

Report from the CDC

Human Papillomavirus-Related Content in State and Tribal Comprehensive Cancer Control Plans

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ABSTRACT

Oncogenic types of the human papillomavirus (HPV) are firmly established as etiological agents for most premalignant and malignant epithelial lesions of the cervical mucosa. Genital infection with HPV is the most common sexually transmitted infection (STI) in the United States. Although most women infected with the virus become HPV negative within 2 years, women with persistent high-risk HPV infections are at greatest risk for developing cervical cancer. Since the development of the Papanicolaou (Pap) test more than 60 years ago to screen for cervical cancer, technological advances have occurred in cervical cytology screening and HPV vaccine research. For example, in 2001, high-risk HPV DNA testing was recommended for the management of women whose Pap smears (collected by a liquid-based method) reveal atypical squamous cells of undetermined significance. In 2006, the Food and Drug Administration licensed a quadrivalent HPV vaccine for females aged 9–26 years to prevent cervical cancer, precancerous lesions, and genital warts associated with HPV types in the vaccine. New and emerging technologies in cancer diagnosis, management, and prevention are often addressed in comprehensive cancer control (CCC) plans developed by states, tribes, and territories. CCC is a collaborative process through which a community and its partners pool resources to reduce the burden of cancer. To assess whether CCC plans include HPV-related content, particularly regarding cervical cancer screening and prevention, we reviewed the most current plans available between October 2006 and January 2007 on an interactive Internet site for CCC programs ($n = 53$). This paper describes the contexts in which HPV-related content occurs in the plans.

INTRODUCTION

THE ROLE OF THE HUMAN PAPILLOMAVIRUS (HPV) in the development of cervical cancer has been studied for more than three decades.^{1–3} To-

day, it is firmly established that certain HPV infections are the primary risk factor for most premalignant and malignant epithelial lesions of the cervical mucosa. Two high-risk types of HPV, types 16 and 18, are responsible for approxi-

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mately 70% of cervical cancers worldwide.⁴ Genital infection with HPV is the most common sexually transmitted infection (STI) in the United States.⁵ In a national population-based study of HPV infection prevalence among sexually active young women who participated in the National Health and Nutrition Examination Survey 2003–2004 (NHANES), the overall estimated prevalence was 26.8% among females aged 14–59 years.⁶ NHANES is administered by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics. Approximately 90% of women with HPV infection become HPV negative within 2 years, according to a study in which HPV DNA testing was performed on participants' self-collected vaginal swabs.⁷ Nearly 10% of women infected with HPV develop persistent HPV infections. Women with persistent high-risk HPV infections are at greatest risk for developing precursor lesions of high-grade cervical cancer and cancer.

Since the development of the Papanicolaou (Pap) test more than six decades ago to screen for cervical cancer, new technologies have emerged

to detect and manage cervical abnormalities. For example, in 2001, high-risk HPV DNA testing was recommended for the management of women whose Pap smears (collected by liquid-based methods) revealed atypical squamous cells of undetermined significance.⁸ A new tool is also available to prevent infection by the virus. In June 2006, the U.S. Food and Drug Administration (FDA) licensed the quadrivalent HPV vaccine types 6, 11, 16, 18 (GARDASIL™, manufactured by Merck and Co., Inc., Whitehouse Station, NJ) for females aged 9–26 years for the prevention of cervical cancer, precancerous lesions, and genital warts associated with HPV types included in the vaccine.⁹ This prophylactic vaccine has been recommended by the CDC's Advisory Committee on Immunization Practices (ACIP).¹⁰ ACIP recommends routine vaccination of females aged 11–12 years with three doses of quadrivalent HPV vaccine. The vaccination series can be started as young as age 9. Vaccination is also recommended for females aged 13–26 years who have not been previously vaccinated or who have not completed the full series.

