2018.

Needle sharing

- Among young adults the rates of *lifetime* needle sharing were consistently very low during the 2005 to 2018 interval, and were even lower among females in 2013 and 2014 (not statistically significant; Figure 9-3 and Table 9-1). The past-year overall rates of needle sharing were quite flat across the entire interval, ranging from 0.1% to 0.2% for all young adults. Among young adult males, rates showed small, nonsignificant increases in 2013 and 2014, when *annual* prevalence was 0.3%. As with past year injection drug use, male rates for needle-sharing reached their highest level of 0.3% in 2018 (though this change was not significant). In all other years, annual prevalence was 0.1% or 0.2% (Figure 9-4; Table 9-1).

[1] We present the trend data in this chapter and the next using two-year moving averages in order to smooth the trend estimates and reduce fluctuations due primarily to sampling error. This is done by taking an arithmetic average of (a) the results for the year labeled at the top of each column in Tables 9-1 and 9-2, and (b) the results from the prior year. The annual sample size increased in 2007 due to the inclusion of this set of questions in an additional questionnaire form; but the 2006 and 2007 data are weighted equally in calculating the two-year moving average for 2007.

Number of sex partners

- One of the more important developments relating to number of sex partners young adults have is that there has been an increase in abstention – particularly among young adult males – that is, in the percent of them reporting *no* sex partners during the prior twelve months. This development is significant in terms of HIV risk because it reduces the risk of unprotected sex. This rise in abstention has been occurring in both genders, but much more so among males (Figure 9-5 and Tables 9-2, second and third pages). Among males the percent reporting no partners rose from 16.9% in 2005 to 23.8% in 2018 ($p<.001$). Among young adult females the increase in reporting no sex partners was from 12.3% in 2005 to 17.3% in 2018 ($p<.001$).

- As Figure 9-6 illustrates, while the percent of young adult males reporting multiple sex partners has been declining, from 27 % in 2005 to 12 % in 2018, the percent of young adult females reporting multiple partners in the prior year has held quite steady, from 22% in 2005 to 21.9% in 2018 (a nonsignificant difference). Interestingly, this has been occurring at much the same time that the percent of young adult females reporting *zero* partners has risen from 12.3% in 2005 to 17.3% in 2018 ($p<.001$) and the proportion reporting just one partner has fallen a bit from 66% in 2005 to 61% in 2018. *The general shift from one partner to zero partners can be observed in the data for both genders (see Table 9-2a). The net effect of these changes since about 2011 is that the difference between the genders in the prevalence of having multiple sex partners has been eliminated, as can be seen most clearly in Figure 9-6. But there still remains a gender difference in having four or more partners (Table 9-2a).* In 2018, 8.7% of the males reported having four or more partners in the prior 12 months compared to 7.9% of the females (Table 9-2a, second and third pages). Having multiple sex partners has declined in salience as a risk factor for the spread of HIV as a result of these changes – an increase in monogamy and a decrease among males in having multiple sex partners.

Same Gender sex partners

- The proportions of young adult male respondents reporting sex with partners of the same gender (including those reporting sex with both genders) during all but the past two years have been quite stable over time (Table 9-2 and Figure 9-7). Each year between 4.0% and 6.0% of the men indicated having sex with other men with no clear trending over time. But 2017 and 2018 showed somewhat higher levels of 6.7% and 6.4%, respectively. (A comparison of 2012-2014 combined with 2017-2018 combined shows a significant difference at $p<.05$). Among young adult women, between 2005 and 2009, the rate of having sex with other women was fairly stable at between 3.6% and 4.2% indicating (although this behavior by women is not a risk behavior for HIV transmission). There has been a gradual, statistically significant increase since 2009 in the percentage of young adult women who report having sex with other women, from 3.7% in 2009 to 6.4% in 2018 (Table 9-2, third page). There has been an increase in both the percent having sex exclusively with women and the percent having sex with both genders.

To summarize, among the young adult population (ages 21–30) there was considerable stability in the earlier years of the study in the major risk behaviors under study here – drug injecting, sharing

needles, having multiple sex partners, and men having sex with men. However, very recent trend lines for several of these risk factors appear to be turning upwards, including annual injection drug use among males, lifetime and past year needle sharing among males, and males having sex with males. On the other hand, one risk factor that has declined significantly among males is having multiple sex partners in the prior year. The genders have reached equivalence on that factor, though the rates for having four or more partners are still higher for males. The proportions who report having sex with partners of the same gender has been growing slowly for both genders, though this is only a serious risk factor for HIV transmission among males. One possibility that could explain this slow but steady increase in having same sex partners could be that, as society has become more accepting of gay and lesbian behavior during this historical period, people have become more willing to admit that they engage in such behaviors.

With regard to the numbers of sex partners reported, there are several positive developments from the perspective of HIV/AIDS transmission risk. Males have shown a significant increase in the percent reporting having *no* sex partners during the prior 12 months, with their *abstention rate* rising from 2008 (14.4%) through 2018 (23.8%). There also has been a significant decline in the percent of males having *multiple* sex partners. These developments are significant for HIV risk reduction because they reduce the risks related to unprotected sex. Young adult females also showed a significant increase in abstention over the same interval, but a more modest one, from 12.8% to 17.3%.

These changes have led to a near-elimination of gender differences in having two or more sex partners. There remains a gap in the prevalence of having four or more partners, however, with males more likely to report a higher number of sex partners.

TABLE 9-1

Trends [a] in Injection Drug Use and Needle Sharing

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

		Total													
Lifetime Frequency of Injecting Drugs	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) in your lifetime? Do not include anything you took under a doctor's orders.															
0 Occasions	—	98.5	98.5	98.3	98.2	98.4	98.5	98.4	98.5	98.4	98.6	98.7	98.7	98.8	98.7
1–2	—	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.2	0.1	0.2	0.3	0.3
3–5	—	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
6–9	—	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.1	*	0.1	0.2	0.1	0.1	0.1
10–19	—	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
20–39	—	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	*	*
40+ Occasions	—	0.4	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.6	0.7	0.6	0.4	0.5
Weighted N =	—	*3,643*	*3,441*	*4,076*	*4,846*	*4,819*	*4,751*	*4,624*	*4,510*	*4,384*	*4,243*	*4,101*	*3,826*	*3,693*	*2,913*
Annual Frequency of Injecting Drugs															
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) during the last 12 months? Do not include anything you took under a doctor's orders.															
0 Occasions	—	99.5	99.6	99.6	99.5	99.5	99.5	99.5	99.5	99.4	99.4	99.4	99.5	99.5	99.4
1–2	—	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
3–5	—	*	0.1	*	*	0.1	0.2	0.1	0.1	*	0.1	0.1	0.1	0.1	0.1
6–9	—	*	0.1	0.1	0.2	0.1	*	*	0.1	0.1	0.1	0.1	*	*	*
10–19	—	0.1	0.1	0.1	0.1	*	*	0.1	0.1	*	*	*	*	*	0.1
20–39	—	*	*	*	0.1	0.1	0.1	0.1	*	0.1	*	0.1	*	*	0.1
40+ Occasions	—	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3
Weighted N =	—	*3,644*	*3,441*	*4,077*	*4,847*	*4,821*	*4,753*	*4,630*	*4,515*	*4,385*	*4,244*	*4,101*	*3,814*	*3,681*	*2,914*
Lifetime and Annual Needle Sharing															
Have you ever taken such drugs using a needle that you knew (or suspected) had been used by someone else before you used it?															
Yes, in the last 12 months	—	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.2
Yes, but not in the last 12 months	—	0.3	0.4	0.4	0.4	0.3	0.3	0.5	0.4	0.3	0.2	0.3	0.5	0.4	0.4
No, never	—	99.7	99.5	99.5	99.5	99.5	99.6	99.4	99.4	99.5	99.6	99.5	99.4	99.5	99.4
Weighted N =	—	*3,610*	*3,387*	*4,032*	*4,813*	*4,783*	*4,716*	*4,587*	*4,475*	*4,349*	*4,214*	*4,066*	*3,786*	*3,670*	*2,896*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable. ' * ' indicates a prevalence rate of less than 0.05%.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The questions were contained in two questionnaire forms in 2004 through 2006 and three forms beginning in 2007.

TABLE 9-1 (cont.)

Trends [a] in Injection Drug Use and Needle Sharing

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

		Male													
Lifetime Frequency of Injecting Drugs	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) in your lifetime? Do not include anything you took under a doctor's orders.															
0 Occasions	—	97.9	97.7	97.4	97.3	97.6	97.9	97.6	97.8	97.7	98.1	98.1	97.9	98.0	97.9
1–2	—	0.6	0.6	0.7	0.7	0.7	0.5	0.4	0.4	0.6	0.4	0.2	0.3	0.5	0.5
3–5	—	0.2	0.3	0.5	0.5	0.4	0.3	0.3	0.4	0.4	0.3	0.1	0.2	0.4	0.3
6–9	—	0.1	0.3	0.4	0.3	0.2	0.3	0.4	0.1	*	0.1	0.2	0.3	0.1	0.1
10–19	—	0.5	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2
20–39	—	0.2	0.2	0.3	0.4	0.3	0.1	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1
40+ Occasions	—	0.5	0.5	0.4	0.4	0.5	0.6	0.8	0.9	0.9	0.9	1.1	1.0	0.7	0.9
Weighted N =	—	*1,727*	*1,615*	*1,904*	*2,277*	*2,285*	*2,247*	*2,154*	*2,099*	*2,027*	*1,954*	*1,902*	*1,780*	*1,717*	*1,354*
Annual Frequency of Injecting Drugs															
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) during the last 12 months? Do not include anything you took under a doctor's orders.															
0 Occasions	—	99.2	99.3	99.2	99.3	99.3	99.2	99.2	99.2	99.1	99.1	99.1	99.2	99.1	98.8
1–2	—	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.1
3–5	—	*	0.1	0.1	*	0.1	0.3	0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.2
6–9	—	*	0.1	0.2	0.3	0.2	*	*	0.1	0.2	*	0.1	0.1	*	*
10–19	—	0.2	0.2	0.1	0.1	*	*	0.1	0.1	*	*	*	*	*	0.1
20–39	—	0.1	*	*	0.1	0.1	0.2	0.2	0.1	0.1	*	*	*	0.1	0.1
40+ Occasions	—	0.2	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.4	0.3	0.6
Weighted N =	—	*1,727*	*1,615*	*1,905*	*2,277*	*2,285*	*2,249*	*2,156*	*2,101*	*2,027*	*1,954*	*1,902*	*1,771*	*1,707*	*1,354*
Lifetime and Annual Needle Sharing															
Have you ever taken such drugs using a needle that you knew (or suspected) had been used by someone else before you used it?															
Yes, in the last 12 months	—	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.3
Yes, but not in the last 12 months	—	0.3	0.4	0.3	0.4	0.3	0.4	0.6	0.5	0.4	0.2	0.5	0.6	0.4	0.6
No, never	—	99.6	99.4	99.4	99.5	99.5	99.5	99.3	99.4	99.4	99.4	99.4	99.3	99.3	99.1
Weighted N =	—	*1,708*	*1,582*	*1,888*	*2,266*	*2,264*	*2,231*	*2,135*	*2,078*	*2,008*	*1,939*	*1,887*	*1,764*	*1,709*	*1,346*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable. ' * ' indicates a prevalence rate of less than 0.05%.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The questions were contained in two questionnaire forms in 2004 through 2006 and three forms beginning in 2007.

