EFFECT OF AGE ON LIKELIHOOD TO TEST FOR HIV

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HIV/AIDS can affect individuals of any age. Efforts to educate those considered to be most at-risk, based on the age at which the most individuals are infected, are ongoing and public. Less work and mainstream education outreach, however, are being directed at an older population, who can be more likely to contract HIV, more susceptible to the effects of HIV, and more likely to develop AIDS, than younger persons. Guided by the health belief model theory, research was conducted to determine what, if any, relationship existed between age of an individual and the possibility that an HIV test will be sought. Factors of gender, education, ethnicity and marital status were included in analyses. The research indicated that, as age increased, likelihood for getting an HIV test decreased. Overall, most individuals had not been tested for HIV. The implications of an aged and aging population with HIV include a need for coordinated service delivery, increased education, and outreach.
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By

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Finally, I dedicate this work to my grandmother, Benita Ramirez (1920-2009): Even with only an elementary school education, you accomplished more with less than most people who start out with everything. Grandma, this one’s for you.
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INTRODUCTION

Age and sexuality have always been regarded as inversely proportional to each other. Youth is linked to sex appeal, while aging is portrayed as a process that diminishes vitality and eliminates any desire for sexual intercourse or intimacy. This inaccurate and unfortunate representation of the relationship between aging and sexual activity has been detrimental to aging and aged adults, and it interferes with older adults being viewed realistically, as individuals with sexual desires that do not evaporate as a function of age. Indeed, believing that only younger adults participate in sexual activities is not merely a benign misperception, but one that carries dangerous consequences. The emergence and proliferation of the human immunodeficiency virus (HIV) constitute an injurious result of underestimating the sexual desire and activity of individuals as they age.

The prevalence of HIV and acquired immune deficiency syndrome (AIDS) in older adults should engender concern but does not receive enough attention, despite statistical evidence. According to the Centers for Disease Control’s (CDC) HIV/AIDS Surveillance Report (2007) nearly one-fifth (17%) of all diagnoses of HIV in 2007 were among adults aged 50 years and older. Both the AIDS Community Research Initiative of America (Karpiak, Shippy, & Cantor, 2006) and the New Mexico AIDS Education and Training Center (2011) report that nearly one-third (27% and 29%, respectively) of people with AIDS are adults 50 years of age and older. These facts document the current connection between older adults and HIV/AIDS, but statistics alone cannot generate the urgency necessary to address the inherent misconceptions regarding older adults and HIV/AIDS. The facts about older adults and HIV serve to clarify the need for older adults who are at risk for contracting HIV to be tested.
STATEMENT OF THE PROBLEM

HIV is not typically associated with older adults primarily because they are not considered to be sexually active (Altschuler, Katz, & Tynan, 2004; Falvo & Norman, 2004; Garvey, 1994; Whipple & Scura, 1989) or thought to engage in other HIV-related risk behaviors (Linsk, 1994; Skiest & Keiser, 1997; Wooten-Bielski, 1999). The effects of aging can mimic symptoms of an HIV infection (Altschuler et al., 2004; Mack & Bland, 1999; Nazon & Levine-Perkell, 1996), which may mislead physicians into believing that the symptoms are due to the age of the patient. Most health care providers are undoubtedly knowledgeable about HIV and its risk behaviors, but they may be uncomfortable discussing an older patient’s sexual history or behavior (Agate, Mullins, Prudent, & Liberti, 2003; Glass & Webb, 1995; Wooten-Bielski, 1999), or unable to acknowledge the telltale symptoms of HIV in older patients (Falvo & Norman, 2004; Grabar, Weiss, & Costagliola, 2006; Maes & Louis, 2003; Skiest & Keiser, 1997).

According to the Kaiser Family Foundation (2009), only 31% of adults aged 50 to 64 years and 14% of adults aged 65 years and older indicated having discussed HIV/AIDS with their doctor or health care provider, as compared to nearly half (46%) of adults aged 30 to 49 years. In addition, distinguishing between age-related symptoms and those caused by HIV can be problematic (Siegel, Dean, & Schrimshaw, 1999), both for an older patient and a health care provider, neither of whom may consider suggesting an HIV test (Maes & Louis, 2003).

Testing for HIV/AIDS in older adults has also been hampered in other ways. Some individuals with AIDS develop dementia; and in such cases physicians typically assume Alzheimer’s disease to be the cause, without considering AIDS as a possible source of dementia in older patients (Altschuler et al., 2004; Grabar et al., 2006; Hillman, 1998). In general, older
adults have been considered to be at risk for contracting HIV/AIDS only from contaminated blood products (Garvey, 1994; Stall & Catania, 1994). Consequently, after the risk for contracting HIV/AIDS from blood transfusions was eliminated when screening of blood products for HIV began in 1985 (Nazon & Levine-Perkell, 1996), older adults were no longer considered in danger of contracting HIV.

Despite the discovery of additional HIV-related risk factors, none of which is dependent on age, there has been insufficient awareness of older adults’ likelihood for contracting HIV. Not all older adults are unaware of HIV (Lekas, Schrimshaw, & Siegel, 2005), but knowledge of risk behaviors does not mean a realistic appraisal of risk (Henderson, Bernstein, St. George, Doyle, Paranjape, & Corbie-Smith 2004; Linsk, 2000; Rose, 1996). Other older adults do not know the risk factors that cause a person to contract HIV (Centers for Disease Control [CDC], 2008; Grabar et al. 2006; Shippy & Karpiak, 2005; Stall & Catania, 1994). For older adults reentering the dating scene, due to divorce or death of a partner (Levy, Ory, & Crystal, 2003; Shah & Mildvan, 2006), this lack of knowledge is certainly problematic.

For older adults who are more aware of HIV risk factors, taking action can be difficult. Older adults are less likely to use protective measures (Emlet & Farkas, 2001; Mack & Bland, 1999), especially if preventing conception is not an issue (Zablotsky & Kennedy, 2003). Even if a request is made, the correct use of condoms may not always occur (Hillman, 2007).

Age should not be considered a protective factor against contracting HIV because the risks for contracting HIV are unrelated to age (McBride, Maw, Dinsmore, Horner, Nelson, & Finnegan, 1992). An undiagnosed HIV-positive older adult can and will lose valuable time to begin medication and treatment (Szerlip, Desalvo, & Szerlip, 2005), can unknowingly infect
others (Nichols et al., 2002), and will progress to AIDS that much sooner (Gordon & Thompson, 1995; Wooten-Bielski, 1999. Given these facts, exploration into the effect of age and HIV is warranted.
SIGNIFICANCE OF THE STUDY

The current research examined what, if any, relationship exists between age and likelihood of being tested for HIV. Understanding the extent to which age affects likelihood of seeking an HIV test is significant for several reasons.

The difference between contracting HIV/AIDS at an older age versus a younger age is underestimated, if considered at all. Valuing and understanding that information is crucial in illustrating how much more devastating HIV and AIDS can be for an older body than for a younger one. Older adults are more susceptible to the severity of HIV due to the effects of the aging process (Ferrini & Ferrini, 2000; Nichols et al., 2002.) If an older adult who is already HIV-positive does not seek an HIV test, complications increase, especially if he or she has already developed AIDS.

The severity of HIV-related symptoms may increase more rapidly without any treatment regimen in an older adult compared to a younger adult (Mack & Bland, 1999). Older adults are more likely than younger adults to die from AIDS in the same quarter they receive their diagnosis (Justice & Weissman, 1998; Zelentz & Epstein, 1998). Older adults may also be at greater risk of suffering HIV-related symptoms and opportunistic infections (Levy, Ory, & Crystal, 2003), and may develop full-blown AIDS sooner than younger persons due to an aging and less effective immune system (Mack & Bland, 1999; Paul, Rose, Lu, & Lin, 2007; Small, 2010). When individuals are tested for HIV and receive treatment, complications that would arise from non-treatment can be avoided (Garvey, 1994).

HIV is now a chronic condition, and HIV-positive individuals have a better chance to survive infection and delay the progression into AIDS due to advances in medicine (Gribble et
al., 1998). Older adults with HIV are either aging with the condition long term or as the result of recent infection. In either case, the disease can progress to AIDS if the HIV infection is left untreated and will then require more resources (Kitahata et. al, 2009), both medical and financial. Costs of treatment are higher when a diagnosis of HIV is delayed (Krentz, Auld, & Gill, 2004; Sanders, Bayoumi, Holodniy, & Owens, 2008).

Older adults are more likely than younger persons to receive a diagnosis of AIDS soon after they have been diagnosed with HIV (Mugavero et al., 2007; Wooten-Bielski, 1999). Delay in HIV diagnosis due to older adults’ unfamiliarity with HIV-related symptoms and medical personnel’s lack of recognition of HIV symptoms present in older adults (AIDS InfoNet, 2011; Siegel et al., 1999) can result in unnecessary and life-threatening delays in treatment (Karpiak, Shippy, & Cantor, 2006; Szerlip et al., 2005), as well as increasing the potential for unwitting transmission of the infection to other persons (Nichols et al., 2002).

Age can affect an individual’s ability to cope with the effects of HIV/AIDS in several ways. First, taking the medications can be problematic for an aging or aged body. For an older person who has multiple chronic conditions, such as diabetes, arthritis, and cardiovascular disease, the introduction of additional medicines necessary for treating HIV/AIDS can be disruptive to an already fragile system (Nokes, 1996). The side-effects of these medications are challenging even in a younger individual, and aging combined with other medications and medical conditions can make HIV/AIDS management more difficult in an older adult (AIDS InfoNet, 2011; Nazon & Levine-Perkell, 1996).

HIV is a significant concern for older adults due to a lack of information about HIV, low awareness of risk, and misconceptions about how HIV is and is not transmitted. Assessing the
The effect of age on being tested for HIV can provide valuable information about risk perception. Individuals who do not perceive themselves to be at risk for contracting HIV would be likely to regard testing as optional or unnecessary. As discussed previously, not being approached by medical professionals, outreach campaigns, or other resources that emphasize the importance of being tested, leads older adults to underestimate or inaccurately appraise the possibility of their contracting or already having contracted HIV.

Understanding older adults’ information level about HIV, specifically with regard to misconceptions and gaps in knowledge, is important in order to determine what approaches are appropriate. Additionally, an understanding of the influence of age, education level, marital status, and ethnicity relative to knowledge, awareness, and information about HIV, is also important in the efforts to prevent HIV in older adults.

The key issues to explore can be organized into four areas: issues of personal susceptibility/vulnerability to HIV (older adults may not be aware of or may underestimate their vulnerability to the disease); severity of the disease or condition (older adults typically do not comprehend how severe HIV can be, especially as it progresses to AIDS); perceived efficacy of behavior in dealing with the condition (older adults may not know about safer sex options or may be disinclined to employ them in the belief that they don’t need them); and perceived barriers to adopting the behavior (older adults may be unaware of how to prevent contraction or transmission of HIV and may not be willing to adopt safer sex behaviors in order to prevent themselves from contracting HIV.) Therefore, the health belief model (Rosenstock, 1966), which encompasses these areas, is relevant for use as a theoretical framework. The purpose of the research is to gain an understanding of how older adults perceive themselves to be at risk,
as well as the behaviors they engage in that make them susceptible, their knowledge of the risk factors, and both the need for and the methods of taking protective measures effectively, even if those measures seem unnecessary and are unwanted. Older adults need to understand the severity of HIV, especially in its progression to AIDS, and how they are especially vulnerable to the consequences. A review of research conducted during the past 30 years provides insight into the evolution of what is understood about aging, HIV/AIDS, and older adults.
LITERATURE REVIEW

AIDS has evolved in many ways since it was first identified in 1981. First, HIV/AIDS is no longer an acute condition, but is now a chronic illness (Emlet, 2004). This change has had an impact on the longevity of individuals diagnosed with HIV (Levy, Ory, & Crystal, 2003; Mugavero, Castellano, Edelman, & Hicks, 2007; Ulett et al., 2009), as long as diagnosis is made early. For older adults, however, diagnosis usually occurs after HIV has developed into AIDS (CDC, 2009; Gordon & Thompson, 1995; Wooten-Bielski, 1999), and the condition becomes acute. Second, the profile of a “typical” person at risk for contracting HIV has expanded. Older adults remain at risk for contracting HIV, but are not typically considered at risk by medical professionals (Altschuler et al., 2004; Falvo & Norman, 2004; Garvey, 1994; Whipple & Scura, 1989). Third, the risk of contracting HIV through blood transfusions has been eliminated. Now that blood products are safe, older adults are not as likely to be screened for HIV risk because they are not thought to be exposed to any other risk factor for contracting HIV (Skiest & Keiser, 1997; Wooten-Bielski, 1999). Fourth, educational messages about HIV are widely disseminated but are geared to individuals 40 years of age and younger, not to older persons (Akers, Bernstein, Henderson, Doyle, & Corbie-Smith, 2007; Mack & Bland, 1999; Orel, Wright, & Wagner, 2004). The evolution of AIDS, now identified as HIV/AIDS, can be seen through a review of studies conducted in the past 30 years. These research efforts demonstrate a response to the evolution of HIV/AIDS and the increased recognition of HIV/AIDS in older adults.

History of Articles on HIV/AIDS and Older Adults (1980-1989)

When AIDS first emerged, emphasis was directed towards those persons most likely to
be at risk for contracting the disease. AIDS began to receive national attention in June 1981, when the CDC published a report documenting five cases of pneumonia. The individuals stricken were all young homosexual males whose identifying symptom was *Pneumocystis pneumonia carinii* (CDC, 1981; Grmek, 1990). Focus was directed to the manifestation of the disease in a singular group of individuals who all engaged in a similar behavior (Linsk, 1994; Nazon & Levine-Perkell, 1996). The urgency in understanding AIDS and its mechanisms was based on its tendency to progress quickly, usually with a fatal outcome. Research focused on the most susceptible individuals. During the 1980s, information and research about AIDS and research increased, with HIV being identified as the cause of the disease.

Most of the initial articles connecting AIDS and older adults stressed the urgent need to regard older adults as just as likely to contract HIV as younger adults. Articles, briefs, and editorials written by physicians witnessing AIDS in older adults relayed information about the risks that older adults faced and their susceptibility for contracting HIV. In 1989, *Generations* dedicated an entire issue to the topic of AIDS and older adults. The issue covered a wide variety of subjects demonstrating the intersection of AIDS and older adults, such as AIDS and dementia (Weiler, 1989), residential and long-term care (Benjamin & Swan, 1989; Kruzich & Lieberman, 1989); caregiving (Orona, 1989; Turner & Pearlin, 1989), and grief (O’Neill, 1989). The journal was comprehensive not only in covering older adults and AIDS, but also in discussing the needs of persons with AIDS as they aged (Catania et al., 1989). Included in the September 1989 *Generations* journal issue was a review of the book *AIDS in an Aging Society*, the product of a conference conducted by the National Institute on Aging (Ory, Zablotsky, & Crystal, 1998). Edited by Riley, Ory, and Zablotsky (1989), this book examined aging and AIDS
within the context of social and clinical factors, and the influence brought to bear on AIDS’ origin, progression, and outcome in older adults. The behavioral and social impacts of the disease are also affected by a person’s life course and age, and this aspect of research conducted on aging and AIDS was also strongly emphasized by Riley et al. (1989). Finally, the authors stressed the significance of age relative to HIV, and its role as an intermediary factor affecting the many ways in which individuals interact with HIV. Although the book was significant in its identification and comprehensive coverage of the interaction of AIDS and older adults, its lack of emphasis on prevention and education was notable (Turner, 1989). Nevertheless, it provided a much-needed foundation for research and policy issues relative to older adults and AIDS (Ory et al., 1998).

Also in 1989, Catania, Turner, Kegeles, Stall, Pollack, and Coates noted the importance targeting adults in late middle age and older as for primary AIDS prevention efforts. In order to take a primary prevention-based research approach, a comprehensive review of how older adults are at risk, by virtue of their behavior, was necessary. In the late 1980s, not enough research had been conducted to understand the sexual behaviors of older adults relative to HIV/AIDS transmission. Given the amount of lag time between original infection and the emergence of AIDS symptoms (typically 5 to 8 years), persons with AIDS unknowingly infected others. Catania et al. (1989) suggested that, in view of the lack of knowledge of how widespread HIV was among adults 50 years of age and older, researchers should oversample that age group in population-based HIV seroprevalence studies. This strategy would also aid in identifying and understanding subgroups within older adult population that are more likely to be at risk for contracting HIV and then gearing prevention efforts towards them.
In addition, Catania et al. (1989) emphasized the need for larger studies on patterns of sexual behavior among heterosexual and homosexual older adults, and outlined a research agenda to investigate primary prevention of HIV among older adults. A preexisting problem could be established by examining the case load of AIDS among adults 50 years of age and older. At the time, blood transfusions were the most likely cause of HIV infection in older adults, but researchers were unable to determine the extent of infected blood receipt in older adults.

