

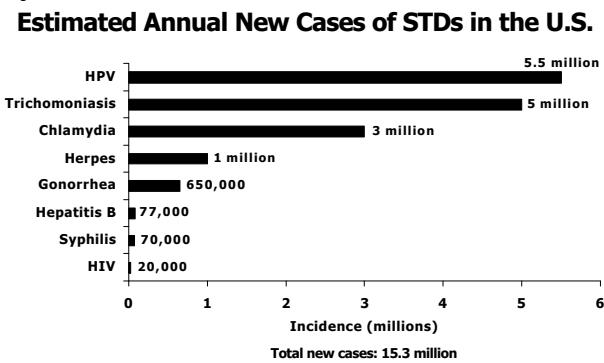
February 2000

## HPV (Human Papillomavirus) and Cervical Cancer

### HPV

- Human papillomavirus (HPV) is the most common sexually transmitted disease in the United States (Fig. 1).
- More than one-third of the estimated 15.3 million new cases of sexually transmitted diseases (STDs) in the United States in 1996 were attributable to HPV.<sup>1</sup>
- HPV is the name of a group of more than 100 viruses. Different types of HPV can cause visible genital warts or can cause no symptoms.<sup>2</sup>
- In spite of how common HPV is, most Americans 18 and older (70%) have never heard of it. Most (89%) have never discussed HPV with their health care provider.<sup>3</sup>
- Certain types of HPV are causally linked to cervical cancer. Recent studies have found that HPV is present in 99.7% of cervical cancer worldwide, and that HPV-negative cervical cancers are extremely rare.<sup>4</sup>
- Because HPV often has no symptoms, many people do not know they are infected or that they can transmit it to others. HPV is usually spread by direct, skin-to-skin contact during vaginal, anal, or oral sex with someone who has this infection (whether or not symptoms are present).<sup>5</sup>

Fig. 1



Note: Estimates for HIV and Hepatitis B reflect only sexual modes of transmission; estimates are higher when non-sexual transmission is included.

Source: Kaiser Family Foundation and American Social Health Association, *Sexually Transmitted Diseases in America: How many cases and at what cost?*, December 1998.

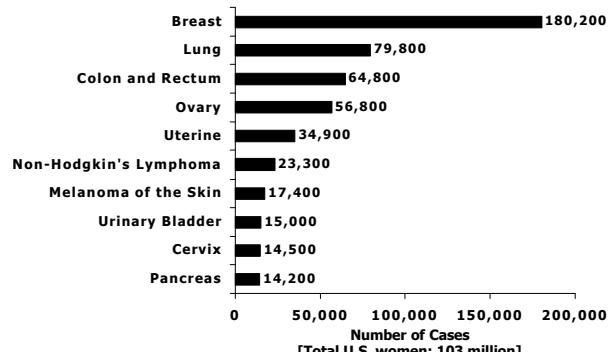
- HPV can not be cured but symptoms such as genital warts and early stages of cervical cancer can be treated. There is some question about whether types of HPV (particularly low-risk types) are mainly transient infections that can be cleared from one's body by themselves, or whether HPV is always persistent but difficult to detect at times. Studies do show that high-risk types of HPV in particular are more persistent.<sup>6</sup>
- There is no universal test for HPV; a DNA test has been developed that can detect HPV in the cervix (see HPV DNA Testing section).

### The Link to Cervical Cancer

- Several studies have concluded that certain types of HPV are a cause of almost all cervical cancers.<sup>7</sup>
- In 1997, it was estimated that cervical cancer was the 9<sup>th</sup> most common newly diagnosed cancer among women in the U.S. (Fig. 2).<sup>8</sup> Worldwide, cervical cancer is the second or third leading type of cancer among women.<sup>9</sup>
- In 1999, it was estimated that 12,800 cases of invasive cervical cancer would be diagnosed in the U.S., and that 4,800 women would die from cervical cancer.<sup>10</sup>

Fig. 2

### Annual New Cancer Cases Among U.S. Women, 1997 Estimates



Source: American Cancer Society, *Cancer Facts and Figures 1997*.

