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## Healthcare Access and Cancer Screening among Victims of Intimate Partner Violence

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### Abstract

**Background**—Intimate partner violence (IPV) victims often experience substantial and persistent mental and physical health problems, including increased risk for chronic disease and barriers to healthcare access. This study investigated the association between IPV and cancer screening.

**Methods**—Behavioral Risk Factor Surveillance System (BRFSS) data from the eight states and one U.S. territory that administered the optional IPV module in 2006 were analyzed to examine demographic characteristics, health behaviors, health status, healthcare coverage, use of health services, and cancer screening among men and women who reported IPV victimization compared to men and women who did not. IPV victimization included physical violence, threats, and sexual violence.

**Results**—In the 9 jurisdictions that administered the IPV module, 23.6% of women and 11.3% of men experienced IPV. Fewer women and men reporting IPV victimization had health insurance, a personal doctor or healthcare provider, or regular checkups within the past two years compared to non-victims. More male and female IPV victims were current tobacco users and engaged in binge drinking in the past month. IPV victims of both sexes also had poorer health status, lower life satisfaction, less social and emotional support, and more days with poor physical and mental health in the past month than non-victims. IPV victimization was associated with lower rates of mammography and colorectal cancer screening but not cervical cancer screening in women and was not associated with colorectal cancer screening in men. In multivariable logistic regression results presented as adjusted proportions controlling for demographics, health status, and healthcare access, only the association with mammography screening remained significant, and the magnitude of this association was modest.

**Conclusions**—There were consistent differences between IPV victims and non-victims in nearly every measure of healthcare access, health status, and preventive service use. Much of this association seems explained by population characteristics associated with both IPV and lower use

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of preventive service use, including differences in demographic characteristics, health status, and healthcare access. Healthcare providers could take steps to identify populations at high risk for lack of access or use of preventive services and IPV victimization.

### Keywords

cancer screening; intimate partner violence; preventive services; health disparities

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Intimate partner violence (IPV), including physical violence, sexual violence, psychological aggression, and stalking by a current or former spouse or romantic/dating partner, affects millions of Americans.<sup>1</sup> More than one in five women and one in seven men have experienced severe IPV at some point in their lifetime.<sup>1</sup> IPV victims often experience substantial and persistent mental and physical health problems in addition to the increased risk for injury and mortality that are direct consequences of violence.<sup>1</sup> They are at increased risk for sexually transmitted infections and chronic diseases like asthma, cardiovascular disease, gastrointestinal disorders, chronic pain, and other conditions that appear to reflect the effects of chronic stress and other mechanisms on the body's systems.<sup>2-8</sup> They are also more likely to engage in negative health behaviors such as high-risk sexual behavior, using tobacco and other harmful substances, and unhealthy diet.<sup>2</sup> These disparities in health status and health behaviors between victims and non-victims can lead to increased risk for chronic diseases like cancer, and constitute barriers in access to healthcare and preventive services.

The mechanisms that underlie the associations between intimate partner violence and poor health, particularly cancer and other chronic diseases are not fully understood. Emerging data suggest victims experience more chronic stress, poorer health behaviors, lower income, and less stable employment than non-victims,<sup>1</sup> creating barriers in access to health care. These barriers in turn can lead to unmet health needs, delays in receiving care, and not obtaining preventive services.

One previous study found female victims of sexual violence were less likely to be up-to-date with breast and colorectal cancer screening.<sup>3</sup> This study, however, only focused on sexual violence, not necessarily in the context of an intimate relationship. The prevalence of IPV is significantly greater than for sexual violence, and the risk factors overlap but are not identical.<sup>1,4,5</sup> Another study looking specifically at preventive services found that female victims of IPV were less likely to have mammography and colorectal cancer screening than non-victims.<sup>6</sup> This study, however, only focused on women and did not include men. In addition, the study assessed receipt of cancer screening over a lifetime as opposed to being up-to-date on screening. Screening during recommended intervals is important for early detection and improved outcomes.<sup>7</sup>

We examined the association between self-reported IPV victimization and being up-to-date with cancer screening tests recommended by the United States Preventive Services Task Force: breast and cervical cancer for women and colorectal cancer for men and women. In addition, we compared IPV victims and non-victims on demographic characteristics, health-related behaviors, health status, and healthcare access, as these factors can act as barriers or facilitators to cancer screening and may help explain associations between IPV and cancer screening. In light of findings from previous studies examining cancer screening and

violence victimization,<sup>3,6</sup> we hypothesized that victims of partner violence would have lower prevalence of cancer screening and worse access to care than non-victims. We further hypothesized that these associations would predominantly be accounted for by differences in sociodemographic characteristics, health-related behaviors, and health status between victims and non-victims.