Other attempts to identify the need for research connecting HIV/AIDS and older adults came about through editorials and conversation briefs (Butler, 1989; Sabin, 1987; Weiler & Peck, 1989). Initially, the ambiguity of symptoms, some of which could be attributed to the aging process (Siegel et al., 1999) made it less likely that older adults would report their symptoms, and kept physicians from either suggesting an HIV test or considering older adults to be at risk. Additionally, although one of the symptoms of AIDS was dementia, its presence in an older client typically led physicians and other health care workers to presume a diagnosis of Alzheimer’s disease, not AIDS (Altschuler et al., 2004; Grabar et al., 2006; Hillman, 1998). Older adults were thought to be at risk for contracting AIDS only via blood transfusions, not through other means associated with younger populations (Butler, 1989). In 1989, adults aged 55 years and older comprised 10% of AIDS cases (Butler, 1989). AIDS was designated as an imitator (Butler, 1989; Sabin, 1987) given its similarity in dementia associated with an older population. During the 1980s, the majority of articles connecting older adults with AIDS served to stress the fact that older adults could contract AIDS. Despite the advances in knowledge and prevention, identification of older adults as being at risk and the risks inherent with being HIV
positive were not promoted as yet. Emphasis was still being placed on younger individuals, but attention was slowly being directed towards older adults and their unique challenges in dealing with AIDS in an aging body.

**History of Articles on HIV/AIDS and Older Adults (1990-1999)**

Although the risk for contracting HIV/AIDS from blood transfusions had been eliminated, older adults remained vulnerable to contracting the disease and either did not know or were unwilling to disclose how they contracted it. The impact of opportunistic infections on an older body was considerable and was starting to attract the attention of researchers.

Kendig and Alder (1990) took a clinical perspective on the effect of HIV/AIDS on the aging population, focusing on the effect of AIDS in the middle-aged adult population. In their research, individuals 40 years of age and older were more likely to die if they contracted an HIV opportunistic infection, and older persons with HIV/AIDS were likely to have the same opportunistic infections as younger persons. In addition, the researchers discovered that opportunistic infections in older adults did not respond to treatment as well as opportunistic infections treated in younger adults and that these infections were more likely to recur in older adults than younger adults with HIV/AIDS. The medications used by older adults were more likely to have side-effects and complications than in younger individuals; and they took longer to be absorbed in, metabolized by, and eliminated from older bodies. Tuberculosis and pneumonia were also problematic for older adults infected with HIV/AIDS. Finally, Kendig and Alder (1990) noted the strain on the health care system that would be created by the increasing influx of individuals with HIV/AIDS, especially older adults who were HIV positive.

During the 1990s, national research was conducted to determine what adults
understood about AIDS. In 1992, the National Health Information Survey (NHIS) added a section on AIDS to assess respondents’ knowledge about the disease. Two years later, Stall and Catania (1994) reported on results from the National AIDS Behavioral Survey research they conducted in 1990 and 1991. Their surveys examined adults 50 years of age and older to determine how frequently these individuals were putting themselves at risk for contracting AIDS. As the authors pointed out, no such research had been conducted previously, despite the need, because, at that time, more interest and attention were focused on the younger population’s risk for contracting HIV/AIDS. For the most part, older adults and their risks for contracting AIDS were largely unexplored and disregarded. Stall and Catania’s (1994) national surveys were undertaken in order to understand which HIV risk behaviors older adults were engaging in; these surveys also served to address the questions of prevalence of behaviors and preventive behaviors.

Two samples were drawn: a national sample and one created from respondents from cities with a large number of AIDS cases. All respondents were aged 50 years or older. The authors found that heterosexual transmission was the cause of AIDS infection among 10% of adults aged 50 years and older, larger than in any other age group (Stall & Catania, 1994). In the national sample, 96.5% of respondents were more likely to indicate they had never been tested for HIV (95% CI, 93.3%-99.7%), compared to 92.7% of respondents in the high-risk cities sample (95% CI, 89.7%-95.8%). Also, 92.4% of older sexually active respondents indicated they never used a condom (95% CI, 87.0%-97.8%), while 82.9% of sexually active respondents from the high-risk cities sample indicated they never used a condom (95% CI, 76.7%-89.1%). Furthermore, 91% of respondents from the national sample reported they did not engage in
any risk behaviors for contracting HIV (95% CI, 89.7%-92.8%), compared to 88.3% of respondents from the high-risk cities sample (95% CI, 86.7%-90.0%). Clearly, understanding what constituted a risk for contracting HIV/AIDS and the means to prevent or reduce that risk were issues in need of promotion among older adults.

In addition to the national research studies being conducted in the 1990s, the book *HIV/AIDS and the Older Adult*, edited by Kathleen Nokes, was published in 1996. This anthology of articles explored diverse issues relating to legal, ethical, and psychosocial needs; presented a discussion of the potential for collaboration between HIV/AIDS and gerontological professionals; and provided resource information for older adults with HIV. This book demonstrated a shift from the work by Riley et al. (1989). In the earlier work, the editors highlighted the need for research and the consequences of AIDS in an aging society. Nokes’s work (1996) acknowledged the presence of HIV in an aging world and considered how to address the needs created by that presence.

Other topics germane to older adults with HIV/AIDS were also beginning to draw attention. The journal *Research on Aging* dedicated an entire issue to the topic in November 1998. Whereas the *Generations* journal (1989) focused on AIDS and aging relative to social policy, housing, and advocacy, the *Research in Aging* journal issue emphasized education (Strombeck & Levy, 1998), methodological issues involved in conducting research on HIV and older adults (Gribble, Rogers, Miller, & Turner, 1998), estimation of AIDS and its effect on an aging population (Manton & Stallard, 1998), and the effect of age on ability to survive with AIDS (Justice & Weissman, 1998). Strombeck and Levy (1998) examined issues of HIV education and prevention among adults aged 50 years and older, reiterating the need for older adults to
access education focused on how HIV/AIDS is transmitted and the risks posed by the disease.
In addition, the authors advocated the inclusion of professionals working in health care, senior
service, and AIDS organizations to collaborate in efforts to educate and empower older adults.

Also included in the November 1998 issue of Research on Aging was an article focused
on the methodological challenges of measuring risk behaviors among older adults (Gribble et
al., 1998). Unfortunately, at that time, little research was available examining older adults and
their risk behaviors relative to HIV transmission, and assumptions that research examining risk
behaviors among younger persons could be generalized were still prevalent. The authors
examined the effect of using interviewer-administered surveys versus respondent-administered
questionnaires, and emphasized the lack of research on older adults’ sexual habits and
behaviors (Gribble et al., 1998).

Manton and Stallard (1998) utilized statistical forecasting models to project AIDS
prevalence in older adults in order to estimate the effect of AIDS on an aging population. Part
of their work involved reviewing rates of HIV infection and AIDS-related deaths; and the study
also projected at what point a person would or could be at a specific stage, with or without
symptoms, with AIDS-related complex, and with AIDS. The authors indicated that risk levels
varied for individuals due to possible genetic and behavioral factors, and use of therapeutic
treatments. Regardless of the risk factor that brought about the HIV infection, older adults
were more likely to have been diagnosed later in the disease, or closer to the point of HIV
progressing to AIDS. Obviously, getting a timely HIV diagnosis was critical; the sooner, the
better to improve capability for survival, especially as a person aged. Justice and Weissman
(1998) determined that, as a person’s age at time of diagnosis increased, survival time
decreased and disease progression increased. The initiation of appropriate medical intervention and drug regimen was affected by timing of diagnosis. Age also affected timing of diagnosis (as age increased, likelihood of diagnosis decreased). The survival rates of older adults (50 years and older) had improved over time (1981-1994), but not as much as those of younger adults (18 to 49 years of age). Justice and Weissman (1998) also determined that younger adults were much less likely to receive an AIDS diagnosis and then die from the disease in the same quarter than were older adults. Similarly, Zelenetz and Epstein (1998) found that the likelihood of death increased for older HIV-positive individuals, pointing out that, among HIV-positive adults aged 80 years and older, over a third (37%) perished within the same month of receiving their diagnosis. Clearly, older adults were at a greater risk of contracting the HIV virus after they came into contact with it, given the changes in their immune system’s function and ability to ward off potential infections. These authors also commented that determining how age or chronic conditions affect older HIV-positive adults is a challenging task.

In 1999, Mack and Bland analyzed 1996 data from the Behavioral Risk Factor Surveillance System (BRFSS) utilized by the CDC to collect information about health behaviors related to chronic conditions from 94,339 persons in all 50 states and the District of Columbia. Questions pertinent to HIV/AIDS included in the survey were posed to respondents aged 18 to 64 years. It should be noted that data from California were deleted because, in that state, the questions were asked only of respondents aged 18 to 45 years.

According to Mack and Bland (1999), the CDC’s research on AIDS prevention was strongly influenced by the following theoretical models: social cognitive theory, theory of reasoned action, health belief model, and the trans-theoretical model of behavioral change.
The combination of these models assumes that testing for HIV was more likely to be sought by persons who knew they were at risk, were experiencing health problems, and had access to resources. These criteria were not equally applicable to all individuals, especially older ones, who were more likely not to see themselves as being at risk for contracting HIV or as having health problems, and who might have had access to fewer resources (Mack & Bland, 1999). The research conducted by Mack and Bland sought to determine whether the assumptions inherent in CDC’s research model as applied to its AIDS prevention efforts could be extrapolated in assessing older adults.

Respondents were grouped by age, with over three-fourths (77.6%) being 18 to 49 years old, and nearly one-fourth (22.4%) 50 to 64 years of age; 52.3% were female, and 47.7% were male. Among respondents who perceived themselves to be at a high or medium chance of contracting HIV, less than half (46.6%) of those aged 50 to 64 years reported ever being tested, compared to 56.3% of younger (18- to 49-year-old) respondents. Also, among respondents believing themselves to be at a high or medium chance for getting HIV, less than one-fifth (18.3%) of participants in the older group reported that they received their last HIV test voluntarily, compared to 31.2% of participants in the younger group. Of the entire group, one-fourth (24.4%) of 18- to 49-year-old participants and 11.4% of 50- to 64-year-olds received their last test voluntarily. In examining the extent to which respondents had changed their sexual behavior in the previous 12 months, 16.6% of 18- to 49-year-old participants indicated a change, compared to only 5% of those aged 50 to 64 years. Among those who perceived themselves to be at a high or medium chance of contracting HIV, about one-third (33.9%) of 18- to 49-year-olds indicated that they changed their sexual behavior in the past 12 months,
compared to only 11.1% of 50-to 64-year-olds. In the older age group, 6.1% of 50- to 54-year-olds, 5.1% of 55- to 59-year-olds, and 3.6% of 60- to 64-year-olds who believed themselves to be at a high or medium chance of contracting HIV, indicated they had changed their sexual behavior in the last 12 months. According to Mack and Bland’s study (1999), older adults seemed to lag behind younger adults in their willingness to be tested for HIV voluntarily. Also, with regard to the extent to which risk behaviors had changed, based on beliefs about potential for contracting HIV, older adults again seemed to be less able or motivated to change compared to younger adults. Furthermore, the results of the study indicated older adults were engaging in both unprotected homosexual activity and intravenous drug use, two risk factors associated with contracting HIV.

By the end of the decade, information about HIV/AIDS and aging was more prevalent, yet the amount of research conducted remained minimal. A literature review conducted by Johnson, Haight, and Benedict (1998) found that only 17% of articles related to AIDS and older adults were research-based; about one-third (30%) were reports, and one-fifth (20%) were case studies.

The research agenda outlined by Catania and his colleagues in 1989 was still valuable nearly ten years after its publication (Strombeck & Levy, 1998); however, much of the material published about older adults and HIV/AIDS was informational and educational in nature, not research-based (Johnson et al., 1998). Also, researchers indicated that middle-aged as well as older adults needed resources and tools for education and prevention (American Association of Retired Persons, 1994; Ory & Mack, 1998.; Stall & Catania, 1994).

The advent of highly active antiretroviral therapy (HAART) in the 1990s allowed HIV-
positive individuals to live longer, and this change is demonstrated in research efforts that
followed. The transition of HIV/AIDS from an acute condition into a chronic disease
engendered the need to consider aging with HIV, not just older adults being at risk for
contracting HIV. It also signaled the need to understand what changes occurred as persons
aged with HIV, no matter how old they were when they first contracted the virus.

History of Articles on HIV/AIDS and Older Adults (2000-Present)

Efforts to examine what older and younger individuals know or do not know about
HIV/AIDS have also occurred in other countries. Im-em, VanLandingham, Knodel, and
Saengtienchai (2002) conducted a study to assess levels of AIDS-related knowledge and
attitudes among older adults in Thailand. The country’s response to the HIV/AIDS epidemic was
considered effective compared to that in other developing countries with similar prevalence of
AIDS cases. The study explored what, if any, differences existed in the level of AIDS-related
knowledge between young and old Thais. A knowledge, attitudes, and practice (KAP) survey
was disseminated to persons aged 50 to 74 years (the group of primary interest to the
researchers), which was divided into a young-old group (50 to 59 years) and a older-old group
(60 to 74 years). The KAP survey was also given to a sample of young adults aged 20 to 39
years. Random quota sampling was utilized as much as possible, but the researchers’ overall
sampling strategy was purposive and focused rather than random and representative.

Participants were selected from sites with moderate to high prevalence rate of AIDS, based on
Thai standards. Both rural and urban communities were included; in the urban samples,
participants were primarily recruited from low-to low-/middle-income residential areas. The
KAP survey measured knowledge and attitudes about caregiving practices for persons living
with HIV/AIDS (PHAs), including those related to perceived risks. Interviewers administered surveys on a one-to-one basis. Responses to questions were measured on a true/very possible, possible, false/not possible scale to gauge level of knowledge related to understanding of risks for contracting HIV and the extent to which survey participants had received information about HIV/AIDS. Interviews were conducted in household settings.

Young and old respondents were similar in their experience with AIDS and extent to which they had received information about the disease. The greatest disparities in knowledge related to myths about transmission routes. Only 50% of 20- to 39-year-olds, 38% of 50- to 59-year-olds, and 27% of 60- to 74-year-olds knew that AIDS was not transmitted via mosquitoes that had bitten a person with AIDS; and only 65% of 20- to 39-year-olds, 58% of 50- to 59-year-olds, and 47% of 60- to 74-year-olds knew that AIDS was not transmitted from eating a meal prepared by someone with AIDS. All age groups were similar in terms of knowledge about unprotected sexual relations with a person with AIDS and the risk for contracting HIV; 99% of 20- to 39-year-olds, and 97% of both 50- to 59-year-olds and 60- to 74-year-olds knew this behavior could lead to contracting HIV.

Im-em and associates’ research findings (2002) suggested that, although younger and older respondents appeared to understand the connection between unprotected sex and contracting HIV, both groups lacked accurate information regarding myths about how HIV is acquired. Older respondents seemed to have less accurate information than the younger respondents. Also, even though older respondents understood what behaviors can lead to HIV, their perception of risk related to engaging in those activities was not examined; and knowledge does not always translate into behavior modification or the use of safer sex
methods. This is true of all individuals, regardless of age, but in older adults, the effects of HIV have greater consequences.