TABLE 9-1 (cont.)

Trends [a] in Injection Drug Use and Needle Sharing

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

	Female														
Lifetime Frequency of Injecting Drugs	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) in your lifetime? Do not include anything you took under a doctor's orders.															
0 Occasions	—	99.1	99.2	99.0	99.1	99.1	99.0	99.0	99.1	99.0	99.1	99.2	99.4	99.4	99.3
1–2	—	0.3	0.5	0.5	0.3	0.3	0.4	0.4	0.4	0.3	0.1	0.1	0.2	0.2	0.2
3–5	—	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2
6–9	—	*	*	*	*	*	0.1	0.1	*	*	0.1	0.1	*	0.1	0.1
10–19	—	*	*	0.1	0.1	0.1	*	*	*	0.2	0.2	*	*	*	*
20–39	—	*	*	*	0.1	0.1	*	*	*	*	*	0.1	*	*	*
40+ Occasions	—	0.3	0.2	0.2	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.2
Weighted N =	—	*1,916*	*1,826*	*2,172*	*2,569*	*2,534*	*2,504*	*2,471*	*2,412*	*2,358*	*2,289*	*2,199*	*2,045*	*1,976*	*1,558*
Annual Frequency of Injecting Drugs															
On how many occasions (if any) have you taken any drugs by injection with a needle (like heroin, cocaine, amphetamines, or steroids) during the last 12 months? Do not include anything you took under a doctor's orders.															
0 Occasions	—	99.7	99.9	99.8	99.7	99.7	99.7	99.8	99.7	99.6	99.6	99.7	99.8	99.9	99.8
1–2	—	0.1	*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	*	*	0.1
3–5	—	*	*	*	*	*	*	*	*	*	*	0.1	*	*	0.1
6–9	—	*	*	*	*	*	*	*	*	0.1	0.1	*	*	*	*
10–19	—	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20–39	—	*	*	*	*	0.1	0.1	*	*	*	0.1	0.1	0.1	*	*
40+ Occasions	—	0.2	0.1	*	0.1	0.1	0.1	0.1	0.1	0.2	0.1	*	0.1	0.1	*
Weighted N =	—	*1,917*	*1,826*	*2,172*	*2,570*	*2,535*	*2,505*	*2,473*	*2,415*	*2,358*	*2,289*	*2,199*	*2,043*	*1,974*	*1,560*
Lifetime and Annual Needle Sharing															
Have you ever taken such drugs using a needle that you knew (or suspected) had been used by someone else before you used it?															
Yes, in the last 12 months	—	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.1
Yes, but not in the last 12 months	—	0.3	0.3	0.4	0.3	0.3	0.2	0.3	0.3	0.2	0.1	0.2	0.3	0.3	0.2
No, never	—	99.7	99.6	99.6	99.5	99.6	99.6	99.5	99.5	99.7	99.8	99.6	99.5	99.6	99.7
Weighted N =	—	*1,902*	*1,805*	*2,144*	*2,547*	*2,519*	*2,485*	*2,453*	*2,396*	*2,340*	*2,275*	*2,179*	*2,023*	*1,962*	*1,550*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable. ' * ' indicates a prevalence rate of less than 0.05%.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The questions were contained in two questionnaire forms in 2004 through 2006 and three forms beginning in 2007.

TABLE 9-2

Trends [a] in Number of Sex Partners and Gender of Sex Partners

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

	Total														
Number of Partners in Last 12 Months	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
During the LAST 12 MONTHS, how many sex partners have you had? (This includes vaginal, oral, or anal sex.)															
None	—	14.5	14.6	13.7	13.5	14.0	14.5	15.9	16.7	16.9	17.3	17.8	18.9	19.3	20.3
One	—	61.2	61.5	61.9	62.2	61.3	61.0	60.1	59.0	58.8	58.9	59.0	59.1	58.2	57.8
Two	—	10.1	9.3	9.5	9.5	9.2	9.9	10.0	9.7	9.9	9.9	9.8	8.6	8.3	8.7
Three	—	5.9	6.2	5.8	5.9	5.9	5.9	5.2	4.9	5.5	5.8	5.2	5.1	5.8	4.9
Four	—	3.2	3.4	4.0	4.1	4.0	3.3	3.5	4.0	3.9	3.8	3.7	3.3	3.1	3.1
5–10	—	3.9	4.1	4.2	4.0	4.3	4.4	4.2	4.4	4.1	3.7	3.7	3.5	3.8	4.0
11–20	—	0.9	0.7	0.6	0.7	0.8	0.5	0.7	0.9	0.7	0.4	0.5	0.9	1.0	0.9
21–100	—	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.2
More than 100	—	0.1	0.2	0.1	0.1	0.2	0.2	0.1	*	0.1	0.1	*	0.1	0.1	0.1
Weighted N =	—	*3,628*	*3,432*	*4,066*	*4,833*	*4,810*	*4,741*	*4,618*	*4,505*	*4,370*	*4,238*	*4,103*	*3,825*	*3,685*	*2,906*
Gender of Partners in Last 12 Months [b]															
During the LAST 12 MONTHS, have your sex partner or partners been …															
Exclusively male?	—	53.4	54.0	54.0	53.4	52.8	52.9	54.0	54.7	55.1	55.1	54.3	54.3	54.7	54.2
Both male and female?	—	1.5	1.4	1.4	1.3	1.4	1.3	1.4	1.6	1.4	1.5	1.7	1.9	2.2	2.2
Exclusively female?	—	45.1	44.6	44.6	45.3	45.8	45.8	44.6	43.7	43.5	43.4	44.0	43.8	43.1	43.6
Weighted N =	—	*3,103*	*2,935*	*3,504*	*4,171*	*4,129*	*4,049*	*3,881*	*3,748*	*3,631*	*3,500*	*3,369*	*3,100*	*2,966*	*2,309*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable. ' * ' indicates a prevalence rate of less than 0.05%.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The 2007 data is a simple average of 2006 and 2007, because these questions were included in two questionnaire forms in 2006 and three forms beginning in 2007.

[b]Based on those reporting sex with one or more partners during the past year. Those reporting no partners are omitted.

TABLE 9-2 (cont.)

Trends [a] in Number of Sex Partners and Gender of Sex Partners

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

	Male														
Number of Partners in Last 12 Months	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
During the LAST 12 MONTHS, how many sex partners have you had? (This includes vaginal, oral, or anal sex.)															
None	—	16.9	16.6	14.7	14.4	14.6	15.3	17.5	19.4	19.8	20.2	20.6	22.3	23.1	23.8
One	—	56.3	56.2	57.0	58.6	57.7	56.4	55.0	54.3	54.1	54.0	54.3	55.2	55.0	54.5
Two	—	10.1	8.7	8.9	8.8	9.2	10.3	9.6	8.5	9.1	9.4	9.7	8.1	7.4	8.8
Three	—	6.1	7.5	7.2	6.4	6.0	6.3	5.9	5.1	5.4	6.3	5.4	4.6	5.2	4.2
Four	—	3.5	4.3	4.8	4.4	4.7	3.7	4.3	5.0	4.3	3.9	3.6	2.9	3.0	3.3
5–10	—	5.2	5.3	5.8	5.5	5.8	6.4	6.1	5.8	5.6	5.0	4.8	4.6	3.9	3.5
11–20	—	1.5	0.9	0.9	1.2	1.2	0.7	0.9	1.4	1.2	0.6	0.8	1.6	1.8	1.5
21–100	—	0.4	0.4	0.5	0.5	0.4	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.4	0.3
More than 100	—	0.1	0.2	0.1	0.2	0.3	0.3	0.2	*	0.1	0.1	0.1	0.2	0.2	0.1
Weighted N =	—	*1,720*	*1,611*	*1,902*	*2,270*	*2,277*	*2,238*	*2,147*	*2,093*	*2,019*	*1,956*	*1,908*	*1,782*	*1,709*	*1,348*
Gender of Partners in Last 12 Months [b]															
During the LAST 12 MONTHS, have your sex partner or partners been …															
Exclusively male?	—	3.9	4.3	4.6	4.1	4.2	3.9	4.6	5.1	4.7	4.8	4.8	4.9	5.4	5.1
Both male and female?	—	1.0	0.8	1.0	0.9	0.8	0.8	0.7	0.9	0.8	0.9	1.0	1.0	1.3	1.3
Exclusively female?	—	95.0	94.9	94.4	95.0	94.9	95.3	94.8	94.0	94.6	94.3	94.3	94.0	93.4	93.6
Weighted N =	—	*1,432*	*1,344*	*1,616*	*1,944*	*1,950*	*1,897*	*1,773*	*1,689*	*1,617*	*1,555*	*1,511*	*1,380*	*1,315*	*1,027*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable. ' * ' indicates a prevalence rate of less than 0.05%.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The 2007 data is a simple average of 2006 and 2007, because these questions were included in two questionnaire forms in 2006 and three forms beginning in 2007.

