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HPV Vaccine

Human Papillomavirus (HPV) is the most prevalent sexually transmitted disease in the United States. The US Centers for Disease Control and Prevention (CDC) estimates that at least 50% of sexually active women and men in the US are infected with HPV at some point in their lives. There are more than 40 types of HPV, some of which are thought to lead to cervical cancer (CDC 2006). In 2007, over 11,000 women in the US were diagnosed with cervical cancer, and about 3,700 deaths occurred due to cervical cancer. Not all of these cases were caused by HPV, although HPV is the greatest risk factor for cervical cancer (Kaiser Family Foundation 2008). It is estimated that the 5-year survival rate (percentage of people living for 5 years after diagnosis) for cervical cancer is 72% (American Cancer Society 2008).

In 2005 the estimated prevalence of cancer in females as a whole, that is, the estimated number of women with cancer was around 6 million. Cervical cancer made up 4.1% of cancer cases, or about 250,000 diagnoses. This compares to about 2,478,000 diagnosed cases of breast cancer in females, 188,000 cases of lung cancer in women, and 374,000 cases of melanoma of the skin diagnosed in women in 2005 (SEER, April 2008).

The FDA approved a vaccine for HPV in June 2006. This vaccine, Gardasil, is produced by Merck and is for preventive use in girls age 9 to 26. Gardasil protects against infection of four strains of HPV, two of which combined account for 70% of cervical cancer cases. Gardasil is intended to be administered in three doses, ideally in girls at the age of 11-12. The current cost of the three doses is a total of \$360 (Kaiser Family Foundation 2008).

In Vermont, approximately 30 women are diagnosed with cervical cancer a year, making it the 12th most common cancer among Vermont women. Although cervical cancer mortality in Vermont is comparable to the United States, diagnosis of cervical cancer is more common than the national average. In Vermont, there are 8.7 cases of cervical cancer per 100,000 white women diagnosed each year, as opposed to 7.2 per 100,000 white females in the United States as a whole. In addition, cervical cancer mortality and prevalence in Vermont have been declining at a slower rate than the rest of the country (Vermont Department of Health 2007).

Political Arguments

There has been much political tension over the enactment of a mandatory HPV vaccination. Among those arguing for implementation are the lobbyists of the pharmaceutical companies responsible for the creation of the vaccine, and Women in Government (a non-partisan lobbying

group composed of female state legislators). Without vaccination, these groups argue, women would continue to be infected with HPV on an unacceptable scale, and consequently develop cervical cancer which the vaccine would otherwise prevent (Vock 2007, Pollack et al, 2007).

Those opposing the vaccine's mandates are conservative groups that describe themselves as Christian and pro-family. These groups have long argued that it is immoral for the state to interfere on issues such as sexual health. They believe this interference restricts the rights of parents to make decisions, and will ultimately encourage sexual promiscuity. Alongside these moral traditionalists are anti-vaccination activists, who in general distrust the pharmaceutical industry. Some social liberals also oppose the vaccine on accusations that the producer, Merck, is attempting to make up for losses on the pain reliever Vioxx, which was taken off the market in 2004 (Levine 2007).

Considering the legal grounds of mandatory vaccination, precedent for such events was affirmed in *Jacobson v. Commonwealth of Massachusetts* (197 U.S. 11, 38, 1905). This established a state's right in mandating that individuals, regardless of health condition, be vaccinated to protect others. The rights of the minority, the Supreme Court of the United States cited, were not tantamount to reducing the protection of the majority: "If such be the privilege of a minority, then a like privilege would belong to each individual of the community, and the spectacle would be presented of the welfare and safety of an entire population being subordinated to the notions of a single individual who chooses to remain a part of that population" (*Jacobson v. Commonwealth of Massachusetts 1905*).

Current State Policies

Legislators in at least 41 states and Washington, D.C. have introduced legislation to require, fund, or educate the public about HPV vaccines. According to February 2008 information from the National Conference of State Legislatures, at least 17 states have enacted legislation: Colorado, Indiana, Iowa, Maine, Maryland, Minnesota, Nevada, New Mexico, New York, North Carolina, North Dakota, Rhode Island, South Dakota, Texas, Utah, Virginia, and Washington. HPV vaccine legislation was introduced for 2007-2008 by four states, Hawaii, Kentucky, New Jersey, and New Mexico (NCSL 2008).

Virginia

As of April 4, 2007 Virginia became the first state passing a law requiring girls in the sixth grade to receive the HPV vaccination, effective in 2009. The law allows parents to override this condition if they do not want their daughter to have the vaccine (Virginia State Legislature 2007).

Texas

On February 2, 2007, Texas Governor Rick Perry made an executive order requiring all girls to receive the vaccine prior to entering the sixth grade (Perry 2007). However, on April 25, 2007, the Texas legislature voted 135-to-2 to override this decision as many of the legislators believed that the Governor was abusing his executive powers (Blumenthal 2007).

New Mexico

New Mexico's Governor Richardson vetoed a bill on April 3, 2007, which passed through the legislature, requiring sixth grade girls to receive the vaccine (Baker 2007).

Iowa

Iowa Governor Chet Culver signed a bill into law in March 2008 requiring insurance companies to cover the cost of vaccines to treat HPV. According to a Des Moines OB-GYN, the new law will make it easier for women to fight off HPV. If a woman has a health insurance policy that includes vaccines, HPV must be covered. No option exists to exclude the vaccine (Radio Iowa News 2008).

Cost Benefit Analysis

There are approximately 3,200 incoming 6th grade females in Vermont public schools for the 2007-2008 school year, as estimated by the Vermont Department of Education. At a cost of \$360/person, the cost to vaccinate this population is \$1,152,000. Although the specific data could not be found for Vermont, the State of Virginia totaled the cost of cervical cancer treatment at \$10,493/person (Ticer 2001). Therefore, if the vaccine prevented 109 cases of cervical cancer in Vermont, the cost of the vaccine to the state would equal that of treatment. However, in Vermont there are about 30 cases of cervical cancer a year, not all caused by HPV and not all preventable by a vaccine, thus the vaccine is unlikely to lead to savings in medical costs.

Sanders and Taira (2003), in a paper produced for the Center for Primary Care and Outcomes Research at Stanford, completed a cost-effectiveness analysis that compares requiring all 12-year-old girls in the United States to be vaccinated with a HPV vaccine that has 75% efficacy (comparable to Gardasil) as opposed to current programs of prevention and treatment. The analysis concluded that mandating the vaccine in the United States will increase the average lifespan of Americans by 2.8 days/person with an average cost of \$248/person (Sanders and Taira 2003).

New Breakthroughs

A study is under way to test whether males should receive a HPV vaccine, as a way to protect females from the virus. The logic behind such research rests on the fact that males can spread the sexually transmitted virus, even if they cannot contract it themselves. This potential vaccine may also protect both sexes from throat cancer, which can be caused by HPV. Researchers have stated that test results for males are still two to three years away.

Researchers say they have created a synthetic vaccine for HPV, which can be used as a nasal spray. So far, the vaccine has only been tested on mice, but researchers are optimistic, as they believe the synthetic vaccine will be cheaper than the current vaccine called, Gardasil, and protect from a range of these cancer-causing strains. The ability to administer the drug through a

nasal spray also takes away significant costs of having to take three separate shots, which can also be quite painful.

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