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Christine Cullen

Haverford College

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The world is currently in crisis. Extreme measures are being proposed to control the spread of HIV/AIDS in countries with astronomically high numbers of residents thought to be infected. Activists and policy makers, such as former President Clinton, have become more inclined to support drastic policies such as mandatory HIV testing in nations with high HIV/AIDS prevalence in order to combat the spread of this disease.

Unfortunately, many Americans now think of the AIDS epidemic as an issue that only affects Third World nations and are unaware of its increasing severity in their own country. In 2003, approximately 14,000 individuals died of AIDS related causes and an estimated 950,000 people are current living with AIDS in America¹.

Drugs to combat HIV and AIDS in First World nations are becoming increasingly effective, as well as expensive. As the life span of those living with AIDS continues to increase due to the efficacy of these medicines, the financial costs of HIV/AIDS is becoming increasingly burdensome. In 2000, a White House report estimated that the average health care expenditures for an HIV/AIDS patient per month were \$1,359, which equals approximately \$16,308 per patient per year. With over 700,000 cases currently diagnosed in the United States, that cost is approximately 12.29 billion dollars a year spent on HIV/AIDS care and treatment. This figure does not include potential dollars that could be spent on people with HIV/AIDS who are not currently being treated by a physician or receiving drug therapy who could benefit from such treatments. This population has been found to be disproportionately composed of very low income individuals who do not have stable housing after controlling for health insurance coverage (Smith, Rapkin, Winkel, Springer, Chhabra & Feldman, 2000).

¹ http://www.unaids.org/en/Regions_Countries/Countries/united_states_of_america.asp

Besides sheer financial costs associated with the medical care and treatment for people with HIV and AIDS, there is also substantial human capital costs associated with the disease. It has been found that there is considerable morbidity associated with the AIDS virus in terms of decreases in physical and mental health (Hays, Cunningham, Sherbourne, Wilson, Wu, Cleary, McCafferty, Fleishman, Crystal, Collins, Eggan, Shapiro & Bozzette, 2000). This is important to note because even though there have been substantial decreases in the mortality rate resulting from HIV/AIDS, people's quality of life is still very negatively effected and now for prolonged periods of time. This disease is especially devastating to the economy and psyche of a nation given that the victims are often in their prime of life when contracting the virus.

Public Knowledge of HIV/AIDS

In the early stages of the HIV/AIDS epidemic, methods of transmission were unclear. However, by the mid-eighties, researchers were able to clearly identify the ways in which this virus is transmitted. In order to quell the pervasive confusion and panic of the general U.S. population, the U.S. government launched a national AIDS informational campaign in 1988, which involved the widespread distribution of 107 million copies of a booklet called 'Understanding AIDS' to every U.S. household². This report was composed by the Center for Disease Control in conjunction with the Surgeon General and contained information about behaviors that increase the risk of contracting the disease and myths about disease transmission involving casual contact and everyday interaction.

In 1987, the US Department of Health and Human Services added the AIDS Attitudes and Knowledge supplemental survey to the National Health Interview Survey in order to gauge the effectiveness of this brochure. LeBlanc (1993) used the supplemental AIDS data from the 1987 National Health Interview Survey to examine individual knowledge of HIV transmission

² <http://www.cdc.gov/mmwr/preview/mmwrhtml/00000019.htm>

and understanding of the disease. This study found that certain segments of the population had less information about the disease, including those with a lower level of education and income as well as people who reported obtaining a majority of their information about HIV/AIDS through the mass media.

Not only did the amount of information available to the public increase after the release of “Understanding AIDS,” but the face of AIDS began to change as well. Magic Johnson announced that he had contracted HIV and that he was retiring from basketball in 1991.³ Heterosexuals also became increasingly susceptible to HIV/AIDS, and the belief that HIV/AIDS only affects homosexual men and drug users began to gradually wane.

In 1995, the AIDS-related mortality rate reached its peak, and antiretroviral therapies were proven to be quite effective for treating this disease. Four new antiretroviral drugs were approved for use by the FDA for AIDS treatments between late 1995 and 1996, which were responsible for a drop in the AIDS-related mortality rate by over ninety percent (Duggan & Evans, 2005). As AIDS becomes an increasingly manageable disease, it is reasonable to believe that fears and stigmas concerning HIV transmission and contact with people with AIDS would subside. However, research has shown that this may not be the case.

Overestimating risk and stigmatization of HIV/AIDS

As written in the informational brochure ‘Understanding AIDS,’ “fear can be useful when it helps people avoid behavior that puts them at risk for AIDS. On the other hand, unreasonable fear can be as crippling as the disease itself.” Thankfully, many campaigns on AIDS awareness have made this balance between suppressing fears against false methods of transmission and making people aware of behaviors that do put one at severe risk of contracting the disease. Although such campaigns have been successful in educating the public about

³ www.avert.org/aids-usa.htm

HIV/AIDS transmission in the early stages of the outbreak, the ability of these campaigns to eliminate the stigma and false perceptions about the disease in more recent years is questionable. A study of Americans' stigma against HIV and AIDS in the U.S. throughout the 1990s found that the United States was not making substantial progress against combating individuals' negative perceptions of people with AIDS (Herek, Capitanio, & Widaman, 2002). This study found that a small yet significant percentage of people have still continued to harbor negative feelings and avoidant intentions towards people with AIDS. One of the most curious findings and probably the most difficult aspect to overcome by AIDS awareness and educational programs is the fact that only 67.0% of survey respondents in 1997 and 69.8% of survey respondents in 1999 believe that scientists and doctors can be trusted to tell the truth about AIDS. Even if programs are able to provide easy-to-understand and accurate information about the transfer and myths about AIDS and HIV, this effort may be a lost cause if people do not trust the source of this information.

HIV/AIDS often exacerbates discrimination because underprivileged and already stigmatized groups are disproportionately affected. In the beginning stages of the AIDS epidemic, HIV seemed to predominately affect gay men and intravenous drug users⁴. Discrimination against people with HIV and/or AIDS and people at risk of contracting HIV was often justified by people's beliefs that the behaviors which caused the transfer of AIDS, such as homosexual sex and illegal drug use, were immoral and those who contracted HIV deserved the disease. Even as more universal behaviors, such as heterosexual sex, became an increasing common mode of transmission, many individuals in the U.S. still see HIV as a warranted consequence of immoral behavior. Herek, Capitanio and Widaman (2002) found that the belief in the statement that "people who got AIDS through sex or drug use have gotten what they

⁴ www.avert.org/aids-usa.htm

deserve" has remained somewhat constant, ranging between 20.3% and 28.1% during the nineties.

Not only does the social stigma against people living with HIV/AIDS promote discrimination and fear of social interaction with this group, but it may also discourage individuals who are concerned about their HIV status from getting tested. Reducing and eliminating the stigma against HIV/AIDS is important for removing barriers to HIV prevention (CDC, 2000).

Underestimating Risk and Preventing the Spread of HIV/AIDS

Although anyone who engages in what has been defined as risky behavior (e.g., unprotected sex, sharing needles, etc.) is susceptible to contracting HIV, certain segments of the U.S. population are affected by HIV/AIDS in disproportionately large numbers. Members of populations that have not been historically affected by HIV/AIDS may observe this information and then underestimate the risk of engaging in risky behaviors with another member of this cohort due to the lower likelihood that this person would be infected by HIV/AIDS.

A meta-analysis conducted by Sheeran and Taylor (1999), which applies Azjen's Theory of Planned Behavior to determine to predictors of condom use within heterosexual populations, reveals some of the difficulties in getting individuals to translate their HIV/AIDS risk awareness into meaningful behavioral change. Another report found no significant effects on AIDS education on the probability for young Americans to abstain from sex, but did show that AIDS education did raise the probability that these individuals would use a condom relative to the probability that they would engage in unsafe sex (Tremblay & Ling, 2005). This finding is troubling given that public school sex education programs are often focused on promoting abstinence rather than effective condom use.

Smaller subsets of the U.S. population may have an even more difficult time in turning knowledge of the real risks of HIV/AIDS into behavioral change especially given their lowered ability to access information on this topic. One demographic group that has been historically ignored by HIV/AIDS prevention programs is the elderly. In 1997, 10% of new AIDS cases in the United States were among adults over the age of 50 (Williams & Donnelly, 2002). The prevailing stereotype that older adults are not sexually active has undermined efforts to educate this population about ways to prevent transmission of HIV/AIDS. A study of elderly residents in community living facilities found that up to 65% of individual ages 60 to 71 were sexually active and up to 20% of residents over the age of 78 were found to engage in some form of sexual activity (Whipple & Scura, 1996). An increase in sexual activity is also expected in this population, particularly due to the advent of popular erectile dysfunction medications such as Viagra. HIV/AIDS is also commonly misdiagnosed in this population, and early symptoms are often attributed to Alzheimer's, Parkinson's and other respiratory diseases because HIV/AIDS is not often thought of as a disease that affects the elderly (Williams and Donnelly, 2002).

Although drastic measures have been proposed to curb the spread of HIV/AIDS, such as mandatory HIV testing of high-risk individuals, it is not clear whether this tactic would be useful in preventing the spread of HIV/AIDS or even individuals' knowledge of their HIV status. Tao, Branson, Kassler and Cohen (1999) looked at the likelihood that people who were tested for HIV would receive their test results. During the years 1994 and 1995, they found that people who were involuntarily tested for the disease due to hospitalization or need for surgery were less likely to receive their results than those who voluntarily sought testing.

The first step to determining the best type of program to put into action to reduce the spread of HIV/AIDS in America is to first understand how people perceive the risks of

contracting HIV/AIDS. Researchers can then examine how individuals' risk perceptions are translated into stigmatizing and/or preventative behavior. This report seeks to study whether gaps in information regarding HIV transmission have emerged over time between certain subsections of the U.S. population.