More recent research related to aging and HIV stresses the importance of age and its singular effect on HIV and older persons. Shah and Mildvan (2006) agreed that age is a significant issue, but they contended that age should not be a sole focus of research. These researchers emphasized that older adults are heterogeneous because immune function does not change uniformly with age, and age is only one factor in those changes. In other words, each person with HIV is just one person with HIV; therefore, age is not necessarily the most important factor. Shah and Mildvan (2006) also suggested that efforts to prevent HIV transmission and educate individuals about the risks for contracting HIV should not focus directly on what types of individuals are engaging in risk behaviors, but should concentrate on the risk behavior alone. The researchers recommended that education and prevention should also direct attention to specific risk behaviors, not groups. This approach removed age from the equation, although age remained important in determining how to reach older adults who might not understand that their behaviors put them at risk. Researchers should understand that age is not a limiting factor, but certainly a contributing factor to longevity in living with HIV/AIDS. Shah and Mildvan (2006) acknowledged the effect of age in addition to other factors, such as timing of diagnosis, aging with the disease, and contracting HIV at an older age. In order to fully understand how older adults cope with HIV, each subgroup of HIV positive older adults should be assessed individually, according to Shah and Mildvan (2006), with subgroups including middle-aged and older women who might become sexually active with new partners after a divorce or the death of a husband.
Although much is known about the progression of HIV in adults, the unique characteristics existing in older bodies coping with an HIV infection have been less studied. Available systems of long-term care become more fragmented and are much less effective in addressing the needs of an older HIV-positive person. Goodkin et al. (2003) underscore the issue that HIV and its physical effects on older adults have been studied and researched; but the underlying aftereffects, including the utilization of appropriate and necessary services for non-physical effects (psychological, emotional) of an HIV-positive diagnosis have been neglected in the research arena. Few, if any, available mental health resources exist that are specifically geared toward older adults who are HIV positive, but other interventions that serve a younger HIV positive population are present, available, and can be utilized in an older population, if adapted properly to suit an individuals who may be coping with multiple losses.

As mentioned previously, the focus on prevention of and education about HIV/AIDS has been aimed at a younger population, despite an obvious need for information geared towards older adults. From 1998 to 2002, the number of adults 55 years of age and older living with AIDS increased by more than an estimated 100% (Orel et al., 2004), more than any other age group. Orel et al. (2004) also stressed that an exclusive or predominant focus on high-risk groups, or on young adults and their risk for contracting HIV, causes other individuals, such as older adults, not to receive the attention they need.

The complexity of assisting older adults with more than one health complication increases with the onset of an HIV infection. Justice, Landefeld, Asch, Gifford, Whalen, and Covinsky (2001) suggested that HIV-positive older adults are likely to experience depression as well as cognitive problems. Older adults who are infected with HIV and contending with other
health problems are likely to be taking multiple medications. Consequently, the potential for drug interactions is increased, and the efficacy of medications can be compromised due to changes related to aging, as well as the effect of combining multiple drug regimens (ACRIA, 2010; AIDS InfoNet, 2011). Therefore, doctors and other medical professionals should investigate whether their older patients are engaging in risky behaviors that would predispose them to contract HIV or ascertain whether they are already infected. Williams and Donnelly (2002) suggested that medical professionals ask about older patients’ sexual practices, including sexually transmitted diseases. Even though older adults are likely to be willing to discuss sexual practices, younger professionals are often less likely to be comfortable with the idea of conversing about an older patient’s sexual history and practices. Older patients are more reticent to discuss illicit drug use as it relates to risk for contracting HIV for fear of potential imprisonment (Williams & Donnelly, 2002).

Abel and Werner (2003) reviewed the sexual habits of adults 45 years of age and older in Switzerland to gather preliminary information concerning older adults’ knowledge about HIV and the behaviors (sexual only, not drug use) that put them at risk for contracting HIV in the past two years. According to these authors, adults aged 46 to 65 reported having a higher number of occasional sexual contacts/persons (8.8) than 19- to 30-year-olds (4.6); also, less or no condom use was more likely to be reported among adults aged 46 to 65 (52.6%) than in 19– to 30-year-olds (26.9%). Additionally, younger adults were more likely to report discussing risks for contracting HIV and methods for preventing it (5.2 mean) compared to middle-aged respondents (4.4), and older adults had the lowest average (3.4).

Research on older women and their knowledge about HIV has been a focus of research.
Henderson, Bernstein, St. George, Doyle, Paranjape, and Corbie-Smith (2004) recruited women 50 years of age and older who were visiting a general medical clinic in an HIV high-incidence county. Henderson et al. (2004) found that less than half (38%) of the respondents stated they had received information about HIV from a health care professional.; More than half of the respondents learned about HIV from family (51%) and friends (51%), and most cited obtaining their HIV information from television (85%).

Henderson et al. (2004) also questioned the kind of information older women were getting. The authors found that the older women in their study were uneducated about how HIV is transmitted and prevented, as well as the use and efficacy of condoms and abstinence, and the ways HIV is not transmitted (specifically through kissing).

Hillman (2007) describes the effect of age and female gender relative to correct use of condoms. Older women were more prone to infection each time they had heterosexual sex compared to younger women, due to using condoms incorrectly. Peri- and post-menopausal changes in hormonal levels can cause an older woman’s vaginal tissue to be more susceptible to tearing; thus increasing vulnerability to transmission and/or receipt of HIV. Vaginal secretions are also less plentiful in older women compared to younger women, which also causes greater susceptibility to tearing. Tears in vaginal tissue can facilitate the transmission of HIV from the male to the female, and transmission is made possible when a condom is used incorrectly. Older women are at risk for contracting HIV from unfaithful partners who do not feel the need to use contraception if they are past the age of conceiving (Levy-Dweck, 2005; Shah & Mildvan, 2006; Williams & Donnelly, 2002), and may be unwilling to negotiate safer sex methods (Emlet & Farkas, 2001). Hillman (2007) also examined what community-dwelling older
women knew and understood about HIV/AIDS, through use of a brief questionnaire completed by 160 women attending a health fair. Overall, Hillman found that less than half of the respondents knew the initial symptoms related to HIV, and nearly one-fifth believed that an HIV-positive person would not look healthy; over 75% had not spoken to a physician about HIV/AIDS and did not know how to get a free HIV test. Furthermore, nearly all respondents (98%) did not know that, in each sexual episode, older women, were more likely to contract HIV than younger women, and the majority of respondents believed their accurate knowledge about AIDS was “some” or “a lot.”

Age was correlated with beliefs about knowledge; the amount of knowledge respondents believed they possessed was more likely to decrease with increasing age, as did their belief in the efficacy of condom use for preventing the transmission of HIV. Hillman’s (2007) results are not generalizable due to the small sample size. Also, there were not many minority women in the sample, and the event at which the respondents were selected was likely to have skewed the sample somewhat, even though they were chosen at random: at a senior health fair, attendees might be more likely to be knowledgeable about, or at least interested in, health issues.

Theall, Elifson, Sterk, and Klein (2003) examined women’s perception of susceptibility to HIV as an effect of their age. In face-to-face interviews conducted by female interviewers, women aged 18 to 71 were questioned within a larger cross-sectional study focusing on multi-generational drug use. Both qualitative and quantitative data were collected via targeted sampling techniques designed to identify mother/daughter dyads in the Atlanta, Georgia area. To qualify for participation, respondents had to be living in a non-institutionalized setting and
not currently participating in a drug program. This study sought to explore factors associated with risk perception for contracting HIV, and how age may influence that perception. Dyads were differentiated by whether mother, daughter, or both mother and daughter had used drugs.

Age appeared to influence perception of risk. Among younger women (aged 18 to 29) who believed they might be infected with HIV, nearly half (46%) believed their risk to be low, compared to close to one-third (30%) of the older women (aged 40 and over) who also believed they might be infected with HIV. A quarter of younger women (24%) and 15% of older women indicated they were at a medium to high risk for infection. More than half of older women (55%) believed they were not at risk for contracting HIV, while less than a third (29%) of younger women indicated they were not at risk (Theall et al., 2003).

Women in both age groups had similar scores relative to the number of risky behaviors practiced in the previous year; the number of HIV-related risk behaviors were calculated to determine level of risk for contracting HIV. Theall et al. (2003) assigned a point per each risk behavior. The researchers used the following eight behaviors: having unprotected sex; having multiple sex partners; engaging in anal intercourse; engaging in sexual intercourse while under the influence of drugs or alcohol, or having sex with a partner who was high or inebriated at the time; having sex with a partner who was an intravenous drug user; having sexual intercourse with a male partner who might also have sex with another man; using sex as an exchange for other goods; and using sexual intercourse to purchase goods (Theall et al., 2003). Among respondents indicating a medium to high risk for contracting HIV/AIDS, younger women reported engaging in an average of three risky behaviors in the previous year (mean 0.3,
standard deviation 0.3), compared to older women, who reported that they participated in an average of four risky behaviors (mean 0.4, standard deviation 0.4). Younger and older women who believed they were not at risk for contracting HIV reported participating in fewer risky behaviors (0.1 mean, 0.2 standard deviation for younger women; 0.1 mean, 0.1 standard deviation for older women) (Theall et al., 2003). Overall, results for both younger and older women demonstrated similar levels of knowledge regarding risks for contracting HIV.

Neundorfer, Harris, Britton, and Lynch (2005) conducted interviews with 24 HIV-positive women, half of whom were 50 years of age or older, to better understand the factors that put older women at risk for contracting HIV. Based on the information gathered from those interviews, Neundorfer et al. classified the risk factors into three categories: sociocultural factors (age, gender, race/ethnicity); individual factors (including drug/alcohol abuse, uncertainty about partner’s sexual/drug history or previous risk behaviors engaged in, not having information about how to prevent contracting HIV), and HIV-risk behaviors (sharing needles and engaging in unprotected sex). Despite the small sample size, which restricted the generalizability of the results, drug/alcohol abuse appeared to be the most influential factor related to HIV transmission. As with adults of any age, use of drugs and alcohol can contribute to a person’s likelihood of being less inhibited and participating in risky behaviors, such as sharing needles or having unprotected sex. An aging body, however, is less able to eliminate drugs as quickly as a younger body can; and older individuals are more likely to have multiple chronic conditions compared to younger individuals, as well as more likely to be taking multiple medications, thereby creating the possibility that multiple medications and conditions may
interact in a more dangerous way, creating a precarious situation in an older adult (Ferrini &
Ferrini, 2000).

Understanding why older adults, especially women, do or do not get tested for HIV has
been another important focus of research. Akers, Bernstein, Henderson, Doyle, and Corbie-
Smith (2007) assessed older women’s interest or lack of interest in testing for HIV.
Characteristics that influenced desire to not be tested included age and education. Older
female respondents (63.3 years, ±8.4 years) expressed less interest in getting tested for HIV as
compared to younger female respondents (58.4 years, ±6.3 years). Also, respondents with less
than a high school education (76.3% versus 23.7%), a high school diploma (73.8% versus 26.2%),
or some college education (78.8% versus 21.2%) preferred not to get an HIV test, compared to
those respondents who did have an interest in getting tested.

Although few publications have focused solely on aging and HIV, two books published
within the past ten years directed attention to HIV/AIDS and older adults, taking a
multidisciplinary approach: Aging with HIV: Psychological, Social, and Health Issues (Nichols et
al., 2002) and HIV/AIDS and Older Adults: Challenges for Individuals, Families, and Communities
(Emlet, 2004). Nichols et al. (2002) took a multilevel approach to reviewing the needs of
middle-aged and older adults as they coped with HIV. The work covers end-of-life concerns and
focuses attention on all of the issues related to living with HIV, from the experience of being
tested, stigma, and disclosure, to the psychosocial, physical, and mental issues that accompany
the experience of being HIV-positive as an older adult. The authors present many issues, and
their book is directed towards an older audience’s needs. They highlight HIV/AIDS’s change
from an acute to a chronic, manageable condition; and they discuss prevention extensively, as
well as cultural and stressors, in addition to qualitative and quantitative data.

Emlet’s (2004) work demonstrated a broad appeal for older adults and their diverse needs. Whatever their experience with HIV might be, from raising a grandchild with HIV to being HIV-positive in a nursing home, from depression with HIV to dementia and HIV, Emlet’s book covers a vast territory. Additionally, the inclusion of service priorities as viewed by older and younger HIV-positive persons reflects the genuine need to address HIV and aging across the lifespan, while maintaining the integrity of addressing an already aged population who may be aging with HIV or simply at risk for contracting the disease.

Studies conducted during the past 10 years demonstrate the inadequate levels of education and awareness among older adults. In some cases, responses from both young and old individuals illustrate the need to provide information about HIV to people of all ages. With an emphasis on younger adults and that population’s propensity for contracting HIV, however, older adults continue to be overlooked. As the research studies indicate, older respondents had similar behavior patterns, education needs, and lack of understanding relative to HIV; but no concerted effort was being made to address this segment of the population (Orel et al., 2004). Older adults are as likely as younger persons to engage in behaviors that put them at risk for contracting HIV without the necessary knowledge to protect themselves. Because older women who have sexual relations may no longer be able to conceive, the use of prophylactics may seem unnecessary (Levy-Dweck, 2005; Williams & Donnelly, 2002). Furthermore, with the emergence of medications available to treat erectile dysfunction, older men may be more likely to attempt sexual relations. In any case, age-based sexual discrimination against older adults is ongoing and unfortunate. Education and outreach geared towards older adults are of vital
importance and much needed.

Attempts to understand the evolution and emergence of HIV/AIDS in an aging and aged population have elicited various research responses. Core elements of research efforts appear to be constant even after several years of research, education, and outreach to older adults: lack of awareness of infection (risk behaviors; need to use condoms for purposes other than birth control; symptoms of HIV or lack of symptoms during the first days, months, and years following infection), lack of education (understanding what the risk behaviors are, understanding that a person who is HIV-positive can look healthy), and susceptibility (aging immune system putting older adults more at risk for developing AIDS after an HIV infection, and at an accelerated rate compared to younger adults). Even though, for the most part, HIV is now a disease of higher morbidity than mortality, older adults are still more likely than younger adults to die from AIDS soon after receiving a diagnosis of HIV (Justice & Weissman, 1998.)

Research has been moving away from considering older adults to be at risk for contracting HIV, in favor of focusing on older adults who contracted HIV earlier in life and are now coping with HIV/AIDS in addition to other diseases. In 2006, the AIDS Community Research Initiative of America (ACRIA) conducted a comprehensive study that examined 1,000 HIV-positive individuals aged 50 and older, Research on Older Adults with HIV (ROAH). This research project focused much-needed attention on the issues facing older adults as they age with HIV, such as social networks, mental health, stigma, and personal resources. Although the value of research of this nature is indisputable, comprehensive research into how older adults’ understanding of HIV, their perception of their risk for contracting HIV, and their beliefs about
the efficacy of using protective measures against becoming infected with HIV is also clearly important.

Older adults are aging with HIV, but sufficient effort is still not being made to include older adults in clinical trials (Butler & Nyberg, 2002; Nazon & Levine-Perkell, 1996), despite the knowledge that other diseases can further compromise the health of older HIV-positive adults, and the fact that these conditions will also continue to affect individuals with HIV as they age. These include osteoporosis and other diseases (Yin et al., 2005). National research projects typically do not examine the relationship between older adults and HIV/AIDS. For example, from 2005 to 2006, the National Social, Life, Health, and Aging Project (NSHAP) conducted interviews with adults aged 57 to 85 years of age, including questions about sexuality (Suzman, 2009), but questions about STDs and HIV were not included in the survey. The Behavioral Risk Factor Surveillance System (BRFSS) includes five questions asking whether the respondent has been tested, but interviewers were directed to skip that section for respondents aged 65 and older. Similarly, the National Health and Nutrition Examination Survey includes questions about sexual behaviors, but confines the sample population to individuals 14 to 69 years of age, and does not ask about HIV or testing.

Other gaps in research related to older persons and HIV include addressing the psychological impact of this disease on older adults (Goodkin et al., 2003) and the need to coordinate care for older HIV-positive individuals (Emlet, Gerkin, & Orel, 2009). HIV research on older adults seems to direct more attention on older women (Akers et al., 2007; AARP, 1994; Henderson et al., 2004; Jacobs & Kane, 2009; Neundorfer et al, 2005; Theall et al., 2003;) than older men. Understanding how HIV affects older men, relative to their self-perception of
risk, should also be studied further. Also, the reasons why older adults do not seek an HIV test without prompting from a physician should be examined. Issues of stigma resulting from not wanting to be seen getting a test or fear of finding out the results, need to be researched. These concerns are not relevant solely to the older generation, but the consequences of delays in testing and treatment are more serious in older persons.

The proposed research will focus on the need to understand what effect, if any, age has on the likelihood of their having been tested for HIV. It is essential that older adults can accurately assess their risk for contracting HIV, and take protective and proactive measures to eliminate or reduce their risk.