- The rate of new cervical cancer cases in African-American women is nearly twice as high as the rate in white women, and African-American women are two to three times more likely to die from it.<sup>11,12</sup>
- 87% of cervical cancer patients survive one year after diagnosis, and 70% survive five years. When detected at an early stage, invasive cervical cancer is one of the most successfully treatable cancers with a 5-year relative survival rate of 91% for localized cancers.<sup>13</sup>
- New cases of cervical cancer have declined steadily over the past several decades, by 44% from 1973-1996. Mortality rates also declined sharply, by 46% over the past several decades. Much of the reduction in cervical cancer mortality has been associated with increased use of Pap tests.<sup>14</sup>

### Pap Smears

- A Papanicolaou (Pap) smear is a test designed to detect abnormal cervical changes that may indicate precancerous cells or cancer. Abnormal changes in the cells are referred to as dysplasia, or low- or high-grade squamous intraepithelial lesions (SIL).<sup>15</sup>

- The Pap smear is a simple procedure that is performed by a health care professional as part of most routine gynecological exams. A small sample of cells is swabbed from the cervix, transferred to a slide, sent to a lab, and examined under a microscope.
- The U.S. Preventive Services Task Force recommends Pap tests for all women beginning when they become sexually active (but no later than age 18) and then every 3 years for women at normal risk for cervical cancer; the interval may be shorter for women at high risk for the disease.<sup>16</sup>
- Women who have one negative Pap smear, and then have annual smears afterwards will have their lifetime risk of cervical cancer reduced by about 92%. If smears are performed every three years, the risk reduction falls only to 90%.<sup>17</sup>
- 84% of women in the U.S. age 18-64 report having had a routine obstetrical or gynecological exam in the past two years; 76% within the past year.<sup>18</sup> Still, between 3% and 17% of women in the U.S. have never had a Pap smear,<sup>19</sup> and even more women - particularly older women - do not get Pap smears every three years, as recommended.<sup>20</sup>
- Although 80-90% of women have had Pap smears, only half have followed the recommended frequency.<sup>21</sup>
- Two tests have been developed that replace or enhance the effectiveness of traditional Pap smears: AutoPap, which can reduce errors in identifying abnormalities, and ThinPrep, which may reduce errors both in identifying abnormalities and in collecting the sample to be studied.<sup>22</sup> Currently, these tests are not as widely available as traditional Pap smears and may cost more; insurers have varying policies regarding coverage of these tests.

### **HPV DNA Testing**

- An HPV DNA test - the Digene Corporation's Hybrid Capture II HPV Test - has been approved by the Food and Drug Administration for use in the U.S. as a follow-up to irregular Pap smears.
- The test detects HPV on the cervix using a cervical swab administered by a health care provider; recent studies have also examined the use of self-collected samples.<sup>20</sup>
- The test differentiates between high-risk types of HPV (those found in nearly all cervical cancer) and low-risk types of HPV. If the test finds high-risk types it is very likely to indicate high-grade cervical squamous intraepithelial lesions (SILs) and invasive cancer, at a rate equivalent or superior to a Pap smear.<sup>23</sup>
- The HPV test has a sensitivity of about 90%, meaning that it is highly likely to detect HPV if it is present in the cervix. However, its specificity - how likely the test is to result in a false-positive - is at 5-20%.<sup>24</sup>
- Since HPV has been causally linked to cervical cancer,<sup>25</sup> it is being debated whether, and for whom, HPV testing should be used more routinely or even instead of a Pap test. The benefits of HPV testing have been raised for women who do not get Pap smears regularly, including older women and women in developing countries. At the same time, some argue that there is not enough research on HPV testing to warrant its use as a primary screener, because HPV is so common.<sup>26</sup>

### **HPV Prevention**

- Abstaining from sexual activity is the only sure measure of protection from HPV, although rarely the virus can be spread by skin contact outside of vaginal, oral, or anal sex.
- While condoms do not provide reliable protection against HPV, condoms may reduce the risk of transmitting HPV for those who are sexually active.<sup>27</sup> Condoms are effective protection from many other STDs.
- Spermicidal foams, creams, and jellies are not proven to act against HPV and genital warts, but used along with condoms they are effective against some other STDs.