## Materials and Methods

Behavioral Risk Factor Surveillance System (BRFSS) data from the 8 states (Arkansas, Hawaii, Louisiana, Montana, Nebraska, Nevada, Virginia, and West Virginia) and one U.S. territory (U.S. Virgin Islands) that administered the optional IPV module in the 2006 survey were analyzed. During the 2006 administration, BRFSS collected data from ongoing cross-sectional, state/territory-based random-digit dial telephone surveys concerning health conditions and associated behavioral risk factors among noninstitutionalized U.S. adults with landline telephones ([www.cdc.gov/brfss/index.htm](http://www.cdc.gov/brfss/index.htm)). The response rate for the 2006 BRFSS administration in the nine jurisdictions that administered the IPV module was 88.2%. Our analysis included 38,317 participants who completed the module.

### Intimate partner violence questions

We used the three questions on the BRFSS module that assess IPV victimization to create a combined variable that assesses whether the person had ever been victimized by an intimate partner. IPV victims were those who responded yes to any of the following questions: 1) has an intimate partner ever threatened you with physical violence? This includes threatening to hit, push, kick, or hurt you in any way; 2) Has an intimate partner ever hit, slapped, pushed, kicked, or hurt you in any way?; and 3) Have you ever experienced any unwanted sex by a current or former intimate partner? These questions include threats, physical violence, and sexual violence by an intimate partner.

### Cancer screening

We examined the association between IPV status and being up-to-date with the following cancer screening tests: 1) mammography screening in the previous two years for women age 40; 2) Pap test for cervical cancer within the previous three years among women age 18; and 3) colorectal cancer screening using fecal occult blood test within the previous year or endoscopy within the previous five years for men and women age 50. Screening intervals and ages were consistent with recommendations of the U.S. Preventive Services Task Force and other major organizations at the time of the 2006 BRFSS module was administered.<sup>9–13</sup>

### Data analysis

All estimates were weighted to be representative of adult residents (age 18 years) in the jurisdictions that administered the module. We used SAS (SAS Institute, Cary, NC) version 9.3 and SAS-callable SUDAAN version 11 (Research Triangle Institute, Research Triangle Park, NC) to produce estimates that accounted for the complex sampling design of the survey. Differences by IPV victim status and sex were examined for the following demographic characteristics: race/ethnicity, age group, marital status, education level, employment status, and household income. We also examined the following health-related

behaviors and health status: body mass index (BMI), tobacco use, binge drinking, leisure time physical activity in the past month, social and emotional support, life satisfaction, health status, and number of days in the past month with poor physical health or mental health. To examine healthcare access, we used the following variables: having a personal doctor or healthcare provider, time since last routine checkup, healthcare coverage, and having a flu shot or mist within the past year.

We categorized all continuous variables and conducted chi square tests to assess significant differences by IPV status for each sex. We then constructed separate multivariable logistic regression models for each cancer screening test by sex. In these models, being up-to-date with the cancer screening test was the dependent variable, IPV victimization was the independent variable, controlling for demographics, health status, and healthcare access. We used the Hosmer-Lemeshow test to assess goodness-of-fit of the logistic regression models and the tests showed no evidence of lack-of-fit. With the exception of insurance status and race/ethnicity in the female colorectal cancer screening model and race/ethnicity in the male colorectal screening model, all the health and demographic variables had  $p$  values  $> 0.05$  in all models. For the cervical cancer screening model, we collapsed age as 18–44 and 45 and older, to assess whether receipt of Pap test was associated with ages when women typically receive reproductive health services. All estimates of the prevalence of being up-to-date on screening tests were adjusted for demographic characteristics and healthcare access to allow for comparison between IPV victims and those without a history of IPV as if they had the same demographic and health characteristics. This adjustment method uses logistic regression analysis to produce adjusted percentages (predicted marginals), which is a method of standardization that produces a weighted average for each level of the health variable of interest.<sup>14</sup>

## Results

The prevalence of IPV victimization in the sample from the 9 jurisdictions that completed the BRFSS module was 23.6% for women and 11.3% for men; Table 1 includes descriptive characteristics of the sample by sex and IPV status. Among women who were IPV victims, 75.4% were non-Hispanic white, 22.6% were in the 45–54 years age group, 46.4% were married, 32.7% were high school graduates, 58.9% were employed, and 33.5% had household incomes of \$50,000 or greater. Male IPV victims were 75.5% non-Hispanic white, 24.6% age 35–44 years, 46.8% were married, 29.8% had some college education, 73.9% were employed, and 42.7% had household incomes of \$50,000 or more. Compared with female non-victims, more female IPV victims were American Indian/Alaska Native or Other race, under the age of 55 years, divorced/separated/widowed, single, and members of unmarried couples. Compared with male non-victims, more male victims were non-Hispanic Black, American Indian/Alaska Native, or Other race, younger than age 55 years, and divorced/separated/widowed or members of an unmarried couple. With respect to education, employment, and income, fewer female victims were college graduates, and more female victims were out of work or unable to work and had lower household income. More male victims were out of work or unable to work and had lower household income.

