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Teenagers Need Drugs Too: Attitudes on the Accessibility and Acceptability of the HPV Vaccine from Parents of Different Socioeconomic Statuses

Kristen Angell Dupard

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The University of Southern Mississippi

Teenagers Need Drugs Too: Attitudes on the Accessibility and Acceptability of the HPV
Vaccine from Parents of Different Socioeconomic Statuses

by

Kristen Angell' Dupard

A Thesis
Submitted to the Honors College of
The University of Southern Mississippi
in Partial Fulfillment
of the Requirements for the Degree of
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Abstract

Cervical cancer is one of the leading causes of death among women around the world and is linked to the human papillomavirus (HPV). Strains HPV-16 and-18 are linked to the causes of cervical cancer. Research shows that HPV vaccination in adolescent females projects a 70% non-contraction rate. However, only 57.3% of girls between the ages of 13-17 in the U.S. have received their first HPV vaccination dose. Researchers have begun speculating that factors such SES and race could be contributing to low vaccination participation. Answers to such information can aid in improving federal and state vaccination policies and prevent the diseases caused by HPV. The current study aimed to determine if race and socioeconomic status (SES) interacted in such a way that predicted the attitudes of minority caregivers toward the HPV vaccine in terms of its acceptability and accessibility. Parents of adolescent females enrolled at a local Mississippi high school were surveyed to determine if this interaction predicts lower vaccination rates. It was anticipated that minority parents of low SES would have lower vaccination rates than those of higher SES. The univariate results indicated the following: 90% of participants identified as African American/Black, 39% (majority) of the respondents had completed some college or obtained an associate's degree, 42% (majority) of the income level was between \$30,001-\$50,000, and 70% of daughters had received some shots of the HPV vaccination. Bivariate Chi-Square (X^2) analyses determined if categorical independent variables (Race, Education, and Finances) were significantly associated with vaccine participation. Bivariate tests were not statistically significant ($p > 0.05$). However, a correlation between vaccination participation and income showed that the higher the income level, the more likely a parent was to vaccinate

their daughter against HPV. Other independent variables yielded significance. At the univariate level, 74% of health care providers had recommended the vaccine, 72% of respondents had insurance to cover vaccine, and 70% of respondents had very easy access to health care. At the bivariate level, only two independent variables were significant. The results showed the following: insurance coverage: (95 % CI: (1.038-20.3810) ($X^2 = 4.353, Df = 1, \text{and Sig } p = 0.037$) and vaccine recommendation (95% CI: 3.675-156.738) ($X^2 = 14.727, Df = 1, \text{and Sig } p = 0.0001$). Being recommended by a health care provider was a significant predictor of vaccine participation at the multivariate level. Ostensibly, parents are aware of the vaccine and are taking preventive measures. Additional research could answer whether minority caregivers from low SES will be less inclined to have their adolescent daughters vaccinated. HPV is one of the most preventive, yet deadly, STIs and further research is imperative.

Keywords: HPV, vaccine, cervical cancer, race, socioeconomic status

Dedication

GOD, Angela Dupard (Mom), Kenneth Dupard (Dad), Algy Irvin Sr. (Grandfather),

Mary Irvin (Grandmother), Family, and Friends

Thank you for your unwavering support, encouragement, tenacious cheers, and prayers.

My successes are not my own.

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Additionally, I would also like to pay special thanks to the faculty of The Honors College. During my four years at the Hattiesburg campus of The University of Southern Mississippi, I was blessed with their support and guidance. Truly, one of the most rigorous thought provoking and rewarding experiences that I have ever had.

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List of Abbreviations

HPV	Human Papillomavirus
SES	Socioeconomic Status
X^2	Chi Square
CI	Confidence Interval
STI	Sexually Transmitted Infection
STD	Sexually Transmitted Disease
Sig p	Significance of p value
Df	Degrees of Freedom
FDA	Food and Drug Administration

Chapter 1: Introduction

Cervical cancer is one of the leading causes of death among women around the world that is caused primarily from sexual contact. The human papillomavirus (HPV) is a sexually transmitted virus that at least half of sexually active men and women will contract. Strains HPV-16 and-18 are linked to the causes of cervical cancer that are responsible for 4,000 annual fatalities. Recent studies suggest that HPV vaccination in adolescent females between the ages of 9-16 (before sexual activity initiation), projects a 70% non-contraction rate. However, only 57.3% of girls between the ages of 13-17 in the United States have received the first HPV vaccination dose.

Researchers speculate that outside factors such as class and race contribute to low participation in HPV vaccination. Class and race play vital roles in the vaccination of young female adults because of increasing health care costs. To further investigate these findings, parents/guardians of high school adolescent females from the Hattiesburg area completed a Likert scale survey. The purpose of this study was to determine how race and socioeconomic status (SES) interact in such a way that minority parents with low SES are more apprehensive about giving their adolescent daughters vaccine due to the lack of health education and physician accessibility. Results were assembled and analyzed appropriately.

Chapter 2: Literature Review

In 1956, a group of researchers from several countries discovered human papillomavirus (HPV) (Roxas). Little is known about the initial discovery and the researchers responsible. However, in 1972, female Polish dermatologist Stefania Ginsburg-Jabłońska discovered the link between skin cancer and HPV (Kibbe, 2012). It was not until the 1980s that HPV DNA was found in genital lesions and HPV-16 and -18 were extracted from the cervix by German virologist Harald zur Hausen (Aronowitz, Epstein, Livingston, & Wailoo, 2010). zur Hausen went on to win the Nobel Peace Prize in Medicine in 2008 for his 1976 research and is credited with discovering the link between HPV and cervical cancer (Aronowitz, Epstein, Livingston, & Wailoo, 2010).

HPV is a sexually transmitted virus infection (STI) that currently affects 20 million people in the United States (The Centers for Disease Control and Prevention, 2012). At least 50% of all sexually active males and females will contract HPV at some point in their lifetimes (Food and Drug Administration Office of Women's Health, 2015). By definition, these viruses are known as *papilloma* because they have the ability to cause genital warts or benign tumors (American Cancer Society, 2014). These *papilloma* viruses reside in epithelial cells (cells that are located on the skin and moist surfaces of the body) that can be found on surfaces of the vagina, anus, cervix, trachea, eyelids, and other moist parts of the body (American Cancer Society, 2014). Unlike human immunodeficiency virus (HIV), which is an infection found in the bodily fluids of an infected person, HPV is a virus that affects the skin and moist membrane linings. Humans are susceptible to HPV contraction through vaginal, anal, and or oral sexual contact with

an infectious person. HPV has no cure, but there are vaccines that can prevent the viral infection (The Centers for Disease Control and Prevention, 2011).

According to the Centers for Disease Control and Prevention (2013), 110 million people in the U.S. are infected with an STI and approximately 20 million new infections surface yearly that cost \$16 billion in national medical expenditures. A 2013 report released by the CDC states “that HPV accounts for the majority of newly acquired STIs” (The Centers for Disease Control and Prevention, 2013). The CDC estimates that HPV cases make up 14,100,000 (90%) new STI cases in the U.S. and young people between the ages of 15-24 make up half of those incident cases (The Centers for Disease Control and Prevention, 2013).