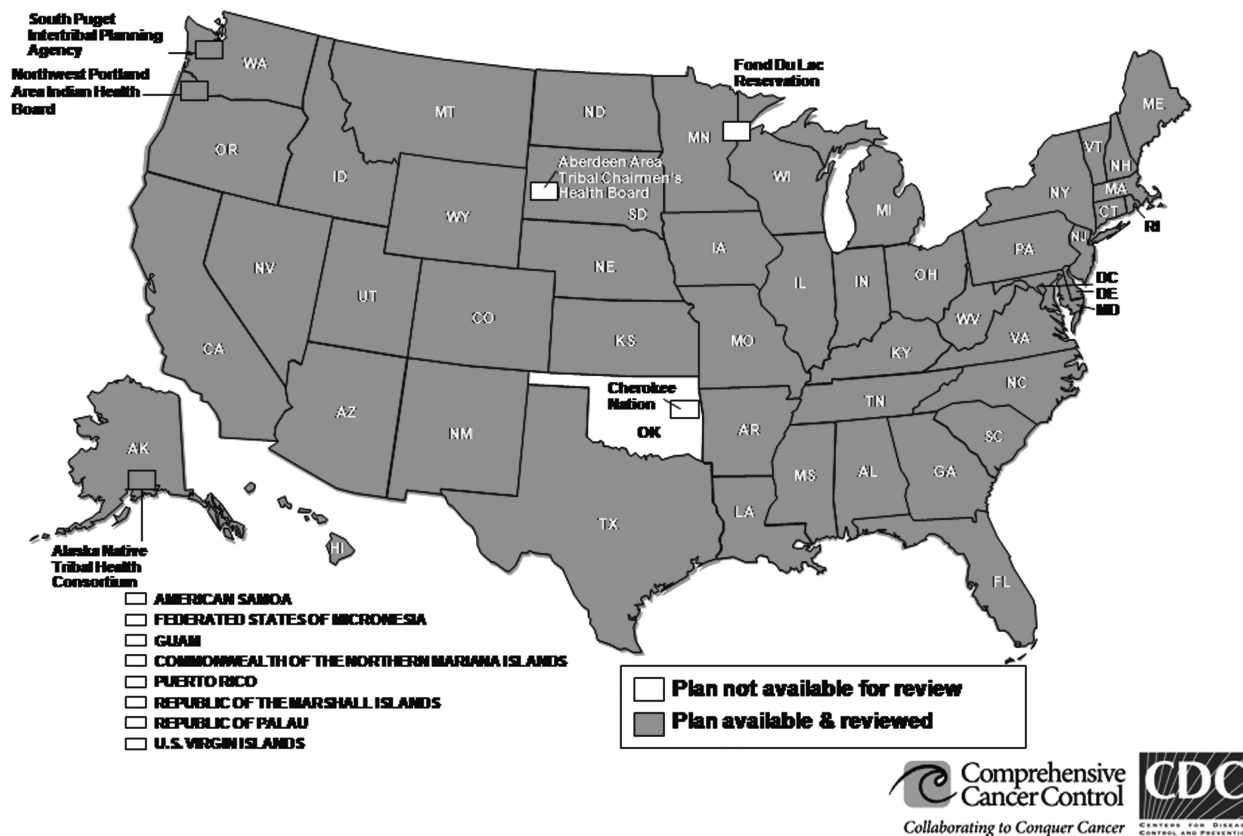


FIG. 1. Comprehensive cancer control (CCC) plans reviewed, January 2007.

New and emerging technologies in cancer screening and prevention are often addressed when states, tribes, and territories and their non-governmental partners form comprehensive cancer control (CCC) coalitions to address cancer prevention and control among the populations they serve. CCC is a collaborative process through which a community and its partners pool resources to reduce the burden of cancer. One of the first activities undertaken by coalitions is to develop CCC plans. The plans serve as written documentation of the need for addressing the burden of cancer, offer a blueprint for coordinated action by CCC coalitions, and lay out measurable objectives. To assess whether CCC plans include HPV-related information, particularly regarding cervical cancer screening and prevention, we reviewed the most current plans available on an interactive website for CCC programs ($n = 53$) for content related to HPV epidemiology, prevention, DNA testing, and vaccines (Fig. 1). Plans were downloaded between October 2006 and January 2007.

COMPREHENSIVE CANCER CONTROL

The CDC defines CCC as “an integrated and coordinated approach to reducing cancer inci-

dence, morbidity, and mortality through prevention, early detection, treatment, rehabilitation, and palliation.”¹¹ Historically, CCC has its roots in the National Institutes of Health’s (NIH) National Cancer Program and the Healthy People initiative of the U.S. Public Health Service.¹² Following the 1986 publication of the National Cancer Institute’s (NCI) Cancer Control Objectives for the Nation: 1985–2000,¹³ the CDC, NCI, and American Cancer Society initiated a large number of new research and program initiatives. When it became clear that the new investments did not have a substantial effect on the achievement of intermediate objectives in NCI’s report, CDC and its national partners collaborated with state health departments to further define CCC as an emerging public health concept.

In 1998, CDC provided funding to five states and one tribal health board that had existing CCC plans.¹⁴ Since 1998, the number of programs funded by CDC through the National Comprehensive Cancer Control Program (NCCCP) has grown from 5 to 65. Health agencies use the funding to establish broad-based CCC coalitions, assess the burden of cancer, and develop and implement CCC plans.

For this review, new or updated CCC plans were available between December 2006 and Jan-

TABLE 1. HPV-RELATED CONTENT IN STATE AND TRIBAL COMPREHENSIVE CANCER CONTROL PLANS ($n = 38$)

<i>Context</i>	<i>Number of plans</i>
Risk factor	
Identify HPV as a risk factor for cervical cancer	33
Identify HPV as a risk factor for at least one other cancer type (e.g., oral, pharyngeal, nasal)	5
HPV epidemiology	
Identify oncogenic types	10
Discuss incidence and/or prevalence	6
Identify groups at high risk for infection	8
HPV vaccine	
Report FDA approval of quadrivalent vaccine in June 2006	3
Mention vaccine trials but not quadrivalent vaccine	17
HPV DNA test	
Mention test in screening guidelines for cervical cancer or discuss it in section on early detection of the disease	15
Goals, objectives, strategies, and action steps	
Include at least one measure related to HPV	17
Include at least one measure related to HPV vaccines	9
Include at least one measure related to the quadrivalent vaccine	4
Include at least one measure related to the HPV DNA test	3
Include at least one measure related to sexually transmitted diseases or other infections associated with cancer	3

uary 2007 for 53 of the 65 programs supported by NCCCP. The plans serve as markers for data review, priority setting, and decision making that characterize a comprehensive approach to cancer control. Because the needs and priorities of programs vary, the organizational structure of the plans is flexible.