In conclusion, researchers have examined the relationship between HIV/AIDS and age as it affects an individual’s ability to perceive risk for contracting HIV. The relationship of age and gender as it affects a person’s ability to understand the need to take preventive and protective sex measures has also been investigated (Hillman, 1997; Neundorfer, 2005; Rodgers-Farmer, 1999). Although age certainly should not be the only consideration in education, prevention, and outreach efforts geared towards any individual at risk for contracting the disease, age is relevant in its relationship to HIV/AIDS. The result has been various research efforts to comprehend the level of impact this disease has on individuals as they age, as well as on newly HIV-diagnosed older adults. Essentially, there is no age-related expiration date for adults to no longer be at risk of contracting HIV (Riley, Ory, & Zablotsky, 1989).
THEORETICAL AND CONCEPTUAL FRAMEWORK

Individuals of all ages can misjudge their risks for becoming infected with HIV. Also, both old and young HIV-positive individuals will develop AIDS over time if no treatment is obtained, and age does not protect anyone from contracting HIV. However, unlike younger individuals, older adults may misjudge their likelihood of contracting HIV (Shippy & Karpiak, 2005), which undermines any ability to view their behaviors as a threat to their overall health (Clarke, Lovegrove, Williams & Machperson, 2000). Without a realistic self-appraisal of risk factors or behaviors, no individual is likely to modify behaviors or take protective measures against contracting a disease (Clarke et al., 2000). Not only do individuals need to understand how well those measures will work, but they must believe in their ability to employ them successfully. With regard to older adults and HIV, their abilities to assess risk and adapt behavior to reduce risk, as well as their belief in their self-efficacy to do so, are especially relevant. These themes are central to the health belief model (Rosenstock, 1966), which provides a framework to address these pertinent issues.

Rosenstock (1974) outlined four key tenets of the health belief model (HBM). The first tenet relates to the perception of personal susceptibility or vulnerability to a disease. Older adults are not considered to be at risk for contracting HIV (Henderson et al., 2004; Linsk, 2000; Paul, Martin, Lu, & Lin, 2007). As a result, no mainstream educational effort geared towards older adults is apparent (Jacobs & Kane, 2009; Orel, Stelle, Watson, & Bunner, 2009) to educate older adults about the need to protect themselves from HIV. Most behavioral interventions are geared towards a younger population, and the translatability of interventions to an older population is unclear (Coon, Lipman, & Ory, 2003; Mack & Bland, 1999). Without information
about the behaviors that put a person at risk for contracting HIV, older adults are unaware, for the most part, about how HIV can be contracted (CDC, 2008; Shippy & Karpiak, 2005); and this is especially true for older women (Ory, Zablotsky, & Crystal, 1998; Savasta, 2004). Furthermore, the beliefs that HIV happens only to other people, and that HIV is detectable in other people, create an optimistic bias (Clarke et al. 2000). Individuals of any age can assume that HIV happens only to other people; but even older adults who are fairly knowledgeable about HIV/AIDS might not consider themselves to be at risk of contracting the disease, and instead, believe that younger persons are more susceptible (Rose, 1996). Also, older adults may believe that only certain people are susceptible, and that those people are not among the individuals with whom they would engage in risky behaviors (Kelly, 1995). This inability or reluctance to understand that persons infected with HIV may look like their friends may also serve to affect the way older adults perceive how serious having HIV can be, and lead to underestimating the seriousness of the disease for themselves and others.

The second tenet involves perception of severity of disease or condition. Older adults might not be aware of how severe HIV can be (Rosenstock, 1974) and the effects it can create in an older body. Older adults’ perception of the severity of HIV might be unrealistic if they do not have any experience with HIV or know anyone who is HIV-positive. Also, they might be under the misconception that a person with HIV can be spotted by sight, and that only certain people get the disease (Kelly, 1995). Even older adults who are more educated about the disease may believe that, if it is contracted, medications are available to mitigate its effects (Levy et al., 2003). Unfortunately, the efficacy of a drug regimen can be compromised due to other medications the HIV-infected older adult might take (Kendig & Alder, 1990; Nazon &
Levine-Perkell, 1996). Moreover, because immune function decreases with age (Ferrini & Ferrini, 2000; Mack & Bland, 1999; Small, 2010), the efficacy of HIV medications can be compromised. Additionally, physicians may be likely to attribute HIV-related symptoms in older adults to aging (Siegel et al., 1999), and follow-up to determine an older person’s HIV status can be delayed. Consequently, older adults typically receive a diagnosis of HIV at a time when the progression of the disease is too advanced for a course of treatment to be effective (Mugavero, Castellano, Edelman, & Hicks, 2007).

The third tenet involves the perceived efficacy of behavior in preventing a negative health condition. Older adults may not have experience with using condoms, may not know about safer sex options, or may be reluctant to employ them (Wooten-Bielski, 1999). Furthermore, if conception is not an issue, older adults may see no risk in engaging in unprotected sex (Levy-Dweck, 2005). Alternatively, for those individuals who are willing to take protective measures, executing them successfully may require time, skill, and confidence (Kelly, 1995; Rosenstock, Strecher, & Becker, 1994). Also, there are people of all ages who are unwilling to undertake precautions, but older adults can face additional challenges. Older women may be unprepared to discuss and negotiate safer sex behaviors, especially if a male partner is reluctant to use a condom. Male partners may be unwilling to participate sexually with a female partner who forces condom use, especially if they have their choice of other female partners who do not insist on condoms or who are not empowered to do so (Coon, Lipman, & Ory, 2003). An individual may assume that his or her partner is monogamous and has never been unfaithful (Lieberman, 2000), or assume the number of sexual partners is correlated with the level of risk for contracting HIV (Kelly, 1995).
Resistance to changes in behaviors is also relevant to the fourth tenet of the HBM: perceived barriers. Older adults, particularly older females, might be unable to convince potential male partners that condom use is mandatory, especially if the male partner has more power in the relationship (Coon, Lipman, & Ory, 2003). The correct use of condoms can also be problematic for older adults (Hillman, 1998). Persons of all ages might be reluctant to get an HIV test due to the unfortunate stigma associated with the disease. Older individuals might be more likely to experience feelings of shame and stigma related to being tested for HIV, due to unrealistic notions about age and sexual activity; thus, they may be reluctant to be perceived as participating in actions that place them at risk for contracting HIV at their age (Emlet, 2007). Alternatively, some older adults typically do not feel the need to get tested for HIV (Akers, Bernstein, Henderson, Doyle, & Corbie-Smith, 2007). In addition, if an older adult does not feel comfortable discussing concerns about risk behaviors with a medical professional who does not perceive older adults to be at risk for contracting HIV (Savasta, 2004), this, too, is a barrier.

At any age, individuals might be adequately informed about HIV and how it is transmitted, realize what behaviors put a person at risk for contracting HIV, but persist in engaging in less than safe behaviors (Catania, Kegeles, & Coates 1990; DiClemente & Peterson, 1994). The influence of a person’s age, gender, and cultural view of sexuality upon the decision to use or not use condoms (DiClemente & Peterson, 1994) can easily override knowledge about how HIV is contracted. In any case, even with that knowledge, individuals may not change their risky behaviors. Similar to other diseases and health problems triggered by behaviors such as tobacco use or excessive alcohol consumption, knowing what creates a risk or increases susceptibility for contracting HIV does not always translate into adopting behaviors that are less
risky or lower susceptibility. Therefore, in order to understand how best to bring about
behavioral change, theoretical models have been and continue to be developed (DiClemente &
Peterson, 1994).

Even though the health belief model contains essential elements that relate to older
adults and their risks for contracting HIV, some gaps remain. As discussed earlier, although
some older adults are aware of behaviors that put individuals at risk for contracting HIV (Lekas,
Schrimshaw, & Siegel, 2005), they might not see themselves as being at risk (Rose, 1996),
despite their participation in the same risky behaviors as younger individuals. Also, there are
few, if any, cues to action for engaging in safer behaviors or getting tested for HIV. Doctors and
other health care professionals may be unlikely to discuss or uncomfortable discussing HIV-
related risk behaviors with older patients (Agate, Mullins, Prudent, & Liberti; 2003, Glass &
Webb, 1995; Wooten-Bielski, 1999). They may not be adequately informed about HIV in elders
or even consider older adults to be at risk for contracting the disease (Maes & Louis, 2003).
Moreover, few, if any media campaigns include older adults in their efforts to educate
individuals (Jacobs & Kane, 2009; Orel et al., 2009). Despite these limitations, the HBM is an
appropriate framework for reviewing the challenges related to HIV and older adults in order to
assess their understanding of their risk for contracting HIV and to address their need to be
tested for HIV.
PURPOSE OF THE STUDY

The study examined to what extent, if any, the age of a respondent influenced likelihood of having gotten an HIV test, assessment of risk perception for contracting HIV, and likelihood of getting an HIV test in the next 12 months. Gender, education, marital status, and ethnicity were also examined to determine whether those variables influenced an individual’s having gotten an HIV test, assessment of risk for contracting HIV, and likelihood of getting an HIV test in the next 12 months. The target group for this research was adults aged 50 years and older.

Factors that prompt individuals to get tested for HIV or prevent them from doing so are diverse. The influence of age, whether it prompts or prevents a person from being tested, is important to understand. This research examined the following questions.

- Does age affect the likelihood that a person has gotten an HIV test?
- Does age affect the likelihood of a person getting an HIV test in future?
- Are older adults more likely or less likely to get tested for HIV as compared to younger adults?
- Are women more likely than men to get an HIV test?
- Do ethnicity, education, and marital status affect the likelihood that a person has gotten an HIV test?
METHODOLOGY

General Approach

The research examined how, if at all, the age of respondents affected likelihood of having been tested for HIV, perception of risk for contracting HIV, and likelihood of getting an HIV test in the next 12 months. Overall, participant responses were divided into two groups by age: 18 to 49 years of age, and 50 years of age and older. Specific age groups were also nested to compare what, if any, effects of age continued as the age of respondents increased (50- to 64-year-old respondents compared to 18- to 49-year-old respondents, 65- to 74-year-old respondents compared to 50- to 64-year-old respondents, and respondents aged 75 years and older compared to respondents aged 50 to 64 years of age). Data were gathered from the 2006, 2007, and 2008 National Health Interview Surveys (NHIS) (Centers for Disease Control, Division of Health Interview Statistics, National Center for Health Statistics, 2007, 2008, & 2009) for a secondary data analysis. Demographic data were taken from the Household Composition, Family Identification, and Family Socio-Demographic sections. Data pertinent to HIV testing, perception of risk, and expectation of getting an HIV test in the next 12 months were taken from the Adult AIDS Knowledge and Attitudes section.

The NHIS is conducted with the assistance of the Census Bureau, which acts as the data collector. Interviews are conducted in person after an initial telephone call to respondents. In the Adult AIDS Knowledge and Attitudes section, respondents are asked whether they have ever been tested for HIV. They are also asked to indicate the main reason why they have or have not gotten an HIV test. Additionally, respondents are asked to assess their perceived risk
for contracting AIDS, with possible answers being high, medium, low, none, already have HIV or AIDS, refused, and don’t know.

Population and Sample

The NHIS employs a multistage, random sample in order to adequately select individuals representing the American civilian non-institutionalized population. Hispanic, African-American, and Asian populations are oversampled to garner a more realistic view of health characteristics in these minority groups.

From 2006 to 2008, 69,449 individual sample members were selected in the sample (CDC, 2007, 2008, & 2009). The final response rate in 2006 was 70.8% (CDC, 2007), 67.8% in 2007 (CDC, 2008), and 62.6% in 2008 (CDC, 2009).

Procedures for Data Analysis

Data were analyzed using SUDAAN in SAS. SUDAAN is required, and is recommended for analysis of NHIS data (CDC, 2007) to adjust for standard errors with complex weighting schemes for varied sample clusters (Bieler & Williams, 1997; Delwiche & Slaughter, 1998).

Descriptive statistics were calculated to provide demographic information about the respondents using the following categories: age, gender, race/ethnicity, marital status, and education. Due to the complex nature of imputation for income of respondents, that variable was excluded from the data analysis.

Inferential statistics, specifically odds ratios, were calculated. A binary logistic regression, using PROC LOGIST in SUDAAN, was calculated to estimate the likelihood of having ever been tested for HIV, as affected by age or gender, and getting an HIV test in the next 12 months. Cumulative logistic regression, using PROC MULITOG in SUDAAN, was used to predict
the effect of age on perception of chance for contracting HIV. The four analyses were created using respondent age as the independent variable while controlling for respondent marital status, race/ethnicity, education, and gender. Through the use of these data analyses, four hypotheses were tested.

Hypotheses

Using responses to the Adult AIDS Knowledge and Attitudes section of the National Health Interview Survey from the years 2006, 2007, and 2008 (CDC, 2007, 2008, & 2009), the following hypotheses were tested.

H1: Older adults are less likely to report getting tested for HIV/AIDS than younger adults.

Older adults do not believe themselves to be at risk for contracting HIV. Consequently, older respondents (50 years of age and older) are less likely to indicate that they have been tested for HIV compared to younger respondents (18 to 49 years of age.)

H2: Men are more likely to report having been tested for HIV compared to women.

Men are more likely to have been tested for HIV due to the origin of the disease in males. It is also possible that physicians are more likely to perceive older men as more likely to be sexually active than older women. Given that women typically outlive men, older women may be less likely to be sexually active than older men, who might have a greater pool of available sex partners.

H3: Older adults are less likely to report being at risk for contracting HIV than younger adults.

Age of respondent will affect likelihood of reporting perception of risk for contracting HIV. Even though some older adults are knowledgeable about HIV and behaviors associated with how it is contracted, a majority of older adults may be less likely to see themselves as
being at risk. Younger respondents will be more likely to consider themselves at risk for contracting HIV based on their perception of their engagement in HIV-related risk behaviors, and knowing what those behaviors are. Additionally, insofar as older respondents do not have sufficient information about the progression of HIV to AIDS and how age affects that progression, they should be more likely to underestimate how severe HIV is, compared to younger respondents. Furthermore, older respondents may be aware of the change in HIV from an acute to a chronic condition, and thus underestimate the disease’s severity.

H4: Older adults are less likely to expect to get an HIV test in the next 12 months compared to younger adults.

Even if older adults perceive their behavioral risks to contract HIV, they may be less likely to seek HIV testing in the future than younger adults engaging in similar risk behaviors. Issues of stigma and knowledge, including where to get tested for HIV, could prevent older adults from getting an HIV test. Also, interactions with physicians are more likely to prevent older adults from interpreting their symptoms as anything other than aging-related processes.

Variables

Age was the independent variable for all hypotheses and was classified into two to four categories: younger adults (respondents 18 to 49 years of age) and older adults (respondents 50 years of age and older), with subdivisions of the latter (cutting at age 65 and age 75) for some analyses. In addition, nested age effects were considered, nesting within younger adults and older adults, to examine what the process of aging contributed to the likelihood of either getting or not getting an HIV test. Gender was also an independent variable for the second hypothesis, and was used as a control variable for the first, third, and fourth hypotheses.
H1 and H2: Report of Receiving HIV test

Question: Except for tests you may have had as part of blood donations, have you ever been tested for HIV?

- Possible responses:
  - Yes
  - No
  - Refused
  - Don’t know

- Binary classification: “Yes” and “No”

- Responses treated as missing: “Refused” and “Don’t know”

Expected Relationship between Variables

With regard to age, as the age of respondent increases, the likelihood of responding “yes,” indicating having received an HIV test will decrease. Respondents 18 to 49 years of age will be more likely to report being tested for HIV compared to respondents 50 years of age and older. Further, subcategories of respondents within the 50 years of age and older group will have a different likelihood for having ever been tested for HIV as compared to the next lower age sub--category (75 years and older compared to 65 years and older; 65 years and older compared to 50 years of age and older).

With regard to gender, males will have a greater likelihood for having been tested for HIV compared to women.

Control Variables

Control variables for H1 and H2 were education, marital status, and race/ethnicity.
**H3: Perception of Risk for Getting HIV**

Question: What are your chances of getting HIV (the virus that causes AIDS)?

- **Possible Responses:**
  - High
  - Medium
  - Low
  - None
  - Already have HIV or AIDS
  - Refused
  - Don’t know

- **Ordinal classifications:** “High” and “Already have HIV or AIDS” were grouped together; “Medium,” “Low,” and “None” were also classified as ordinal

- **Responses treated as missing:** “Refused” and “Don’t know”

**Expected Relationship between Variables**

As age increases, likelihood of reporting being at risk for contracting the HIV virus will decrease. Respondents 18 to 49 years of age will have a different likelihood for their reporting of risk for HIV compared to respondents 50 years of age and older. Subcategories of respondents within the 50 years of age and older group will also have a different likelihood for having ever been tested for HIV as compared to the next lower age sub-category (75 years and older compared to 65 years and older; 65 years of age and older compared to 50 years of age and older).