Unlike STIs such as gonorrhea, HPV is asymptomatic. Thus, thousands of cases go undiagnosed annually. The National Cancer Institute (2012) suggests that 42.5 percent of women have genital HPV infections, whereas fewer than 7% of adults have oral HPV infections at any point in time. Contraction of HPV increases if sexual activity begins at an early age or if a young person (ages between 9-26) has polygamous sexual relationships (The National Cancer Institute, 2012). Besides sexual skin contact, the odds of HPV contraction increase if one smokes, has HIV or any other immune system deficiency, uses birth-control for more than five years, or has three or more children (Food and Drug Administration Office of Women's Health , 2015). Most HPV strains resolve without intervention, while others cause genital warts, which present as soft growths on the skin and mucus membranes of the genitals. With over 150 strains of HPV, only types 16 and 18 are known to be carcinogenic (American Cancer Society, 2014). Strains 16 and 18 have been of significant interest because they are linked to cervical

cancer, which is one of the most fatal cancers among women in the United States (American Cancer Society, 2014).

In order to understand the link between cervical cancer and HPV, the origin and areas affected by cervical cancer must be thoroughly explained. Cancer is a disease in which cells divide abnormally. Regions in which those cells grow irregularly are given names based on their bodily location. Cervical cancer is a disease that originates within the cervix of a female. The cervix connects the vagina to the uterus in the female organ system. Cervical cancer is caused from HPV strains 16 and 18 (The Centers for Disease Control and Prevention, 2012). Detection of this disease comes from annually scheduled Papanicolaou smear tests (Pap Test) that identify cancerous cells on the cervix, or HPV tests which detect the virus itself. Early signs and symptoms are rare but they can include abnormal or bleeding discharge from the vagina (The Centers for Disease Control and Prevention, 2012). If HPV is contracted, cervical cancer can take 10-20 months to fully develop. As the third leading type of cancer among women in the United States, approximately 12,000 cases are diagnosed each year (American Cancer Society, 2014). The American Cancer Society (2014) suggests that in 2015, 4,100 women will die from cervical cancer. Eighty-five percent of the women diagnosed with cervical cancer will be younger than 65, with Blacks and Hispanics having higher rates (American Cancer Society, 2015).

As previously stated, in 1976 Harald zur Hausen discovered the link between cervical cancer and HPV. However, it was not until June of 2006 that the Food and Drug Administration (FDA) approved Merck & Co., Inc.'s distribution of the Gardasil Human Papillomavirus Quadrivalent (Types 6, 11, 16, and 18) Vaccine, Recombinant to prevent

infection with the two most commonly occurring strains of HPV that cause cervical cancer and the two most commonly occurring strains of HPV that cause genital warts. (Aronowitz, Epstein, Livingston, & Wailoo, 2010). According to the National Institutes of Health, the FDA has approved Gardasil for use in females for the prevention of cervical cancer and some vulvar and vaginal cancers caused by HPV types 16 and 18, and for use in males and females for the prevention of anal cancer and precancerous anal lesions caused by HPV types 16 and 18 (The National Cancer Institute, 2012). Gardasil is one of two vaccines known to prevent strains 6, 11, 16, and 18. The other vaccine is GlaxoSmithKline's Cervarix, and it is only known to prevent HPV strains 16 and 18. Gardasil is injected into muscle tissue in a series of three doses over a six-month period. It is highly recommended by physicians and health agencies for adolescents (male and female) before they become sexually active. This vaccine is recommended for non-pregnant women between the ages of 9-26.

Since becoming available in 2006, an estimated 70% of cervical cancer cases among those who received the complete vaccination series were prevented (The Centers for Disease Control and Prevention, 2011). The earlier a young person receives the vaccination, the less susceptible he or she is to contract the viral strains linked to cervical cancer. However, while Merck's Gardasil vaccine made strides with regard to cancer prevention and STI treatment, its cost sparked controversy. At \$350 per dose in 2007, Merck & Co., Inc. had the monopoly on the Gardasil vaccine because they were the only company distributing it (Aronowitz, Epstein, Livingston, & Wailoo, 2010). Thus, they had almost complete control over the cost and distribution. Costs for Gardasil in 2006, which at this point had become known as a preventive "cancer drug," drew closer

attention to the United States' "haves and have-nots" (Aronowitz, Epstein, Livingston, & Wailoo, 2010). In other words, the cost of this vaccine illuminated economic disparities between those who could and could not afford it.

In April of 2014, the American Cancer Society estimated that the price of Gardasil ranged from \$130 to \$140 per dose with the total cost being \$360 not including the cost of the physician visit (American Cancer Society, 2014). This was a significant reduction from the \$350 per dose cost that was charged before the 2010 Patient Protection and Affordable Care Act (PPACA or Affordable Health Care Act), which mandated that "plans and issuers are required to provide coverage without cost-sharing for this service exactly" (U.S. Department of Health & Human Services, 2012). This means that health and insurance companies cannot share the cost of the vaccine but must choose whether or not to pay for health fees. Although costs of the vaccination series have been reduced since 2006, currently the cost is \$360 per vaccination series per person (American Cancer Society, 2014).

It is important to consider this issue of cost from a socioeconomic standpoint. The American Psychological Association defines socioeconomic status (SES) as the following:

Socioeconomic status (SES) is often measured as a combination of education, income, and occupation. It is commonly conceptualized as the social standing or class of an individual or group. When viewed through a social class lens, privilege, power, and control are emphasized. Furthermore, an examination of SES as a gradient or continuous variable reveals inequities in access to and distribution of resources (American Psychological Association, 2015).

The U.S. Census Bureau stated that in 2012 the average income family earnings (family of four) based on socioeconomic class were as follows: lower class at \$23,050, lower middle class between \$32,500 and \$60,000, upper middle class at \$100,000, and the upper class at \$250,000 (Francis, 2012). The average American family of four in 2014 spent \$23,215 on healthcare with an average employer sponsored health plan (Milliman, 2014). Costs more than doubled in 2014 over 2004 when the average family spent just \$11,192 (Milliman, 2014). With the median household income at \$51, 939, almost half of the average American family's earnings is spent on healthcare for families with average insurance plans (Milliman, 2014). This income ratio as it relates to SES limits health care access to certain groups that fall within the lower and middle class income levels. Ostensibly, over the past 50 years, medicine's ability to increase the quality of life and life expectancy has illustrated the gap between those who do and do not have access to health care in the United States (Swartz, 2009).

It is evident that the relationship between income and healthcare cost for average Americans is non-proportional and that this ratio is the result of health disparities among specific groups such as minorities. The Centers for Disease Control (2014) defines minorities as Asian American, Black or African American, Hispanic or Latino, Native Hawaiian and Other Pacific Islander, American Indian and Alaska Native. In 2013, the average income of minorities was \$33,901 (DeNavas-Walt & Proctor, 2014). In that same year, the income level among Whites was \$55,257 (DeNavas-Walt & Proctor, 2014). Average minorities fall into the lower class and lower middle class based on their earnings. Because of this, average minority households do not have easy access to healthcare, primarily because they cannot afford it. For example, a study published by the

United States Bureau of Labor Statistics (2014) analyzed the average income of African American households, and found that the average income in an African American household was \$45,287. Of that income, \$1,794 was spent on healthcare (Noël, 2014). It is plausible to infer that the low income of average minorities affect how much they spend on healthcare. On average, minorities fall into a socioeconomically deprived class that cannot afford healthcare. As a domino effect, this situation deprives minorities of health education, which is part of the reason they do not receive vaccinations.