### **References**

- American Social Health Association and the Kaiser Family Foundation. *Sexually Transmitted Diseases in America: How Many Cases and at What Cost?* Menlo Park: Kaiser Family Foundation. 1998.
- American Social Health Association. *HPV Questions and Answers.* <http://www.ashastd.org/hpv/hpvref.html>.
- Kaiser Family Foundation/Harvard School of Public Health. Health News Index 2/2000.
- Walboomers J. et al. Human Papillomavirus is a Necessary Cause of Invasive Cancer Worldwide. *Journal of Pathology*, 189: 12-19, 1999. Wallin KL et al Type-Specific Persistence of Human Papillomavirus DNA Before the Development of Invasive Cervical Cancer. *New England Journal of Medicine*. 341 (22): 1999.
- American Social Health Association. *HPV Questions and Answers.* Op Cit.
- Ho G et al. Natural History of Cervicovaginal Papillomavirus Infection in Young Women. *The New England Journal of Medicine* 1998; 338: 423-428. Brisson J et al Determinants of Persistent Detection of Human Papillomavirus DNA in the Uterine Cervix. *Journal of Infectious Diseases*. 1996; 173: 794-9.
- Walboomers J. et al. Op Cit; Wallin KL et al Op Cit.
- American Cancer Society, Leading Sites of New Cancer Cases and Deaths -- 1997 Estimates.
- Schiffman M. et al "HPV DNA Testing in Cervical Cancer Screening." *Journal of the American Medical Association*. 2000; 283 (1).
- American Cancer Society. 1999 Facts and Figures, Selected Cancers. <http://www.cancer.org/statistics/cff99/selectedcancers.html#cervix>
- American Cancer Society. Ibid.
- American College of Obstetricians and Gynecologists, Press Release: Race Predicts Cancer Survival, September 30, 1999.
- American Cancer Society. Op Cit.
- Centers for Disease Control and Prevention. Trends in Self-Reported Use of Mammograms (1989-1997) and Papanicolaou Tests (1991-1997) -- Behavioral Risk Factor Surveillance System. *Morbidity and Mortality Weekly Report*. October 8, 1999 / 48(SS06);1-22.
- National Cancer Institute. *Cancer of the Cervix*. 9/28/98. [http://cancernet.nci.nih.gov/wyntk\\_pubs/cervix.htm#1](http://cancernet.nci.nih.gov/wyntk_pubs/cervix.htm#1)
- U.S. Preventive Services Task Force. *Guide to Clinical Preventive Services*, 2<sup>nd</sup> Edition.
- Miller AB. Editorial: Failures of Cervical Cancer Screening. *American Journal of Public Health*. 85 (6), 1995.
- Kaiser Family Foundation with Essence, Latina and LA Times. A National Survey of Women About Their Reproductive Health Care. Pending 1999.
- Centers for Disease Control and Prevention 1998 *Behavioral Risk Factor Surveillance System Summary Prevalence Report*. 1999. <http://www.cdc.gov/nccdphp/brfss/pubrfdat.htm>
- Wright TC et al. HPV DNA Testing of Self-Collected Vaginal Samples Compared with Cytologic Screening to Detect Cervical Cancer. *Journal of the American Medical Association*. 283(1) 2000.
- Miller AB. Op Cit.
- Adalsteinn DB and Alan MG, Cost-effectiveness of 3 Methods to Enhance the Sensitivity of Papanicolaou Testing. *American Journal of Public Health*. 89 (4), 1999.
- Wright TC et al. Op Cit.
- Cuzick J. Human Papillomavirus Testing for Primary Cervical Cancer Screening. *Journal of the American Medical Association*. 283 (1), 2000.
- Walboomers J. et al. Op Cit.; Wallin KL Op Cit..
- Schiffman et al, Op cit. Wright et al. Op Cit.
- Wen CM et al. Risk Factors for the Acquisition of Genital Warts: are Condoms Protective? *Sexually Transmitted Infections* 10/99.