### Health behaviors and health status

For both men and women, IPV victims had higher percentages of tobacco use, binge drinking, inconsistent social or emotional support, and low life satisfaction compared to non-victims (Table 2). More male and female IPV victims were in fair or poor health, had five or more days in the past month with poor physical health, and had five or more days in the past month with poor mental health compared to non-victims. Overweight or obesity status or having had leisure time physical activity in the past month did not significantly differ between IPV victims and non-victims.

### Healthcare access and cancer screening

Table 2 includes descriptive statistics on healthcare access and use by sex and IPV victimization status. For both men and women, fewer IPV victims had a personal healthcare provider, had a routine checkup within the past year, had healthcare coverage, or had received a flu immunization compared to non-victims. Table 3 shows female IPV victims had lower percentages of mammography screening for breast cancer within the past 2 years (66.3% vs. 76.9%,  $p < 0.001$ ) and colorectal cancer screening (49.0% vs. 55.0%,  $p = 0.005$ ) compared to non-victims. IPV victims and non-victims did not differ on receipt of a Pap test in the past three years ( $p = .589$ ). Colorectal cancer screening was not associated with IPV victimization for men ( $p = 0.387$ ).

After adjusting for demographic characteristics, health status, and healthcare access, only mammography screening for breast cancer was significantly associated with IPV victimization (72.0% for victims compared to 76.0% for non-victims,  $p = 0.018$ ; Table 4). IPV victimization was no longer significantly associated with colorectal cancer screening for women ( $p = 0.340$ ). Similar to the unadjusted model, IPV victimization was not associated with colorectal cancer screening for men or women in the adjusted model ( $p = 0.246$  and  $p = 0.340$ , respectively) or cervical cancer screening for women ( $p = 0.073$ ).

### Discussion

To our knowledge, this is the largest population-based study to examine the association between IPV victimization, health status, healthcare access, and cancer screening within the recommended period for women and men. These findings provide some information to explain why IPV is associated with chronic diseases and poor preventive care such as cancer screening. Compared to non-victims, more IPV victims engaged in health behaviors that increased their risk for chronic diseases; had poorer overall health; poorer access to healthcare; and less screening for breast and colorectal cancers among women. IPV victims utilize more health care resources than non-victims, leading to higher health care use and costs for victims.<sup>15–16</sup> Increased access to preventive services such as cancer screening could help avoid these costs and prevent disease progression and health care costs for IPV victims.<sup>7</sup> When controlling for differences in demographics, health status, and health access, IPV was only associated with lower rates of mammography, not colorectal cancer screening in women. These findings suggest that demographic and health access factors affect screening practices. Cervical cancer screening among female victims and colorectal cancer screening among male victims were not associated with IPV.

Several explanations relating IPV to increased risk of chronic disease have been proposed, including the toxic effects of chronic stress and allostatic load,<sup>17–19</sup> increased risk from poor health behaviors,<sup>20–21</sup> and barriers in access to health care,<sup>6,22–23</sup> among others. Our findings are consistent with these theories as they relate to increased risk for cancer. More than one third of male and female victims were current smokers; fewer than half of both males and females were never smokers. Nearly a third of male victims (29%) had an episode of binge drinking in the past month. Both tobacco and alcohol use increase risk for certain cancers.<sup>24</sup> These findings indicate that IPV is associated with increased risk for tobacco and alcohol use that can cause cancer and other chronic diseases. Health status also appears to be associated with both IPV and cancer screening. Victims of both sexes reported poor life satisfaction, fair or poor health, and poor physical and mental health. These indicators of poor mental and physical health status may be amenable to intervention in healthcare and mental health settings. Healthcare access was also an important difference between victims and non-victims. Fewer than half of male victims had a routine checkup in the past year and more than one in five male and female victims had no health insurance. Nearly three in ten male and one in six female victims did not have a healthcare provider, one of the strongest predictors of receiving preventive services. These disparities in health behaviors, status, and access compounded with disparities in screening increase victims' risk for developing cancer and having it detected at later stages leading to worse outcomes.<sup>2–6</sup>