In order to fully understand how SES impacted the accessibility of the Gardasil vaccine to minority groups, it is necessary to examine what began to transpire in the United States economically at the time of Gardasil's initial distribution and how that relates to socioeconomic disparities. The National Bureau of Economic Research stated that in December of 2007, the United States along with other countries around the world began to experience the Great Recession. This led to the loss of 8.9 million jobs across the country between 2007 and 2010. Minorities were among those most affected by this recession. Pew's Research Center reports:

From 2005 to 2009, inflation-adjusted median wealth fell by 66% among Hispanic households and 53% among black households, compared with just 16% among white households. As a result of these declines, the typical black household had just \$5,677 in wealth (assets minus debts) in 2009; the typical Hispanic household had \$6,325 in wealth; and the typical white household had \$113,149. Worse, 35% of African Americans and 31% of Hispanics reported zero or negative net worth in 2009. By contrast, only 15% of white households were in the same boat (Taylor, Kochhar, Fry, Velasco, & Motel, 2011).

Because of the loss of jobs and the net worth among minorities during this great recession, many lost access to affordable health insurance. Access to health services diminished and the consideration of risking savings on a new expensive vaccine was unlikely. The 16% of white households that were affected, compared to the 66% of African Americans and 53% of Hispanic households that were affected, illustrates who was excluded from Merck's vaccine during its initial distribution stages due to cost. Non-minority groups had better access to health care services because only a small percentage of their household populations was affected. Thus, they were more likely to receive the vaccination because they could afford it. Because of this monopoly and the country's economic crisis, some minorities of low socioeconomic status were financially excluded from obtaining Gardasil.

Attempts to indirectly remedy the problem of Gardasil's cost only furthered the problem for these minority groups. In late 2006, 26 state legislatures across the United States began to produce legislation that required the vaccine to be received by middle school girls (Aronowitz, Epstein, Livingston, & Wailoo, 2010). Of these 26 states, 22 state legislative bodies rejected the Gardasil mandate (Aronowitz, Epstein, Livingston, & Wailoo, 2010). Many legislators, conservative organizations, and concerned parents/guardians viewed the Gardasil mandate as healthcare socialism while some viewed it as a positive governmental intervention that benefited the health of its citizens. Only the District of Columbia and Virginia passed legislation mandating the vaccine. Despite the fact that Texas rejected these mandates, Texas Governor Rick Perry went as far as issuing an executive order to mandate the vaccine (Aronowitz, Epstein, Livingston,

& Wailoo, 2010). Perry's use of governmental authority was overruled and no laws were implemented.

In the midst of these proposed mandates, the question of cost began to surface, including who would cover the cost and what type of economic burden this would place on the average American family. In 2013 (eight years since the beginning of these mandates), only eight states provided funding for this vaccine (The Henry J. Kaiser Family Foundation, 2013). This left the other 42 states' citizens to rely upon federal, private, and employment based insurance to compensate for the cost. This burden of cost continues to increase for average lower and working class citizens, especially when health insurance companies opt out of covering the vaccine's cost.

This problem of cost is most prevalent among those who are socioeconomically disadvantaged. In this way, HPV vaccination can be viewed as both a health care issue and a socioeconomic problem that targets specific social classes in each state. The state of Mississippi is a clear representation of the socioeconomic disparity attached to HPV vaccination. The issues that Mississippi faces regarding HPV vaccination revolve around the fact that HPV vaccination is not accepted by or accessible to those with low SES and minority racial groups.

Mississippi is composed of 59.8% Whites, 37.4% of Blacks/African Americans, and 2.8% Asian, Hispanic or Latino Americans (U.S. Census Bureau, 2014). In 2014, the average income of Mississippians was \$39,031 (U.S. Census Bureau, 2014), making it the poorest state in America. Today, 22.7% of Mississippians are below the poverty level in comparison to the national average of persons below poverty level, which is 15.7% (U.S. Census Bureau, 2014). Minorities in Mississippi are the most socioeconomically

disadvantaged group of individuals in the state. For example, the household income of Blacks in 2006, “was \$21,969 or just 51% that of white households (\$43,139)” (Hill, 2008). This study on the Economic Status of Blacks in the State of Mississippi highlighted the economic disparity between racial groups and how those who come from a lower SES background suffer (Hill, 2008).

The majority of Mississippians from low SES backgrounds also lives in impoverished communities. As a result they only have access to substandard education. To understand how Mississippi’s impoverished communities affect education, it is important to explore national correlations between poverty and education.

More than one in five U.S. children live in “official” poverty today, with an even higher rate for Black and Hispanic children and for those in families headed by a single parent. Among the world’s 35 richest countries, the United States holds the distinction of ranking second highest in child poverty. A large body of research continues to document the negative effects of poverty on children and their later life outcomes. Children growing up in poverty complete less schooling, work and earn less as adults, are more likely to receive public assistance, and have poorer health (Coley & Baker, 2013).

Twenty-two percent of children in the U.S. live in poverty (National Center for Children in Poverty (NCCP), 2014). Statistically, these national trends have placed not only a strain on the U.S. economy, but also they continue to jeopardize the health education of its citizens. Predictably, Mississippi’s correlations between poverty and education fall below the national trends. Thirty-two percent of children in Mississippi live in poverty (National Center for Children in Poverty (NCCP), 2014). Of that 32%, child minorities

are the most impoverished. Columbia University researchers at the National Center for Children in Poverty (2014) estimate that “49% of Blacks and 40% of Hispanics in Mississippi are impoverished while only 17% of Whites fall into that category.” This relates to education because the higher the average poverty rate, the less likely one is to attend college (The Pell Institute for the Study of Opportunity in Higher Education, 2015). Overall, this decline in the ability to climb the educational ladder limits their knowledge and access to health education because they cannot afford education let alone healthcare. Inadequate health education and access increase in Mississippi as poverty continues to increase. Limited health education and access to health care increases the risk for impoverished Mississippians to develop health problems.

In 2014, Mississippi ranked last in overall health (United Health Foundation, 2014). Mississippi currently has the second highest sexually transmitted infection (STI) rate in the U.S., including but not limited to HIV, gonorrhea, trichomoniasis, syphilis, and HPV. Despite the fact that it ranks among the highest in incidence rates for STIs, it has one of the lowest budgets for overall health. Furthermore, Mississippi only allocates \$1,354,661 in preventive funding (The Henry J. Kaiser Family Foundation, 2013).

In 2014 Mississippians had a 78.5% preventable hospitalization rate (United Health Foundation, 2014). According to the United Health Foundation, immunization among young adults (who make up half the amount of new STI/STD rates) could have significantly decreased this hospitalization rate. Mississippi is ranked 11th in the country for child immunization (United Health Foundation, 2014). Although 74.6% of children ages 1-12 in Mississippi are immunized, only 45.2% of adolescents between the ages of

13-27 are immunized (United Health Foundation, 2014) . This leaves Mississippi with an overall state adolescent immunization ranking of 50 (United Health Foundation, 2014).

As previously noted, HPV makes up 90% of newly acquired STI infections in the United States. HPV, like most STIs, is a preventable disease. Its contraction rate and the amount of hospitalizations associated with HPV could be significantly decreased if vaccination was more prevalent in Mississippi. No laws, governing policies, funding, or mandates regarding the HPV vaccinations have been implemented in Mississippi (The Henry J. Kaiser Family Foundation, 2015). Mississippi is one of ten states in which fewer than 30% of adolescents (between the ages of 13-17) have received the HPV vaccination (The Henry J. Kaiser Family Foundation, 2015).