**Control Variables**

Control variables for H3 were education, marital status, race/ethnicity, and gender.
**H4: Likelihood of Getting an HIV Test in the Next 12 months**

**Question:** Do you expect to have another test for HIV in the next 12 months, not including blood donations? Do you expect to have a test for HIV in the next 12 months, not including blood donations?

- Possible responses:
  - Yes
  - No
  - Refused
  - Don’t know

- Binary classification: “Yes” and “No”

- Responses treated as missing: “Refused” and “Don’t know”

**Expected Relationship between Variables**

As age of respondent increases, the likelihood of planning to get an HIV test in the next 12 months will decrease. Respondents 18 to 49 years of age will have a different likelihood for their reporting of risk for HIV compared to respondents 50 years of age and older.

Subcategories of respondents within the 50 years of age and older group will also have a different likelihood for having ever been tested for HIV as compared to the next lower age subcategory (75 years and older compared to 65 years and older; 65 years and older compared to 50 years of age and older).

**Control Variables**

Control variables for H4 were education, marital status, race/ethnicity, and gender.

**Definition of Key Terms**

For the purposes of this research, key terms are sorted into two classifications:
conceptual definitions and operational definitions. Conceptual definitions relate to terms used in questions posed by the 2006, 2007, and 2008 National Health Information Surveys (CDC, 2007, 2008, & 2009). Operational definitions are used to determine levels of classification on dependent and/or control variables.

**Conceptual Definitions**

- **Acquired immune deficiency syndrome (AIDS):** A disease which renders the immune system defenseless; classified as a CD4 count under 200 (CDC, 2005).

- **Human immunodeficiency virus (HIV):** The virus that causes AIDS; classified by CD4 count and viral load.

**Operational Definitions**

- **Education:** Measured in respondents as those with some high school education, a high school diploma but no college education, some college education, and a college degree.

- **Marital status:** Categories are married-spouse in house; married-spouse not in house; widowed; divorced; separated; never married; living with partner; and unknown marital status. In the inferential data analyses, the marital status category is divided into three groups: “married,” comprised of married-spouse in house, married-spouse not in house, and living with partner; “unmarried,” comprised of divorced, separated, and never married; and “widowed.”

- **Older adults:** Respondents aged 50 years or older; subcategories include “65 years and older” and “75 years and older” for inferential data analyses.

- **Younger adults:** Respondents aged 18 years to 49 years.

- **Race/ethnicity:** Categories are Caucasian, African-American, Hispanic, and other, which include Native Americans, Alaskan Natives, Asians, and Pacific Islanders.
• *Risk factors:* Measured as perception of risk for contracting HIV (high and already have HIV are combined; medium; low; none).
DATA ANALYSIS

Data tables are presented below and divided into two sections: descriptive statistics and inferential statistics. There are eight descriptive statistical tables which present demographic characteristics related to respondents. Also, data about respondents’ testing for HIV relative to gender, age, marital status, and ethnicity are provided. Furthermore, data about respondents’ perception of chance for getting HIV is shown, and their risk for HIV broken out into separate age groups.

Descriptive Statistics

Demographic characteristics of respondents are presented in Table 1. From 2006 to 2008, the total number of respondents participating in the survey decreased, and the change in population was evenly distributed among each demographic category.

- **Age group**: The majority of respondents (59.7%) were in the 18 to 49 years age group. A little more than one-fifth (23.9%) of the respondents were in the 50 to 64 years age group, and less than one-fifth (16.3%) were aged 65 years old or older for the three-year period.

- **Gender**: There were slightly more male respondents (51.7%) than female respondents (48.3%) for the three-year period.

- **Race/ethnicity**: Nearly 70% (69.5%) of respondents were Caucasian. Respondents of African American and Hispanic race/ethnicity accounted for just over 10% (11.6% and 13.3%, respectively). Only 5.5% of respondents were from the other race/ethnicity category during the three-year period.
### Table 1

**Demographic Characteristics of Respondents**

<table>
<thead>
<tr>
<th></th>
<th>2006 N = 24,275</th>
<th></th>
<th>2007 N = 23,393</th>
<th></th>
<th>2008 N = 21,781</th>
<th></th>
<th>Total N = 69,449</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td>Unweighted #</td>
<td>Weighted %</td>
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<td><strong>AGE GROUP</strong></td>
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<td></td>
</tr>
<tr>
<td>18-49</td>
<td>14,076</td>
<td>60.5</td>
<td>13,289</td>
<td>59.8</td>
<td>12,059</td>
<td>59.0</td>
<td>39,424</td>
<td>59.7</td>
</tr>
<tr>
<td>50-64</td>
<td>5,552</td>
<td>23.3</td>
<td>5,521</td>
<td>23.9</td>
<td>5,278</td>
<td>24.5</td>
<td>16,351</td>
<td>23.9</td>
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<td>65 and older</td>
<td>4,647</td>
<td>16.2</td>
<td>4,583</td>
<td>16.2</td>
<td>4,444</td>
<td>16.5</td>
<td>13,674</td>
<td>16.3</td>
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<td><strong>GENDER</strong></td>
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<td></td>
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<tr>
<td>Male</td>
<td>13,560</td>
<td>51.8</td>
<td>13,018</td>
<td>51.7</td>
<td>12,267</td>
<td>51.7</td>
<td>38,845</td>
<td>51.7</td>
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<td>Female</td>
<td>10,715</td>
<td>48.2</td>
<td>10,375</td>
<td>48.2</td>
<td>9,514</td>
<td>48.3</td>
<td>30,604</td>
<td>48.3</td>
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<td><strong>RACE/ETHNICITY</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Caucasian</td>
<td>14,548</td>
<td>70.0</td>
<td>14,052</td>
<td>69.4</td>
<td>13,289</td>
<td>69.1</td>
<td>41,889</td>
<td>69.5</td>
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<tr>
<td>African American</td>
<td>4,004</td>
<td>11.6</td>
<td>3,681</td>
<td>11.6</td>
<td>3,365</td>
<td>11.7</td>
<td>11,050</td>
<td>11.6</td>
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<tr>
<td>Hispanic</td>
<td>4,227</td>
<td>13.0</td>
<td>4,196</td>
<td>13.4</td>
<td>3,673</td>
<td>13.6</td>
<td>12,096</td>
<td>13.3</td>
</tr>
<tr>
<td>Other *</td>
<td>1,496</td>
<td>5.4</td>
<td>1,464</td>
<td>5.6</td>
<td>1,454</td>
<td>5.6</td>
<td>4,414</td>
<td>5.5</td>
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<td><strong>MARITAL STATUS</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married; spouse in house</td>
<td>10,961</td>
<td>55.5</td>
<td>10,404</td>
<td>54.5</td>
<td>9,546</td>
<td>53.8</td>
<td>30,911</td>
<td>54.6</td>
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<tr>
<td>Married; spouse not in house</td>
<td>406</td>
<td>1.1</td>
<td>369</td>
<td>1.1</td>
<td>341</td>
<td>1.2</td>
<td>1,116</td>
<td>1.1</td>
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<td>Widowed</td>
<td>2,216</td>
<td>5.9</td>
<td>2,262</td>
<td>6.3</td>
<td>2,122</td>
<td>6.0</td>
<td>6,600</td>
<td>6.1</td>
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<td>Divorced</td>
<td>3,143</td>
<td>9.5</td>
<td>2,986</td>
<td>8.7</td>
<td>2,913</td>
<td>9.1</td>
<td>9,042</td>
<td>8.9</td>
</tr>
<tr>
<td>Separated</td>
<td>770</td>
<td>1.2</td>
<td>800</td>
<td>2.0</td>
<td>724</td>
<td>2.1</td>
<td>2,294</td>
<td>2.1</td>
</tr>
<tr>
<td>Never married</td>
<td>5,481</td>
<td>20.2</td>
<td>5,216</td>
<td>20.4</td>
<td>4,862</td>
<td>20.7</td>
<td>15,559</td>
<td>20.4</td>
</tr>
<tr>
<td>Living with partner</td>
<td>1,142</td>
<td>5.8</td>
<td>1,225</td>
<td>6.5</td>
<td>1,194</td>
<td>6.8</td>
<td>3,561</td>
<td>6.4</td>
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<tr>
<td>Unknown marital status</td>
<td>156</td>
<td>0.4</td>
<td>131</td>
<td>0.4</td>
<td>79</td>
<td>0.2</td>
<td>366</td>
<td>0.3</td>
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<tr>
<td><strong>EDUCATION</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>4,695</td>
<td>16.9</td>
<td>4,224</td>
<td>15.6</td>
<td>3,749</td>
<td>15.4</td>
<td>12,668</td>
<td>16.0</td>
</tr>
<tr>
<td>High school graduate; no college</td>
<td>6,708</td>
<td>28.9</td>
<td>6,522</td>
<td>28.9</td>
<td>5,853</td>
<td>27.7</td>
<td>19,083</td>
<td>28.5</td>
</tr>
<tr>
<td>Some college</td>
<td>6,786</td>
<td>28.9</td>
<td>6,478</td>
<td>28.5</td>
<td>6,399</td>
<td>30.1</td>
<td>19,663</td>
<td>29.2</td>
</tr>
<tr>
<td>College graduate</td>
<td>5,767</td>
<td>25.1</td>
<td>5,909</td>
<td>26.9</td>
<td>5,631</td>
<td>26.7</td>
<td>17,307*</td>
<td>26.2</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), *National Health Interview Survey (NHIS)*, Household Composition Section, Family Identification Section, Family Socio-Demographic Section. *Includes Native Americans, Alaskan Natives, Asians or Pacific Islanders, and persons of unspecified groups. *Missing 728 cases.
• **Marital status:** Over half (54.6%) of respondents indicated that they were married with their spouse living in the house with them. Those who had never been married amounted to one-fifth (20.4%) of respondents, while those who were living with their partner (6.4%) or widowed (6.1%) were the next highest numbers of respondents. No respondents indicated that they were married with a spouse who lived in an unknown home.

• **Education:** The percentage of respondents’ educational level was nearly equally distributed among those with a high school diploma (28.5%), those with some college (29.2%), and college graduates (26.2%). About one-fifth (16%) of respondents indicated that they had received some high school education.

Table 2

**Percentage of Respondents Tested for HIV by Gender**

<table>
<thead>
<tr>
<th>Tested for HIV</th>
<th>Males</th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
<th>Totals</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td></td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td></td>
<td>Unweighted #</td>
<td>Weighted %</td>
</tr>
<tr>
<td>No</td>
<td>18,553</td>
<td>64.8</td>
<td></td>
<td>21,937</td>
<td>60.8</td>
<td></td>
<td>40,490</td>
<td>100.0</td>
</tr>
<tr>
<td>Yes</td>
<td>10,480</td>
<td>35.2</td>
<td></td>
<td>15,148</td>
<td>39.2</td>
<td></td>
<td>25,628</td>
<td>100.0</td>
</tr>
<tr>
<td>Totals</td>
<td>29,033</td>
<td>100.0</td>
<td></td>
<td>37,085</td>
<td>100.0</td>
<td></td>
<td>66,118(^a)</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section, Household Composition Section.  
\(^a\)Missing 3,331 cases.

As shown in Table 2, male respondents were slightly less likely to report having been tested for HIV as compared to female respondents. About one-third of male respondents (35.2%) reported that they had been tested for HIV, whereas about 40% (39.2 %) of female respondents indicated that they had received an HIV test.
Table 3

Percentage of Respondents Tested for HIV by Age

<table>
<thead>
<tr>
<th>Tested for HIV</th>
<th>18-49</th>
<th>50-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td>Unweighted #</td>
<td>Weighted %</td>
</tr>
<tr>
<td>NO</td>
<td>18,688</td>
<td>52.8</td>
<td>10,630</td>
<td>70.7</td>
</tr>
<tr>
<td>YES</td>
<td>19,172</td>
<td>47.2</td>
<td>4,868</td>
<td>29.3</td>
</tr>
<tr>
<td>Totals</td>
<td>37,860</td>
<td>100.0</td>
<td>15,498</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section, Household Composition Section.

As shown in Table 3, respondents 18 to 49 years old were nearly as likely to report having been tested for HIV (52.8%) as not having been tested (47.2%). Of those respondents in the 50 to 64 years age range, less than one-third (29.3%) indicated that they had been tested for HIV. Respondents aged 65 years and older (88.2%) were less likely to have reported receiving an HIV test than any of the other age groups. The data suggest that, as age increased, the likelihood for being tested for HIV decreased.

Table 4

Receipt of HIV Test by Marital Status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>HIV Test</th>
<th>No HIV Test</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td>Unweighted #</td>
</tr>
<tr>
<td>Married; spouse in house</td>
<td>10,833</td>
<td>36.0</td>
<td>18,668</td>
</tr>
<tr>
<td>Married; spouse not in house</td>
<td>430</td>
<td>39.1</td>
<td>622</td>
</tr>
<tr>
<td>Widowed</td>
<td>908</td>
<td>14.7</td>
<td>5,286</td>
</tr>
<tr>
<td>Divorced</td>
<td>3,875</td>
<td>45.2</td>
<td>4,723</td>
</tr>
<tr>
<td>Separated</td>
<td>1,174</td>
<td>52.9</td>
<td>1,008</td>
</tr>
<tr>
<td>Never been married</td>
<td>6,434</td>
<td>36.7</td>
<td>8,466</td>
</tr>
<tr>
<td>Living with partner</td>
<td>1,891</td>
<td>54.6</td>
<td>1,536</td>
</tr>
<tr>
<td>Unknown marital status</td>
<td>83</td>
<td>34.8</td>
<td>181</td>
</tr>
<tr>
<td>Totals</td>
<td>25,628</td>
<td>38.8</td>
<td>40,490</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section, Family Identification Section.

a Missing 3,331 cases.
As shown in Table 4, the majority of respondents, regardless of reported marital status, were more likely to indicate that they had not received an HIV test. According to the data, individuals who were widowed (85.3%) were more likely to report not having been tested for HIV than individuals of any other marital status. Respondents who reported having an unknown marital status (65.2%), being married (64.0%), or married but with a spouse living away from the house (60.9%) also were very likely to respond that they had not received an HIV test.

Over half of respondents who were either living with a partner (54.6%) or separated (52.9%) reported that they had been tested for HIV.

Table 5

*Receipt of HIV Test by Ethnicity*

<table>
<thead>
<tr>
<th></th>
<th>Caucasian</th>
<th>African American</th>
<th>Hispanic</th>
<th>Other(^a)</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tested for HIV</strong></td>
<td>Unweighted</td>
<td>Weighted %</td>
<td>Unweighted</td>
<td>Weighted %</td>
<td>Unweighted</td>
</tr>
<tr>
<td><strong>NO</strong></td>
<td>26,475</td>
<td>66.5</td>
<td>4,776</td>
<td>45.3</td>
<td>6,491</td>
</tr>
<tr>
<td><strong>YES</strong></td>
<td>13,334</td>
<td>33.5</td>
<td>5,748</td>
<td>54.7</td>
<td>5,107</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>39,809</td>
<td>100.0</td>
<td>10,524</td>
<td>100.0</td>
<td>11,598</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), *NHIS, AIDS Knowledge and Attitudes Section, Household Composition Section.* \(^a\)Includes Native Americans, Alaskan Natives, Asians or Pacific Islanders, and persons of unspecified groups. \(^b\)Missing 3,331 cases.

Table 5 shows that, in nearly every category of race/ethnicity, the majority of respondents were more likely to report that they had not been tested for HIV than to report having been tested for HIV. Two-thirds of respondents in both the Caucasian (66.5%) and Other (64.6%) race/ethnicity categories indicated they had not received an HIV test. Over half (57.6%) of Hispanic respondents had not been tested for HIV. Only respondents of African American ethnicity (54.7%) were more likely to indicate getting an HIV test than not getting tested.
Table 6

Receipt of AIDS Test by Education

| Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section, Family Socio-Demographic Section. aMissing 3,858 cases. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | High School Diploma, No College | Some College | College Degree | Totals |
| Tested for HIV | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % |
| NO | 7,980 | 67.7 | 11,930 | 67.0 | 10,644 | 59.0 | 9,563 | 59.0 | 40,117 |
| YES | 4,061 | 32.3 | 6,227 | 33.0 | 8,203 | 41.0 | 6,983 | 41.0 | 25,474 |
| Totals | 12,041 | 100.0 | 18,157 | 100.0 | 18,847 | 100.0 | 16,546 | 100.0 | 65,591 |

According to the data presented in Table 6, two-thirds of individuals with some high school (67.7%) and at least a high school diploma (67.0%) were equally likely to report not receiving an HIV test. Similarly, individuals with some college (59.0%) and with a college degree (59.0%) were also equally likely to report not having been tested for HIV. Respondents with college-level education were only slightly more likely to have received an HIV test than those respondents with only some high school or a high school diploma.