[b]Based on those reporting sex with one or more partners during the past year. Those reporting no partners are omitted.

TABLE 9-2 (cont.)

Trends [a] in Number of Sex Partners and Gender of Sex Partners

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

	Female														
Number of Partners in Last 12 Months	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
During the LAST 12 MONTHS, how many sex partners have you had? (This includes vaginal, oral, or anal sex.)															
None	—	12.3	12.8	12.7	12.8	13.5	13.8	14.6	14.4	14.4	14.8	15.4	15.9	16.1	17.3
One	—	65.6	66.1	66.2	65.3	64.6	65.2	64.6	63.1	62.8	63.0	63.0	62.6	61.0	60.8
Two	—	10.2	9.8	10.1	10.0	9.2	9.5	10.3	10.8	10.6	10.3	9.8	9.1	9.1	8.6
Three	—	5.6	5.1	4.5	5.4	5.8	5.5	4.6	4.7	5.7	5.4	5.1	5.6	6.2	5.5
Four	—	2.9	2.6	3.3	3.7	3.4	2.9	2.8	3.2	3.5	3.7	3.7	3.7	3.3	2.9
5–10	—	2.7	3.0	2.8	2.6	2.9	2.7	2.6	3.2	2.7	2.5	2.7	2.6	3.7	4.4
11–20	—	0.4	0.5	0.4	0.2	0.3	0.3	0.5	0.5	0.3	0.3	0.1	0.2	0.4	0.5
21–100	—	0.1	*	*	0.1	0.2	0.2	0.1	0.1	0.1	*	0.1	0.3	0.1	0.1
More than 100	—	0.1	0.1	*	*	*	*	*	*	*	*	*	0.1	0.1	*
Weighted N =	—	*1,908*	*1,821*	*2,163*	*2,563*	*2,532*	*2,503*	*2,471*	*2,412*	*2,350*	*2,282*	*2,195*	*2,044*	*1,977*	*1,558*
Gender of Partners in Last 12 Months [b]															
During the LAST 12 MONTHS, have your sex partner or partners been …															
Exclusively male?	—	95.8	96.0	96.3	96.4	96.3	96.0	95.6	95.4	95.5	95.3	94.6	94.0	94.0	93.6
Both male and female?	—	1.9	1.9	1.7	1.7	1.9	1.8	2.0	2.2	2.0	2.0	2.2	2.5	2.9	2.9
Exclusively female?	—	2.3	2.1	2.0	1.9	1.8	2.2	2.4	2.4	2.5	2.7	3.2	3.5	3.1	3.5
Weighted N =	—	*1,672*	*1,590*	*1,888*	*2,226*	*2,180*	*2,153*	*2,108*	*2,059*	*2,014*	*1,945*	*1,858*	*1,720*	*1,651*	*1,282*

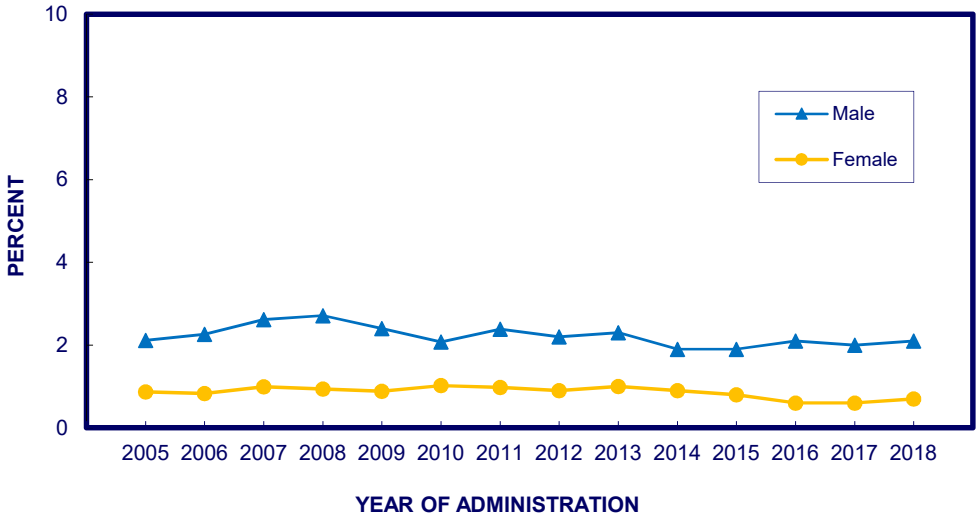
Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable. ' * ' indicates a prevalence rate of less than 0.05%.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The 2007 data is a simple average of 2006 and 2007, because these questions were included in two questionnaire forms in 2006 and three forms beginning in 2007.

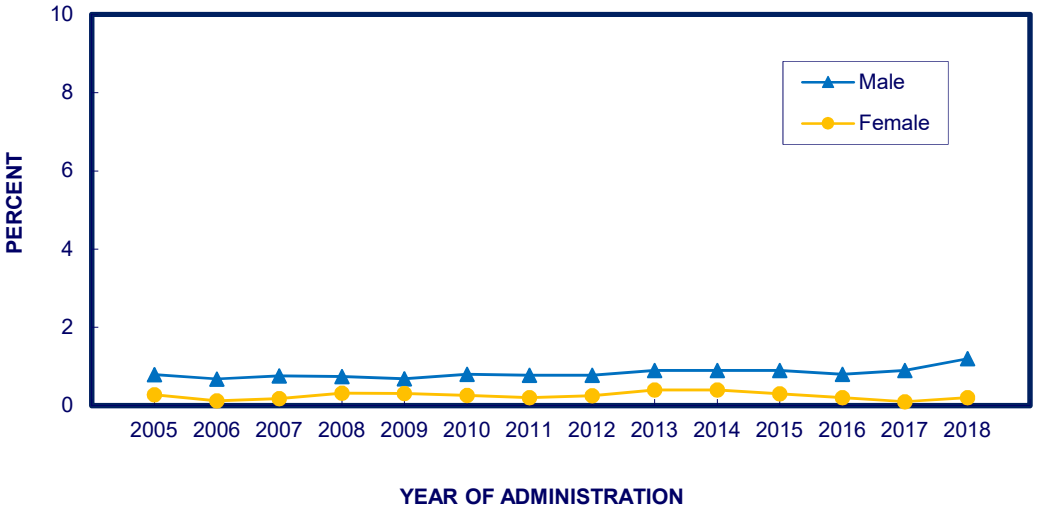
[b]Based on those reporting sex with one or more partners during the past year. Those reporting no partners are omitted.

FIGURE 9-1
Trends (2-year average) in Lifetime Injection Drug Use by Gender among Respondents of Modal Ages 21-30



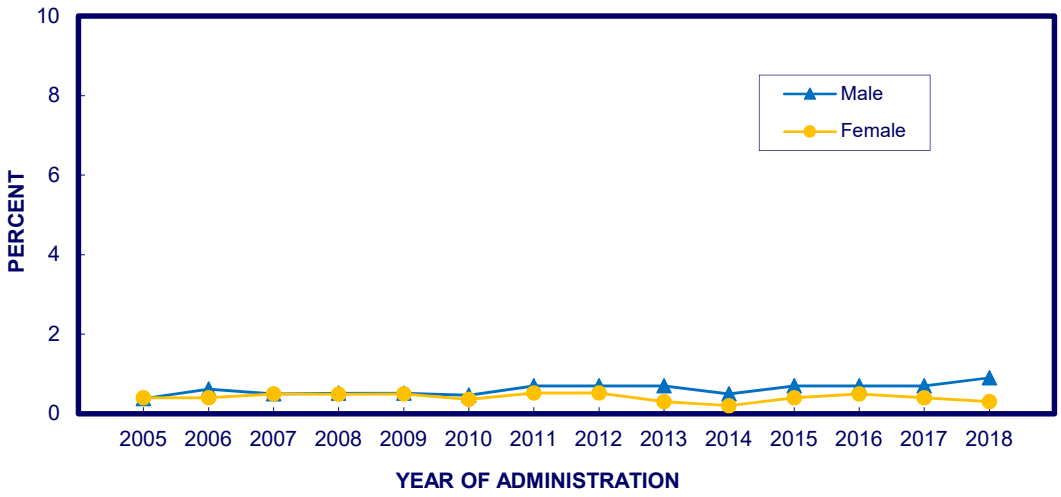
Source. The Monitoring the Future study, the University of Michigan.

FIGURE 9-2
Trends (2-year average) in Annual Injection Drug Use by Gender among Respondents of Modal Ages 21-30



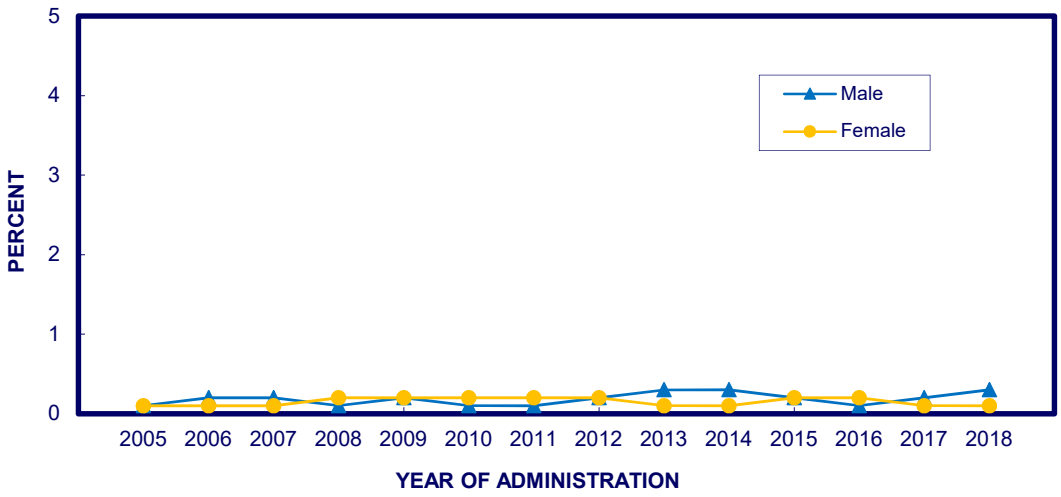
Source. The Monitoring the Future study, the University of Michigan.