Nationally, socioeconomic hardship has proven to be one of the primary reasons why parents are not having their adolescent sons and daughters vaccinated against HPV. This, along with lack of education about the vaccine, seems to play a major role in why minority individuals from a low SES background are not having their children vaccinated in southern Mississippi. The current study focuses on determining if race and socioeconomic status (SES) interact in such a way that will predict the attitudes of minority caregivers toward the HPV vaccination, in terms of its acceptability and accessibility. It is presumed that minority caregivers in Mississippi from a low SES will be less inclined to have their adolescent daughters vaccinated due to their lack of education about the vaccine as well as their inability to afford the vaccine.

Parents of guardians of adolescent females enrolled at Hattiesburg High School in Hattiesburg, Mississippi, were surveyed to determine if this interaction predicted lower

vaccination rates. This population was chosen because HPV is responsible for cervical cancer fatalities among women and adolescent females and because Mississippi women have a higher cervical cancer contraction rate than the national average (Mississippi State University, 2010). This population was also chosen because the Hattiesburg area has an increasing STI incidence rate (Frelix, 2009). Understanding this relationship is important because it answers questions regarding how parents in Mississippi feel about the HPV vaccine. Such information could have implications for health policies at both the state and federal levels that could help to improve vaccination policies and prevent the diseases caused by HPV.

Chapter 3: Methodology

Participants

Participants were 18 years of age or older and were the current parent/guardian of an adolescent female at Hattiesburg High School.

Measures

A 22-item questionnaire was distributed to all parents/guardians of Hattiesburg High School students in order to examine the extent to which race and SES influence parental attitudes toward the HPV vaccination of adolescent females. Most questions were answered on a 5-point Likert scale. Items were adapted from a survey used in a study conducted by Reiter et al. (2009) regarding parental attitudes toward the HPV vaccine.

Procedure

Before distributing the questionnaire, permission was sought from both the superintendent's office of the Hattiesburg Public School District and the principal of Hattiesburg High School. Upon receiving approval, the principal of Hattiesburg High School distributed an anonymous survey link via email to all parents/guardians of Hattiesburg High School students. This survey was administered using the web-based Qualtrics survey system. Responses were immediately uploaded to the Qualtrics system and remained completely anonymous. The survey remained open for two weeks.

Chapter 4: Results and Discussion

Experimental Results

On the first attempt, a survey was sent via email to a total of 1,053 parents/guardians at Hattiesburg High School. On the second attempt, the survey was emailed to a total of 1,114 parents/guardians at Hattiesburg High School. A total of 60 respondents completed the survey. Only 43 of the 60 respondents answered whether their child had received any shots of the HPV vaccination. Of those 43 participants, 90% of them identified as Black (Figure 1). Most of the respondents had completed some college or obtained an associate's degree (Figure 2). The majority income level of respondents was between \$30,001-\$50,000 (Figure 3). More than half of the respondents answered "Yes" to their adolescent daughter receiving the HPV Vaccination (Figure 4) and provided reasons why (Figure 5 and Figure 6). Once these univariate descriptive statistics were examined, bivariate Pearson Chi-Square (X^2) analyses were conducted to determine if categorical independent variables were significantly associated with vaccine participation (Table 1). The results of all hypothesis driven analyses were non-significant. However, a general correlation was observed between income level and vaccine participation (Table 2). Results show that the higher the income of the respondent, the more likely parents were to vaccinate their adolescent daughters against HPV.

Exploratory Results

Some univariate results also proved to be of significance. Figure 7 shows that 74% of healthcare providers recommended the vaccine. Figure 8 shows that 94% of the respondent's insurance covered the vaccine. Although the hypothesized data were not statistically significant, additional bivariate analysis produced results that were

statistically significant (Table 1). Because of these findings, a logistic regression analysis was conducted to model the relationship between independent and dependent variables. Those independent variables found to be significantly associated with vaccine participation at the bivariate level were included in the multivariate model (Table 2). The only independent variable that remained statistically significant during the logistic regression was the question regarding vaccine recommendation by health care providers (95% CI: 3.675-156.738) ($X^2 = 14.727, Df = 1, \text{and Sig } p = 0.0001$) (Table 2).