Research has shown partner violence can also cause stress response on the body and impair endocrine and immune system functioning, biological mechanisms that can increase cancer risk. This coupled with lower percentages of breast cancer screening can put female IPV victims at increased risk for getting and dying from breast cancer due to later diagnosis, a significant concern considering breast cancer is the leading cause of cancer incidence for women affecting more than 230,000 women annually.<sup>25</sup> In our multivariable analyses, only breast cancer screening rates were significantly lower among IPV victims and this difference was modest. The findings that IPV victims had lower rates of mammography are consistent with previous findings that breast cancer screening is lower among victims of sexual violence not necessarily in intimate partner contexts.<sup>3</sup> Colorectal cancer screening was lower among IPV victims in bivariate analyses but not significant after controlling for demographic and other variables; this finding indicates these effects were accounted for by demographic, health status, and health access differences between victims and non-victims. In fact, there were consistent differences between victims and non-victims in every measure of lack of healthcare access and poor health status. IPV victims and other high-risk groups likely encounter barriers in access to services and following up on referrals from providers. These factors likely explain the relationship between IPV and colorectal cancer screening among women seen in the bivariate analyses. More targeted strategies to increase access to healthcare services and screening are needed to address both chronic disease and violence victimization and their impacts on health.

Receipt of colorectal cancer screening was relatively low overall, with rates for both men and women around 50%. Since the year these data were collected, federal initiatives and partnership efforts have increased efforts to raise awareness of the need for colorectal cancer screening.<sup>26</sup> These efforts have significantly increased population rates of colorectal cancer screening, and continued efforts have the potential to continue this trend.<sup>27</sup> Additional data

can help shed light on continued disparities in colorectal cancer screening, such as whether IPV victims currently experience lower rates.

There were no differences between IPV victims and non-victims in receipt of cervical cancer screening. This may be due to the fact that cervical cancer screening rates are generally high. IPV victim status does not appear to represent a disparity in receipt of cervical cancer screening, possibly because cervical cancer screening is often provided in a single visit at the same time as other reproductive health services. Therefore, barriers to health care access are less likely to impact receipt of screening than for mammography among women of reproductive age.

Increasing cervical cancer, breast cancer, and colorectal cancer screening are all Healthy People 2020 objectives ([www.healthypeople.gov/2020/topics-objectives/topic/cancer/objectives](http://www.healthypeople.gov/2020/topics-objectives/topic/cancer/objectives)) and have been included in previous versions. Healthy People provides science-based national objectives for improving the health of all Americans. Although the present data predate Healthy People 2020, current national rates indicate targets have still not been met in any of these areas. Efforts to identify women and men who are hard to reach and are in need of screening could include strategies to reach victims of IPV. In particular, community and victim advocacy organizations that provide legal and housing assistance, mental health services, and victim support services could partner with clinics and health system organizations to provide cancer screenings as part of comprehensive health services for victims. CDC funds the National Breast and Cervical Cancer Early Detection Program and the Colorectal Cancer Control Program, which both aim to increase population-level cancer screening rates. CDC also funds the Consortium of National Networks to Impact Tobacco-Related and Cancer Health Disparities (<http://www.cdc.gov/cancer/ncccp/dp13-1314.htm>). These organizations are funded to raise awareness about cancer disparities among underserved populations, and to provide technical assistance to organizations which serve victims of partner violence, particularly those with low socioeconomic status and mental health and substance abuse problems. Partnerships across health care and community-based organizations are critical in improving access to preventive services among vulnerable populations and could address barriers in screening among IPV victims.

In addition to recommendations for cancer screening, the USPSTF recommends clinicians screen women of childbearing age for IPV and refer victims to intervention services. Despite this recommendation, there are challenges in integrating IPV screening in primary care settings, as providers are often not trained in addressing issues of violence, not comfortable with the topic, and may be unaware of resources to refer victims.<sup>28</sup> It is important to note that just providing a referral to positive-screen IPV victims without additional follow-up or services may be insufficient in improving their health;<sup>29–30</sup> some evidence suggests facilitating patients' access to resources<sup>31</sup> or onsite counseling<sup>32</sup> is effective in improving health outcomes. Models for integrating trauma-informed care for potential victims in primary care are needed.

There are a number of limitations that must be considered in this study. First, the analyses use older data. However, the data are the only large-scale, population-based assessment of the association of IPV victimization, healthcare access, and cancer screening, so this is

valuable information that begins to shed light on the barriers to health care access and services for victims. Second, only adults with residential landline telephones were included in the BRFSS surveys at the time of this study, and institutionalized adults are not included. Therefore, findings may not be generalizable beyond the sample included in the surveys. Third, the findings are only generalizable to those jurisdictions that participated in the IPV module; national data are not available. Fourth, the questions only include measures of physical and sexual partner violence, and do not assess other forms of partner violence such as psychological threats or emotional abuse. Fifth, the current analysis examines healthcare access and cancer screening among IPV victims, but no information about actual health outcomes such as cancer incidence or deaths is available. Finally, responses are self-reported and may be subject to social desirability or recall bias.