FIGURE 9-3
Trends (2-year average) in Lifetime Needle Sharing by Gender among Respondents of Modal Ages 21-30



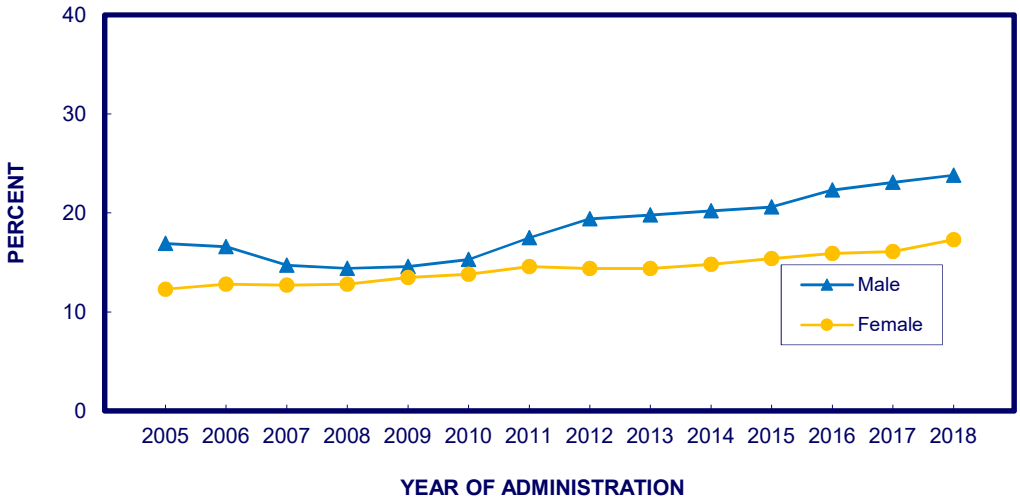
Source. The Monitoring the Future study, the University of Michigan.

FIGURE 9-4
Trends (2-year average) in Annual Needle Sharing by Gender among Respondents of Modal Ages 21-30



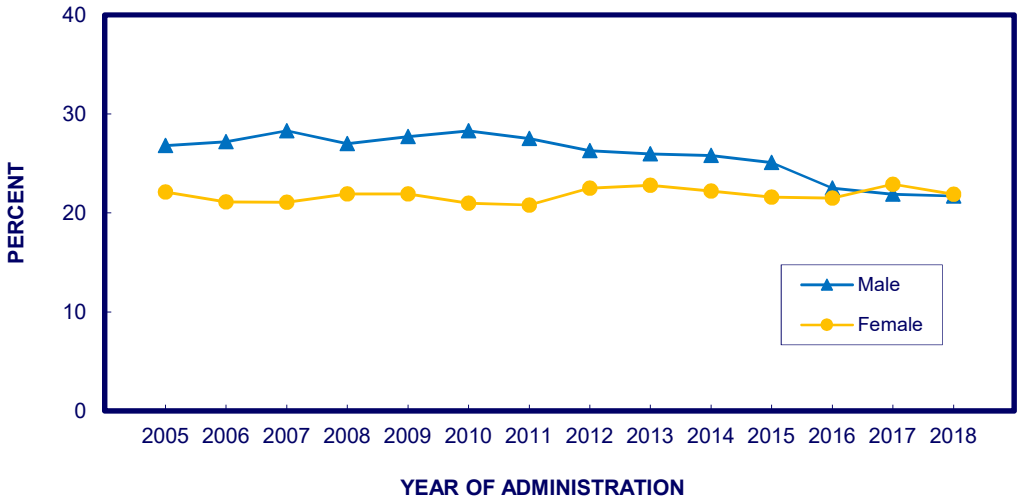
Source. The Monitoring the Future study, the University of Michigan.

FIGURE 9-5
Trends (2-year average) in Abstention from Sex in the Last Year by Gender [a] among Respondents of Modal Ages 21-30



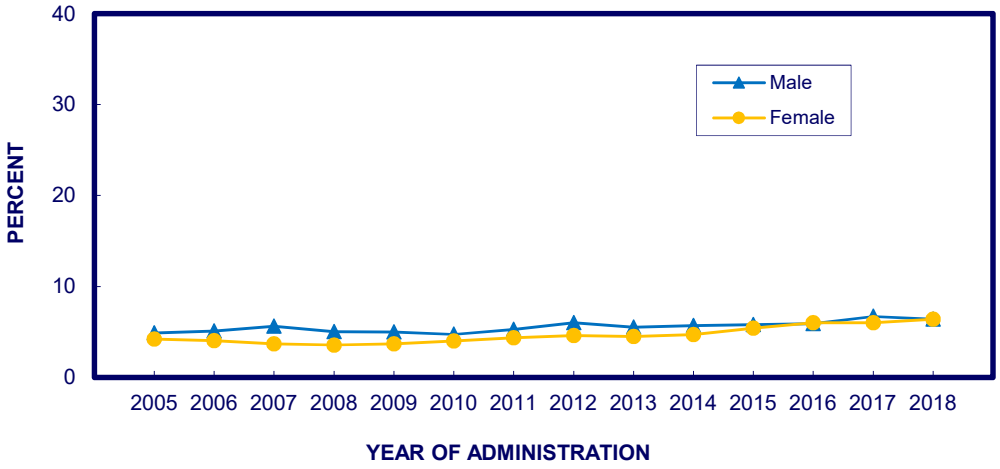
Source. The Monitoring the Future study, the University of Michigan.

FIGURE 9-6
Trends (2-year average) in Having More than One Sex Partner in the Last Year by Gender [a] among Respondents of Modal Ages 21-30



Source. The Monitoring the Future study, the University of Michigan.

FIGURE 9-7
Trends (2-year average) in Having a Sex Partner of the Same/Both Genders in the Last Year by Gender [a] among Respondents of Modal Ages 21-30



Source. The Monitoring the Future study, the University of Michigan.

[a]Based on those reporting sexual activity with one or more partners during the past year. Those reporting no partners are omitted.

Chapter 10

TRENDS IN THE PREVALENCE AND FREQUENCY OF PROTECTIVE BEHAVIORS

The behaviors that can help to protect against the spread of HIV have not shown a great deal of change in the 2005–2018 interval among young adults, but some changes have been emerging.

Condom Use

Past-year prevalence of using ***condoms*** "most times or always" among young adults did not change much from 2005 to 2018 (Table 10-1a and Figure 10-1). The proportion indicating having used condoms at all when having sex in the past 12 months has remained fairly flat for both genders since 2005, with prevalence levels among males (ranging between 62% and 67%) considerably higher than among females (ranging between 50% and 58%). The only change shown in Figure 10-1 to reach statistical significance was the decline in annual prevalence of using condoms "most times or always" among females from 2014 to 2018 ($p<.05$).

Table 10-1b makes clear that the prevalence and frequency of using condoms declines with age across the young adult years. Averaged across the 2004-2018 surveys, it can be seen in the right hand column that 75% of the 21-22 year-olds reported they used a condom at least once in the last 12 months, but that rate fell to 46% among those ages 29-30. And, in 2018 specifically, while 41% of the 21-22 year-olds said they have used condoms most times or always, that rate fell by more than half to 19% among the 29-30 year-olds, in considerable part due to the rising proportion who are married or cohabiting (as is documented in Tables 6-1c and 6-1d).

Getting Tested for HIV/AIDS

The *lifetime* prevalence of ***getting tested*** for HIV/AIDS has shown a small but significant decline ($p<.05$) among young adult females (50.2% in 2005; 47.0% in 2018, Table 10-1a) and a larger decline among young adult males (from 37.9% to 30.6%; $p<.05$, Table 10-1a). Despite some decline in lifetime testing, among females the prevalence of getting tested in the *past 12 months* was at 23.7% in 2005, but then rose gradually and somewhat unevenly, reaching 27.6% by 2018 ($p<.05$). Among males, the prevalence of getting tested in the *past 12 months* declined slightly between 2005 (16.7%) and 2018 (15.3%, n.s.). *These different changes produced a widening gap between the genders in the prevalence of getting tested in the past 12 months, with females trending toward higher levels, especially through 2010, and becoming considerably more likely than males to get tested since (Figure 10-2). The change in the gap is significant ($p<.001$).*

Since 2005, the percentages of young adults ***receiving the test results*** have been stable and very high (92%–95%) with females being very slightly higher than males in most years (Table 10-1a and Figure 10-3).

Summary

It is clear that condom use is a protective behavior that occurs relatively infrequently among young adults. On average about 55-60% of sexually active young adults indicate *any* use of condoms in the last 12 months—more males than females—and there has been little change in this practice since 2005 among young adult males. Young adult females have shown some gradual falloff in condom use, particularly in the past four years ($p<.05$). The use of condoms declines considerably between the ages of 21-22 and 29-30. Using condoms "most times" or "always" is substantially less likely to be reported, with an annual prevalence of about 30-33% of young adults giving these answers.

Only between 40% and 50% of all young adults report getting tested for HIV/AIDS at some time in their lives, with females being more likely than males to have done so. The rate of getting tested in the prior year showed some increase among females between 2006 and 2010 and then a more gradual increase; the 2005-2018 increase, which was statistically significant, helped to open a somewhat greater difference between the genders among young adults. Failing to obtain the test results after being tested is rare, with little trending, and thus seems not to be a serious problem (Figure 10-3).

As we have seen in the previous chapter, males have considerably higher risks of contracting HIV/AIDS, but they are somewhat less likely to adopt the protective behavior of getting tested for HIV/AIDS, leaving them even more vulnerable to being unaware that they have the disease. They are, however, more likely than females to report having used condoms, perhaps in part because more of them have a large number of sex partners.

The newly added question in 2018 on the use of PrEP or pre-exposure prophylaxis—a very effective drug to keep people at high risk from contracting HIV—shows a very low prevalence in the population under study here in 2018 (Lifetime prevalence in 2018 was 0.3% and past 12 month prevalence was 0.1%.). Going forward we will track whether this protective behavior increases.