Data Analysis

In addition to the standard National Health Interview Survey (NHIS), the CDC's National Center for Health Statistics began to administer an AIDS Knowledge and Attitudes supplemental questionnaire each year beginning in 1987 and ending in 1995 to gauge American's beliefs about AIDS and the virus that causes AIDS (HIV) in order to analyze the effectiveness of public health campaigns. The data gathered from this survey is also able to identify key populations that are receiving insufficient information about the disease and/or hold beliefs that are contrary to the various informational campaigns.

Bureau of Census personnel conducted face-face interviews with one adult member of each surveyed household of at least 18 years of age for each year of the AIDS Knowledge and Attitudes supplemental survey. The three years that this paper is looking at in its analysis are 1987, 1991 and 1995 due to their evenly spaced periods of time of collection and other marked HIV/AIDS related events that make these years interesting to study.

There were a total of 17,696 respondents in 1987, 47,725 in 1991 and 16,848 in 1995. Due to the methods of sampling used by NHIS and the large sample sizes, responses on this survey are thought to accurately represent the beliefs and attitudes of the entire U.S. population

Results

Underestimation of Risk in Transmitting HIV/AIDS: Descriptive Statistics

Questions were chosen from each survey year to analyze the underestimation of the risk in transmitting HIV/AIDS. The questions selected were based on the questions' ability to gauge personal held beliefs about the likelihood of HIV transmission both from behaviors that do not result in HIV transmission and behaviors that have been proven to spread the virus, as determined by a Center for Disease Control fact sheet on HIV transmission.⁵ As seen in Table 1, an overwhelming majority of respondents were able to correctly identify behaviors that are strongly associated with HIV transmission. In 1987, 94.68% of respondents believed that it was likely that HIV/AIDS could be transmitted by sharing a needle with someone who had the virus, increasing to 95.29% of respondents in 1991 and 96.20% of respondents in 1995. The percentage of respondents who indicated that it was true that AIDS could be passed from an infected person to a non-infected person through sexual intercourse increased from 92.47% in 1987 to 94.28% in 1991. In 1995, 96.34% correctly indicated that AIDS could be passed on through sexual intercourse between a man and woman and 94.95% correctly indicated that AIDS could be transmitted through sexual intercourse between two men. A large proportion of respondents (91.13% in 1987, 93.15% in 1991 and 92.11% in 1995) correctly indicated that an HIV positive pregnant mother could transmit the virus to her unborn baby. Given that over 90% of people correctly identifying behaviors that lead to HIV/AIDS transmission in each of the three years analyzed, there is not enough response variance to warrant further non-linear regression analysis.

People's beliefs about the effectiveness of condom use in preventing the transmission of HIV/AIDS were also studied. Although a strong majority of respondents reported believing that condom use is either "very effective" or "somewhat effective" in preventing the transmission of HIV/AIDS in each survey year, percentages were on the decline, dropping from 81.48% in 1987 to 74.85% in 1991 and 72.85% in 1995. However, the U.S. population may not have a universal

⁵ <http://www.cdc.gov/hiv/pubs/facts/transmission.htm>

awareness of how the effectiveness of condom use can decrease. In 1991, only 17.30% of respondents knew that natural membrane condoms were not as effective as latex condoms in preventing the spread of HIV. The number of respondents correctly reporting that oil-based lubricants can cause latex condoms to break did, however, increase from 26.66% in 1991 to 42.05% in 1995. Although it would be interesting to further investigate the characteristics of respondents who responded either correctly and incorrectly to questions about effective condom use, the data was not collected in a consistent manner that could afford further investigation.

Overestimating Risk and Stigmatization of HIV/AIDS: Descriptive Statistics

Many questions in the NHIS AIDS Knowledge and Attitudes Supplemental Questionnaire were asked to measure misperceptions concerning behaviors that have often been incorrectly associated with HIV transmission. In order to study trends in risk perception over time, only questions that were present in all three survey years were used in further analyses. Five questions measuring misperceptions about inaccurate modes of HIV transmission were found in all three surveys. Respondents were asked in all three years to choose the answer that most closely matched their beliefs about the likelihood of HIV transmission occurring while attending school with a child who has HIV/AIDS, working near or with a person who has AIDS or the AIDS virus, using a public toilet, being coughed or sneezed on by an HIV positive person and using glasses and utensils that have been used by an HIV positive person. The first two questions are designed to gauge misperceptions about the risk of HIV transfer through symbolic, non-physical contact with HIV positive individuals. The last three questions were used to measure misperceptions about HIV transmission through casual or indirect physical contact with an HIV positive person.

“Very likely,” “somewhat likely,” “somewhat unlikely,” “very unlikely,” and “not possible” were among the pre-selected answers from which respondents could choose; respondents could also decline from answering any of those questions. According to the Center for Disease Control’s fact sheet on HIV transmission, all of the behaviors that are asked about in these five questions pose virtually no risk of HIV transmission in all but highly unusual circumstances.⁶ For this reason, “very unlikely” and “not possible” were coded as correct responses to the above questions and “somewhat unlikely,” “somewhat likely,” and “very likely” were coded as incorrect responses.

In all three survey years, respondents were more likely to believe that casual or indirect physical contact with an HIV positive person could lead to HIV transmission than symbolic, non-physical contact with an HIV positive person. As shown in Table 2, the percentages of individuals reporting correct beliefs about likelihood of HIV transmission from symbolic, non-direct contact with HIV positive persons such as attending school with a child who has HIV/AIDS and working with a person with HIV/AIDS, increased from 62.73% and 58.61% respectively in 1987 to 78.54% and 79.25% in 1991. However, the percentage of respondents answering correctly in 1995 (76.57% and 73.20% respectively) exhibited slight declines from 1991. The percentages of individuals reporting correct beliefs about likelihood of HIV transmission from casual or indirect physical contact, such as using a public toilet, being coughed or sneezed on by a person with HIV/AIDS and sharing glasses and utensils with a person with HIV/AIDS, showed large increases from 1987 (45.41%, 32.43% and 35.02% respectively) to 1991 (63.35%, 47.83% and 49.93% respectively). The percentage of correct answers only increased minimally from 1991 to 1995 (74.47%, 49.21% and 52.96% respectively).

⁶ <http://www.cdc.gov/hiv/pubs/facts/transmission.htm>

Respondents were then coded based on the number of questions they answered correctly in order to approximately determine the extent to which they overestimate the risks of HIV transmission. Answering all questions correctly was used to operationalize an overall awareness of the ways in which HIV/AIDS cannot be transmitted. According to their correct answers to these questions, these respondents may be less likely to hold stigmatizing beliefs about people with AIDS (Herek et al., 2002). Panel A of Table 3 indicates that the percentage of respondents answering all statements correctly rose 78% from 18.55% in 1987 to 33.09% in 1991. The percentage of respondents answering all statements correctly in 1995 (35.19%) only rose 6% from 1991.

Three or more incorrectly answered questions has been used to operationalize an overall misunderstanding of the ways in which HIV/AIDS can be transmitted by overestimating the risks of contact with people with HIV/AIDS. These incorrect beliefs may also indicate negative attitudes towards people with HIV/AIDS in general or the social groups that are disproportionately affected by this disease (Herek & Capitano, 1997). Panel A of Table 3 indicates that the percentage of respondents answering three or more statements incorrectly dropped 38% from 53.57% in 1987 to 33.26% in 1991. The percentage of respondents answering all statements correctly in 1995 only dropped 8% from 1991 to 30.48% of all respondents.

Respondents who answered one or two questions incorrectly exhibit gaps in their knowledge of HIV/AIDS transmission, but it is unclear whether the degree of their misinformation could translate into overall negative attitudes regarding contact with people with HIV/AIDS. This study will not focus on examining the characteristics of this population because it is too difficult to draw conclusions about the amount of stigma they hold against HIV/AIDS. The demographic, socio-economic and geographic characteristics of respondents who answered

all of the questions correctly and respondents who answered three or more questions incorrectly were then analyzed.

Demographic Factors. As shown in Panel B of Table 3, the number of questions answered incorrectly were analyzed based on respondents' gender. Men and women exhibited similar trends to the total population in each survey year. As time progressed, however, female respondents appeared gain more knowledge about HIV/AIDS transmission relative to their male counterparts. In 1987, the proportion of men answering all of the questions correctly was 2.88 percentage points higher than the proportion of women who answered all of the questions correctly; however, the proportion of women who answered was 1.16 percentage points larger than the proportion of men who answered all of the questions correctly in 1995. This may indicate a gain in knowledge about HIV/AIDS transmission for females relative to males over time. However, women were more likely to answer three or more questions correctly than men in all three survey years.

Respondents' relative knowledge of HIV/AIDS transmission was also examined according to race. As seen in Panel C of Table 3, a larger proportion of Caucasian respondents (20.29% in 1987, 34.71% in 1991 and 37.13% in 1995) answered all questions correctly than did the proportion of Black respondents (11.29% in 1987, 27.19% in 1991 and 30.22% in 1995) or Hispanic respondents (14.34% in 1987, 28.62% in 1991 and 30.75% in 1995). The proportion of Caucasians who answered more than three questions incorrectly (50.55% in 1987, 30.87% in 1991 and 28.11% in 1995) was also smaller than the proportion of Black respondents (66.53% in 1987, 42.98% in 1991 and 36.20% in 1995) and Hispanic respondents (58.80% in 1987, 38.28% in 1991 and 35.52% in 1995).