## Conclusions

Women who had a history of IPV victimization had lower percentages of breast and colorectal cancer screening than non-victims, whereas no differences were found for cervical cancer screening among women and colorectal cancer screening among men. Victims were also in poorer health and had less healthcare access than non-victims. After controlling for differences in demographics, health status, and healthcare access, differences between victims and non-victims decreased substantially for colorectal cancer screening and remained significant but modest for breast cancer screening. IPV victims represent a population less likely to have ready access to clinics or a provider for preventive care. Reaching IPV victims may require victim advocacy groups and community organizations partnering with health systems to expand the spectrum of services they provide to include cancer screening, IPV screening, and other critical preventive services. These efforts can bring attention to the need for screening and preventive services among victims and establish partnerships to provide continuity of care for victims.

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**Table 1**  
 Demographic Characteristics among Intimate Partner Violence Victims ( $n = 7,216$ ) and Non-victims ( $n = 31,101$ ) by Sex, 2006 Behavioral Risk Factor Surveillance System, eight States and one U.S. Territory That Administered the Optional Intimate Partner Violence Module

|                                    | Female          |   | Male            |   | Chi-square<br><i>p</i> value |                 |   |
|------------------------------------|-----------------|---|-----------------|---|------------------------------|-----------------|---|
|                                    | Weighted % (SE) | No IPV ( $n = 17,676$ ) ( $n = 1,828,382$ weighted) | Weighted % (SE) | IPV ( $n = 1,683$ ) ( $n = 825,161$ weighted) |                              | Weighted % (SE) | No IPV ( $n = 13,425$ ) ( $n = 6,503,916$ weighted) |
| Weighted prevalence of IPV history | 23.6 (0.5)      |   | 76.4 (0.5)      |   | 11.3 (0.5)                   | 88.7 (0.5)      | <0.001  |
| <i>Demographic characteristics</i> |                 |   |                 |   |                              |                 |   |
| <i>Race/ethnicity</i>              |                 |   |                 |   |                              |                 |   |
| White, non-Hispanic                | 75.4 (1.3)      |   | 74.8 (0.7)      |   | 75.5 (1.9)                   | 76.5 (0.7)      | <0.001  |
| Black, non-Hispanic                | 12.2 (1.1)      |   | 11.9 (0.5)      |   | 11.8 (1.4)                   | 9.0 (0.4)       |   |
| American Indian/Alaska Native      | 1.9 (0.3)       |   | 0.9 (0.1)       |   | 1.7 (0.5)                    | 1.1 (0.1)       |   |
| Asian/Pacific Islander             | 2.5 (0.3)       |   | 5.2 (0.4)       |   | 2.7 (0.5)                    | 4.7 (0.3)       |   |
| Hispanic                           | 5.6 (0.7)       |   | 5.7 (0.4)       |   | 3.9 (0.8)                    | 6.3 (0.5)       |   |
| Other/no preference (multi-racial) | 2.4 (0.5)       |   | 1.5 (0.2)       |   | 4.3 (1.0)                    | 2.4 (0.3)       |   |
| <i>Age, years</i>                  |                 |   |                 |   |                              |                 |   |
| 18–24                              | 15.4 (1.4)      |   | 12.1 (0.6)      |   | 13.5 (1.7)                   | 14.4 (0.8)      | <0.001  |
| 25–34                              | 20.2 (1.0)      |   | 16.4 (0.6)      |   | 23.0 (1.9)                   | 17.3 (0.7)      |   |
| 35–44                              | 22.2 (1.0)      |   | 18.3 (0.5)      |   | 24.6 (2.0)                   | 19.0 (0.6)      |   |
| 45–54                              | 22.6 (1.1)      |   | 18.6 (0.5)      |   | 24.4 (2.2)                   | 19.1 (0.5)      |   |
| 55–64                              | 12.6 (0.6)      |   | 15.2 (0.4)      |   | 9.8 (1.1)                    | 15.2 (0.5)      |   |
| 65 or older                        | 7.1 (0.4)       |   | 19.4 (0.5)      |   | 4.6 (0.6)                    | 14.9 (0.4)      |   |
| <i>Marital status</i>              |                 |   |                 |   |                              |                 |   |
| Married                            | 46.4 (1.3)      |   | 64.3 (0.7)      |   | 46.8 (2.3)                   | 67.3 (0.8)      | <0.001  |
| Divorced/separated/widowed         | 31.4 (1.2)      |   | 18.1 (0.4)      |   | 24.7 (1.9)                   | 10.3 (0.4)      |   |
| Single, never married              | 18.1 (1.3)      |   | 14.7 (0.6)      |   | 22.5 (1.9)                   | 19.5 (0.8)      |   |
| Member of unmarried couple         | 4.2 (0.4)       |   | 2.9 (0.3)       |   | 6.0 (0.9)                    | 2.9 (0.3)       |   |
| <i>Education</i>                   |                 |   |                 |   |                              |                 |   |