Table 7

Expectation of Getting HIV Test by Perception of Chances for Getting HIV

| Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section. aMissing 3,773 cases. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Expect to Get an HIV Test in the Next 12 Months | High/Already Have HIV | Medium | Low | None | Totals |
| | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % | Unweighted | Weighted % |
| YES | 114 | 26.6 | 271 | 25.0 | 2,192 | 13.4 | 3,801 | 6.6 | 6,378 |
| NO | 305 | 73.4 | 731 | 75.0 | 12,166 | 86.6 | 46,096 | 93.4 | 59,298 |
| TOTALS | 419 | 100.0 | 1,002 | 100.0 | 14,358 | 100.0 | 49,897 | 100.0 | 65,676 |

As shown in Table 7, about one-fourth (26.6%) of respondents who believed their
chances for getting HIV as “High/Already have HIV” or “Medium” (25.0%) expect to get an HIV test in the next 12 months. Also, the majority of respondents indicated that their chance for getting HIV as “Low” (86.6%) or “None” (93.4%) and did not expect to get an HIV in the next 12 months. Not surprisingly, according to the data, assessment of chances for getting HIV as “Low” was more likely to influence the expectation of not getting an HIV test in the next 12 months. As perception of chances for getting HIV became higher, the expectation of getting an HIV test in the next 12 months increased.

Table 8

**Perception of HIV Risk by Age**

<table>
<thead>
<tr>
<th>Chances for Getting HIV</th>
<th>18-49</th>
<th>50-64</th>
<th>65+</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unweighted #</td>
<td>Weighted %</td>
<td>Unweighted #</td>
<td>Weighted %</td>
</tr>
<tr>
<td>High / Already have HIV</td>
<td>278</td>
<td>0.62</td>
<td>110</td>
<td>0.58</td>
</tr>
<tr>
<td>Medium</td>
<td>758</td>
<td>1.9</td>
<td>195</td>
<td>1.1</td>
</tr>
<tr>
<td>Low</td>
<td>10,615</td>
<td>26.4</td>
<td>2,875</td>
<td>17.4</td>
</tr>
<tr>
<td>None</td>
<td>26,243</td>
<td>71.0</td>
<td>12,553</td>
<td>80.9</td>
</tr>
<tr>
<td>Totals</td>
<td>37,894</td>
<td>100.0</td>
<td>15,733</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), *NHIS*, AIDS Knowledge and Attitudes Section, Household Composition Section.

Table 8 shows that, as the age of respondent increased, the percentage of those perceiving their chances for getting HIV as “High” decreased. Overall, less than 1% of respondents in each age group indicated their chances for getting HIV as “High/Already have HIV.” As age increased, perception of chances for getting HIV decreased. Ninety percent of respondents aged 65 years or older believed their chances for getting HIV were “None,” compared to about three-fourths (71%) of respondents 18 to 49 years of age. Further, less than
one-fifth (9%) of respondents aged 65 years or older believed themselves to be at a low risk for contracting HIV, compared to over one-fourth (26.4%) of respondents aged 18 to 49 years who also believed themselves to be at a low risk of getting HIV.

Inferential Statistics

Data generated to test four hypotheses are presented in the next four tables. Those tables examine the following four data results:

- The effect of a respondent’s age on the likelihood that an HIV test has been obtained
- The interaction of gender and age of a respondent to affect the likelihood that an HIV test has been obtained
- The effect of a respondent’s age on expected chance for getting HIV
- The effect of a respondent’s age on the likelihood for getting an HIV test in the next 12 months

**Effect of Age and Getting an HIV Test**

Independent Variable

According to the data presented in Table 9, age of respondent appeared to affect the likelihood of having been tested for HIV. Respondents 50 and older were two-thirds less likely to have gotten an HIV test compared to those 18 to 49 years of age (odds ratio, .39; 95% confidence interval, .36-.43; \( p \leq 0.001 \)). Respondents aged 65 years and older were about half as likely as respondents 50 years and older to report having been tested for HIV (odds ratio, .42; 95% confidence interval, .38-.46; \( p \leq 0.001 \)). Likewise, respondents aged 75 years and older were about half as likely as respondents 65 years and older to report having been tested for HIV (odds ratio, .42; 95% confidence interval; .36-.48, \( p \leq 0.001 \)).
**Table 9**

*Odds Ratio to Test the Effect of Age on Getting an HIV Test*

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td><strong>INTERCEPT</strong></td>
<td>0.84***</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>INDEPENDENT VARIABLES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 50 years and older(^a)</td>
<td>0.39***</td>
<td>0.36</td>
</tr>
<tr>
<td>Age 65 years and older(^b)</td>
<td>0.42***</td>
<td>0.38</td>
</tr>
<tr>
<td>Age 75 years and older(^c)</td>
<td>0.42***</td>
<td>0.36</td>
</tr>
<tr>
<td>Age in 10-year intervals(^d)</td>
<td>1.09***</td>
<td>1.06</td>
</tr>
<tr>
<td><strong>CONTROL VARIABLES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MARITAL STATUS</strong>(^e)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>0.96</td>
<td>0.91</td>
</tr>
<tr>
<td>Widowed</td>
<td>0.85**</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>RACE/ETHNICITY</strong>(^f)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>2.31***</td>
<td>2.15</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.32***</td>
<td>1.24</td>
</tr>
<tr>
<td>Other(^g)</td>
<td>0.91*</td>
<td>0.83</td>
</tr>
<tr>
<td><strong>EDUCATION</strong>(^h)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma, no college</td>
<td>1.02</td>
<td>0.95</td>
</tr>
<tr>
<td>Some college</td>
<td>1.30***</td>
<td>1.23</td>
</tr>
<tr>
<td>College degree</td>
<td>1.09***</td>
<td>1.03</td>
</tr>
<tr>
<td><strong>GENDER</strong>(^i)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.79***</td>
<td>0.76</td>
</tr>
</tbody>
</table>

---

Source: CDC (2006-2008), *NHIS*, AIDS Knowledge and Attitudes Section, Household Composition Section, Family Identification Section, Family Socio-Demographic Section. †Missing 3,035 cases. *p < 0.05; **p < 0.01; ***p < 0.001. \(^a\)18-49 years of age is the contrast category. \(^b\)50-64 years of age is the contrast category. \(^c\)65-74 years of age is the contrast category. \(^d\)Effect of age in 10-year intervals (younger age group) is the contrast category. \(^e\)Divorced, separated, and never been married combined is the contrast category. \(^f\)Caucasian is the contrast category. \(^g\)Includes Native American, Alaskan Native, Asian or Pacific Islander, and persons of unspecified groups. \(^h\)Some high school is the contrast category. \(^i\)Female is the contrast category.

However, respondents’ likelihood for having gotten an HIV test was greater for every 10 years of age (odds ratio; 1.09, 95% confidence interval, 1.06-1.12; \(p \leq 0.001\)). Thus, aside from major age spans, each year of age tended to somewhat increase the likelihood of having gotten tested.
Control Variables

- **Marital status:** Married respondents were almost as likely to report having received an HIV test as respondents who indicated they were divorced, separated, or had never been married (odds ratio, .96; 95% confidence interval, .91-1.01). Respondents who reported their marital status as widowed were less likely to indicate they had been tested for HIV as compared to respondents who indicated that they were divorced, separated, or had never been married (odds ratio, .85; 95% confidence interval, .76-.95; \(p < 0.01\)).

- **Race/ethnicity:** African American respondents were more than twice as likely as Caucasian respondents to indicate they had been tested for HIV (odds ratio, 2.31; 95% confidence interval, 2.15-2.48; \(p \leq 0.001\)). Hispanic respondents were about 30% more likely than Caucasian respondents to have gotten an HIV test (odds ratio, 1.32; 95% confidence interval, 1.24-1.42; \(p \leq 0.001\)). Only respondents who indicated they were Native American, Alaskan Native, Asian or Pacific Islander, and persons of unspecified groups were less likely than Caucasian respondents to have been tested for HIV (odds ratio, 0.91; 95% confidence interval, 0.83-1.00; \(p \leq 0.05\)).

- **Education:** Individuals with a high school diploma were equally likely to have been tested for HIV as respondents with only some high school education. Individuals with some college were about 30% more likely to be tested for HIV than those with only some high school education (odds ratio, 1.30; 95% confidence interval, 1.23-1.37; \(p \leq 0.001\)). Respondents with a college degree were only slightly more likely to have been tested than those with only some high school (odds ratio, 1.09; 95% confidence interval, 1.03-1.15; \(p \leq 0.001\)).
• **Gender:** Males were about 20% less likely than females to report having been tested for HIV (odds ratio, .79; 95% confidence interval, .76-.83; \( p \leq 0.001 \)).

**Interaction of Gender with Age and Getting an HIV Test**

Independent Variable

The data presented in Table 10 suggest that gender of respondents influenced the likelihood of a respondent having been tested for HIV. Overall, men were about one-third less likely to have gotten an HIV test (odds ratio, .63; 95% confidence interval, .59-.66; \( p \leq 0.001 \)). However, men 50 years of age and older were twice as likely to have been tested for HIV as compared to women 50 years of age and older (odds ratio, 2.09; 95% confidence interval, 1.90-2.31; \( p \leq 0.001 \)). Likewise, men age 75 years and older were about 50% more likely than women age 75 years and older to indicate having gotten an HIV test (odds ratio, 1.47; 95% confidence interval, 1.09-1.97; \( p \leq 0.05 \)). Men 65 years of age and older were about 13% more likely to have been tested for HIV compared to women 65 years of age and older (odds ratio, 1.13; 95% confidence interval, 0.94-1.35).

Further, the age of respondents had an effect on the likelihood that they would have gotten tested for HIV. Respondents 50 and older were about 75% less likely than those aged 18 to 49 years of age to have been tested for HIV (odds ratio, .27; 95% confidence interval, .25-.30; \( p \leq 0.001 \)). Respondents aged 65 years and older were about two-thirds less likely than respondents 50 years and older to report having been tested for HIV (odds ratio, .39; 95% confidence interval, .34-.45; \( p \leq 0.001 \)). Respondents aged 75 years and older were also about two-thirds less likely than respondents 65 years and older to report having been tested for HIV (odds ratio, .34; 95% confidence interval, 0.28-0.42; \( p \leq 0.001 \)). Respondents’ likelihood for
having gotten an HIV test was about 9% greater for every 10 years of age (odds ratio, 1.09; 95% confidence interval, 1.06-1.13; \( p < 0.001 \)).

Table 10

*Odds Ratio to Test Interaction of Gender with Age and Getting HIV Test*

| Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section, Household Composition Section, Family Identification Section, Family Socio-Demographic Section. †Missing 3,331 cases. *\( p < 0.05 \); **\( p < 0.01 \); ***\( p < 0.001 \). ¹8-49 years of age is the contrast category. ²50-64 years of age is the contrast category. ³65-74 years of age is the contrast category. ⁴Effect of age in 10-year intervals (younger age group) is the contrast category. ⁵Divorced, separated, and never been married combined is the contrast category. ⁶Caucasian is the contrast category. ⁷Includes Native American, Alaskan Native, Asian or Pacific Islander, and persons of unspecified groups. ⁸Some high school is the contrast category. ⁹Female is the contrast category.

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>INTERCEPT</td>
<td>0.95</td>
<td>0.87</td>
</tr>
<tr>
<td>INDEPENDENT VARIABLES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 50 years and older</td>
<td>0.27***</td>
<td>0.25</td>
</tr>
<tr>
<td>Age 65 years and older</td>
<td>0.39***</td>
<td>0.34</td>
</tr>
<tr>
<td>Age 75 years and older</td>
<td>0.34***</td>
<td>0.28</td>
</tr>
<tr>
<td>Age in 10 year intervals</td>
<td>1.09***</td>
<td>1.06</td>
</tr>
<tr>
<td>CONTROL VARIABLES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MARITAL STATUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>0.95*</td>
<td>0.90</td>
</tr>
<tr>
<td>Widowed</td>
<td>1.01</td>
<td>0.90</td>
</tr>
<tr>
<td>RACE/ETHNICITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>2.31***</td>
<td>2.14</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.33***</td>
<td>1.24</td>
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<tr>
<td>Other</td>
<td>0.91</td>
<td>0.84</td>
</tr>
<tr>
<td>EDUCATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>1.03</td>
<td>0.96</td>
</tr>
<tr>
<td>Some college</td>
<td>1.28***</td>
<td>1.21</td>
</tr>
<tr>
<td>College degree</td>
<td>1.08*</td>
<td>1.02</td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0.63***</td>
<td>0.59</td>
</tr>
<tr>
<td>Male age 50 years and older</td>
<td>2.09***</td>
<td>1.90</td>
</tr>
<tr>
<td>Male age 65 years and older</td>
<td>1.13</td>
<td>0.94</td>
</tr>
<tr>
<td>Male age 75 years and older</td>
<td>1.47*</td>
<td>1.09</td>
</tr>
<tr>
<td>N†</td>
<td>66,118</td>
<td></td>
</tr>
<tr>
<td>Degrees of Freedom</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Model ( \chi^2 )</td>
<td></td>
<td>332.53</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section, Household Composition Section, Family Identification Section, Family Socio-Demographic Section. †Missing 3,331 cases. *\( p < 0.05 \); **\( p < 0.01 \); ***\( p < 0.001 \). ¹8-49 years of age is the contrast category. ²50-64 years of age is the contrast category. ³65-74 years of age is the contrast category. ⁴Effect of age in 10-year intervals (younger age group) is the contrast category. ⁵Divorced, separated, and never been married combined is the contrast category. ⁶Caucasian is the contrast category. ⁷Includes Native American, Alaskan Native, Asian or Pacific Islander, and persons of unspecified groups. ⁸Some high school is the contrast category. ⁹Female is the contrast category.
Control Variables

- **Marital status**: Married respondents were no more likely to report having received an HIV test than respondents who indicated they were divorced, separated, or had never been married (odds ratio, .95; 95% confidence interval, .90-1.00; \( p < 0.05 \)). Respondents who reported their marital status as widowed were also about as likely to indicate that they had been tested for HIV as compared to respondents who indicated they were divorced, separated, or had never been married (odds ratio, 1.01; 95% confidence interval, 0.90-1.14).

- **Race/ethnicity**: African American respondents were more than twice as likely as Caucasian respondents to indicate they had been tested for HIV (odds ratio, 2.31; 95% confidence interval, 2.14-2.48; \( p < 0.001 \)). Hispanic respondents were about one-third more likely than Caucasian respondents to have gotten an HIV test (odds ratio, 1.33; 95% confidence interval, 1.24-1.42; \( p < 0.001 \)). Only respondents who indicated they were Native American, Alaskan Native, Asian or Pacific Islander, and persons of unspecified groups were less likely than Caucasian respondents to have been tested for HIV (odds ratio, 0.91; 95% confidence interval, 0.84-1.00). Controlling for age did not seem to change the likelihood for respondents of any race/ethnicity to have or have not been tested for HIV.

- **Education**: Individuals with a high school diploma were about as likely as respondents with only some high school education to have gotten tested for HIV (odds ratio, 1.03; 95% confidence interval, 0.96-1.11). Individuals with some college were about one-fourth more likely to be tested for HIV than those with only some high school education (odds ratio, 1.28; 95% confidence interval, 1.21-1.35; \( p < 0.001 \)). Respondents with a college degree were only
slightly more likely to have been tested than those with only some high school (odds ratio, 1.08; 95% confidence interval, 1.02-1.14; \( p < 0.05 \)).