There were larger gaps in knowledge between Blacks and Hispanics in 1987 than in 1995. A 27% larger proportion of Hispanics than Blacks answered all questions correctly in 1987, compared to a 2% larger proportion of Hispanics than Blacks answering all questions correctly in 1995. A decrease in the gap between the proportions of Hispanic and Black respondents who answered three or more questions incorrectly also occurred during the three survey years. However, the gap in knowledge does not appear to be closing between Caucasian respondents and respondents of a minority race.

Discrepancies in knowledge of HIV transmission among respondents of different age groups were also examined. As shown in Table 4, the 35 to 44 year age category had the largest proportion of respondents who answered all questions correctly (23.03%) in 1987; this age category also had smallest proportion of respondents who answered three or more questions incorrectly (46.84%) that year. Both the proportion of respondents who answered all questions correctly and the proportions that answered three or more questions incorrectly were of similar levels for respondents in the 25 to 34 year age range (21.44% and 48.47% respectively) and the 17 to 24 year age range (20.70% and 49.10% respectively). Proportions of respondents who answered all questions correctly decreased and proportions of respondents answering three or more questions incorrectly increased as the mean age of each category increased. All age groups exhibited decreases in the proportions of people answering three or more questions incorrectly over the eight year span.

The proportions of respondents answering all questions correctly increased each survey year for all age groups except for the 55 to 64 year age group and the 65 years and over age group between the years 1991 and 1995. Although there is only a 4-5% drop in the proportions of respondents who were 55 to 64 year olds and respondents who were 65 years and over who

demonstrated sufficient awareness of actual risks of HIV/AIDS transmission, this decrease in relative knowledge is still a step in the wrong direction.

Socioeconomic Factors. Misperceptions about HIV/AIDS transmission were also examined based on factors influencing socioeconomic status. In Table 5, respondents were divided into groups according to their highest level of education. All groups exhibited increases in the percentage of respondents who answered all questions correctly and decreases in the percentage of respondents who answered three or more questions incorrectly over the three survey years. The largest gains in the percentage of respondents who answered all questions correctly were in the less than high school and some high school categories (134% and 135% increases from 1987 to 1991 respectively). However, these astronomical gains in knowledge may be distorted due to the very small percent of respondents in these categories who answered all questions correctly in 1987 (6.00% for respondents who completed less than high school and 10.78% for respondents completing some high school). The proportional drop in the amount of respondents who answered three or more questions incorrectly increased in magnitude from 1987 to 1991 as the respondents' education levels increased. For instance, the proportion of respondents answering three or more questions incorrectly dropped 49% from 35.40% in 1987 to 17.88% in 1991 for respondents receiving a post graduate education, compared to a 38% decrease from 65.43% in 1987 to 43.05% in 1991 for high school graduates.

All gains in knowledge between 1991 and 1995 were relatively small for all of the educational categories and the percentage of respondents with less than a high school education or some high school education who answered all questions correctly actually dropped from 1991 to 1995 (4% and 2% decreases respectively).

Differences in household income were also used to examine respondents' knowledge of HIV transmission. Respondents were first divided into categories based on whether they were either above or below the median income for the given survey year.⁷ Respondents were also divided based on whether they fell above or below the NHIS poverty threshold. As seen in Panel A of Table 6, overall knowledge of HIV transmission was greater for respondents above the median household income than those below the median household income. Panel B of Table 6 showed that knowledge of HIV transmission was greater for those above the poverty threshold compared to those who fell below it. However, the gap in knowledge appeared to be greater between respondents below and above the median income than the gap between respondents above and below the poverty threshold. The gap in the percentage of respondents answering all questions correctly increased between those falling below the median income (15.74% in 1987 and 32.67% in 1995) and those above the median income (23.70% in 1987 and 41.21% in 1995) from a difference of 7.96 percentage points in 1987 to a difference of 8.54 percentage points in 1995. The gap in the percentage of respondents who answered all questions correctly decreased between those falling below the poverty line (13.69% in 1987 and 33.96% in 1995) and those above the poverty line (20.11% in 1987 and 36.49% in 1995), from a difference of 6.42 percentage points in 1987 to a difference of 3.43 percentage points in 1995. This may be because respondents falling below the poverty line are more adversely affected by the AIDS epidemic in America than the total pool of respondents below the median income (Smith et al., 2000).

Geographic Factors. Regional differences among respondents were also examined in regards to knowledge and attitudes towards HIV transmission. As seen in Panel A of Table 7, the percentage of respondents who answered all of the questions correctly was greatest for those

⁷ <http://www.census.gov/hhes/income/histinc/h08.html>. Due to categorical reporting of respondents' family income in the NHIS AIDS Knowledge and Attitudes Supplement, coding of median income is only approximate.

living in the Western part of the United States (24.14%) followed by respondents living in the Northeast (20.19%), Midwest (17.79%) and the South (14.76%) in 1987. The percentage of respondents answering all of the questions correctly increased for all regions from 1987 to 1991, with the West having the highest percentage of respondents who answered all questions correctly (36.00%), followed by the Midwest (33.82%), Northeast (32.24%) and the South (31.18%). The West (38.43%), Northeast (37.25%) and the Midwest (36.04%) exhibited slight gains in the proportion of respondents who correctly answered all of the questions in 1995; the South's proportion of respondents who correctly answered all of the questions in 1995 remained close 1991 levels (31.13%).

All regions showed downward trends in the percentages of respondents who answered three or more questions incorrectly over the three survey years; the South had the largest proportion of respondents answering three or more questions incorrectly (60.48% in 1987, 36.57% in 1991 and 33.80% in 1995), followed by the Northeast (51.14% in 1987, 33.485 in 1991 and 28.90% in 1995) and Midwest (53.60% in 1987, 31.54% in 1991 and 28.92% in 1995), which exhibited similar trends and the West (44.53% in 1987, 29.97% in 1991 and 28.69% in 1995), which had the smallest proportion.

Responses of survey participants were also examined based on whether the respondent did or did not live in a center city. As seen from Panel B of Table 7, trends in knowledge accumulation for center city and non-center city sample populations were similar to those of the general population; there was a substantial increase in HIV transmission knowledge from 1987 to 1991 and less significant increases in knowledge from 1991 to 1995. Although values were relatively similar, the percentage point differences between the proportion of respondents living in a center city who answered all of the questions correctly (19.08% in 1987, 34.38% in 1991

and 37.89% in 1995) and those who did not live in a center city (18.28% in 1987, 32.44% 33.88% in 1995) began to widen in later survey years, increasing from a less than 1 percentage point difference in 1987 to a 4 percentage point gap in 1995. There was virtually no difference in between the proportion of respondents who lived in a center city who answered three or more questions incorrectly (53.47% in 1987, 33.12% in 1991 and 29.94% in 1995) and the proportion of respondents who did not live in a center city who answered three or more questions incorrectly (53.62% in 1987, 33.32% in 1991 and 30.75% in 1995).

Overestimating Risk and Stigmatization of HIV/AIDS: Regression Analysis I

A non-linear regression was conducted to determine the significant factors that influence the likelihood that a respondent would answer all of the questions measuring misperceptions concerning behaviors that have often been incorrectly associated with HIV transmission correctly (See Table 8). Demographic variables, socioeconomic variables and geographic variables all had a significant influence on the likelihood that a person would answer all of the questions correctly (See Table 9). However, certain groups of factors had relatively more influence than other groups dependent on the survey year.

1987 Survey Data. In 1987, socioeconomic variables held the relatively highest level of joint significance in the model ($\chi^2=376.12$). Holding constant for all other variables in the probability regression, there was a negative and statistically significant relationship between being below the 1987 median household income and answering all of the questions correctly, such that a respondent whose family earned less than the median income for 1987 was 1.62% less likely to answer all of the questions correctly.

Education levels were also found to have a significant relationship with the likelihood of answering all of the questions correctly. A negative and statistically significant relationship was

found between having less than a high school education and the probability that a person would answer all of the questions correctly, such that a person with less than a high school education was 11.89% less likely than a respondent with some college education to answer all of the questions posed correctly. A negative and statistically significant relationship was also found between having only some high school education and the probability that a person would answer all of the questions correctly, such that a person with a partial high school education was 7.93% less likely than a respondent with some college education to answer all of the questions posed correctly. A negative and statistically significant relationship was again found between being a high school graduate and the probability that a person would answer all of the questions correctly, such that a high school graduate was 3.66% less likely than a respondent with some college education to answer all of the questions posed correctly. There was a positive and statistically significant relationship between graduating college and answering all of the questions correctly, such that college graduates were 6.06% more likely to answer all of the questions correctly than respondents who received a partial college education. There was also a positive and statistically significant relationship between receiving a post graduate education and providing correct answers to all of the questions, such that respondents with a post graduate education were 9.57% more likely than respondents receiving some college school education to respond correctly for all questions. Of the socioeconomic factors, education was a stronger predictor of whether respondents would answer all of the questions correctly than income levels.

Demographic variables also accounted for a substantial level of joint significance in the model ($\chi^2=146.63$). Holding constant for all other variables in the probability regression, the relationship between gender and respondents' likelihood of answering all of the HIV

transmission questions correctly approached statistical significance, such that men were 1.21% more likely to answer all of the questions correctly.

However, there were statistically significant relationships between race variables and respondents' likelihood of answering all of the questions correctly. There was a negative and statistically significant relationship between being black and respondents' likelihood of answering all of the questions correctly, such that a respondent who was black was 6.90% less likely to correctly answer all of the questions than a white respondent. There was also a negative and statistically significant relationship between being Hispanic and respondents' likelihood of answering all of the questions correctly, such that a respondent who was Hispanic was 3.89% less likely to correctly answer all of the questions than a white respondent.