|                              | Female   |  | Male   |  | Chi-square<br>p value |
|------------------------------|--|--|--|--|-----------------------|
|                              | IPV (n = 5,533)<br>(n = 1,828,382<br>weighted) | No IPV (n = 17,676)<br>(n = 5,912,385<br>weighted) | IPV (n = 1,683)<br>(n = 825,161<br>weighted) | No IPV (n = 13,425)<br>(n = 6,503,916<br>weighted) |                       |
|                              | Weighted % (SE)                                | Weighted % (SE)                                    | Weighted % (SE)                              | Weighted % (SE)                                    | Chi-square<br>p value |
| Did not graduate high school | 9.4 (0.7)                                      | 9.3 (0.4)  | 10.3 (1.2)                                   | 10.8 (0.5)   | 0.105                 |
| High school graduate         | 32.7 (1.4)                                     | 30.9 (0.6)   | 28.2 (1.9)                                   | 30.8 (0.7)   |                       |
| Some college                 | 32.2 (1.2)                                     | 25.4 (0.6)   | 29.8 (2.2)                                   | 24.1 (0.7)   |                       |
| College graduate             | 25.7 (1.1)                                     | 34.4 (0.7)   | 31.7 (2.3)                                   | 34.4 (0.8)   |                       |
| Employment                   |  |  |  |  |                       |
| Employed for wages           | 58.9 (1.3)                                     | 53.8 (0.7)   | 73.9 (1.8)                                   | 71.6 (0.7)   | < 0.001               |
| Out of work/unable to work   | 16.2 (1.1)                                     | 7.6 (0.3)  | 15.7 (1.4)                                   | 8.0 (0.4)  |                       |
| Other (student/retired)      | 24.9 (1.1)                                     | 38.6 (0.7)   | 10.5 (1.2)                                   | 20.4 (0.6)   |                       |
| Household income             |  |  |  |  |                       |
| < \$15,000                   | 13.8 (0.7)                                     | 7.6 (0.3)  | 9.6 (1.2)                                    | 5.2 (0.3)  | 0.011                 |
| \$15,000–\$34,999            | 25.7 (1.1)                                     | 23.2 (0.5)   | 22.7 (1.9)                                   | 22.0 (0.6)   |                       |
| \$35,000–\$49,999            | 14.4 (0.8)                                     | 13.3 (0.4)   | 14.2 (1.4)                                   | 15.3 (0.5)   |                       |
| \$50,000                     | 33.5 (1.3)                                     | 40.1 (0.7)   | 42.7 (2.4)                                   | 47.2 (0.8)   |                       |
| Unknown/refused              | 12.5 (1.0)                                     | 15.8 (0.5)   | 10.7 (1.3)                                   | 10.3 (0.5)   |                       |

IPV = Intimate Partner Violence  
 Respondents with missing data or who answered don't know or refused are excluded from the denominators.  
 SE, standard error.

**Table 2** Health Behaviors, Health Status, and Access to Healthcare among Intimate Partner Violence Victims and Non-victims by Sex, 2006 Behavioral Risk Factor Surveillance System, eight States and one U.S. Territory That Administered the Optional Intimate Partner Violence Module