Over the interval covered so far for young adults we note a limited amount of systematic movement in these protective factors. The modest increase in getting tested observed among young adult females is probably the most positive development in terms of protective behaviors. The fact that nearly all people tested in any of these age groups do secure their test results is also encouraging. The significant decline the over the past four years in the past-year prevalence of condom use "most times or always" by female young adults is probably the most disturbing of the findings regarding trends in protective behaviors, and it is happening during a time when the prevalence of several other sexually transmitted diseases has reached record highs (CDC, 2019).

References

Centers for Disease Control and Prevention (2019). *CDC Fact Sheet: Reported STDs in the United States, 2018.* Accessed on 10/12/2019.

TABLE 10-1a

Trends [a] in Frequency of Condom Use and Testing for HIV

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

	Total														
Frequency of Condom Use in Last 12 Months [b]	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
When you had sexual intercourse during the LAST 12 MONTHS, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)															
Never	—	42.1	41.6	40.5	40.7	40.1	39.5	40.2	40.0	39.4	40.4	42.3	44.3	44.3	44.1
Seldom	—	13.7	13.2	13.6	13.1	13.3	14.0	14.4	14.4	14.6	14.3	13.7	12.6	12.8	13.0
Sometimes	—	12.4	13.3	13.5	13.0	13.0	13.0	12.2	12.6	12.8	12.4	11.9	11.9	12.4	12.7
Most times	—	15.5	15.2	15.2	15.0	14.4	14.0	14.6	15.3	14.8	14.5	14.6	14.3	14.3	14.0
Always	—	16.4	16.7	17.2	18.2	19.2	19.6	18.6	17.7	18.4	18.4	17.6	16.9	16.0	16.3
Weighted N =	—	*3,076*	*2,905*	*3,476*	*4,151*	*4,096*	*4,009*	*3,847*	*3,719*	*3,600*	*3,472*	*3,347*	*3,077*	*2,946*	*2,301*
Testing for HIV: Lifetime and Last 12 Months															
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)															
Yes, in the last 12 months	—	20.4	19.6	20.1	20.9	21.5	21.0	20.9	22.1	21.5	20.7	21.4	20.8	21.5	21.9
Yes, but not in the last 12 months	—	24.0	23.9	23.5	23.0	22.9	23.3	22.4	21.4	20.9	19.9	18.9	18.9	18.4	17.5
No, never	—	55.7	56.5	56.4	56.1	55.6	55.7	56.7	56.5	57.7	59.4	59.7	60.3	60.2	60.6
Weighted N =	—	*3,664*	*3,459*	*4,098*	*4,872*	*4,835*	*4,774*	*4,647*	*4,520*	*4,399*	*4,255*	*4,099*	*3,820*	*3,695*	*2,919*
Received HIV Test Results [c]															
Did you receive the results of your most recent HIV/AIDS test? (We don't want to know your test results.)															
Yes	—	92.2	92.8	92.5	92.7	93.1	93.7	94.2	94.1	93.7	93.7	93.7	93.5	94.4	94.7
No	—	7.8	7.2	7.5	7.3	6.9	6.3	5.8	6.0	6.3	6.3	6.3	6.5	5.6	5.3
Weighted N =	—	*1,610*	*1,486*	*1,764*	*2,117*	*2,125*	*2,088*	*1,982*	*1,937*	*1,836*	*1,707*	*1,631*	*1,507*	*1,463*	*1,135*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The questions were contained in two questionnaire forms in 2004–2006 and three forms beginning in 2007.

[b]Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

[c]Those respondents who report never having been tested for HIV are excluded from these percentages.

TABLE 10-1a (cont.)

Trends [a] in Frequency of Condom Use and Testing for HIV

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

	Male														
Frequency of Condom Use in Last 12 Months [b]	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
When you had sexual intercourse during the LAST 12 MONTHS, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)															
Never	—	37.0	36.4	35.8	36.1	35.2	36.1	36.2	34.7	33.0	34.6	36.8	38.0	37.7	37.4
Seldom	—	13.7	12.8	13.3	13.7	13.3	13.0	13.7	14.3	15.0	14.3	14.4	13.3	13.4	13.9
Sometimes	—	12.8	13.0	13.3	13.2	13.3	13.2	12.7	13.6	13.6	13.5	12.9	12.7	12.9	13.0
Most times	—	17.8	18.0	16.8	15.7	15.6	15.7	16.8	17.2	17.1	16.9	15.5	16.1	17.5	16.5
Always	—	18.8	19.9	20.7	21.3	22.6	22.1	20.7	20.3	21.3	20.7	20.4	20.0	18.6	19.2
Weighted N =	—	*1,423*	*1,330*	*1,607*	*1,941*	*1,937*	*1,878*	*1,760*	*1,684*	*1,610*	*1,545*	*1,503*	*1,369*	*1,307*	*1,030*
Testing for HIV: Lifetime and Last 12 Months															
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)															
Yes, in the last 12 months	—	16.7	16.0	16.0	16.4	16.4	15.0	15.3	17.1	16.3	15.0	15.8	14.3	15.1	15.3
Yes, but not in the last 12 months	—	21.2	20.8	21.2	20.9	20.3	20.2	19.1	18.9	17.5	16.1	15.8	15.4	15.8	15.3
No, never	—	62.2	63.2	62.8	62.7	63.3	64.8	65.6	64.0	66.3	68.9	68.4	70.3	69.1	69.4
Weighted N =	—	*1,738*	*1,629*	*1,919*	*2,288*	*2,290*	*2,257*	*2,166*	*2,102*	*2,034*	*1,963*	*1,904*	*1,782*	*1,719*	*1,359*
Received HIV Test Results [c]															
Did you receive the results of your most recent HIV/AIDS test? (We don't want to know your test results.)															
Yes	—	89.8	91.2	92.2	91.9	91.4	91.5	92.6	93.5	92.9	93.8	93.5	92.7	93.1	91.9
No	—	10.2	8.8	7.8	8.1	8.6	8.6	7.4	6.5	7.1	6.2	6.5	7.3	6.9	8.1
Weighted N =	—	*655*	*591*	*701*	*845*	*830*	*775*	*727*	*744*	*673*	*602*	*593*	*520*	*525*	*411*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The questions were contained in two questionnaire forms in 2004–2006 and three forms beginning in 2007.

[b]Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

[c]Those respondents who report never having been tested for HIV are excluded from these percentages.

TABLE 10-1a (cont.)

Trends [a] in Frequency of Condom Use and Testing for HIV

Total and by Gender among Respondents of Modal Ages 21–30

(Entries are percentages.)

	Female														
Frequency of Condom Use in Last 12 Months [b]	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
When you had sexual intercourse during the LAST 12 MONTHS, how often were condoms used? (This includes vaginal and anal sex, but not oral sex.)															
Never	—	46.5	46.1	44.4	44.8	44.5	42.4	43.6	44.3	44.5	45.1	46.8	49.3	49.6	49.5
Seldom	—	13.7	13.5	13.7	12.6	13.2	14.9	15.0	14.5	14.3	14.2	13.2	12.1	12.4	12.2
Sometimes	—	12.0	13.5	13.7	12.8	12.8	12.8	11.8	11.7	12.1	11.6	11.0	11.3	12.1	12.4
Most times	—	13.5	12.9	13.9	14.3	13.4	12.5	12.8	13.8	13.0	12.6	13.8	12.9	11.9	12.0
Always	—	14.3	14.0	14.3	15.5	16.1	17.5	16.9	15.6	16.1	16.5	15.3	14.4	14.0	13.8
Weighted N =	—	*1,653*	*1,574*	*1,869*	*2,210*	*2,159*	*2,131*	*2,087*	*2,035*	*1,990*	*1,927*	*1,844*	*1,708*	*1,639*	*1,272*
Testing for HIV: Lifetime and Last 12 Months															
Have you ever been tested for HIV/AIDS? (Do not include tests that you may have had when donating blood or blood plasma.)															
Yes, in the last 12 months	—	23.7	22.9	23.8	24.9	26.0	26.4	25.8	26.4	25.9	25.6	26.2	26.4	27.0	27.6
Yes, but not in the last 12 months	—	26.5	26.6	25.5	24.9	25.2	26.1	25.3	23.6	23.9	23.2	21.7	22.1	20.7	19.4
No, never	—	49.8	50.6	50.7	50.1	48.8	47.5	48.9	50.0	50.2	51.3	52.1	51.5	52.3	53.0
Weighted N =	—	*1,927*	*1,830*	*2,179*	*2,584*	*2,545*	*2,517*	*2,480*	*2,418*	*2,364*	*2,292*	*2,194*	*2,038*	*1,976*	*1,559*
Received HIV Test Results [c]															
Did you receive the results of your most recent HIV/AIDS test? (We don't want to know your test results.)															
Yes	—	93.9	93.8	92.7	93.2	94.2	95.1	95.1	94.4	94.2	93.7	93.8	93.9	95.1	96.3
No	—	6.1	6.2	7.3	6.8	5.8	5.0	4.9	5.6	5.8	6.3	6.3	6.1	4.9	3.7
Weighted N =	—	*955*	*895*	*1,063*	*1,273*	*1,295*	*1,312*	*1,255*	*1,193*	*1,163*	*1,105*	*1,037*	*987*	*938*	*724*

Source. The Monitoring the Future study, the University of Michigan.

Notes. ' — ' indicates not applicable.

[a]Data presented in this table are two-year moving averages. The 2005 data is 2004 and 2005 combined and so forth. The questions were contained in two questionnaire forms in 2004–2006 and three forms beginning in 2007.

[b]Percentages based on those reporting sex with one or more partners during the last 12 months. Those reporting no partners are omitted.

[c]Those respondents who report never having been tested for HIV are excluded from these percentages.