There were also statistically significant relationships between respondents' age and answering all of the questions correctly. Holding all other variables constant, there was a positive and statistically significant relationship between being 17 to 24 years of age and respondents' likelihood of answering all of the questions correctly, such that respondents who were 17 to 24 years old were 2.33% more likely to correctly answer all of the questions than respondents ranging in age from 25 to 44. There was a negative and statistically significant relationship between being 45 to 64 years of age and respondents' likelihood of answering all of the questions correctly, such that respondents who were 45 to 64 years old were 3.35% less likely to correctly answer all of the questions than respondents ranging in age from 25 to 44. There was also negative and statistically significant relationship between being 65 years of age or older and respondents' likelihood of answering all of the questions correctly, such that respondents who were 65 years of age or older were 5.62% less likely to correctly answer all of the questions than respondents ranging in age from 25 to 44. Of the demographic variables, the race and age

variables were similar in their ability to predict whether respondents would have a comprehensive knowledge of the myths of HIV transmission, measured by their ability to correctly answer all of the questions. However, the gender of the respondent only mildly predicted respondents' ability to answer all of the questions correctly.

Geographic factors held the relatively lowest level of joint significance in the model ($\chi^2=91.32$). Residing in a center city was found to have a positive and statistically significant relationship with the probability that respondents would answer all of the questions correctly, such that respondents living in a center city were 1.63% more likely to answer all of the questions correctly. Living in the Northeast region of the U.S. rather than in the West also had a negative and statistically significant relationship with answering all of the questions correctly, such that respondents living in the Northeast were 2.18% less likely to answer all of the questions correctly than respondents living in the West. Living in the Midwest had a stronger negative relationship with answering the questions correctly, such that a respondent living in the Midwest was 4.95% less likely to answer all of the questions correctly than a respondent living in the West. Living in the South also had a strong, statistically significant negative relationship with a respondents' probability of answering all of the questions correctly, such that respondents living in the South were 6.97% less likely than respondents living in the West to answer all of the questions correctly. Of the geographic variables, regional differences in residence appeared to better predict whether a person would exhibit knowledge of HIV transmission by answering all of the questions correctly.

1991 Survey Data. Socioeconomic variables continued to hold the relatively highest level of joint significance in the model using 1991 data ($\chi^2=767.65$). There was an approximately

two-fold increase in the ability for socioeconomic variables to predict the likelihood of whether a person would answer all of the HIV transmission questions correctly from 1991.

Unlike 1987, having a family income above the 1991 median household income was not significantly related to a respondents' likelihood of answering all of the questions correctly. However, all of the education variables except for being a college graduate exhibited an increase in predictive power from 1987 to 1991. A negative and statistically significant relationship was found between having less than a high school education and the probability that a person would answer all of the questions correctly, such that a person with less than a high school education was 17.00% less likely than a respondent with some college education to answer all of the questions posed correctly. A negative and statistically significant relationship was also found between having only some high school education and the probability that a person would answer all of the questions correctly, such that a person with a partial high school education was 9.38% less likely than a respondent with some college education to answer all of the questions posed correctly. A negative and statistically significant relationship was again found between being a high school graduate and the probability that a person would answer all of the questions correctly, such that high school graduates were 6.15% less likely than respondents with some college education to answer all of the questions posed correctly. There was a positive and statistically significant relationship between graduating college and answering all of the questions correctly, such that college graduates were 3.14% more likely to answer all of the questions correctly than respondents who received a partial college education. There was also a positive and statistically significant relationship between receiving a post graduate education and providing correct answers to all of the questions, such that respondents with a post graduate

education were 11.18% more likely that respondents receiving some college school education to respond correctly for all questions.

Demographic variables also accounted for a nearly equal level of joint significance in the model as did the socioeconomic variables in the 1991 survey year ($\chi^2=760.96$). This represents over a 400% increase in the level of joint significance of demographic variables from the 1987 survey year data.

In 1991, there was no significant relationship found between gender and the likelihood that respondents would answer all of the questions correctly. However, there continued to be significant relationships between race and answering all of the questions correctly. A negative and statistically significant relationship was found between being black and answering all of the questions correctly, such that black respondents were 6.87% less likely to answer all of the questions correctly than white respondents. This demographic variable had similar predictive power in the 1987 survey year. However, the negative relationship between being Hispanic and answering all of the questions correctly increased since 1987, such that Hispanic respondents were now 6.58% less likely to answer all of the questions correctly when compared with white respondents.

Age variables from the 1991 data could also more strongly predict the probability that a respondent would answer all of the questions correctly than in the 1987 data set. There was a positive and statistically significant relationship between being 17 to 24 years of age and answering all of the questions correctly, such that respondents in this age group were 7.00% more likely to have answered all of the questions correctly than respondents who ranged in age from 25 to 44. There was a negative and statistically significant relationship between being 45 to 64 years of age and respondents' likelihood of answering all of the questions correctly, such that

respondents who were 45 to 64 years old were 6.16% less likely to correctly answer all of the questions than respondents ranging in age from 25 to 44. There was also negative and statistically significant relationship between being 65 years of age or older and respondents' likelihood of answering all of the questions correctly, such that respondents who were 65 years of age or older were 15.19% less likely to correctly answer all of the questions than respondents ranging in age from 25 to 44.

Geographic factors continued to hold the relatively lowest level of joint significance in the model ($\chi^2=59.18$). This is a decrease from the level of joint significance held by these factors in 1987. There was a slight increase in the strength of the positive and statistically significant relationship between residing in a center city and the likelihood those respondents would answer all of the questions correctly from 1987, such that respondents living in a center city were 3.05% more likely to answer all of the questions correctly in 1991.

Overall, regional variables appeared to decline slightly in their predictive power since 1987. There was a negative and statistically significant relationship between living in the Midwest region of the U.S. and answering all of the questions correctly, such that respondents living in the Midwest were 2.19% less likely to answer all of the questions correctly than respondents living in the West. A slightly stronger negative relationship between living in the Northeast and answering the all of the questions correctly had emerged, such that a respondent living in the Northeast was 2.28% less likely to answer all of the questions correctly than a respondent living in the West. Living in the South also had a statistically significant negative relationship with a respondents' probability of answering all of the questions correctly, such that respondents living in the South were 3.61% less likely than respondents living in the West to answer all of the questions correctly.

1995 Survey Data. Demographic variables surpassed socioeconomic variables and held the relatively largest level of joint significance in the 1995 model ($\chi^2=546.51$). However, the joint significance of demographic variables in the 1995 model actually dropped relative to their level of joint significance in the 1991 model.

Contrary to the 1991 model, there was a negative and statistically significant relationship between being male and answering the questions correctly, such that men were 1.99% less likely to answer all of the questions correctly. This relationship was also in the opposite direction of the relationship found between these two variables in the 1987 model.

Once again, there were significant relationships between race and answering all of the questions correctly. A negative and statistically significant relationship was found between being black and answering all of the questions correctly, such that Black respondents were 8.14% less likely to answer all of the questions correctly than white respondents. This demographic variable increased in predictive power from the 1991 survey data. However, the negative relationship between being Hispanic and answering all of the questions correctly decreased in strength since 1991, such that Hispanic respondents were 5.23% less likely to answer all of the questions correctly when compared with white respondents in 1995.

Age variables continued to increase in predictive power from the previous years. There was a positive and statistically significant relationship between being 17 to 24 years of age and answering all of the questions correctly, such that respondents in this age group were 11.55% more likely to have answered all of the questions correctly than respondents who ranged in age from 25 to 44. There was a negative and statistically significant relationship between being 45 to 64 years of age and respondents' likelihood of answering all of the questions correctly, such that respondents who were 45 to 64 years old were 9.17% less likely to correctly answer all of the

questions than respondents ranging in age from 25 to 44. There was also negative and statistically significant relationship between being 65 years of age or older and respondents' likelihood of answering all of the questions correctly, such that respondents who were 65 years of age or older were 19.67% less likely to correctly answer all of the questions than respondents ranging in age from 25 to 44.

Socioeconomic variables continued to account for substantial levels of joint significance in the 1995 model ($\chi^2=482.57$). However, like the demographic variables, the joint significance of socioeconomic variables in the 1995 model actually dropped relative to their level of joint significance in the 1991 model.

As was the case in 1991, having an income below the national median household income was not significantly related to a respondents' likelihood of answering all of the questions correctly. However, all of the education variables exhibited an increase in predictive power from 1991 to 1995. A statistically significant, negative relationship was found between having less than a high school education and the probability that a person would answer all of the questions correctly, such that a person with less than a high school education was 21.35% less likely than a respondent with some college education to answer all of the questions posed correctly. A negative and statistically significant relationship was also found between having only some high school education and the probability that a person would answer all of the questions correctly, such that a person with a partial high school education was 12.99% less likely than a respondent with some college education to answer all of the questions posed correctly. A negative and statistically significant relationship was again found between being a high school graduate and the probability that a person would answer all of the questions correctly, such that high school graduates were 8.48% less likely than respondents with some college education to answer all of

the questions posed correctly. There was a positive and statistically significant relationship between graduating college and answering all of the questions correctly, such that college graduates were 5.42% more likely to answer all of the questions correctly than respondents who received a partial college education. There was also a positive and statistically significant relationship between receiving a post graduate education and providing correct answers to all of the questions, such that respondents with a post graduate education were 11.84% more likely than respondents receiving some college school education to respond correctly for all questions.

Geographic factors continued to hold the relatively lowest level of joint significance in the 1995 model ($\chi^2=81.28$). However, the level of joint significance for geographic factors in the 1995 model exhibited a relative increase in joint significance from the 1991 model.

There was a slight increase in the strength of the positive and statistically significant relationship between residing in a center city and the likelihood that respondents would answer all of the questions correctly from previous survey years, such that respondents living in a center city were 4.89% more likely to answer all of the questions correctly in 1995.