Experimental Tables and Figures

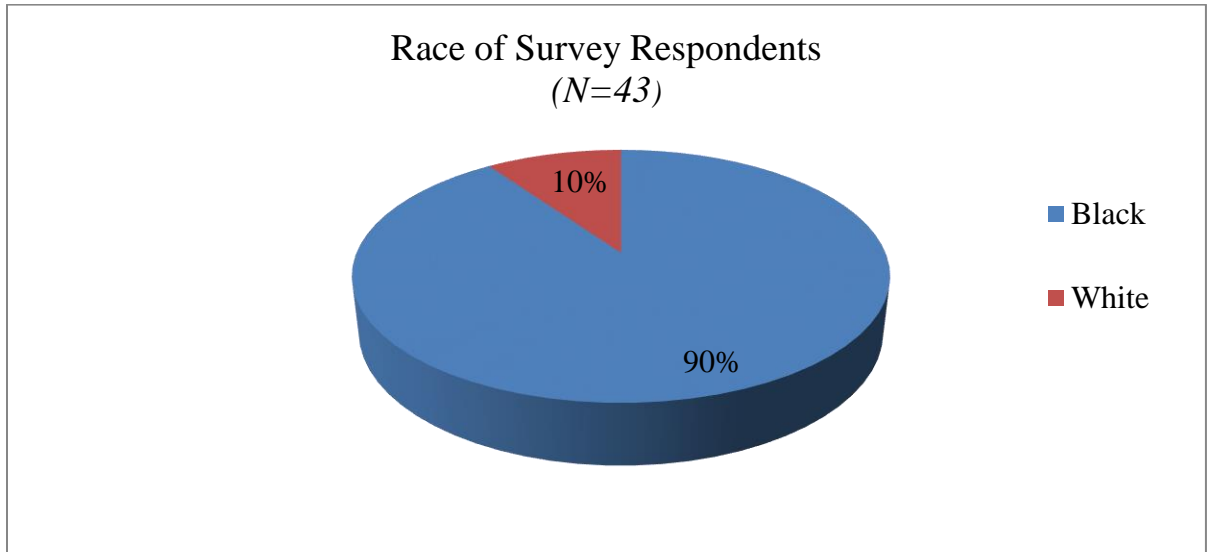


Figure 1. Race of Survey Respondents

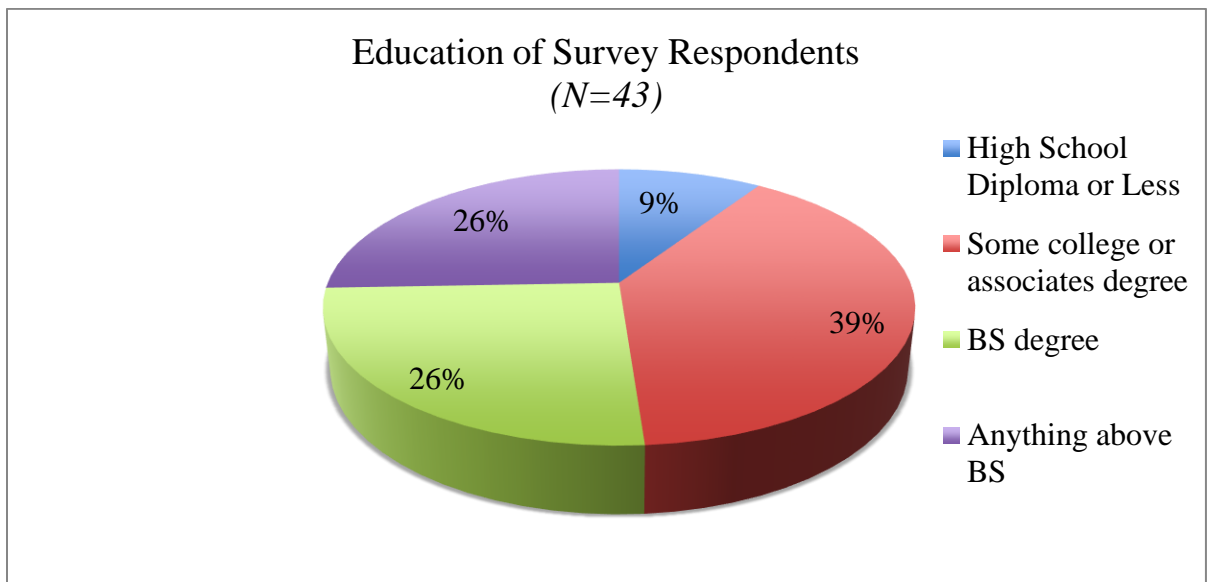


Figure 2. Education of Survey Respondents

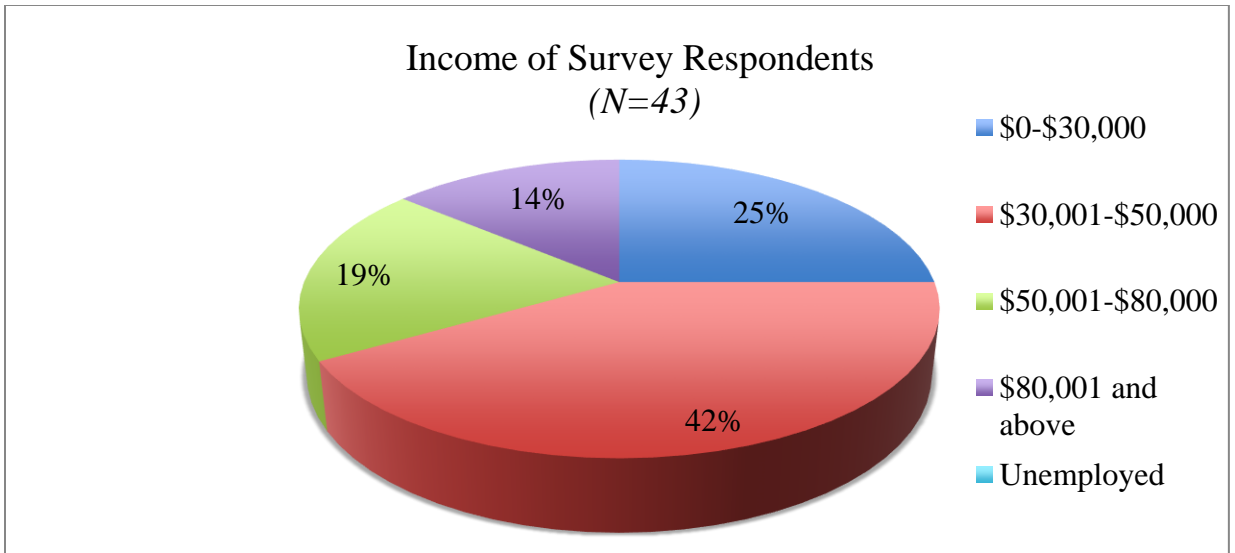


Figure 3. Income of Survey Respondents

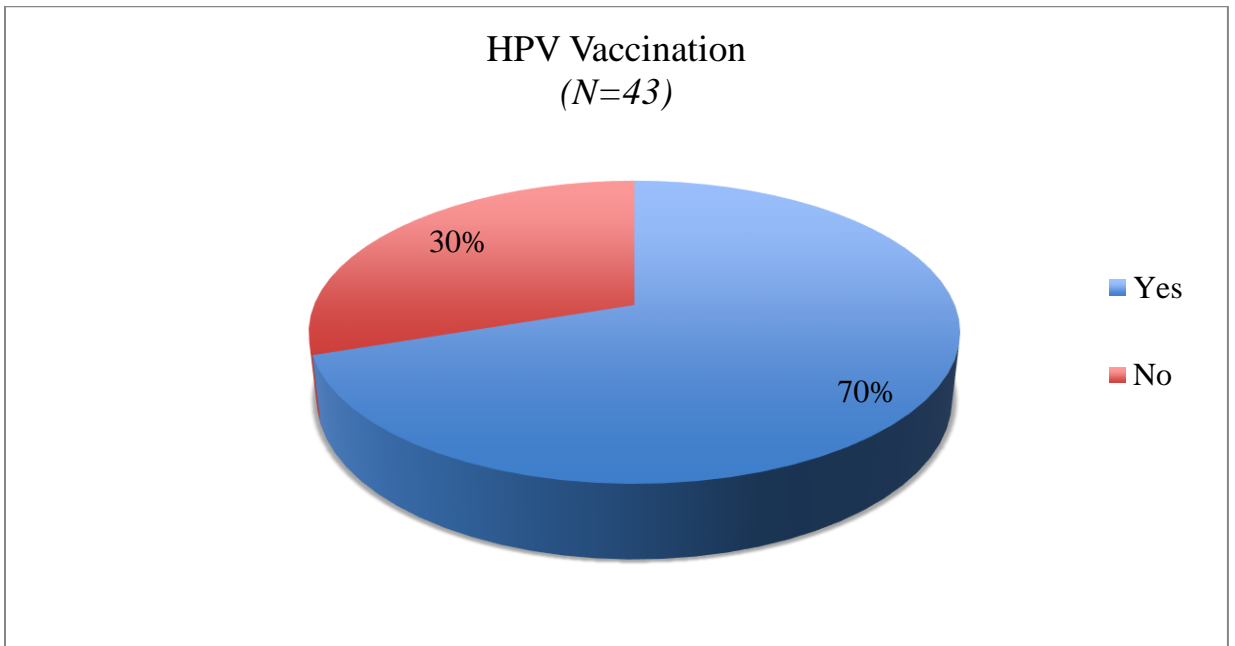


Figure 4. HPV Vaccination

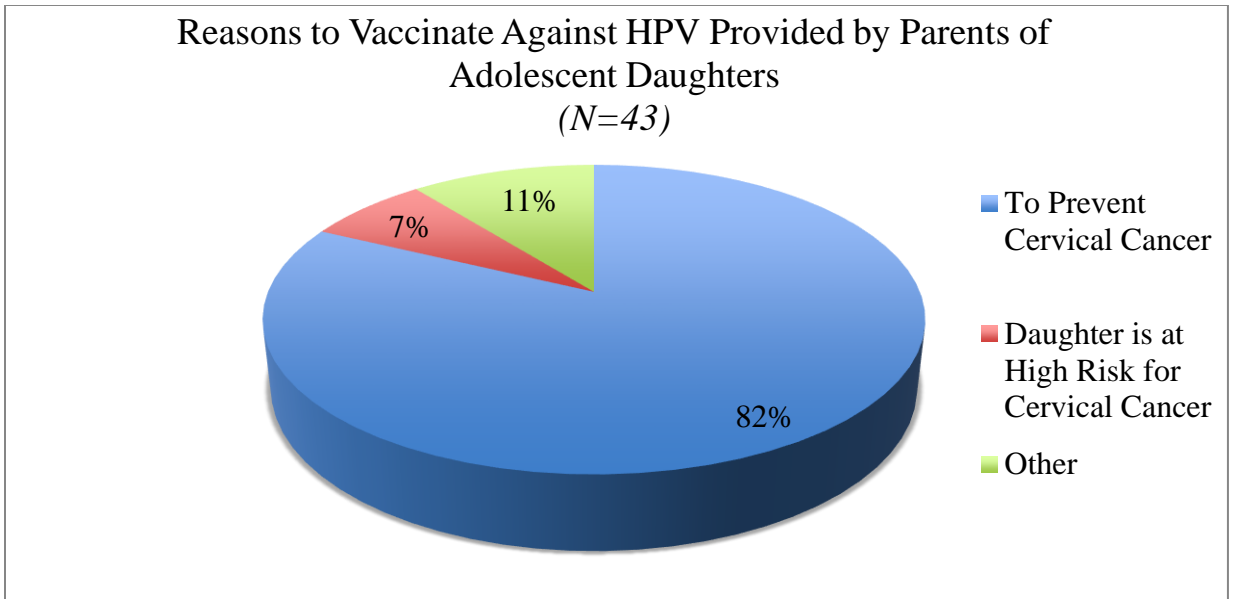


Figure 5. Reasons to Vaccinate Against HPV Provided by Parents of Adolescent Daughters

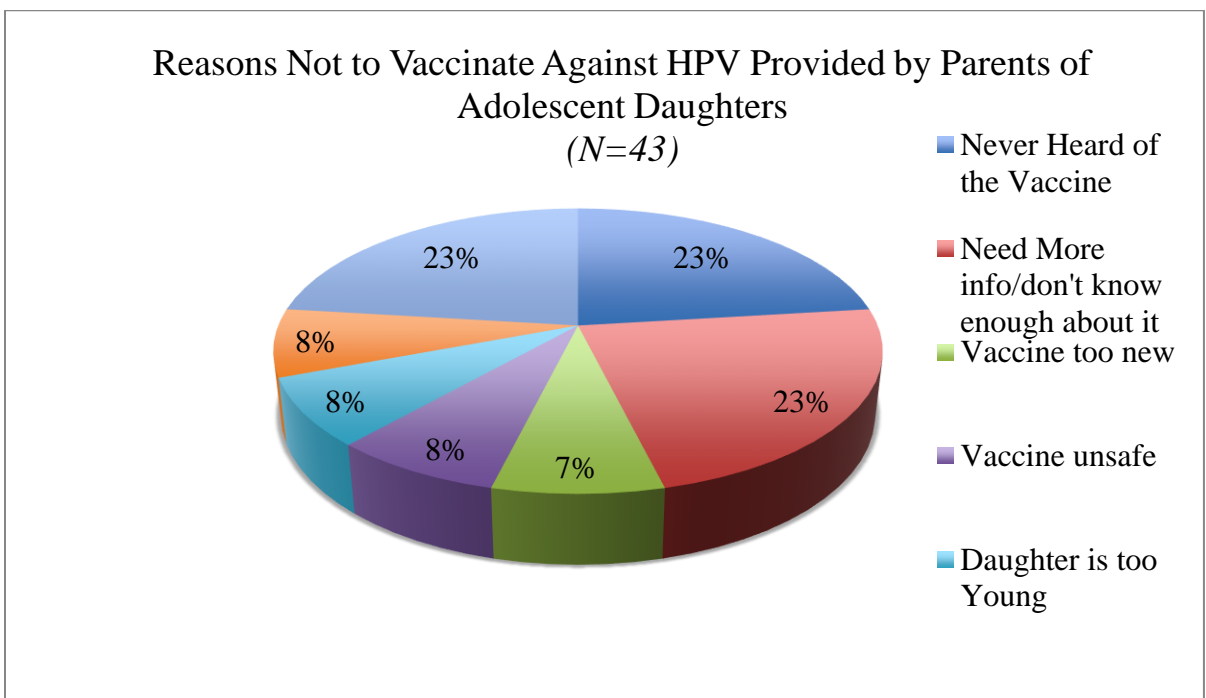


Figure 6. Reasons Not to Vaccinate Against HPV Provided by Parents of Adolescent Daughters

Table 1. Bivariate Results for Race, Education, and Finances (*N=43*)

Independent Variable	Category (<i>N=43</i>)	Percent Vaccinated	Chi-Square Tests	Value	Df	Asymp. Sig. (2-sided)
Race	Black (37)	70.30%	Pearson Chi-Square	1.612	2	0.447
Education	Some College or Associates Degree (17)	64.70%	Pearson Chi-Square	1.751	3	0.626
Financial	\$30,001-\$50,000 (15)	73.30%	Pearson Chi-Square	6.878	5	0.230

Table 2. Bivariate Results for Income (*N=43*)

Has your daughter had any shots of the HPV Vaccine?	\$0-\$30,000	\$30,001-\$50,000	\$50,001-\$80,000	\$80,001- and above
Yes	4	11	7	4
No	5	4	0	1
Total	9	15	7	5