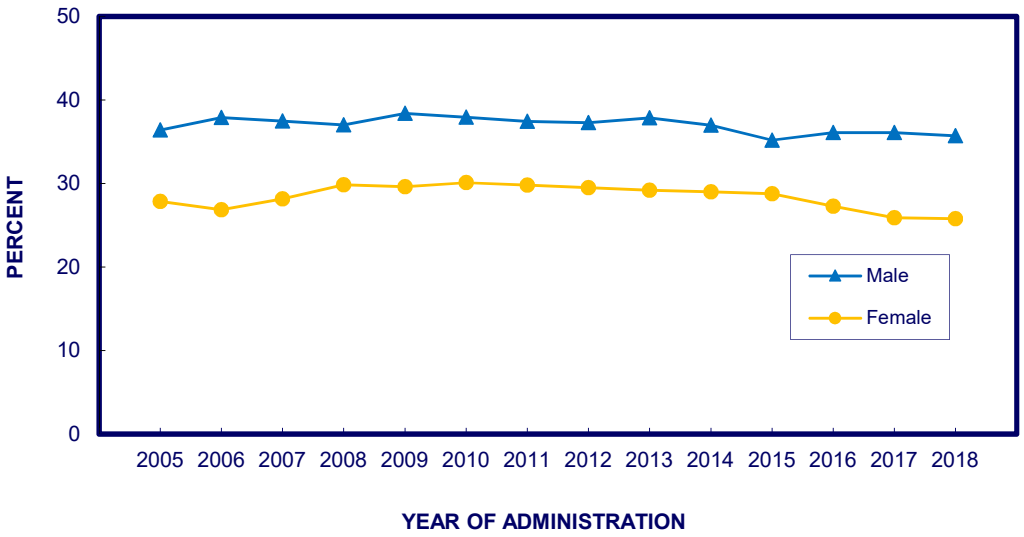
TABLE 10-1b
Use of Condoms in Past Year by 2-Year Age Groups[a]
among Young Adults
(Entries are percentages.)

	Year of Administration															
Age 21–22	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2004–2018
Frequency of Condom Use in Past Year:																
Never	26.1	26.6	26.8	23.5	23.4	23.8	22.7	25.9	19.3	22.2	25.4	29.9	33.4	31.4	31.3	25.5
Seldom/Sometimes	32.5	30.7	29.8	28.7	28.7	28.7	29.0	30.6	31.0	29.5	29.6	27.1	23.8	33.5	28.1	29.4
Most times/Always	41.4	42.6	43.4	47.8	47.9	47.5	48.3	43.5	49.7	48.3	45.0	43.0	42.8	35.1	40.5	45.1
Weighted N =	*307*	*266*	*266*	*376*	*424*	*419*	*394*	*351*	*365*	*312*	*336*	*278*	*255*	*263*	*122*	*4,616*
Age 23–24																
Frequency of Condom Use in Past Year:																
Never	36.8	36.2	31.1	30.1	33.2	30.2	31.8	34.3	32.0	33.7	36.1	35.5	39.1	35.5	39.2	33.8
Seldom/Sometimes	28.8	30.8	28.8	29.0	31.7	24.7	27.2	28.5	29.8	27.4	22.4	27.3	29.0	29.5	26.2	28.0
Most times/Always	34.4	33.0	40.1	40.9	35.1	45.1	41.1	37.2	38.2	38.9	41.5	37.2	31.9	35.0	34.7	38.2
Weighted N =	*322*	*316*	*284*	*398*	*422*	*394*	*398*	*399*	*400*	*336*	*351*	*298*	*291*	*280*	*160*	*5,031*
Age 25–26																
Frequency of Condom Use in Past Year:																
Never	43.1	39.5	41.6	40.1	40.4	40.6	40.8	38.0	39.8	38.3	39.8	44.9	48.1	42.6	40.3	40.8
Seldom/Sometimes	23.5	27.1	29.2	27.8	21.6	29.4	30.5	26.3	28.5	27.8	29.9	26.6	22.5	23.9	28.0	26.9
Most times/Always	33.4	33.4	29.3	32.1	37.9	30.0	28.7	35.7	31.7	33.9	30.3	28.5	29.4	33.6	31.7	32.2
Weighted N =	*331*	*299*	*273*	*408*	*387*	*392*	*417*	*355*	*360*	*365*	*360*	*322*	*302*	*274*	*165*	*5,031*
Age 27–28																
Frequency of Condom Use in Past Year:																
Never	47.0	55.2	50.2	49.6	53.3	47.7	46.7	50.6	51.7	45.6	48.8	48.2	48.9	51.1	49.7	49.4
Seldom/Sometimes	27.1	19.8	24.2	25.6	22.9	28.4	26.1	24.0	25.2	25.4	24.9	23.8	23.7	21.8	22.8	24.5
Most times/Always	33.4	25.0	25.6	24.8	23.9	23.8	27.2	25.4	23.2	29.0	26.3	28.0	27.4	27.1	27.4	26.1
Weighted N =	*308*	*320*	*312*	*413*	*409*	*387*	*388*	*365*	*382*	*343*	*334*	*315*	*319*	*338*	*184*	*5,189*
Age 29–30																
Frequency of Condom Use in Past Year:																
Never	54.3	53.8	51.3	54.8	53.7	51.8	55.9	53.4	53.5	54.0	57.3	57.8	55.6	51.6	60.7	54.4
Seldom/Sometimes	21.4	19.4	25.8	23.1	23.1	24.6	21.9	22.0	24.7	26.7	25.9	19.6	22.9	23.9	20.0	23.2
Most times/Always	24.3	26.8	22.9	22.1	23.2	23.6	22.2	24.6	21.8	19.3	16.8	22.6	21.5	24.5	19.2	22.5
Weighted N =	*319*	*287*	*281*	*464*	*459*	*416*	*405*	*379*	*378*	*368*	*372*	*299*	*311*	*312*	*204*	*5,353*

Source. The Monitoring the Future study, the University of Michigan.

[a]In 2004–2006, the questions about condom use were included in two questionnaire forms. In 2007, these questions were added to a third questionnaire form.

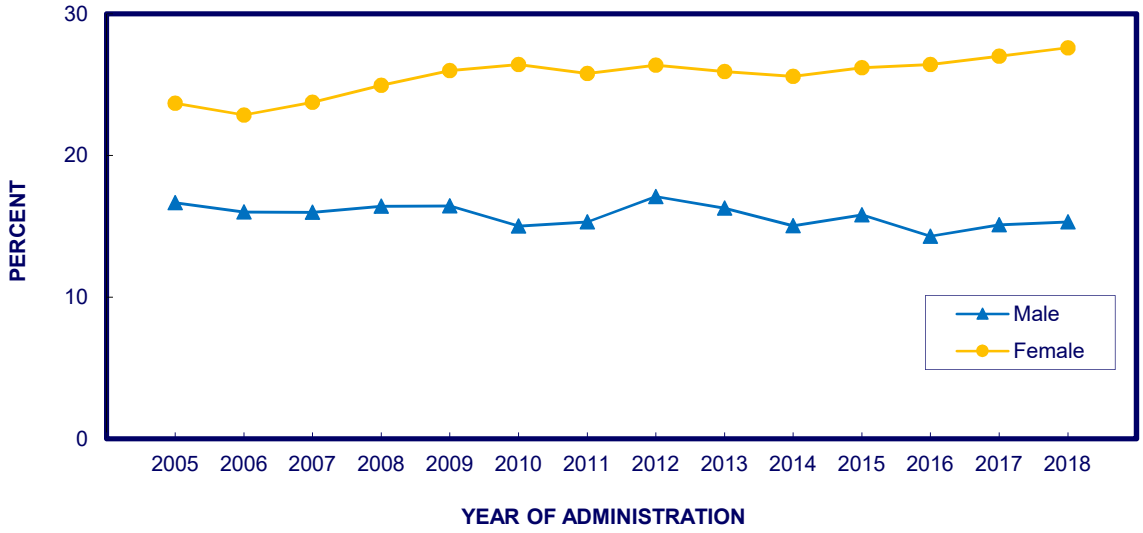
FIGURE 10-1
Trends (2-year average) in Annual Condom Use by Gender [a] among Respondents of Modal Ages 21-30
(most times or always)



Source. The Monitoring the Future study, the University of Michigan.

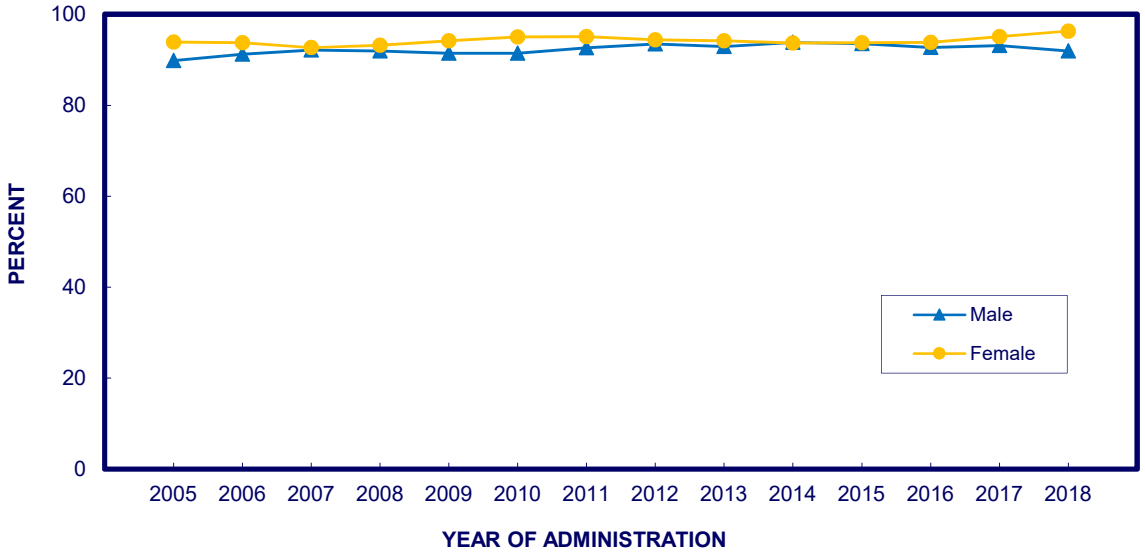
[a]Based on those reporting sexual activity with one or more partners during the past year. Those reporting no partners are omitted.