Overall, there was greater disparity in the predictive power among regional variables since 1991. There were no statistically significant differences between the ability to predict the probability that respondents would answer all of the questions correctly based on whether they lived in the West or Northeast region of the United States. There was, however, a negative and statistically significant relationship between living in the Midwest region of the U.S. and answering all of the questions correctly, such that respondents living in the Midwest were 2.71% less likely to answer all of the questions correctly than respondents living in the West. The negative and statistically significant relationship between living in the South and respondents' probability of answering all of the questions correctly grew in power since 1991, such that

respondents living in the South were 6.87% less likely than respondents living in the West to answer all of the questions correctly.

Overestimating Risk and Stigmatization of HIV/AIDS: Regression Analysis II

A non-linear regression was also performed to determine the significant factors that influence the likelihood that a respondent will incorrectly answer three or more questions designed to measure misperceptions concerning behaviors that have often been incorrectly associated with HIV transmission (See Table 10). Demographic variables, socioeconomic variables and geographic factors all had a significant influence on the likelihood that a person would answer three or more questions incorrectly in each of the three survey years (See Table 11).

1987 Survey Data. In 1987, socioeconomic variables held the relatively highest level of joint significance in the model ($\chi^2=479.21$). The respondents' family income was found to be significantly related to whether a person answers three or more of the questions concerning incorrect methods of HIV transmission incorrectly. Having a household income below the national median household income had a positive and statistically significant relationship with answering three or more of the questions incorrectly, such that a respondent with a family income below the median was 2.40% more likely to answer three or more questions incorrectly.

The education level of the respondent was also found to be a large predictor of whether the respondent would answer three or more of the questions incorrectly. A positive and statistically significant relationship was found between having less than a high school education and the probability that a person would answer three or more of the questions incorrectly, such that a person with less than a high school education was 19.49% more likely than a respondent with some college education to answer three or more of the questions incorrectly. A positive and

statistically significant relationship was also found between having only some high school education and the probability that a person would answer three or more questions incorrectly, such that a person with a partial high school education was 13.75% more likely than a respondent with some college education to answer three or more of the questions incorrectly. There was also a positive and statistically significant relationship between being a high school graduate and the probability that a person would answer three or more of the questions incorrectly, such that high school graduates were 6.00% more likely than respondents with some college education to answer three or more of the questions incorrectly. There was a negative and statistically significant relationship between graduating college and answering three or more of the questions incorrectly, such that college graduates were 10.16% less likely to answer three or more questions incorrectly than respondents who received a partial college education. There was also a negative and statistically significant relationship between receiving a post graduate education and providing three or more incorrect answers for the questions posed, such that respondents with a post graduate education were 11.66% less likely than respondents receiving some college school education to respond incorrectly to three or more questions.

Demographic variables also accounted for a substantial level of joint significance in the model ($\chi^2=245.18$). However, there was no significant relationship found between a respondents' gender and their likelihood of answering three or more questions incorrectly.

There were significant relationships between race and whether a respondent answered three or more of the questions incorrectly. A positive and statistically significant relationship was found between being black and answering three or more of the questions incorrectly, such that black respondents were 11.99% more likely to answer three or more of the questions incorrectly than white respondents. There was also a positive and statistically significant relationship

between being Hispanic and answering three or more questions incorrectly, such that Hispanic respondents were 6.81% more likely to answer three or more question incorrectly when compared with white respondents.

Age variables also significantly predicted whether a respondent would answer three or more questions incorrectly. There was a negative and statistically significant relationship between being 17 to 24 years of age and answering three or more of the questions incorrectly, such that respondents in this age group were 2.84% less likely to have answered three or more questions incorrectly than respondents who ranged in age from 25 to 44. There was a positive and statistically significant relationship between being 45 to 64 years of age and respondents' likelihood of answering three or more questions incorrectly, such that respondents who were 45 to 64 years old were 4.98% more likely to incorrectly answer three or more questions than respondents ranging in age from 25 to 44. There was also positive and statistically significant relationship between being 65 years of age or older and respondents' likelihood of answering three or more questions incorrectly, such that respondents who were 65 years of age or older were 11.37% more likely to incorrectly answer three or more of the questions than respondents ranging in age from 25 to 44.

Geographic factors held the relatively lowest level of joint significance in the model ($\chi^2=160.91$). The research found that there was a negative and statistically significant relationship between residing in a center city and the likelihood that a respondent would answer three or more of the questions incorrectly, such that respondents living in a center city were 1.80% less likely to answer three or more questions incorrectly.

Regional factors were also significant predictors of whether a respondent answers three or more of the questions concerning incorrect modes of HIV transmission incorrectly. There was

a positive and statistically significant relationship between living in the Northeast region of the U.S. and answering three or more questions incorrectly, such that respondents living in the Northeast were 5.52% more likely to answer three or more questions incorrectly than respondents living in the Western part of the United States. There was also a positive and statistically significant relationship between living in the Midwest region of the U.S. and answering all of the questions correctly, such that respondents living in the Midwest were 8.14% more likely to answer three or more questions incorrectly than respondents living in the West. There was an even stronger positive and statistically significant relationship between living in the South and respondents' probability of answering three or more of the questions incorrectly, such that respondents living in the South were 13.88% more likely than respondents living in the West to answer three or more of the questions incorrectly.

1991 Survey Data. Socioeconomic variables continued to hold the relatively highest level of joint significance in the model using 1991 data ($\chi^2=1157.07$). The relative level of joint significance for socioeconomic variables in the 1991 model was about twice the level of joint significance exhibited by these variables in the 1987 model.

A positive and statistically significant relationship was found between household income level and the likelihood that a respondent would answer three or more of the questions incorrectly, such that a respondent with a family income below the median was 3.47% more likely to answer three or more questions incorrectly. The strength of this relationship was slightly higher than the strength of the relationship between these two variables that was found in 1987.

The education level of the respondent was once again found to be a large predictor of whether the respondent would answer three or more of the questions incorrectly. A positive and statistically significant relationship was found between having less than a high school education

and the probability that a person would answer three or more of the questions incorrectly, such that a person with less than a high school education was 25.88% more likely than a respondent with some college education to answer three or more of the questions incorrectly. A positive and statistically significant relationship was also found between having only some high school education and the probability that a person would answer three or more questions incorrectly, such that a person with a partial high school education was 13.07% more likely than a respondent with some college education to answer three or more of the questions incorrectly. There was also a positive and statistically significant relationship between being a high school graduate and the probability that a person would answer three or more of the questions incorrectly, such that high school graduates were 7.48% more likely than respondents with some college education to answer three or more of the questions incorrectly. There was a negative and statistically significant relationship between graduating college and answering three or more of the questions incorrectly, such that college graduates were 1.98% less likely to answer three or more questions incorrectly than respondents who received a partial college education. There was also a negative and statistically significant relationship between receiving a post graduate education and providing three or more incorrect answers for the questions posed, such that respondents with a post graduate education were 9.04% less likely than respondents receiving some college school education to respond incorrectly to three or more questions.

Demographic variables also accounted for a considerable level of joint significance relative to the other variable groups in the model ($\chi^2=929.11$). This represents a 279% increase in the level of joint significance of demographic variables from the 1987 survey year data.

As was the case in 1987, there was no significant relationship found between a respondent's gender and their likelihood of answering three or more questions incorrectly.

However, there were significant relationships between the respondents' race and the probability of respondents answering three or more of the questions incorrectly. A positive and statistically significant relationship was found between being black and answering three or more of the questions incorrectly, such that black respondents were 10.58% more likely to answer three or more of the questions incorrectly than white respondents. There was also a positive and statistically significant relationship between being Hispanic and answering three or more questions incorrectly, such that Hispanic respondents were 5.98% more likely to answer three or more question incorrectly when compared with white respondents. The predictive power of these variables only decreased marginally since 1987.

There was a negative and statistically significant relationship between being 17 to 24 years of age and answering three or more of the questions incorrectly, such that respondents in this age group were 7.28% less likely to have answered three or more questions incorrectly than respondents who ranged in age from 25 to 44. There was a positive and statistically significant relationship between being 45 to 64 years of age and respondents' likelihood of answering three or more questions incorrectly, such that respondents who were 45 to 64 years old were 6.59% more likely to incorrectly answer three or more questions than respondents ranging in age from 25 to 44. There was also positive and statistically significant relationship between being 65 years of age or older and respondents' likelihood of answering three or more questions incorrectly, such that respondents who were 65 years of age or older were 17.07% more likely to incorrectly answer three or more of the questions than respondents ranging in age from 25 to 44.

Geographic factors continued to hold the relatively lowest level of joint significance in the model ($\chi^2=64.44$). This is a decrease from the level of joint significance held by these factors in 1987. The research once again found that there was a negative and statistically

significant relationship between residing in a center city and the likelihood that a respondent would answer three or more of the questions incorrectly concerning incorrect modes of HIV transmission incorrectly in 1991, such that respondents living in a center city were 2.51% less likely to answer three or more questions incorrectly.

Regional factors decreased in their predictive power to determine the likelihood of whether a respondent would answer three or more of the questions from the 1987 survey year. There was still a positive and statistically significant relationship between living in the Northeast region of the U.S. and answering three or more questions incorrectly, such that respondents living in the Northeast were 3.33% more likely to answer three or more questions incorrectly than respondents living in the Western part of the United States. The positive relationship between living in the Midwest region of the U.S. and answering all of the questions correctly approached statistical significance, such that respondents living in the Midwest were 1.29% more likely to answer three or more questions incorrectly than respondents living in the West. There was a positive and statistically significant relationship between living in the South and respondents' probability of answering three or more of the questions incorrectly, such that respondents living in the South were 4.18% more likely than respondents living in the West to answer three or more of the questions incorrectly.

1995 Survey Data. Socioeconomic variables continued to account for the largest relative level of joint significance in the 1995 model ($\chi^2=566.00$). However, the joint significance of socioeconomic variables in the 1995 model actually dropped relative to their level of joint significance in the 1991 model.