|   | Female   |  | Male                          |  | Chi-square<br>p value |
|---|--|--|-------------------------------|--|-----------------------|
|   | IPV (n = 5,533)<br>(n = 1,828,382<br>weighted) | No IPV (n = 17,676)<br>(n = 5,912,385<br>weighted) | IPV (n = 825,161<br>weighted) | No IPV (n = 13,425)<br>(n = 6,503,916<br>weighted) |                       |
| <i>Health Behaviors and Health Status</i>       |  |  |                               |  |                       |
| Body Mass Index                                 |  |  |                               |  |                       |
| Underweight (<19)                               | 5.0 (0.6)                                      | 4.6 (0.4)  | a                             | a  | 0.622                 |
| Normal weight (19–24.9)                         | 37.8 (1.3)                                     | 40.8 (0.7)   | a                             | a  |                       |
| Overweight (25–29.9)                            | 31.2 (1.3)                                     | 29.4 (0.6)   | a                             | a  |                       |
| Obese (≥ 30)                                    | 26.0 (1.1)                                     | 25.2 (0.6)   | 27.0 (2.3)                    | 26.8 (0.7)   |                       |
| Tobacco use                                     |  |  |                               |  |                       |
| Current   | 37.4 (1.4)                                     | 15.0 (0.5)   | 34.9 (2.1)                    | 20.9 (0.6)   | < 0.001               |
| Former  | 21.7 (0.9)                                     | 20.5 (0.5)   | 29.4 (2.3)                    | 28.4 (0.7)   |                       |
| Never   | 41.0 (1.3)                                     | 64.5 (0.7)   | 35.7 (2.2)                    | 50.7 (0.8)   |                       |
| Binge drinking in the past month                | 13.8 (0.9)                                     | 7.8 (0.4)  | 29.4 (2.0)                    | 18.5 (0.6)   | < 0.001               |
| No leisure time physical activity in past month | 26.9 (1.1)                                     | 26.0 (0.6)   | 19.6 (1.5)                    | 22.2 (0.7)   | 0.126                 |
| Social and emotional support                    |  |  |                               |  |                       |
| Always/usually/sometimes                        | 89.1 (0.7)                                     | 93.8 (0.3)   | 86.5 (1.3)                    | 91.5 (0.4)   | < 0.001               |
| Rarely/never                                    | 10.9 (0.7)                                     | 6.2 (0.3)  | 13.5 (1.3)                    | 8.5 (0.4)  |                       |
| Life satisfaction                               |  |  |                               |  |                       |
| Very satisfied/Satisfied                        | 87.4 (0.9)                                     | 96.9 (0.2)   | 86.1 (1.3)                    | 96.6 (0.3)   | < 0.001               |
| Dissatisfied/Very dissatisfied                  | 12.6 (0.9)                                     | 3.1 (0.2)  | 13.9 (1.3)                    | 3.4 (0.3)  |                       |
| Health status                                   |  |  |                               |  |                       |
| Excellent                                       | 46.1 (1.3)                                     | 56.6 (0.7)   | 49.5 (2.3)                    | 55.4 (0.8)   | 0.023                 |
| Good  | 31.0 (1.3)                                     | 28.6 (0.6)   | 32.7 (2.4)                    | 31.1 (0.8)   |                       |
| Fair/poor                                       | 22.8 (1.1)                                     | 14.8 (0.4)   | 17.8 (1.9)                    | 13.5 (0.4)   |                       |

|   | Female   |  | Male   |  | Chi-square<br>p value |
|---|--|--|--|--|-----------------------|
|   | IPV (n = 5,533)<br>(n = 1,828,382<br>weighted) | No IPV (n = 17,676)<br>(n = 5,912,385<br>weighted) | IPV (n = 1,683)<br>(n = 825,161<br>weighted) | No IPV (n = 13,425)<br>(n = 6,503,916<br>weighted) |                       |
| Number of days in past 30 days physical health was not good | Weighted % (SE)                                | Weighted % (SE)                                    | Weighted % (SE)                              | Weighted % (SE)                                    | Chi-square<br>p value |
| 0   | 49.6 (1.3)                                     | 63.8 (0.7)   | 61.0 (2.4)                                   | 69.3 (0.8)   | 0.001                 |
| 1-4   | 18.6 (1.0)                                     | 18.0 (0.6)   | 20.1 (2.4)                                   | 16.2 (0.6)   |                       |
| 5 or more   | 31.8 (1.2)                                     | 18.2 (0.5)   | 18.9 (1.5)                                   | 14.5 (0.5)   |                       |
| Number of days in past 30 days mental health was not good   | Weighted % (SE)                                | Weighted % (SE)                                    | Weighted % (SE)                              | Weighted % (SE)                                    | Chi-square<br>p value |
| 0   | 40.5 (1.3)                                     | 65.8 (0.7)   | 51.8 (2.4)                                   | 75.7 (0.8)   | < 0.001               |
| 1-4   | 17.8 (1.0)                                     | 15.9 (0.6)   | 17.4 (2.3)                                   | 11.0 (0.6)   |                       |
| 5 or more   | 41.7 (1.3)                                     | 18.3 (0.5)   | 30.7 (2.1)                                   | 13.3 (0.6)   |                       |
| <i>Access to Healthcare</i>                                 |  |  |  |  |                       |
| Has personal healthcare provider                            | 83.1 (1.0)                                     | 86.2 (0.5)   | 70.3 (2.1)                                   | 76.5 (0.7)   | 0.005                 |
| Last routine checkup  |  |  |  |  |                       |
| Within past year (1-12 months ago)                          | 63.3 (1.3)                                     | 73.2 (0.6)   | 47.5 (2.3)                                   | 60.9 (0.8)   | < 0.001               |
| Within past 2 years (1-2 years ago)                         | 15.0 (1.1)                                     | 13.0 (0.5)   | 20.9 (2.6)                                   | 14.8 (0.5)   |                       |
| 2 years ago / never   | 21.7 (1.1)                                     | 13.8 (0.5)   | 31.6 (2.0)                                   | 24.3 (0.7)   |                       |
| Has healthcare coverage                                     | 79.2 (1.1)                                     | 87.0 (0.5)   | 76.2 (1.8)                                   | 85.3 (0.5)   | < 0.001               |
| Had flu shot or mist  | 30.0 (1.2)                                     | 37.0 (0.7)   | 25.5 (1.9)                                   | 33.1 (0.7)   | < 0.001               |