FIGURE 10-2
Trends (2-year average) in Having an HIV/AIDS Test in the Past Year by Gender among Respondents of Modal Ages 21-30



Source. The Monitoring the Future study, the University of Michigan.

FIGURE 10-3
Trends (2-year average) in Receiving HIV/AIDS Test Results by Gender [a] among Respondents of Modal Ages 21-30



Source. The Monitoring the Future study, the University of Michigan.

[a]Those respondents who report never having been tested for HIV are excluded from these percentages.

Chapter 11

SUMMARY AND CONCLUSIONS

Risk behaviors for the spread of HIV/AIDS are all too prevalent among today's young adults. Sharing needles, engaging in sex with multiple partners, and having unprotected male-to-male sex are perhaps the most important ones.

Based on our 2004 through 2018 national surveys *combined*, about one quarter (23.8%) of young adults aged 21 to 30 indicated having more than one sex partner in the prior 12 months (26.0% of males and 21.7% of females). However, trend data show that previously observed differences between males and females on this statistic have been virtually eliminated by 2018 (21.7% for males vs. 21.9% for females) as having multiple sex partners has declined significantly among young adult males. However, males are still somewhat more likely than females to report having four or more partners in the past 12 months (8.7% of males, 7.9% of females, and 8.3% overall). Thus, young adult men on average are still at higher risk than young adult women based on number of sex partners they have, but the gender difference has narrowed substantially as the proportion of males having more than one partner has declined along with a significantly increasing abstention rate for both genders. The percent of young adult males indicating they had no sex partners in the prior 12 months rose from 14.4% in 2008 to 23.8% in 2018 ($p<.001$). Females also have shown an increase in having no sex partners in the prior 12 months, albeit a smaller one, from 12.3% in 2005 to 17.3% in 2018 ($p<.001$). These reductions in the number of sex partners are important changes in a risk factor for HIV/AIDS.

Young adult men reporting sex exclusively with men are considerably more likely to have multiple partners than men reporting sex exclusively with women, thus compounding their already higher risk. Among sexually active male respondents in 2018 almost one in twenty (4.6%) indicated having had sex exclusively with male partners in the prior 12 months (and another 0.9% indicated having sex with both genders); slightly over half of them reported having multiple male partners, including 22% of them reporting five or more male partners—a rate higher than the rate among men who have had sex exclusively with women in the prior year.

While young adult men who have sex exclusively with men use condoms about as frequently as men who have sex exclusively with women, the differences are small and not statistically significant—37% of the former group say they use condoms "most times" or "always" versus 38% in the latter group.

Among all young adults, the protective behavior of using condoms rises considerably with the number of sex partners reported, and, as we have previously reported, that is true among 35- and 40-year-olds as well (Volume II, 2018). The higher the number of partners, the higher the rate of condom use; this holds true for both genders. So, there is some compensatory protective behavior here, as well, associated with the increased risk derived from having more sex partners, but certainly not enough to fully offset that added risk.

Some 41% of young adult men who report having sex exclusively with men in the prior 12 months indicate having been tested for HIV/AIDS in the same interval. This compares with only 17% of

young adult men who report having sex exclusively with women. Men who have sex exclusively with men are also more likely to obtain the results of their tests. Thus there is evidence of some compensatory protective behavior indicated in this high risk group.

Among all respondents, the proportion getting tested for HIV/AIDS rises with the number of sex partners reported—again indicating some compensatory protective behavior related to increased risk—though even among those with five or more partners during the prior year, only 41% indicate being tested in that interval.

These data suggest that a number of people recognize that their sexual practices put them at greater risk and take action to determine whether or not they are already infected. That can be particularly important because it can allow a person testing positive to initiate treatment and also protect against spreading the disease to others by refraining from risky sexual contact, using condoms if they do have sex, and avoiding sharing needles with others if they are drug injectors. Their partners can also be alerted to use pre-exposure prophylaxis (PrEP) because they are at heightened risk (CDC, 2018). Interestingly, condom use and HIV testing—two risk-reduction behaviors—do not seem to correlate with each other.

Only about 0.5%, or one in every 200, of 21-30 year-old respondents surveyed in 2004–2018 (combined) reported ever sharing needles in their lifetime—0.2% in the prior 12 months. Importantly, one-third of young adults who ever injected drugs (1.5%) reported having ever shared needles (0.5%). Of those injecting drugs in just the prior 12 months (0.5%) nearly half (0.2%) indicated that they shared needles in that time interval. Although those who have shared needles represent a small proportion of the population, they are at particularly high risk for contracting and transmitting HIV. Furthermore, we believe it likely that we underestimate the size of this group.

Of those few respondents in the samples who have ever shared needles, about 40% indicate having been tested for HIV in the prior 12 months—roughly twice the rate among all young adults who have never shared needles—indicating some compensatory protective behavior for those engaged in this serious risk behavior. Those who have shared needles, however, carry increased risk from being more likely than others to have multiple sex partners and from having a lower prevalence of condom use than those who have not shared needles, thus increasing the risk that they acquire HIV and/or transmit it to others.

Findings reported here for young adults are based on the fifteen annual data collections combined; and, as we have stated at various points in this monograph, even then the numbers of cases often are not sufficient to provide statistical confidence for relatively rare behaviors and especially for the intersection of rare behaviors. Nevertheless, the prevalence data tend to replicate across years, giving us increased confidence in their validity.

The extent to which these HIV/AIDS risk and protective behaviors are changing over time is of great importance to the country, and the evidence here from the most recent fourteen-year interval suggests that, while some change is taking place in the general population of young adults who have completed high school, it is somewhat limited. One change that seems to be in the wrong direction is that fact that use of a condom “most times or always” in the prior year declined among young adult females between 2014 and 2018, from 29.1% to 25.8% ($p<.05$). Of course the increase

in abstention from having any sex partners may account for some of this change. Another change in the wrong direction was a gradual but significant decline in the proportion of young adult males who reported ever getting tested for HIV/AIDS. To illustrate, the percent of young adult males who had *never* been tested for HIV rose from 62% in 2005 to 69% in 2018. On the other hand, rates of past-year young adult female testing appear to have risen gradually and significantly from 2005 (23.7%) through 2018 (27.6%), and that combined with the reduction in testing by males during that period has resulted in a larger gender difference in recent years (Figure 10-2; the increase in the gap is significant: $p<.001$). Thus, in 2018, 28% of young adult females reported getting tested in the prior 12 months compared to only 15% of young adult males; this is despite the fact that the males are at considerably higher risk of contracting HIV.

One positive development is that the proportion of all young adults who fail to secure their test results started out quite low at about 8% among those tested in 2004—the beginning year for this study—and became still lower (about 6% of those tested) by 2011 by a statistically significant amount. It reached 5% in 2018.

As we have argued in the context of drug abuse, there is always a danger of *generational forgetting*—that through generational replacement combined with reduced attention to the topic in media and with fewer casualties, younger cohorts may not acquire the knowledge and concern about risks that earlier cohorts possessed and that motivated them to avoid risky behaviors. It seems likely that there has been a considerable shift over the past two decades in the perceived dangers of HIV/AIDS. Some reduction in perceptions of risk may be due to improvements in treatment effectiveness, but this likely left recent cohorts of young adults more vulnerable to taking the kinds of risks associated with both contracting and transmitting the disease. In particular, survival rates for those having AIDS have increased, starting around 1996 with the introduction of antiretroviral therapy (Crum et al., 2006; see also http://www.cdc.gov/media/pressrel/aids-d1.htm). This improvement in survival rates is certainly a very favorable development—but one that also carries the risk of reduced perceptions of the dangers of AIDS for incoming cohorts of young adults. This underscores the importance of continued education and prevention efforts.

Although great progress has been made in HIV risk reduction in recent decades, in large part through medical advances, the MTF results show that there has been only limited progress over the past decade in key behaviors in the population related to acquiring HIV/AIDS, and thus, there is little room for complacency.[1] There appears to be a substantial portion of the population that current HIV policies and interventions are not reaching. These MTF results suggest that efforts to reduce HIV risk beyond current levels will require further effort, research, and innovation in HIV prevention.

[1] A number of efforts are still being made, of course, to further improve biomedical approaches to the prevention of HIV (*HIV.gov*, 2018).

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APPENDIX

OTHER RELEVANT STUDIES OF THE GENERAL POPULATION

Seven other studies that generate information on risk and protective behaviors on national samples of the U.S. general population are described below. The degree of overlap with MTF is discussed for each.

National Longitudinal Study of Adolescent Health (Add Health). The Add Health study is a nationally representative, longitudinal study of U.S. youth who were in grades 7–12 during the 1994–1995 school year. The original panel, surveyed in-home, initially comprised around 21,000 individuals, with about 15,000 interviewed at waves 2, 3, and 4. This set of class cohorts has been followed into adulthood, with additional data collection waves in 1996, 2001/2002, and 2008/2009, and (most recently) 2016-18 (Carolina Population Center, 2018; Harris et al., 2008). Collected data include measures on perceived risk of HIV/AIDS, sexual behavior history, contraceptive use, sexually transmitted disease (STD) history, and substance use including injection drug use (IDU) and needle sharing. Not all of the HIV/AIDS risk behavior measures are asked at each wave of data collection. A wide range of analyses focusing on risk behaviors for HIV and other sexually-transmitted infections have been published with Add Health data (for a listing of publications, see https://www.cpc.unc.edu/projects/addhealth/publications). These studies provide important data based on the six adjacent class cohorts included in Add Health; however, MTF continually adds cohorts and can thus track historical trends for fixed age groups and also for many cohorts over time. For more information on Add Health, see https://www.cpc.unc.edu/projects/addhealth.