A positive and statistically significant relationship was found between household income level and the likelihood that a respondent would answer three or more of the questions

incorrectly, such that a respondent with a family income below the median was 2.30% more likely to answer three or more questions incorrectly. The magnitude of this relationship was slightly smaller in 1995 than the strength of the relationship between these two variables that was found in 1991.

The education level of the respondent was once again found to be a significant predictor of whether the respondent would answer three or more of the questions incorrectly. All of the education variables except for having a post graduate education exhibited an increase in predictive power from 1991 to 1995. A positive and statistically significant relationship was found between having less than a high school education and the probability that a person would answer three or more of the questions incorrectly, such that a person with less than a high school education was 28.92% more likely than a respondent with some college education to answer three or more of the questions incorrectly. A positive and statistically significant relationship was also found between having only some high school education and the probability that a person would answer three or more questions incorrectly, such that a person with a partial high school education was 18.21% more likely than a respondent with some college education to answer three or more of the questions incorrectly. There was also a positive and statistically significant relationship between being a high school graduate and the probability that a person would answer three or more of the questions incorrectly, such that high school graduates were 8.28% more likely than respondents with some college education to answer three or more of the questions incorrectly. There was a negative and statistically significant relationship between graduating college and answering three or more of the questions incorrectly, such that college graduates were 3.58% less likely to answer three or more questions incorrectly than respondents who received a partial college education. There was also a negative and statistically significant

relationship between receiving a post graduate education and providing three or more incorrect answers for the questions posed, such that respondents with a post graduate education were 5.48% less likely than respondents receiving some college school education to respond incorrectly to three or more questions.

Demographic variables continued to hold a relatively high level of joint significance in the 1995 model ($\chi^2=445.71$). The joint significance of demographic variables in the 1995 model decreased relative to their level of joint significance in the 1991 model as well. A positive and statistically significant relationship emerged between being male and a respondent's likelihood of answering three or more questions incorrectly, such that men were 1.74% more likely to answer three or more questions incorrectly compared to women.

There continued to be significant relationships between the respondents' race and the probability of respondents answering three or more of the questions incorrectly although the strength of this relationship declined from previous survey years. A positive and statistically significant relationship was found between being black and answering three or more of the questions incorrectly, such that black respondents were 8.46% more likely to answer three or more of the questions incorrectly than white respondents. There was also a positive and statistically significant relationship between being Hispanic and answering three or more questions incorrectly, such that Hispanic respondents were 3.64% more likely to answer three or more question incorrectly when compared with white respondents.

There was a negative and statistically significant relationship between being 17 to 24 years of age and answering three or more of the questions incorrectly, such that respondents in this age group were 10.11% less likely to have answered three or more questions incorrectly than respondents who ranged in age from 25 to 44. There was a positive and statistically significant

relationship between being 45 to 64 years of age and respondents' likelihood of answering three or more questions incorrectly, such that respondents who were 45 to 64 years old were 5.43% more likely to incorrectly answer three or more questions than respondents ranging in age from 25 to 44. There was also positive and statistically significant relationship between being 65 years of age or older and respondents' likelihood of answering three or more questions incorrectly, such that respondents who were 65 years of age or older were 18.23% more likely to incorrectly answer three or more of the questions than respondents ranging in age from 25 to 44. The magnitude of the relationship between being a member of either the oldest or youngest age group and the likelihood of a respondent to answer three or more questions incorrectly increased relative to the strength of the relationship between the two middle age groups and whether a respondent would answer three or more questions incorrectly.

Geographic factors continued to hold the relatively lowest level of joint significance in the 1995 model ($\chi^2=42.34$). Geographic factors in the 1995 model also exhibited relative declines in joint significance from the 1991 model.

A negative and statistically significant relationship between residing in a center city and the likelihood that a respondent would answer three or more of the questions incorrectly concerning incorrect modes of HIV transmission incorrectly, such that respondents living in a center city were 2.51% less likely to answer three or more questions incorrectly.

Regional factors continued to decrease in their predictive power to determine the likelihood of whether a respondent would answer three or more of the questions. Respondents living in the Northeast and the Midwest did not significantly differ from respondents living in the West in their likelihood of answering three or more of the questions incorrectly. However, there continued to be a positive and statistically significant relationship between living in the South

and respondents' probability of answering three or more of the questions incorrectly, such that respondents living in the South were 4.17% more likely than respondents living in the West to answer three or more of the questions incorrectly.

Overestimating Risk and Stigmatization of HIV/AIDS: Summary of Data

Overall, the joint levels of significance for geographic factors, socioeconomic factors and demographic factors when predicting respondents' probability of answering all of the questions correctly were similar to their joint levels of significance when predicting respondents' probability of answering three or more questions incorrectly. Geographic factors had greater strength in predicting individuals' knowledge of HIV/AIDS transmission in the 1987 survey year but decreased in predictive strength during later survey years, suggesting that geographic barriers to information about HIV/AIDS transmission were more easily overcome once this information was made more widely available to the general public.

However, demographic and socioeconomic variables predicting misperceptions concerning behaviors that have often been incorrectly associated with HIV transmission drastically increased in their predictive strength from 1987 to 1991, suggesting that gaps in individuals' knowledge of HIV/AIDS transmission were increasing based on their inherent characteristics and social class once information became widely available to the public. Socially constructed barriers to information had become a much stronger predictor of HIV transmission knowledge relative to geographic barriers during the survey years analyzed. Although the joint significance of these variables dropped from 1991 to 1995, they continued to remain much higher than their joint significance levels in 1987.

Discussion

It is evident from the data presented in this study that overall knowledge about the risks of HIV transmission has increased within the U.S. population; the most drastic increases occurred between 1987 and 1991 with relatively small increases in general HIV transmission knowledge from 1991 to 1995. The initial spike in knowledge of NHIS respondents that occurred between 1987 and 1991 may have been due to widespread efforts of the U.S. government to provide the public with information concerning this disease, through the distribution of the Understanding AIDS brochure and other HIV/AIDS awareness campaigns. The drastic tapering of knowledge growth among NHIS respondents from 1991 to 1995 may indicate that the people who had a desire to learn about HIV/AIDS did so as soon as information about the disease was made available to the public in 1988. This hypothesis, however, was unable to be directly tested given that data collected by the NHIS was not longitudinal in nature.

Holtgrave, Thomas, Chen, Edlavitch, Pinkerton and Fleming (2002) found that the Centers for Disease Control and Prevention have allocated funds for HIV prevention programs in a way that reflects the HIV/AIDS epidemic in terms of race and ethnicity. It appears that a broader HIV awareness campaign would be warranted in order to better educate the entire U.S. population on proper condom use, given that respondents in this study were largely lacking in knowledge about this subject.

However, the CDC and other programs in charge of distributing funds for HIV/AIDS educational programs have often neglected the importance of continuing programs to educate people about misperceptions concerning behaviors that have often been incorrectly associated with HIV transmission. Preventing the immediate spread of HIV/AIDS has been the sole focus of U.S. informational campaigns since the distribution of "Understanding AIDS" in 1987.

For the most part, it is clear from the information gathered in this study that the U.S. population is and has always been aware of the behaviors that lead to HIV transmission; inaccurate beliefs concerning behaviors that have often been incorrectly associated with HIV transmission are much more common. Among the individual variables examined in this study, age, race and education levels appeared to have the most pronounced effects when predicting whether a person would be well informed or misinformed about the behaviors that have often been incorrectly associated with HIV transmission. Large strides have been made by the U.S. government to educate minority races about the risks associated with HIV transmission and these efforts have been somewhat successful (Holtgrave, Thomas, Chen, Edlavitch, Pinkerton and Fleming, 2002). The data also showed that respondents' racial background had continued to decline in its predictive potential indetermining whether these individuals would be able to identify incorrect modes of HIV transmission.

However, the gaps in knowledge of HIV transmission between people of different ages and educational backgrounds have continued to widen. It is possible that these gaps in knowledge have emerged in older and less educated populations from either a lack of desire to learn about HIV/AIDS due to perceived disassociation from the impact of the epidemic or general tendencies to hold prejudiced attitudes towards people with HIV/AIDS or the people who compose the populations that are most at risk of contracting the disease. It is unlikely that these reasons would explain why individuals from racial minority groups lack knowledge about the behaviors often incorrectly associated with HIV transmission.

The United States should increase its efforts in both arousing empathy for U.S. populations that have been disproportionately affected by the HIV/AIDS epidemic and educating populations that have not been historically affected by the AIDS epidemic, such as older

populations, about the increasing risks of contracting HIV/AIDS from another member of their through unprotected sex. By decreasing Americans' social stigma against HIV/AIDS, people may become less fearful of learning their HIV status and would be more likely to seek treatment if they become infected with this disease.