Exploratory Figures and Tables

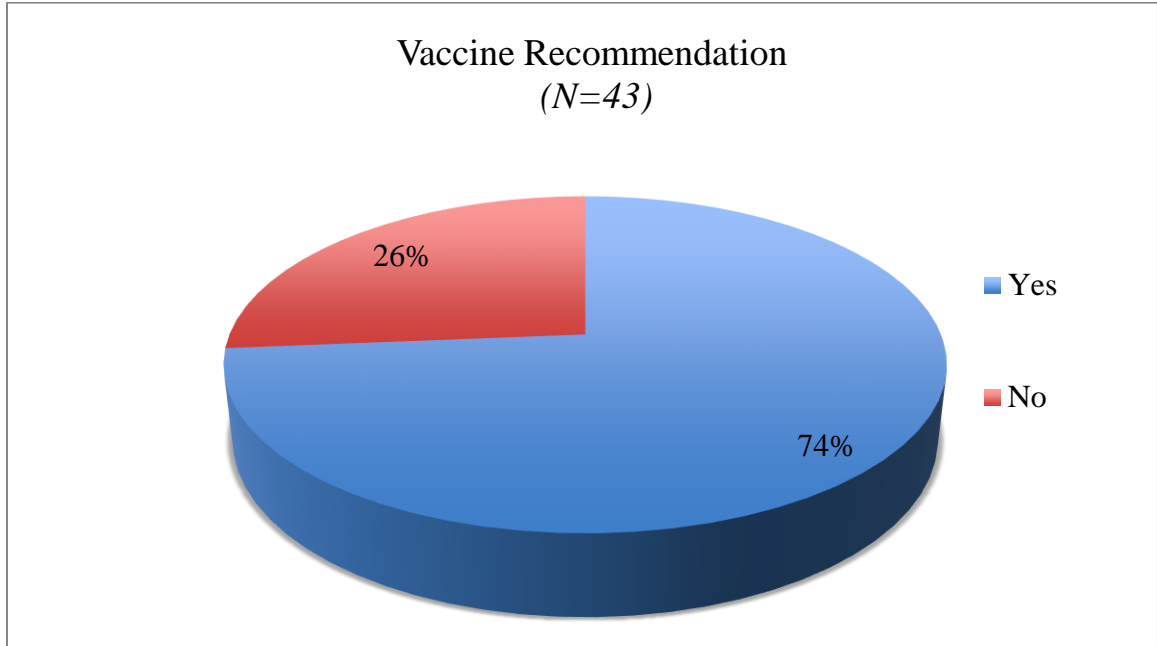


Figure 7: Vaccine Recommendation

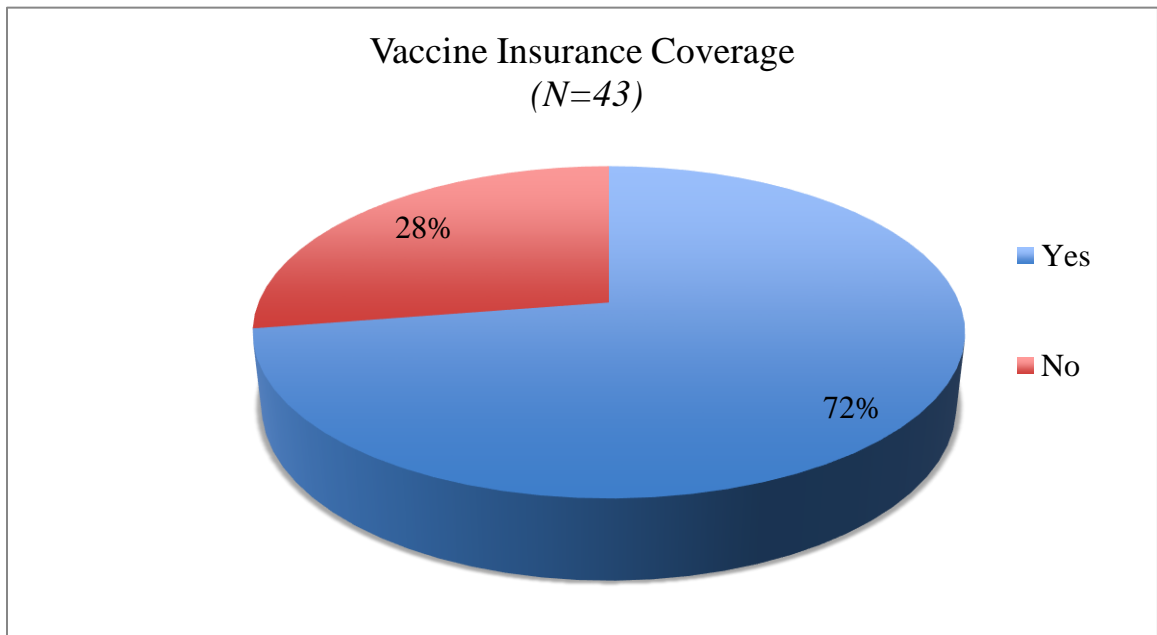


Figure 8. Vaccine Insurance Coverage

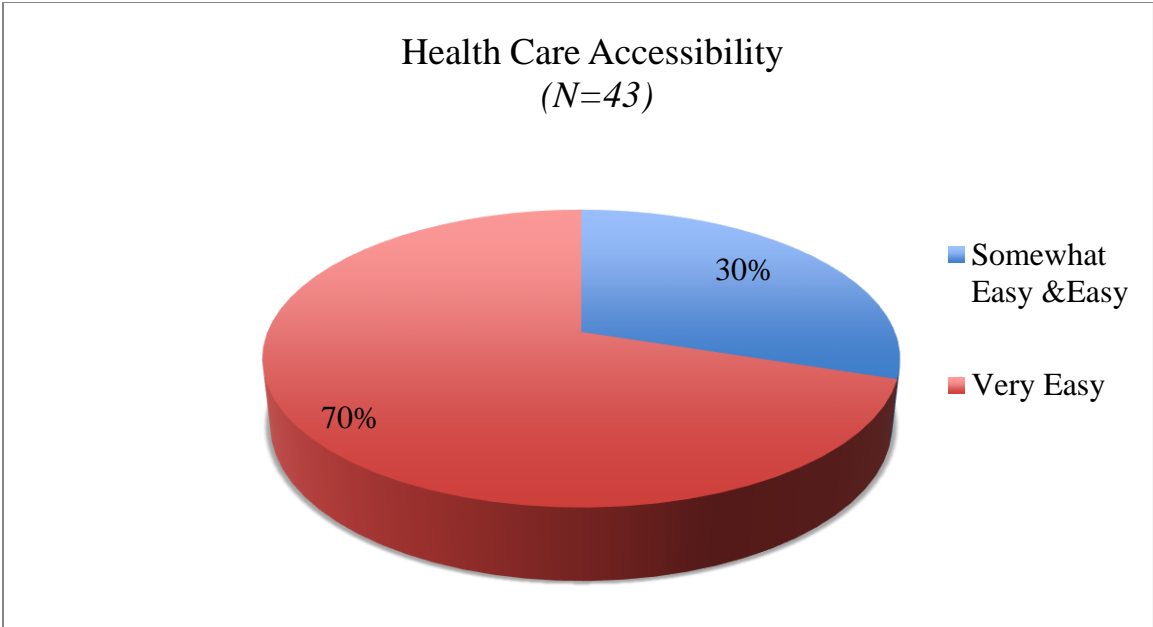


Figure 9. Health Care Accessibility (N=43)

Table 3. Bivariate Results for Exploratory Analysis (* indicates significance)

Independent Variables	Category (N=43)	Percent Vaccinated	Chi-Square Tests	Value	Df	Asymp. Sig (2-sided)
HPV Insurance Coverage Health Care Access Health Care Recommendation	Yes (28)	82.1%	Pearson Chi-Square	4.353	1	0.037*
	Very Easy (28)	78.6%	Pearson Chi-Square	3.265	1	0.071*
	Yes (28)	85.7%	Pearson Chi-Square	14.72	7	0.0001*

Table 4. Multivariate Regression of Vaccine Recommendation (* indicates significance)

Step 1 ^a	Df	Sig	Exp (B)	95% C.I. Lower	95% C.I. Higher
Q22 Recode: Vaccine Recommendation	1	0.001*	24.000	3.675	156.738

Chapter 5: Conclusion

Experimental Conclusion

Examining how race and SES interact to determine how minority parents/guardians with low income feel toward vaccinating their adolescent daughters against HPV did not yield the expected results. The literary analysis concludes that minority parents of low SES are more unlikely to vaccinate their children against HPV. This lack of vaccination participation is reportedly due to a lack of educational and financial means regarding vaccination (Coley & Baker, 2013). In the current study, the data do not support those described in the literature pertaining to vaccination, race, and SES. Approximately 90% of the survey respondents were Black and 70% of the respondents' adolescent daughters had received at least some shots of the vaccine. While the majority of respondents had some college education but made no more than \$50,000 a year, a majority of their daughters still received some, if not all, shots of the vaccine series. These descriptive statistics illustrate how minorities of low SES are not entirely apathetic toward HPV vaccination. At the univariate level, these results suggest that parents/guardians are aware of the HPV vaccine and are pursuing preventive measures to protect their daughters. No differences between white or black, rich or poor, influenced whether or not parents/guardians vaccinated their daughters against HPV. This finding could be due to a small respondent pool.