- **Gender:** Overall, males were about one-third less likely to have gotten tested for HIV as compared to females (odds ratio, 0.63; 95% confidence interval, 0.59 – 0.66; \( p < 0.001 \)). However, male respondents aged 50 years and older were twice as likely to indicate they had been tested for HIV compared to female respondents of the same age (odds ratio, 2.09; 95% confidence interval, 1.90-2.31; \( p < 0.001 \)). Males 65 years old and older were about as likely as females of the same age to have gotten an HIV test (odds ratio, 1.13; 95% confidence interval, 0.94-1.35). Males 75 years of age and older were about 50% more likely than females 75 years of age and older to report having been tested for HIV (odds ratio, 1.47; 95% confidence interval, 1.09-1.97; \( p < 0.05 \)).

**Effect of Age on Chance for Getting the AIDS Virus**

**Independent Variable**

As shown in Table 11, overall, age of respondents had an effect on perception of getting HIV. When controlling for age, respondents 50 years of age and older were about 75% more likely to perceive their chance of getting HIV as “none” when compared to respondents aged 18 to 49 years (odds ratio, 1.74; 95% confidence interval, 1.12-2.70; \( p < 0.01 \)). Respondents aged 65 years and older were three times more likely to estimate their chance of getting HIV as “none” than respondents 50 to 64 years of age (odds ratio, 3.71; 95% confidence interval, 2.13-6.46; \( p < 0.05 \)). However, respondents’ perception of their risk for contracting HIV as lower was reduced by about 25% for every 10 years of age (odds ratio; 0.77, 95% confidence interval,
0.66-0.89; \( p < 0.01 \). Overall, older respondents tend to rate their chance for contracting HIV lower at every age span.

Table 11

\textit{Odds Ratio to Estimate the Effect of Age on Expected Chance for Getting HIV}

<table>
<thead>
<tr>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>116.35*** 72.86 185.79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 50 years and older\textsuperscript{a}</td>
<td>1.74** 1.12 2.70</td>
<td></td>
</tr>
<tr>
<td>Age 65 years and older\textsuperscript{b}</td>
<td>3.71*** 2.13 6.46</td>
<td></td>
</tr>
<tr>
<td>Age in 10-year intervals\textsuperscript{c}</td>
<td>0.77** 0.66 0.89</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTROL VARIABLES</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARITAL STATUS\textsuperscript{d}</td>
<td>Married 1.60* 1.21 2.13</td>
<td></td>
</tr>
<tr>
<td>Widowed 0.75 0.42 1.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RACE/ETHNICITY\textsuperscript{e}</td>
<td>African American 0.51*** 0.37 0.70</td>
<td></td>
</tr>
<tr>
<td>Hispanic 0.81 0.57 1.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other\textsuperscript{f} 0.83 0.48 1.43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| EDUCATION\textsuperscript{g} | High school diploma 1.01 0.66 1.53 |
| Some college 0.81 0.60 1.08 |
| College degree 1.43 1.02 2.01 |

| GENDER\textsuperscript{h} | Male 0.81 0.64 1.02 |

N\textsuperscript{†} 65,676

Degrees of Freedom 13

Model \( \chi^2 \) 586.93

Source: CDC (2006-2008). \textit{NHIS}, AIDS Knowledge and Attitudes Section, Household Composition Section, Family Identification Section, Family Socio-Demographic Section. \( \text{†}\)Missing 3,773 cases. \*\text{\( p \leq 0.05; \)**\text{\( p \leq 0.01; \)***\text{\( p \leq 0.001. \)**50-64 years of age is the contrast category. \)**65-74 years of age is the contrast category. \)**Effect of age in 10-year intervals (younger age group) is the contrast category. \)**Divorced, separated, and never been married combined is the contrast category. \)**Caucasian is the contrast category. \)**Includes Native American, Alaskan Native, Asian or Pacific Islander, and persons of unspecified groups. \)**Some high school is the contrast category. \)**Female is the contrast category.

Control Variables

- \textit{Marital status}: Marital status seemed to affect respondent’s perception of risk for
getting HIV. As compared to respondents who were living together, divorced, or separated, married respondents were about 60% more likely to report their risk for contracting HIV as “none” (odds ratio, 1.60; 95% confidence interval, 1.21-2.13; \( p < 0.05 \)). Also, widowed respondents were about one-fourth as likely to perceive their risk as “none” compared to respondents who reported their marital status as living together with a partner, being divorced, or separated (odds ratio, 0.75; 95% confidence interval, 0.42-1.35).

- **Race/ethnicity:** African-American respondents were half as likely to perceive themselves as having no risk for contracting HIV as compared to Caucasians (odds ratio, 0.51; 95% confidence interval, 0.37-0.70; \( p < 0.001 \)). Hispanic and respondents in the Other ethnicity category were both about one-fifth less likely to perceive their chance for getting HIV as “none” when compared to Caucasian respondents (for Hispanic respondents, odds ratio, 0.81; 95% confidence interval, 0.57-1.14; for respondents in the “Other” ethnicity category, odds ratio, 0.83; 95% confidence interval, 0.48-1.43).

- **Education:** When controlling for education, having a high school diploma did not have any effect on a respondent’s likelihood of perception for getting HIV as compared to respondents who only had some high school education (odds ratio, 1.01; 95% confidence interval, 0.66-1.53). Respondents with only some college where about one-fifth less likely to believe they were not at risk for contracting HIV (odds ratio, 0.81; 95% confidence interval, 0.60-1.08), while those with a college degree were almost twice (43%) as likely to believe they were not at risk for contracting HIV, compared to those with only some high school education (odds ratio, 1.43; 95% confidence interval, 1.02-2.01).
• **Gender:** As compared to women, men were about one-fifth less likely to respond that their risk for getting HIV was “none” (odds ratio, 0.81; 95% confidence interval, 0.64-1.02).

**Effect of Age on the Likelihood of Getting an HIV Test in the Next 12 Months**

**Independent Variable**

As shown in Table 12, overall, the age of respondents had an effect on perception of getting tested for HIV in the next 12 months. Respondents 50 years of age and older were about 25% less likely to indicate that they were likely to get an HIV test in the next 12 months, as compared to those aged 18 to 49 years (odds ratio, 0.79; 95% confidence interval, 0.69-0.91; \( p < 0.05 \)). Respondents aged 65 and older were about a third less likely than those aged 50 to 64 years to report that they expected to get tested for HIV (odds ratio, 0.68; 95% confidence interval, 0.54-0.84; \( p < 0.001 \)). Further, respondents’ likelihood for getting tested in the next 12 months was reduced by about 25% for every ten years of age (odds ratio; 0.77, 95% confidence interval, 0.74-0.80; \( p < 0.001 \)).

**Control Variables**

**Marital Status:** Marital status seemed to influence a respondent’s likelihood for getting an HIV test in the next 12 months. Compared to respondents who were living together, divorced, or separated, married respondents were about half as likely to respond that they expected to get an HIV test in the next 12 months (odds ratio, 0.45; 95% confidence interval, 0.42-0.49; \( p < 0.001 \)). Likewise, widowed respondents were about one-third less likely to indicate they expected to get tested for HIV (odds ratio, 0.61; 95% confidence interval, 0.49-0.76; \( p < 0.001 \)).
Table 12

Odds Ratio to Test the Effect the Age on the Likelihood of Getting an HIV Test in the Next 12 Months

<table>
<thead>
<tr>
<th>INTERCEPT</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>0.08***</td>
<td>0.07</td>
</tr>
<tr>
<td>0.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDEPENDENT VARIABLES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 50 years and older&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.79*</td>
<td>0.69</td>
</tr>
<tr>
<td>Age 65 years and older&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.68***</td>
<td>0.54</td>
</tr>
<tr>
<td>Age 75 years and older&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.66</td>
<td>0.43</td>
</tr>
<tr>
<td>Age in 10-year intervals&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.77***</td>
<td>0.74</td>
</tr>
<tr>
<td>CONTROL VARIABLES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RACE/ETHNICITY&lt;sup&gt;f&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>4.45***</td>
<td>4.07</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.30***</td>
<td>2.07</td>
</tr>
<tr>
<td>Other&lt;sup&gt;g&lt;/sup&gt;</td>
<td>1.09</td>
<td>0.92</td>
</tr>
<tr>
<td>EDUCATION&lt;sup&gt;h&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>0.91</td>
<td>0.81</td>
</tr>
<tr>
<td>Some college</td>
<td>1.09</td>
<td>0.99</td>
</tr>
<tr>
<td>College degree</td>
<td>0.81***</td>
<td>0.73</td>
</tr>
<tr>
<td>GENDER&lt;sup&gt;i&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.12**</td>
<td>1.05</td>
</tr>
<tr>
<td>N†</td>
<td>66,414</td>
<td></td>
</tr>
<tr>
<td>Degrees of Freedom</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Model χ²</td>
<td></td>
<td>241.43</td>
</tr>
</tbody>
</table>

Source: CDC (2006-2008), NHIS, AIDS Knowledge and Attitudes Section, Household Composition Section, Family Identification Section, Family Socio-Demographic Section. <sup>†</sup>Missing 3,035 cases. <sup>*</sup>p ≤ 0.05; <sup>**</sup>p ≤ 0.01; <sup>***</sup>p ≤ 0.001. <sup>a</sup>18-49 years of age is the contrast category. <sup>b</sup>50-64 years of age is the contrast category. <sup>c</sup>65-74 years of age is the contrast category. <sup<d>Age of in 10-year intervals (younger age group) is the contrast category. <sup>e</sup>Divorced, separated, and never been married combined is the contrast category. <sup>f</sup>Caucasian is the contrast category. <sup>g</sup>Includes Native American, Alaskan Native, Asian or Pacific Islander, and persons of unspecified groups. <sup>h</sup>Some high school is the contrast category. <sup>i</sup>Female is the contrast category.

- Race/ethnicity: African-American respondents were about four and a half times more likely than Caucasian respondents to report they would be likely to get an HIV test in the next twelve months (odds ratio, 4.45; 95% confidence interval, 4.07-4.88; p ≤ 0.001). Also, Hispanic
respondents were more than twice as likely to indicate they were getting tested for HIV in the next 12 months compared to Caucasian respondents (odds ratio, 2.30; 95% confidence interval, 2.07-2.55; \( p < 0.001 \)). Respondents in the other ethnicity category were about as likely as Caucasian respondents to report that they were getting tested for HIV in the next twelve months (odds ratio, 1.09; 95% confidence interval, 0.92-1.29).

- **Education:** When controlling for education, respondents with only a high school diploma were about 10% less likely than those with only some high school education to indicate they were getting an HIV test in the next 12 months (odds ratio, 0.91; 95% confidence interval, 0.81-1.01). Respondents with only some college were about as likely to get an HIV test in the next 12 months as those with only some high school education (odds ratio, 1.09; 95% confidence interval, 0.99-1.20). Respondents with a college degree, however, were about a fifth less likely to get tested for HIV in the next 12 months compared to those with only some high school education (odds ratio, 0.81; 95% confidence interval, 0.73-0.90; \( p < 0.001 \)).

- **Gender:** Compared to women, men were about as likely to expect to get an HIV test in the next 12 months (odds ratio, 1.12; 95% confidence interval, 1.05-1.20; \( p < 0.01 \)).
DATA RESULTS SUMMARY

Four hypotheses were proposed and tested using data collected from the Adult AIDS Knowledge and Attitudes section of the National Health Interview Survey from the years 2006, 2007, and 2008 (CDC/DHIS/NCHS, 2007, 2008, & 2009). These hypotheses are presented below, including a discussion indicating whether the hypotheses were supported by the data.

Results for Research Hypotheses

• **H1: Older adults are less likely to report getting tested for HIV/AIDS than younger adults.**

The data indicated that, as a respondent’s age increased, the likelihood of that respondent’s reporting having been tested for HIV decreased. Respondents 50 years old and older were about 60% less likely than respondents aged 18 to 49 years to indicate being tested for HIV. Also, respondents in the 65 years of age and older, and the 75 years of age and older age groups were more than 50% less likely to report that they had gotten an HIV test as compared to respondents in the 50 years and older, and 65 years and older age groups, respectively. Overall, age does appear to affect the likelihood of having been tested for HIV when comparing older and younger adults. The data appear to support this hypothesis. It is important to note, however, that, when reviewing the effect of a respondent’s age in 10-year intervals and comparing those respondents to the next younger age group, there was a 9% greater likelihood that a respondent would have gotten an HIV test.

• **H2: Men are more likely to report having been tested for HIV compared to women.**

The data showed that, overall, when compared to female respondents, male respondents were about one-third less likely to report that they had gotten an HIV test. However, when controlling for age, male respondents aged 50 years and older were more than
twice as likely to indicate they had been tested for HIV, compared to female respondents of the same age. Similarly, male respondents aged 75 years and older were about 50 percent more likely to report having been tested for HIV, compared to female respondents of the same age. Males in the 65 years of age and older age category were about 13% more likely to have been tested for HIV compared to females in the same age group. Thus, among older adults and at greater ages, the gender difference reverses, with men becoming more likely than women to have had a test. The data seem to support the hypothesis.

- **H3: Older adults are less likely to report being at risk for contracting HIV than younger adults.**

  Generally, the data revealed that, as age increased, the likelihood that a respondent would indicate a lower chance for getting HIV increased. Respondents aged 50 years and older were about 75% more likely to report that they were at a lower risk for contracting HIV compared to respondents aged 18 to 49 years. In addition, respondents in the 65 years and older age group were more than three times as likely to indicate they were at a lower risk for contracting AIDS, compared to respondents in the 50 years and older age group. These results support the hypothesis. It should be noted that, when examining the effect of age in 10-year intervals, respondents were about 25% less likely to report their risk for contracting HIV as “none.”

- **H4: Older adults are less likely to expect to get an HIV test in the next 12 months compared to younger adults.**

  Overall, the age of a respondent did appear to exert major influence on a respondent’s likelihood to indicate an expectation of getting an HIV test in the next 12 months. Respondents in the 50 years and older age group were about one-fifth as likely to report that they expected
to get tested for HIV as compared to respondents 18 to 49 years of age. Similarly, respondents aged 65 and older were about one-third as likely to report that they planned to get an HIV test in the next 12 months, compared to respondents in the 50 years of age and older age group. Likewise, respondents 75 years and older were also about one-third as likely as respondents aged 65 years and older to report an expectation of getting tested for HIV in the next 12 months. However, the effect of age in 10-year intervals indicated that only about one-fourth of respondents reported plans to be tested for HIV in the next 12 months, and this result is only moderately different compared to results seen for respondents 50 years of age and older. Overall, the data somewhat support this hypothesis.

Additional Data Results

Race/Ethnicity

Overall, respondents of both African-American and Hispanic ethnicities were more likely than Caucasian respondents to report having been tested for HIV. Further, African-American respondents were about half as likely to report being at no risk for contracting HIV as compared to Caucasian respondents. Likewise, Hispanic respondents, as well as respondents in the “other” race/ethnicity category were about one-fifth as likely as Caucasian respondents to indicate that they were not at risk for contracting HIV.

Additionally, African-American respondents were more than four times more likely to expect to get an HIV test in the next 12 months, compared to Caucasian respondents. Hispanic respondents were about twice as likely as Caucasian respondents to expect to get an HIV test in the next 12 months.
The data suggest that race/ethnicity influences the likelihood that a person has gotten an HIV test and expects to get tested for HIV in the next 12 months. In addition, perception of risk for contracting HIV is also affected by a person’s race/ethnicity. These results suggest that outreach and education efforts are reaching individuals of African-American and Hispanic descent. According to findings from the Centers for Disease Control and Prevention, in 2009, among African-American males, the estimated rate of new HIV infections was 103.9 per 100,000, and 39.7 per 100,000 in African American females (CDC, 2011). These statistics indicate that individuals of this race/ethnicity should be informed about the need for HIV testing. It is possible that some respondents, who have been tested for HIV in the past, and tested negative, believe that no further testing is needed. Also, the receipt of a negative HIV test may create a belief that the respondent is not at risk for contracting HIV.

Marital Status

Married respondents were about as likely as unmarried respondents to report that they had been tested for HIV. Widowed respondents were about 15% less likely than unmarried respondents to report having been tested for HIV. Since older respondents are more likely to be widowed than younger respondents, age more than likely has an effect on getting an HIV test when examining marital status. Furthermore, when controlling for age, widowed respondents were equally likely to report having been tested for HIV as compared to unmarried respondents.

Perception of risk was also influenced by marital status, but in divergent ways. Married respondents were 60% more likely to believe that they were not at risk of contracting HIV as compared to unmarried respondents. However, widowed respondents were about 25% less
likely to indicate they were not at risk of contracting HIV as compared to unmarried respondents. This result is most likely influenced by the age of the widowed respondent.