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Additional Resources

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Health Resources and Services Administration (HRSA) HIV/AIDS Bureau (HAB)

<http://hab.hrsa.gov/publications/stigma/introduction.htm>

<http://www.cdc.gov/mmwr/preview/mmwrhtml/00000019.htm>

Understanding AIDS http://profiles.nlm.nih.gov/NN/B/B/V/N/_nnbbvn.pdf

<http://www.census.gov/hhes/income/histinc/h08.html>

Table 1. Misperceptions about HIV/AIDS Transmission: Underestimation of Risk

Panel A. All Respondents

	1987	1991	1995
Likelihood of getting AIDS from sharing needles with someone who has AIDS/AIDS virus:			
Likely	94.68(16,755)	95.29(40,714)	96.20(16,208)
Unlikely	0.45(79)	0.76(323)	0.54(91)
Not Possible	0.16(28)	0.28(120)	0.15(26)
T/F: Any person with the AIDS virus can pass it on to someone else through sexual intercourse			
True	92.47(16,364)	94.28(40,282)	-
False	1.46(258)	1.10(472)	-
T/F: AIDS can be passed on through sexual intercourse between a man and woman			
True	-	-	96.34(16,232)
False	-	-	0.42(71)
T/F: AIDS can be passed on through sexual intercourse between two men			
True	-	-	94.95(15,998)
False	-	-	0.36(60)
T/F: A pregnant woman who has the AIDS virus can give it to her baby			
True	91.13(16,127)	93.15(39,798)	92.11(15,519)
False	0.45(80)	0.53(227)	1.01(171)
Effectiveness of the use of condoms to prevent getting the AIDS virus through sexual activity			
Very Effective	33.31(5,814)	27.01(11,540)	20.16(3,397)
Somewhat Effective	47.17(8,233)	47.84(20,440)	52.69(8,878)
Not at All Effective	5.72(998)	3.63(1,550)	5.31(895)
Don't know how effective	9.86(1,721)	18.00(7,691)	18.89(3,189)
Latex condoms and natural membrane condoms are equally good at preventing transmission of the AIDS virus			
True	-	17.30(7,200)	-
False	-	19.66(8,183)	-
Don't Know or Refused	-	61.83(25,731)	-
Oil-based lubricants can cause latex to break			
True	-	26.66(11,095)	42.05(7,095)
False	-	5.57(2,318)	9.80(1,651)
Don't Know or Refused	-	66.50(27,671)	47.62(8,023)

Table 2. Misperceptions about HIV/AIDS Transmission: Overestimation of Risk

Panel A. All Respondents (Reported Percentages and Number of Respondents)

Likelihood of getting AIDS from:	1987	1991	1995
<u><i>Symbolic, Non-Physical Contact</i></u>			
Attending school with a child who has the AIDS/AIDS virus :			
Correct Answer	62.73(11,101)	78.54(33,558)	76.57(12,900)
Incorrect Answer	25.35(4,486)	12.58(5,373)	15.76(2,655)
No Answer/DK/Refused	11.92(2,109)	8.88(3,794)	7.67(1,293)
Working near or with a person who has the AIDS/AIDS virus :			
Correct Answer	58.61(10,371)	79.25(33,861)	73.20(12,332)
Incorrect Answer	30.82(5,454)	13.23(5,652)	20.10(3,386)
No Answer/DK/Refused	10.57(1,871)	7.52(3,212)	6.71(1,130)
<u><i>Casual or Indirect Physical Contact</i></u>			
Using as public toilet:			
Correct Answer	45.41(8,035)	63.35(2,066)	74.47(12,546)
Incorrect Answer	41.50(7,344)	26.24(11,209)	17.82(3,003)
No Answer/DK/Refused	13.09(2,317)	10.42(4,450)	7.71(1,299)
Being coughed or sneezed on by someone who has AIDS/AIDS virus:			
Correct Answer	32.43(5,738)	47.83(20,435)	49.21(8,291)
Incorrect Answer	55.02(9,737)	39.11(16,709)	38.42(6,473)
No Answer/DK/Refused	12.55(2,221)	13.06(5,581)	12.37(2,084)
Sharing plates, forks, or glasses with someone who has AIDS/ AIDS virus:			
Correct Answer	35.02(6,197)	49.93(21,332)	52.96(8,922)
Incorrect Answer	51.12(9,046)	38.88(16,613)	36.62(6,169)
No Answer/DK/Refused	13.86(2,453)	11.19(4,780)	10.43(1,757)

Table 3. Misperceptions about HIV/AIDS Transmission: Overestimation of Risk: Number of likelihood statements (from Table 2) that respondents answered incorrectly given in percentages

Panel A: Total Population

	1987	1991	1995
No Statements	18.55(3,283)	33.09(14,138)	35.19(5,929)
One Statement	13.35(2,363)	17.98(7,682)	17.73(2,987)
Two Statements	14.52(2,570)	15.67(6,696)	16.60(2,796)
Three or More Statements	53.57(9,480)	33.26(14,209)	30.48(5,136)

Panel B: Sex of Respondent

	1987	1991	1995
Male			
No Statements	20.24(1,479)	33.76(6,030)	35.86(2,567)
One Statement	13.49(986)	18.32(3,271)	18.01(1,289)
Two Statements	14.68(1,073)	16.06(2,868)	16.51(1,182)
Three or More Statements	51.58(3,769)	31.86(5,690)	29.63(2,121)
Female			
No Statements	17.36(1,804)	32.61(8,108)	34.70(3362)
One Statement	13.25(1,377)	17.74(4,411)	17.53(1,698)
Two Statements	14.41(1,497)	15.39(3,828)	16.66(1,614)
Three or More Statements	54.97(5,711)	34.26(8,519)	31.12(3,015)

Panel C: Race of Respondent

	1987	1991	1995
Caucasian			
No Statements	20.29(2,835)	34.71(11,512)	37.13(4,370)
One Statement	14.03(1,960)	18.63(6,180)	17.80(2,095)
Two Statements	15.12(2,112)	15.79(5,238)	16.96(1,996)
Three or More Statements	50.55(7,062)	30.87(10,237)	28.11(3,308)
Black/African-American			
No Statements	11.29(277)	27.19(1,552)	30.22(622)
One Statement	9.99(245)	14.68(838)	18.32(377)
Two Statements	12.19(299)	15.14(864)	15.26(314)
Three or More Statements	66.53(1,632)	42.98(2,453)	36.20(745)
Hispanic			
No Statements	14.34(119)	28.62(741)	30.75(651)
One Statement	13.73(114)	17.11(443)	17.19(364)
Two Statements	13.13(109)	15.99(414)	16.53(350)
Three or More Statements	58.80(488)	38.28(991)	35.52(752)

Table 4. Misperceptions about HIV/AIDS Transmission - Overestimation of Risk: Number of likelihood statements (from Table 2) that respondents answered incorrectly given in percentages

Panel A: Age of Respondent

	1987	1991	1995
17-24 Years of Age			
No Statements	20.70(481)	42.72(2,061)	50.19(914)
One Statement	14.80(344)	19.78(954)	20.81(379)
Two Statements	15.40(358)	14.66(707)	11.26(205)
Three or More Statements	49.10(1,141)	22.84(1,102)	17.74(323)
25-34 Years of Age			
No Statements	21.44(910)	40.11(4,001)	41.90(1,502)
One Statement	15.46(656)	18.87(1,882)	18.52(664)
Two Statements	14.63(621)	15.17(1,513)	15.23(546)
Three or More Statements	48.47(2,057)	25.85(2,578)	24.35(873)
35-44 Years of Age			
No Statements	23.03(797)	36.64(3,264)	41.26(1,592)
One Statement	14.62(506)	19.55(1,742)	18.22(703)
Two Statements	15.52(537)	16.05(1,430)	15.43(596)
Three or More Statements	46.84(1,621)	27.76(2,473)	25.06(967)
45-54 Years of Age			
No Statements	17.93(383)	33.29(1,920)	34.12(900)
One Statement	12.17(260)	18.79(1,084)	19.33(510)
Two Statements	14.84(317)	15.98(922)	18.65(492)
Three or More Statements	55.06(1,176)	31.93(1,842)	27.90(736)
55-64 Years of Age			
No Statements	15.32(320)	27.09(1,343)	25.95(456)
One Statement	12.49(261)	17.16(851)	17.02(299)
Two Statements	15.17(317)	17.39(862)	19.92(350)
Three or More Statements	57.01(1,191)	38.36(1,902)	37.11(652)
65 Years of Age and Up			
No Statements	11.39(392)	18.68(1,549)	17.72(565)
One Statement	9.76(336)	14.10(1,169)	13.55(432)
Two Statements	12.20(420)	15.22(1,262)	19.03(607)
Three or More Statements	66.65(2,294)	52.00(4,312)	49.70(1,585)

Table 5. Misperceptions about HIV/AIDS Transmission - Overestimation of Risk: Number of likelihood statements (from Table 2) that respondents answered incorrectly given in percentages

Panel A: Education Level of Respondent

	1987	1991	1995
Less Than High School			
No Statements	6.00(112)	14.05(569)	13.50(218)
One Statement	8.30(155)	10.77(436)	11.95(193)
Two Statements	10.18(190)	13.21(535)	14.92(241)
Three or More Statements	75.52(1,410)	61.98(2,510)	59.63(963)
Some High School			
No Statements	10.78(241)	25.38(1,275)	24.78(460)
One Statement	10.15(227)	16.44(826)	14.82(275)
Two Statements	13.64(305)	15.13(760)	16.86(313)
Three or More Statements	65.43(1,463)	43.05(2,163)	43.53(808)
High School Graduate			
No Statements	16.93(1,137)	30.54(4,801)	31.45(1,907)
One Statement	13.51(907)	18.38(2,890)	18.74(1,136)
Two Statements	14.43(969)	17.02(2,675)	18.60(1,128)
Three or More Statements	55.14(3,703)	34.06(5,355)	31.21(1,892)
Some College			
No Statements	21.98(785)	38.91(3,534)	42.23(1,544)
One Statement	14.89(532)	20.28(1,842)	20.13(736)
Two Statements	16.13(576)	15.65(1,421)	15.81(578)
Three or More Statements	47.00(1,679)	25.16(2,285)	21.83(798)
College Graduate			
No Statements	28.95(540)	41.96(2,121)	47.54(974)
One Statement	16.51(308)	18.89(955)	18.16(372)
Two Statements	17.48(326)	15.71(794)	15.62(320)
Three or More Statements	37.05(691)	23.44(1,185)	18.69(383)
Post Graduate Education			
No Statements	33.31(461)	49.16(1,823)	52.20(807)
One Statement	16.84(233)	19.50(723)	17.21(266)
Two Statements	14.45(200)	13.46(499)	13.39(207)
Three or More Statements	35.40(490)	17.88(663)	17.21(266)