General Social Survey (GSS). Conducted by the National Opinion Research Center at the University of Chicago, GSS began in 1972 as an annual survey (although no surveys were conducted in 1979, 1981, or 1992) and went to a biennial format beginning in 1994. Prior to 2008, the study used cross-sectional surveys of the U.S. non-institutionalized adult household population (ages 18 and over). Starting in 2008, the design was changed to a rotating panel, with each entering cohort to be followed up for the next two consecutive surveys (e.g., the 2006 cohort was re-interviewed in 2008 and 2010; National Opinion Research Center, 2018). Most items on sexual risk and protective factors were added to the GSS starting in 1988, and the survey now includes measures such as number and type of sex partners, ever paying for sex, heterosexual and homosexual sex, condom use, and HIV/AIDS testing. A limited number of substance use items are asked, including injection drug use (but not needle sharing) and crack cocaine use (both lifetime and past 30-day use). However, the only other item on substance use (use of any illegal drugs in the past 12 months) has not been asked since 2004 (Davis & Smith, 2007). GSS data are collected in a face-to-face interview context: paper-and-pencil questionnaires were used through 2000; collection via computer-assisted personal interviewing (CAPI) has been used since 2002. As part of the CAPI format, the respondent is handed the interviewer's laptop computer to self-complete the more sensitive sections using computer-assisted self-interviewing (CASI). Because MTF uses self-administered, mailed questionnaires, and thus does not have an interviewer present, a higher level of perceived privacy may exist for respondents when answering HIV/AIDS risk behavior–related items (Brener et al., 2006) resulting in more valid data. HIV/AIDS publications from the GSS have reported on sexual risk behaviors (e.g., Anderson, 2003; Anderson et al., 2003; Choi et

al., 1994; Johnen et al., 1995; Twenge et al., 2017), HIV testing (e.g., Oraka et al., 2018; Pitasi et al., 2018), and HIV diagnoses rates (Jones et al., 2018). Given that substance use behaviors are not consistently collected in the GSS and needle sharing is not measured, MTF provides an important additional source for both cross-sectional and longitudinal data that look at the intersection of these behaviors with other HIV/AIDS risk and protective factors. For more information about GSS, see http://www.norc.org/Research/Projects/Pages/general-social-survey.aspx.

National Epidemiological Survey on Alcohol and Related Conditions (NESARC). During 2001-2002, NESARC surveyed a nationally representative sample of approximately 43,000 U.S. civilian, noninstitutionalized adults aged 18 and older (Hasin & Grant, 2016). The initial participants were surveyed again in 2004-2005 through NESARC-II. Most recently, a new large-scale nationally representative sample was surveyed in 2012-2013 through NESARC-III (Grant et al., 2015). Data collection involved face-to-face computer-assisted personal interviewing (CAPI). The NESARC studies examine detailed measures of alcohol, drug, and psychiatric disorders; sex risk behaviors; substance use (including injection drug use); and HIV diagnosis and testing. Publications using NESARC data have addressed prevalence and correlates of HIV testing (Blanco et al., 2018) and associations between a range of psychological and substance use/disorder measures and risk behaviors associated with HIV (e.g., Lopes et al., 2012; O'Leary et al., 2006; Reisner et al., 2011; Sareen et al., 2009; Thompson et al., 2014). While NESARC provides detailed data in these areas, the survey is time-limited, and has involved only one 3-year longitudinal component. MTF provides an important broad-based range of risk and protective factors using a continued cohort-sequential longitudinal design, with potentially higher perceived privacy due to not utilizing in-person interviewing. For more information on NESARC, see https://www.niaaa.nih.gov/research/nesarc-iii.

National Survey on Drug Use and Health (NSDUH). Begun in 1971, the NSDUH study is now an annual, cross-sectional survey of the civilian, non-institutionalized U.S. population ages 12 and older (SAMHSA, 2017). Approximately 67,500 persons are interviewed in NSDUH each year. In 1999, NSDUH was redesigned to allow state-level estimates. As suggested by the study name, a major focus is on measures related to substance use, including injection drug use (IDU). Published findings utilizing NSDUH data related to IDU have reported national IDU prevalence levels, demographic and geographic variation in such use, and correlates of risky injection practices (Novak & Kral, 2011; Ropelewski et al., 2011; SAMHSA, 2007). Data are also collected on lifetime and past-year HIV/AIDS diagnoses as well as related health conditions such as hepatitis and sexually transmitted diseases (e.g., SAMHSA, 2010). However, data on participation in high-risk sexual behaviors are not collected, which distinguishes MTF from NSDUH. In addition, MTF collects longitudinal data on individuals over time as part of its cohort-sequential design. For more information about NSDUH, see https://nsduhweb.rti.org/respweb/homepage.cfm.

National Health and Nutrition Examination Survey (NHANES). NHANES began in the early 1960s as a series of surveys initiated by the National Center for Health Statistics, focusing on different population groups and health topics. In 1999, NHANES began to be conducted on a continuous basis with a nationally representative cross-sectional sample of approximately 5,000 individuals per year (CDC, 2017a). Data on number and type of sexual partners and behaviors (including condom use) are collected from respondents aged 14–69. Through 2004, only limited drug use data were collected. However, beginning in 2005, age at first use, lifetime, and past 30-day use of

marijuana, cocaine, heroin, methamphetamine, and injection drug use were collected from individuals aged 12–69 (needle sharing is not included). NHANES data for these items are collected using audio computer-assisted self-interviewing (ACASI) at NHANES mobile examination centers. With ACASI, the interviewer is unaware of the highly sensitive questions as they are asked or of the answers being given, thus providing respondents with a high level of privacy similar to self-administered questionnaires like those used in MTF (Brener et al., 2006). Studies using NHANES data have focused on HIV testing (Guo & Sims, 2017) and prevalence (McQuillan et al., 2006), as well as characteristics of sub-groups at high risk for sexually-transmitted diseases (e.g., Esie et al., 2018; Martinez et al., 2017; Xu et al., 2010). NHANES is the only national survey that collects and tests blood samples from participants aged 18–49 for the HIV antibody (CDC, 2016b). A longitudinal component of NHANES is underway that follows up a sub-sample of participants in the 2007-2014 continuous NHANES surveys (CDC 2017b). MTF includes a broader range of substance use measures, including needle sharing, and is able to utilize on-going panel data to examine individual change over time in HIV/AIDS risk and protective behaviors. For more information on NHANES, see https://www.cdc.gov/nchs/nhanes/index.htm.

National Survey of Family Growth (NSFG). Sponsored by the National Center for Health Statistics, NSFG was begun in 1973 and was initially designed to be a periodic national fertility study of U.S. females. In 2002, the survey provided nationally representative cross-sectional samples of both males and females ages 15–44. In mid-2006, the NSFG began continuous interviewing utilizing a rolling, cumulating yearly nationally representative sample of U.S. households (Lepkowski et al., 2006), with a target of approximately 5,000 interviews among individuals ages 15-44 per year. The NSFG gathers detailed data on sexual risk behaviors of many kinds, including number of sex partners and condom use, heterosexual anal and oral sex, sexual health risks and formal sex education, and homosexual sex (CDC, 2016a). The NSFG contains some items on substance use, including injection drug use and needle sharing; it also asks about testing and diagnoses of sexually transmitted diseases including HIV. The most sensitive questions are asked using ACASI in order to provide respondents with a high level of privacy. Published NSFG data have addressing HIV risk and protective factors including condom use (Nasrullah et al., 2017), number of sex partners (Harper et al., 2017) and sexual behaviors (Copen et al., 2016). Longitudinal panel data are not collected on NSFG respondents. MTF uses self-administered, mailed questionnaires, which should also provide respondents with a high level of privacy similar to that in ACASI and thus provide similarly valid data (Brener et al., 2006). Further, the longitudinal component of the MTF study has allowed for examination of HIV/AIDS risk and protective behaviors from age 21 through 40 among all U.S. high school graduating cohorts since 2004. Further, MTF is capable of correcting for the recanting of earlier reported drug using behaviors (Johnston & O'Malley, 1997; Johnston et al., 2015). For more information on NSFG, see https://www.cdc.gov/nchs/nsfg/index.htm.

National Youth Risk Behavior Survey (YRBS). YRBS is conducted every two years, and provides nationally representative, cross-sectional data on priority health risk behaviors for 9th- through 12th-grade students in public and private U.S. schools (Brener et al., 2013). The number of respondents averages around 15,000 per survey (Brenner et al., 2013). Several HIV/AIDS-related risk behaviors have been measured since its inception in 1991, including substance use and sexual activity. YRBS data include national and sociodemographic group-specific prevalence measures of high school student licit and illicit substance use (including a measure of lifetime intravenous drug use), lifetime and current sexual activity (including number of partners), condom use,

substance use before sexual behavior, and HIV/AIDs education and testing (CDC, 2018a). YRBS data have been used to examine trends over time in such behaviors (CDC, 2018b; Harper et al., 2018), as well as how substance use and sexual risk behaviors interrelate (Dunn & Yannessa, 2018; Santelli et al., 2009; Springer et al., 2007). The work of MTF complements that of the YRBS coverage of 14- through 18-year olds by covering respondents ages 21 to 40, a highly relevant age group for the spread of HIV/AIDS. MTF also contains a considerably more complete set of drug use measures, including annual and 30-day injection drug use, and lifetime and past-year needle sharing. In addition, the longitudinal nature of MTF allows an examination of how HIV/AIDS risk behaviors change over time across age within different cohorts. For more information on YRBS, see https://www.cdc.gov/healthyyouth/data/yrbs/index.htm.

Key Distinctions among the Studies

A review of these seven studies shows that, although key data are provided by each, none of the studies allows for the ongoing, cohort-sequential prospective examination of both substance use and other risk and protective behaviors for HIV/AIDS among the U.S. young adult population. YRBS does not cover age groups above 18 or 19; GSS does not broadly examine substance use behaviors; NSDUH does not cover high-risk sexual behaviors; Add Health covers only six class-cohorts; NESARC is not a yearly survey; NSDUH, NSFG, and YRBS do not gather longitudinal panel data on their respondents, and NHANES has only recently introduced a longitudinal follow-up component. Further, most of these studies do not include all of the measures of risk and protective behaviors covered in MTF. Thus, along with these other national studies, MTF is an essential component of the nation's efforts to monitor and understand HIV/AIDS risk behaviors in the general population, as opposed to specially selected high risk populations.

Whatever changes occur in the proportions of American young adults choosing to engage in these risk and risk-reduction behaviors will, of course, have very important consequences for the course of the nation’s HIV/AIDS epidemic. MTF findings thus stand to make important contributions to our understanding of this major health problem and our ability to deal with it effectively.

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