Finally, when considering the likelihood of getting an HIV test in the next 12 months, both married and widowed respondents were less likely than unmarried respondents to report that they were likely be tested. Married respondents were less than half as likely as unmarried respondents to report they would get an HIV test in the next 12 months. Widowed respondents were about 40% less likely to indicate they would be tested for HIV as compared to unmarried respondents. These results suggest that married and widowed persons might believe that they do not need to get tested for HIV based on their relationship status. Unmarried persons may believe their risk for contracting HIV could be greater, if they believe their relationship status affects their likelihood of contracting HIV.

**Education**

With regard to having been tested for HIV, respondents with only some college education were 30% more likely to indicate that they had been tested, compared to respondents with some high school education. Respondents with a high school diploma were about as likely as those with some high school education to report that they had gotten an HIV test. Respondents with a college degree were 9% more likely to have been tested, compared to those with some high school education.

When examining the chance for contracting HIV, respondents having a college degree were 43% more likely to indicate they were not at risk, compared to respondents with some high school education. Respondents with some college education were about one-fifth less
likely than those with some high school education to believe they were not at risk of contracting HIV.

Likewise, when asking about the likelihood for getting an HIV test in the next 12 months, respondents with some college were 9% more likely than those with some high school education to report they would likely be tested for HIV in the next 12 months. Also, those with a college degree were about one-fifth less likely than respondents with some high school education to indicate that they were likely to be tested for HIV in the next 12 months. Respondents with a high school diploma were also 9% less likely than those with some high school education to report an expectation of getting an HIV test in the next 12 months.

Overall, having some college education seemed to influence likelihood for having been tested for HIV, perception of risk for contracting HIV, and likelihood for being tested in the next 12 months. Education did not appear to be as influential as other variables. This result may be due to the influence of other factors that may override education and knowledge. As mentioned previously, individuals can be educated and knowledgeable about HIV, its transmission routes, and related risk behaviors, but continue to participate in those behaviors (Catania, Kegeles, & Coates, 1990; DiClemente & Peterson, 1994).

The results from this research highlight the need to examine how age and HIV testing, perception of risk for contracting HIV, and likelihood of getting an HIV test in the next 12 months could affect future research, outreach, education, resources, and policy decisions. The implications of the current study for all of these areas of endeavor are discussed below.
LIMITATIONS OF THE STUDY

Structure of Survey

The National Health Interview Survey is lengthy. Collecting extensive information in person may be daunting to respondents, and requesting personal information related to risks for contracting HIV can be difficult under the best of circumstances. Lack of anonymity, as well as the source conducting the interview, a governmental agency, may cause respondents to be less than forthcoming. Older respondents might be more comfortable answering questions about HIV and their risk factors if the interviewer is close to their age and not substantially younger (Catania, 1999). Also, a female respondent might be more responsive to a female interviewer, as a male respondent might be more likely to answer honestly if the questions asked are being posed by a male interviewer (Catania, Gibson, Chitwood, & Coates, 1990). Furthermore, face-to-face interviews may prevent respondents from being as forthcoming as they would be to surveys conducted by telephone (Berrios, Hearts, Coates, Stall, Hudes, Turner, Eversley, & Catania, 1993). In order to collect sensitive data about a person’s sex habits, methodology is crucial. The survey tool must be designed appropriately to collect self-reported information. Also, both the interviewer and the interviewee must be comfortable enough to discuss the latter’s sexual history, including any diseases, and sexual habits, such as engaging in unprotected sexual relations (Gribble et al., 1998).

Earlier versions of the Adult AIDS Knowledge and Attitudes section in the NHIS contained questions to assess AIDS knowledge and misperceptions (Hardy, 1990). The removal of these questions and the content covered by them limits the ability of researchers using the survey to assess knowledge about HIV/AIDS and likelihood to interpret risk among respondents
drawn from a nationwide sample. Using the revised version of the NHIS’s Adult AIDS Knowledge and Attitudes section may automatically create an asexual picture of older respondents who are not given the opportunity to respond to questions about sexually transmitted diseases for methodological reasons, not due to personal choice to be non-responsive. Gribble et al. (1998) point out that researchers typically conduct reactive research related to aging, in lieu of taking a proactive research perspective. Additionally, too few studies ask adults 50 years of age and older about their sexual habits, including less-than-safe behaviors; access to that type of data requires utilizing specific methods for the purpose of collecting information about personal, somewhat provocative, behaviors (Gribble et al., 1998).

Use of Secondary Data

The use of secondary data creates a limitation due to the lack of questions not asked, such as condom use and sexually transmitted diseases in older respondents, thus affecting information available for analysis. The questions do not measure exactly what is intended to be measured (Emlet & Farkas, 2002), thus affecting validity. The NHIS contains questions about sexually transmitted diseases, but these questions were only asked of 18- to 49-year-old respondents. There are no questions about condom use, and only one question relative to risk assessment. Similarly, in the Adult AIDS Knowledge and Attitudes section of the survey, questions about sexually transmitted diseases are posed only to respondents aged 18 to 49 years. This omission is disturbing and problematic. The belief that persons aged 50 and over do not need to be asked about sexually transmitted diseases is not only ageist, but unrealistic. Older adults are certainly at risk of contracting sexually transmitted diseases due to inconsistent condom use (Calvet, 2003; Hillman, 2007), given that 33% of single older adults
reported that they used condoms rarely or not at all (AARP, 2003). This omission also underscores researchers’ inattention to the need for this type of data to be collected and analyzed. Furthermore, it perpetuates the myth that research questions designed to collect data regarding sexual habits among younger individuals can be extrapolated to older adults. Levy, Holmes, and Smith (2003) stress that not all research methods are translatable across respondents of all ages; consequently, the age of respondents should be carefully considered and taken into account when conducting HIV research. To counteract this limitation, age was carefully calculated to determine the effect of age grouped by cohort. Responses and data for 18-year-old respondents were not grouped together with those for individuals 50 years of age and older; instead, cohorts were created.

Also, questions regarding knowledge of AIDS/HIV ask respondents only to indicate whether any of statements related to risk is true, not to specify which statements are true (NHIS/DHIS/NCHS, 2007, 2008, 2009). The validity of the data for the purposes of this research is not as strong as it could be if a primary data analysis were conducted (Babbie, 2001).

**Variables Covered**

Income was not considered or included in the research because, given the complexity of the data as measured for each year, the imputation made a data analysis including income prohibitive. Further, responses of “High” and “Already have HIV” related to perception of risk were combined due to the small number of cases. These categories are distinct, and should be analyzed separately; however, other researchers (Theall et al., 2003) have combined responses related to HIV risk perception for the same reason, and indicate that this methodology has been
found to be valid. Future research efforts should disaggregate the categories in the data analysis if at all possible.
IMPLICATIONS

According to the data, older respondents were less likely than younger adults to report that they had been tested for HIV, or planned to get an HIV test in the next 12 months. Also, older respondents were more likely than younger respondents to indicate that they were at lower risk for contracting HIV. Other research indicates that older adults are sexually active but use condoms infrequently, if at all, or incorrectly (Hillman, 2007), and are less likely than younger adults to receive information about HIV and their risks for contracting the disease, either through mainstream educational outlets (Henderson et al., 2004) or from their physicians (Wooten-Bielski, 1999). Consequently, these results, in light of their congruity with other findings, should be considered for their implications on future research, service delivery, education and outreach, and policy, as they relate to HIV and older adults.

Future Research

According to Levy, Holmes, & Smith (2003), the intersection of aging and HIV/AIDS requires multiple research approaches in order to fully understand and address the unique effects of aging and its relationship to HIV/AIDS. In some cases, research studies do not examine risk behavior in older adults, yet those studies anticipate that research results for younger adults can be sufficiently extrapolated to an older population (Levy, Holmes, & Smith, 2003). Even in the NHIS research, as mentioned previously, questions about sexually transmitted diseases were not asked of respondents older than 49 years of age. Unfortunately, older adults are commonly omitted from STD-related research (Levy et al., 2007). Future research efforts examining HIV and older adults need to concentrate on HIV-risk related behavior--e.g., drug use, males having intercourse with males, and lack of condom use among
older adults—not just measuring these behaviors in younger adults and generalizing the results to an older segment of the population. Additionally, conducting qualitative research can be especially useful to gather meaningful data that provide insights about what older adults believe about HIV and what methods of outreach and education would work most effectively (Small, 2010).

Service Delivery

Issues of service delivery related to HIV and older adults are multifaceted. As Emlet, Gerkin, and Orel (2009) point out, older adults with HIV/AIDS are a diverse group, which includes, but is not limited to, those who have aged with HIV, those who recently received an HIV diagnosis, those who do not know they are HIV positive, and those who are not HIV positive but are participating in HIV-related risk behaviors. Service providers in the aging network should be responsive to each of these groups, and that response through service delivery must take into account the varied nature of these individuals and their needs, as well as their setting, whether in the community or a residential facility.

Emlet et al. (2009) also call upon service providers in the aging network to become educated about the needs of HIV-positive older adults. Staff members who provide direct care must understand the needs of HIV-positive older adults and take necessary measures to protect both themselves and their clients, and do so without any stigmatizing effects. Staff should also be sensitive about the social needs of HIV-positive individuals in a long-term care setting, and cautious about disclosure about HIV status to other residents. Furthermore, personnel should be cognizant of the need for socialization to prevent isolation of HIV-positive residents. Not being stigmatized for their HIV status is critical to supporting these individuals, whether they
have aged with HIV or have been recently diagnosed and require custodial care in a residential setting. Emlet et al. (2009) also stress that HIV-positive adults need the ability to access services not only from providers of services to older adults, but also from AIDS-related service providers.

Individuals who are HIV positive may not have a wide social network of caregivers and thus may be forced to rely on their own ability to negotiate the aging care network. Inability to disclose their status prevents them from accessing all care options (Emlet et al., 2009). Older adults may not be willing to research support groups or HIV-related agencies due to fears of stigma (Lekas, Schrimshaw, & Siegel, 2005) and the concern that their HIV status could be discovered by others, especially family and/or friends (Emlet, 2007).

Education and Outreach

As Skiest and Keiser (1997) state, most physicians are profoundly deficient in discussing HIV with older patients as compared to younger patients. The reluctance among physicians to engage in a meaningful conversation with their older patients about their risk behaviors, sexual history, and need for getting an HIV test, is problematic and distressing. If physicians are not able or willing to discuss HIV with their older patients, other professionals need to be involved.

Prevention efforts, specifically information about the need for HIV testing and coverage by Medicare, can come from social workers (Williams & Donnelly, 2002). Social workers can serve as a means of communicating with older adults, if they are not getting their information from doctors who may be younger than they are and either are embarrassed to ask or don’t regard their older patients as fully sexual beings.

Social workers may be more likely to view older adults as sexually active, regardless of
their sexual orientation, and to understand that they need information about HIV (Williams & Donnelly, 2002). Williams and Donnelly also recommend that undertaking primary prevention should include a comprehensive health history, including information about sexually transmitted diseases, participation in risk behaviors such as drug and alcohol abuse, and determining whether the older adult has been tested for HIV.

Gaps in service provision from service providers in both the aging and AIDS networks are also problematic (Linsk, Fowler, & Klein, 2003). An older, HIV-positive client can be eligible for services from either network, which can be valuable yet challenging, if one provider decides that the client should seek benefits from another, more capable provider, or if one provider feels ownerships of the client (Torrone, Levandowski, Thomas, Isler, & Leone, 2010). Emlet and Poindexter (2004) stress that it is incumbent on social workers to understand the provisions of the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act of 1990, as well as the Older Americans Act, in order to streamline service provision and adequately serve older adults with HIV. Knowledge of policy and legislation is crucial in offering services, given current fiscal restraints.

Policy

With persistent economic challenges comes the need for identifying the most cost-effective and efficient uses of funds. From an HIV/AIDS service provider perspective, the ability to develop new or additional educational programs is likely to be limited due to funding and resource constraints (Torrone et al., 2010). Limitations in financial resources are an issue that policy-makers can address in order to make the best and most appropriate use of funds. The emergence of advocacy groups, such as National Association on HIV Over Fifty is a means to
direct changes in policy related to HIV-positive older adults (Emlet & Poindexter, 2004; Linsk, Fowler, & Klein, 2003). Also, the Centers for Disease Control and Prevention’s recommendations for HIV testing as well as opt-out HIV screening for adults (CDC, 2006) represent an encouraging change in policy. Medicare coverage of costs associated with HIV screening once a year (CMS, 2011) is another step in the right direction.
CONCLUSION

As this research and other studies indicate, older adults are less likely to believe that they are at risk for contracting HIV than younger adults. Older adults do not automatically cease sexual activity as a result of age, and also do not always perceive the need for consistent condom use (Calvert, 2002; Hillman, 2007). Despite these facts, they are still at risk for contracting HIV, and need to understand the behaviors that put them at risk, as well as what protective measures can be taken. Furthermore, older adults should be aware of the need to get an HIV test.

HIV-related information that typically is given to younger adults is not usually available to older adults. Medical personnel are mostly unable to discuss HIV with or oblivious to that possibility in older patients (Agate et al., 2003; Glass & Webb, 1995; Wooten-Bielski, 1999). Likewise, the lack of mainstream HIV awareness and education efforts directed to older adults (Henderson et al., 2004) means that the risks related to HIV are not being communicated to the older population.

The nature of research involving older adults and HIV has progressed. Research efforts have explored how older adults intersect with HIV/AIDS in many ways, including educational needs (Orel et al., 2009), factors that influence access to care (Emlet & Farkas, 2002), and health care provider education (Paul, Martin, Lu, & Lin, 2007; Szerlip et. al, 2005), to name just a few. These research studies appeared in response to the changing nature of HIV in older adults in order to address the needs of an aging HIV-positive population, in addition to individuals who are either newly diagnosed with HIV at an older age, or are at risk and HIV positive, yet unaware of their status. The emergence of advocacy groups like the National
Association on HIV Over Fifty and the AIDS Community Research Initiative of America allow more attention to and focus on the needs of older adults who are faced with HIV, either knowingly or unknowingly. By understanding why older adults do not get tested for HIV, education and prevention efforts can be designed to address the issues that prevent older adults from considering getting an HIV test. As Henderson et al. (2004) and Orel et al. (2009) have stressed, education and outreach are essential for all individuals in order for them to realistically assess their risks for contracting HIV and understand how to protect themselves.

Finally, it is critical to restate that older adults, through engaging in risk behaviors that increase their chances of contracting HIV, suffer additional consequences at an accelerated pace (Justice & Weissman, 1998; Mack & Bland, 1999; Zelentz & Epstein, 1998), compared to younger individuals, because the immune system of an older adult is not as effective as that of a younger adult (Ferrini & Ferrini, 2000; Nichols et al., 2002). Regardless of age-related issues, individuals of all ages need to know their risks for contracting HIV, and the importance of getting an HIV test. Although older age may mean that the likelihood of getting an HIV test is less, this does not mean that all younger adults are getting tested for HIV. In some cases, providers are reluctant to offer and administer an HIV test, regardless of a patient’s age, due to barriers related to time, lack of knowledge, and reluctance to discuss the topic for fear of insulting a patient (Burke, Sepkowitz, Bernstein, Karpati, Myers, Tsoi, & Begier, 2007). In fact, the data indicate that less than half (47.2%) of respondents aged 18 to 49 years reported having been tested for HIV (NHIS/DHIS/NCHS, 2007, 2008, 2009). Consequently, although older age does not offer a protective effect, younger age does not ensure invincibility. Prevention, outreach, and awareness are crucial at every age and for people of all ages.
APPENDIX

NATIONAL HEALTH INTERVIEW SURVEY, ADULT AIDS KNOWLEDGE AND ATTITUDES SECTION

The following questions and responses were taken from the Adult AIDS Knowledge and Attitudes Section, National Health Interview Survey, and used for data analysis.

Except for tests you may have had as part of blood donations, have you ever been tested for HIV? Have you ever been tested for HIV?

Yes
No
Refused
Don’t know

Do you expect to have another test for HIV in the next 12 months, not including blood donations? Do you expect to have a test for HIV in the next 12 months, not including blood donations?

Yes
No
Refused
Don’t know

What are your chances of getting HIV (the virus that causes AIDS)? Would you say high, medium, low, or none?

High
Medium
Low
None
Already have HIV or AIDS
Refused
Don’t know
REFERENCES