Table 6. Misperceptions about HIV/AIDS Transmission - Overestimation of Risk: Number of likelihood statements (from Table 2) that respondents answered incorrectly given in percentages

Panel A: Family Yearly Income of Respondent

	1987	1991	1995
Under (Approximate) Median Yearly Income for Survey Year			
No Statements	15.74(1,376)	30.20(6,089)	32.67(2,930)
One Statement	12.19(1,066)	16.75(3,377)	17.06(1,530)
Two Statements	14.03(1,227)	15.29(3,082)	16.60(1,489)
Three or More Statements	58.03(5,074)	37.75(7,611)	33.66(3,019)
Over (Approximate) Median Yearly Income for Survey Year			
No Statements	23.70(1,617)	38.37(6,092)	41.21(2,369)
One Statement	15.18(1,036)	20.16(3,200)	19.54(1,123)
Two Statements	15.43(1,053)	16.18(2,568)	17.08(982)
Three or More Statements	45.69(3,118)	25.29(4,051)	22.16(1,274)

	1987	1991	1995
Below Poverty Threshold			
No Statements	13.69(316)	30.27(1,560)	33.06(772)
One Statement	11.65(269)	15.49(798)	15.97(373)
Two Statements	12.17(281)	13.51(696)	13.83(323)
Three or More Statements	62.49(1,443)	40.73(2,099)	37.13(867)
At or Above Poverty Threshold			
No Statements	20.11(2,830)	34.53(11,681)	36.49(4,870)
One Statement	13.81(1,943)	18.69(6,324)	18.31(2,443)
Two Statements	15.09(2,124)	16.09(5,443)	17.41(2,323)
Three or More Statements	50.98(7,174)	30.69(10,384)	27.80(3,710)

Table 7. Misperceptions about HIV/AIDS Transmission - Overestimation of Risk: Number of likelihood statements (from Table 2) that respondents answered incorrectly given in percentages

Panel F: Region of Respondent

	1987	1991	1995
West			
No Statements	24.14(868)	36.00(3,278)	38.43(1,421)
One Statement	15.91(572)	18.93(1,724)	17.85(660)
Two Statements	15.41(554)	15.10(1,375)	15.04(556)
Three or More Statements	44.53(1,601)	29.97(2,729)	28.69(1,061)
Northeast			
No Statements	20.19(727)	32.24(2,839)	37.25(1,324)
One Statement	14.08(507)	18.01(1,586)	17.65(628)
Two Statements	14.58(525)	16.27(1,433)	16.18(575)
Three or More Statements	51.14(1,841)	33.48(2,949)	28.90(1,027)
Midwest			
No Statements	17.79(810)	33.82(3,646)	36.04(1,444)
One Statement	13.73(625)	18.79(2,026)	18.07(724)
Two Statements	14.87(677)	15.85(1,709)	16.97(680)
Three or More Statements	53.60(2,440)	31.54(3,400)	28.92(1,159)
South			
No Statements	14.76(878)	31.18(4,375)	31.13(1,740)
One Statement	11.08(659)	16.72(2,346)	17.44(975)
Two Statements	13.68(814)	15.53(2,179)	17.62(985)
Three or More Statements	60.48(3,598)	36.57(5,131)	33.80(1,889)

Panel G: MSA Residence

	1987	1991	1995
Center City Resident			
No Statements	19.08(1,149)	34.38(4,908)	37.89(2,094)
One Statement	13.38(883)	17.33(2,473)	17.12(946)
Two Statements	13.62(820)	15.17(2,165)	15.05(832)
Three or More Statements	53.47(3,220)	33.12(4,728)	29.94(1,655)
Non-Center City Resident			
No Statements	18.28(2,134)	32.44(9,230)	33.88(3,835)
One Statement	13.11(1,530)	18.31(5,209)	18.03(2,041)
Two Statements	14.99(1,750)	15.93(4,531)	17.35(1,964)
Three or More Statements	53.62(6,260)	33.32(9,481)	30.75(3,481)

Table 8. Factors that Influence the Likelihood that Respondents Will Answer All Likelihood Questions Correctly (of the 5 that are analyzed)

Independent Variables	1987 Respondents [Coefficient (Std. Error)]	1991 Respondents [Coefficient (Std. Error)]	1995 Respondents [Coefficient (Std. Error)]
<i>Demographic Factors</i>			
Sex (Male)	.0121746(.0063464)**	-.0066589(.005126)	-.0198612(.0081854)*
Race			
Black	-.0689702(.0086592)*	-.0687001(.0077759)*	-.0814372(.012391)*
Hispanic	-.0389111(.0136794)*	-.0658021(.0103342)*	-.0523582(.0130919)*
Age			
17-24 Years	.0232922(.0100364)*	.0700042(.0085951)*	.1155196(.0141195)*
45-64 Years	-.033522(.0075146)*	-.0615668(.0060441)*	-.091719(.009382)*
65 and Up	-.0561542(.0136794)*	-.1519215(.0066601)*	-.1967405(.010102)*
<i>Socio-Economic Factors</i>			
Income (Below Median)	-.0161708(.0069603)*	-.006332(.0056819)	.0019633(.0091046)
Education			
Less than High School	-.1189161(.0090679)*	-.1699941(.0089231)*	-.2134959(.0131209)*
Some High School	-.0793296(.0092229)*	-.0937848(.0085379)*	-.1298889(.0132718)*
High School Grad	-.0365968(.0080003)*	-.0615291(.0065939)*	-.084789(.0104029)*
College Grad	.0606232(.0123839)*	.0314478(.0090015)*	.0541705(.0143428)*
Post-Grad	.0957135(.0144708)*	.1118106(.0104185)*	.1184416(.0162834)*
<i>Geographic Factors</i>			
MSA Residence: Center City	.016303(.0069449)*	.0304852(.0056676)*	.0488923(.0090714)*
Region (Missing West)			
Northeast	-.0217571(.0089688)*	-.0228378(.0075668)*	-.0077624(.0124461)
Midwest	-.0495384(.0081295)*	-.0218666(.0073221)*	-.0271466(.0120431)*
South	-.0697163(.0079173)*	-.0361421(.0070301)*	-.0686748(.0109734)*
Number of Observations	15540	35993	14676
Log Likelihood	-7179.2478	-21944.892	-8884.052
% Positive Observations	19.23423%	33.82602%	36.00436%

*=statistically significant within a 95% confidence interval

**=trend of significance within a 90% confidence interval

Table 9. Chi-Square Values for Groups of Factors that Influence the Likelihood That Respondents Will Answer All Likelihood Questions Correctly

	1987 Respondents	1991 Respondents	1995 Respondents
Demographic Factors	146.63	760.96	546.51
Socio-Economic Factors	376.12	767.65	482.57
Geographic Factors	91.32	59.18	81.28

Table 10. Factors that Influence the Likelihood that Respondents Will Answer More Than Three Likelihood Questions Incorrectly (of the 5 that are analyzed)

Independent Variables	1987 Respondents [Coefficient (Std. Error)]	1991 Respondents [Coefficient (Std. Error)]	1995 Respondents [Coefficient (Std. Error)]
<i>Demographic Factors</i>			
Sex (Male)	-.0088398(.0084093)	.0040532(.0051216)	.0173615(.0077672)*
Race			
Black	.1199387(.0126814)*	.1057544(.0086023)*	.0846112(.0133529)*
Hispanic	.0680699(.0197376)*	.0598285(.0114809)*	.0364143(.0132275)*
Age			
17-24 Years	-.028413(.012926)*	-.0727752(.007935)*	-.1011193(.0116791)*
45-64 Years	.0497537(.0105421)*	.0659345(.006538)*	.054305(.0097973)*
65 and Up	.1136638(.0121895)*	.1707163(.0080108)*	.1823878(.012352)*
<i>Socio-Economic Factors</i>			
Income (Below Median)	.0239648(.0092694)*	.0346996(.0056804)*	.0230063(.0087096)*
Education			
Less than High School	.194913(.0156828)*	.2587884(.0116498)*	.28917(.0180357)*
Some High School	.1375326(.0143667)*	.1307045(.010123)*	.1821372(.0162441)*
High School Grad	.0600437(.0111173)*	.0748182(.0070569)*	.0828468(.0108952)*
College Grad	-.1015517(.015413)*	-.0197981(.009174)*	-.0358437(.0137164)*
Post-Grad	-.1165653(.0169847)*	-.0903879(.0094695)*	-.0548376(.0146352)*
<i>Geographic Factors</i>			
MSA Residence: Center City	-.018008(.0091804)*	-.0251572(.0055609)*	-.029715(.0083541)*
Region (Missing West)			
Northeast	.0551963(.0129219)*	.0332861(.007959)*	-.0071788(.0119793)
Midwest	.08141(.0120177)*	.0129326(.0076362)**	.0038544(.011863)
South	.138798(.0114299)*	.0417766(.0073408)*	.0416614(.0108865)*
Number of Observations	15540	35993	14676
Log Likelihood	-10114.753	-21047.222	-8129.5812
% Positive Observations	52.58044%	32.23405%	29.15645%

*=statistically significant within a 95% confidence interval

**=trend of significance within a 90% confidence interval

Table 11. Chi-Square Values for Groups of Factors that Influence the Likelihood That Respondents Will Answer More Than Three Likelihood Questions Incorrectly

	1987 Respondents	1991 Respondents	1995 Respondents
Demographic Factors	245.18	929.11	445.71
Socio-Economic Factors	479.21	1157.07	566.00
Geographic Factors	160.91	64.44	42.34