At the bivariate level, the hypothesized analysis did not yield significant results. The Pearson Chi-Square test was used to determine if there was a significant association between vaccination participation and key categorical variables. An analysis of the association between race and HPV participation yielded a Pearson Chi-Square test $X^2 =$

1.612, $Df = 2$, and $Sig p = 0.447$. Analysis of the association between educational level and HPV participation yielded a Pearson Chi Square of $X^2 = 1.751$, $Df = 3$, and $Sig p = 0.626$. Analysis of the association between income before taxes and HPV participation yielded a Pearson Chi-Square of $X^2 = 6.878$, $Df = 5$, and $Sig p = 0.230$. Because no association was found ($p \leq 0.05$) between any of the above variables pairs, multivariate inferential statistics were not conducted. This lack of a significant association showed that SES (education and finances) and race had no significant relationship to HPV vaccination participation. This lack of significance between vaccination participation and Race and SES could be due to the lack of a large respondents population. Although these results yielded no significant relationships, a correlation was noticed between income and vaccination participation (Table 2). The percentage of respondents vaccinating their daughters rose for each increasing income bracket. In the first category 44.4% were vaccinated, in the second income bracket 73.3% were vaccinated and in the highest income bracket 80% were vaccinated. As income increases, vaccination rates increase. This trend supports the findings in other studies that suggest that the higher the income level, the more likely one is to vaccinate their daughter against HPV (Coley & Baker, 2013).

Exploratory Conclusion

While the hypothesized data did not yield significance at the bivariate level, other independent variables did yield interesting results. At the univariate level, 74% of health care providers had recommended the vaccine, 72% of respondents also had insurance to cover vaccine, and 70% of respondents had very easy access to health care. At the

bivariate level, all of these independent variables showed a significant association with vaccine participation ($p \leq 0.05$). Those who had insurance coverage were 4.6 times more likely to be vaccinated than those who did not have coverage or were unaware if their insurance companies covered the vaccine (95 % CI: (1.038-20.3810) ($X^2 = 4.353, Df = 1, \text{and Sig } p = 0.037$)). Those who found it very easy to find a doctor, health care provider, or clinic to access were 3.67 times more likely to get the vaccine, but these results were not significant (95% CI: 0.862-15.593) ($X^2 = 3.265, Df = 1, \text{and Sig } p = 0.071$). Because this relationship was nearly significant, this variable was included in the multivariate analysis. Participants whose doctor or healthcare provider recommended the vaccine were 24 times more likely to be vaccinated than those not recommended (95% CI: 3.675-156.738) ($X^2 = 14.727, Df = 1, \text{and Sig } p = 0.0001$). These three variables that were found to be significantly associated at the bivariate level ($p < 0.10$) were analyzed using forward stepwise linear regression. After the analysis was completed, only being recommended to vaccination by a health care provider was a significant predictor of vaccine participation ($p < 0.005$) (Exploratory Tables and Figures: Table 2). There is a 95% confidence that the general populations of people who are recommended to get the vaccine are 3.675- 156.738 times more likely to do so. While this 95% confidence is an accurate representation of the population, those receiving vaccination based on recommendation, these values are not precise. This large range in the confidence interval bounds could be due to the lack of respondents.

Limitations

A majority of the results found were limited to a lack of survey respondents. Only 60 respondents completed the survey, but only 43 of those 60 respondents were used.

Low participation in this study could be due to a lack of incentives to complete the survey, summer-break, or lack of access to technology. If there were incentives such as a gift card, raffle, etc., parents could have been more likely to respond. However, if these incentives had been in place, it could have jeopardized the confidentiality of the survey by linking the survey to the respondents. Summer-break could have been a deterrent of study participation. Students at Hattiesburg High School were out of school during the release of the survey, thus parents/guardians could have been less inclined to participate in a study that was not during the school year. Access to technology is another drawback of study participation. Many parents/guardians may be older and not be technologically savvy, or they could have not had access to the survey. All of these factors could have contributed to a lack of survey participation. If the number of survey respondents was increased, it is probable that the hypothesized and exploratory results would have projected more significant findings.

Ostensibly, it is evident that parents/guardians are aware of the HPV vaccine and are taking measures to protect their daughters against HPV. The hypothesized analysis did not yield significance, but it did project a trend between income levels and vaccination. Thus, allowing one to conclude that there is some correlation between SES and HPV vaccination participation. The exploratory analysis did yield significant results at both the bivariate and multivariate levels, thus showing that parents/guardians are more likely to get their daughters vaccinated if there is very easy access, doctor recommendations, and vaccine coverage.

Because the largest limitation of this study is lack of participation, the results can only be discussed as preliminary findings. Further research efforts should focus on

increasing participation among parents in order to assess if race and SES variables are significantly associated with HPV vaccination participation. The only way to determine if these outcome values interact significantly with each other is by increasing respondent participation. Additional research to this preliminary analysis could answer the unknown question as to whether or not minority caregivers in Mississippi from a low SES will be less inclined to have their adolescent daughters vaccinated due to their lack of education about the vaccine as well as their inability to afford the vaccine. Additional research could also lead to HPV cost reform. Because HPV is one of the most preventive, yet deadly STIs amongst women in the United States, further research is imperative.

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NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- x The risks to subjects are minimized.
- x The risks to subjects are reasonable in relation to the anticipated benefits.
- x The selection of subjects is equitable.
- x Informed consent is adequate and appropriately documented.
- x Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- x Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- x Appropriate additional safeguards have been included to protect vulnerable subjects.
- x Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Effect Report Form”.
- x If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 15040608

PROJECT TITLE: Teenagers Need Drugs too: Attitudes on Accessibility and Acceptability of HPV Vaccination from Parents of Different Socioeconomic Statuses

PROJECT TYPE: New Project

RESEARCHER(S): Kristen Dupard

COLLEGE/DIVISION: College of Health

DEPARTMENT: Public Health

FUNDING AGENCY/SPONSOR: The Ronald E. McNair Scholars Program Post-Baccalaureate

Achievement Program

IRB COMMITTEE ACTION: Exempt Review Approval

PERIOD OF APPROVAL: 05/11/2015 to 05/10/2016

Lawrence A.

A.Hosman,

Ph.D.

Appendix B:

Participant Permission Letter

Dear Prospective Participant,

My name is Kristen Dupard, and I am a student-researcher from the University of Southern Mississippi. I am conducting an anonymous survey about parent's/guardian's attitudes on accessibility and acceptability of HPV vaccination in adolescent females. This study is important because it will begin to answer unknown questions of how parents in Mississippi feel about HPV vaccination for their adolescent daughters; thus, trying to develop policy guidelines for HPV education and vaccination. To participate in this study, you must be 18 years or older and be the parent/ guardian of an adolescent female that currently attends Hattiesburg High School. If you have more than one adolescent daughter at Hattiesburg High School, please complete this survey for each one. This survey is strictly voluntary and will remain completely anonymous. There are no benefits or other incentives that will be provided to you or your adolescent daughter if you choose to complete this survey. Some questions in this survey below are sensitive in nature and may ask for personal information. Some risks for participating in this survey include: asking about personal information regarding your adolescent daughter's vaccination information, your income information, your gender, and your race. All participation in this study is voluntary, and has been approved by the Institutional Review Board (IRB) at the University of Southern Mississippi. All data compiled from this survey via the Qualtrics system will be destroyed once the data is collected and analyzed.

The survey will take 5-15 minutes to complete. Please answer all questions to your comfort level. In addition, you may choose not to answer any questions that make you uncomfortable. Remember, your participation in this survey is completely **anonymous**. The results will be reported for the group of respondents as a whole, and no individual names or specific individual information will be released. This study is voluntary in nature, and you can choose whether or not to participate after reading this information letter.

For more information regarding the survey or for any unforeseen circumstances due to survey malfunction, uncomfortably, or any other inquires please contact the following individual:

Dr. Ray G. Newman
Phone: 601-266-5435
Email: ray.newman@usm.edu.

Thank you for your consideration.

Sincerely,
Kristen Dupard

If you would like to begin the survey, select the ">>" tab in the bottom right hand corner below.

If you choose not to continue, please exit out of this window.