IPV = Intimate Partner Violence

FOBT = fecal occult blood test

Respondents with missing data or who answered don't know or refused are excluded from the denominators.  
SE, standard error.

<sup>a</sup>Suppressed because of small sample size.

**Table 3**  
 Cancer Screening Test Use among Intimate Partner Violence Victims and Non-victims by Sex, 2006 Behavioral Risk Factor Surveillance System, eight States and one U.S. Territory That Administered the Optional Intimate Partner Violence Module

|  | Female  |   | Male  |   | Chi-square<br>p value | Chi-square<br>p value |
|--|---|---|---|---|-----------------------|-----------------------|
|  | IPV (n =<br>5,533) (n =<br>1,828,382<br>weighted) | No IPV (n =<br>17,676) (n =<br>5,912,385<br>weighted) | IPV (n =<br>1,683) (n =<br>825,161<br>weighted) | No IPV (n =<br>13,425) (n =<br>6,503,916<br>weighted) |                       |                       |
| <b>Cancer Screenings</b>   | <b>Weighted % (SE)</b>                            | <b>Weighted % (SE)</b>                                | <b>Weighted % (SE)</b>                          | <b>Weighted % (SE)</b>                                |                       |                       |
| Mammography within past 2 years (women aged 40 years, n=16,919)                | 66.3 (1.4)  | 76.9 (0.6)  |   |   | <0.001                |                       |
| Pap test within past 3 years (women aged 18 years, n=16,246)                   | 84.5 (1.2)  | 83.8 (0.7)  |   |   | 0.589                 |                       |
| Among women aged 18-44 (n=7,461)   | 86.4 (1.6)  | 85.7 (0.9)  |   |   | 0.709                 |                       |
| Among women aged 45+ (n= 8,785)  | 80.4 (1.7)  | 81.0 (0.9)  |   |   | 0.758                 |                       |
| Colorectal cancer screening [men (n=8,050) and women (n=12,277) aged 50 years] |   |   |   |   |                       |                       |
| FOBT in past 12 months or endoscopy in past 5 years                            | 49.0 (2.0)  | 55.0 (0.9)  | 51.8 (4.9)                                      | 55.9 (0.9)  | 0.005                 | 0.387                 |

IPV = Intimate Partner Violence  
 FOBT = fecal occult blood test  
 Respondents with missing data or who answered don't know or refused are excluded from the denominators.  
 SE, standard error.

**Table 4**  
 Adjusted Estimates from Predicted Marginals of Percentage of Women Up-To-Date for Recommended Breast Cancer Screening and Men and Women Up-To-Date for Recommended Colorectal Cancer Screening, by History of Intimate Partner Violence, 2006 Behavioral Risk Factor Surveillance System, eight States and one U.S. Territory That Administered the Optional Intimate Partner Violence Module

| Cancer screening test: Percentage up-to-date  | History of intimate partner violence |   | p value |
|---|--------------------------------------|---|---------|
|   | History of intimate partner violence | No history of intimate partner violence |         |
| Mammography within previous 2 years among women aged 40 years                             | 72 (2.0)                             | 76 (1.0)                                | 0.018   |
| Pap test within past 3 years  | 86 (0.01)                            | 83 (0.01)                               | 0.073   |
| Colorectal cancer screening (FOBT in previous 12 months or endoscopy in previous 5 years) |                                      |   |         |
| Among women aged 50 years   | 56 (2.0)                             | 54 (1.0)                                | 0.340   |
| Among men aged 50 years   | 61 (4.0)                             | 56 (1.0)                                | 0.246   |

IPV = Intimate Partner Violence

FOBT = fecal occult blood test

Models adjusted for demographic characteristics and healthcare access.

Respondents with missing data or who answered don't know or refused are excluded from the denominators.  
 SE, standard error.