REVIEW METHODS

We reviewed CCC plans for 49 states, the District of Columbia, and three tribes (Fig. 1). The plans were downloaded from CancerPlan.org (www.cancerplan.org), an interactive website that provides resources and tools to assist states, tribes, territories, and community cancer planners to develop, implement, and evaluate CCC plans. We used the search feature in Adobe Acrobat Reader

(version 7.0; Adobe Systems Inc, San Jose, CA) to search each plan for the following key terms: human papillomavirus, human papilloma virus, HPV, cervical cancer, vaccine, vaccination, and infectious agents. The contexts in which the terms cervical cancer, vaccine, vaccination, and infectious agents were used were reviewed to determine whether they referred to HPV indirectly.

References to HPV were included in this review if they met one of the following criteria: HPV was identified as a risk factor for cervical cancer; HPV was identified as an infectious agent linked to cancer; the HPV DNA test was mentioned; HPV vaccines were mentioned; HPV was defined in a glossary; at least one measured outcome developed or endorsed by the state or tribe was related to HPV. If the term was included only in a list of acronyms or in a title of a study cited in the plan, the reference was excluded.

TABLE 2. COMPREHENSIVE CANCER CONTROL PLANS THAT MENTION HPV, THE HPV DNA TEST, AND THE LICENSED QUADRIVALENT HPV VACCINE BY PUBLICATION DATE ($n = 40$) AND YEARS OF IMPLEMENTATION ($n = 42$)

	<i>Number of plans</i>	<i>HPV</i>	<i>HPV DNA test</i>	<i>Licensed quadrivalent HPV vaccine</i>
Publication year^a				
2000	1	1	0	0
2001	2	1	1	0
2002	3	2	1	0
2003	3	2	0	0
2004	6	3	2	0
2005	15	13	3	0
2006	10	8	3	3
Total	40	30	10	3
Implementation year(s)^b				
2001–2005	2	1	0	0
2001–2006	1	1	1	0
2002–2006	1	1	0	0
2003–2006	1	1	0	0
2003–2010	1	1	0	0
2004	2	2	1	0
2004–2008	2	2	1	0
2004–2009	1	0	0	0
2004–2010	2	1	1	0
2005	1	1	0	0
2005–2007	1	1	1	0
2005–2008	2	2	0	0
2005–2010	11	10	2	2
2005–2012	1	1	1	0
2006	1	1	1	0
2006–2010	7	6	2	1
2006–2011	3	1	1	0
2010	2	1	0	0
Total	42	34	12	3

^aPlan includes clearly visible publication year or dated and signed letter of support from high-ranking official.

^bPlan includes clearly visible implementation year(s).

REVIEW FINDINGS

CCC plans generally follow one of two organizing formats: the continuum of cancer (e.g., prevention, early detection/screening, diagnosis, treatment, survivorship, and palliation) or cancer site (e.g., breast, lung, prostate). Thirty-eight plans included at least one reference to human papillomavirus, human papilloma virus, or HPV that met the criteria for the review. Most references were found in sections on cervical cancer. The terms were also found in introductions and in sections on oral and pharyngeal cancers, emerging issues, infectious agents, and cancer disparities. The contexts in which the key terms were mentioned in the plans are listed in Table 1. Table 2 lists the year of publication and year(s) of implementation of plans that included at least

one reference to HPV, the HPV DNA test, and the licensed quadrivalent HPV vaccine. Some CCC plans did not include clearly visible publication dates or years of implementation.

Table 3 outlines HPV-related goals, objectives, strategies, and action steps in selected CCC plans. Only three plans included HPV-related goals, all of which aimed to reduce the effect of infectious agents associated with the development of cancer. The rest of the plans included HPV-related objectives and strategies or action steps, most of which were unique to each plan.

DISCUSSION

Throughout the United States, public health departments and other stakeholders have collab-

TABLE 3. HPV-RELATED GOALS, OBJECTIVES, STRATEGIES, AND ACTION STEPS IN COMPREHENSIVE CANCER CONTROL PLANS

Goals	Reduce the effect of sexually transmitted diseases or infectious agents associated with the development of cancer
Objectives	<ul style="list-style-type: none"> Promote a vaccine when available^a Address lack of coverage of prevention services, such as HPV testing Prevent HPV infection and implement objectives created by special task force Coordinate with the State's breast and cervical cancer early detection program and tribal clinics to create and implement activities related to transmittable disease prevention Reduce sexually transmitted diseases Promote educational campaigns targeting providers and family planning professionals about HPV prevention, new developments in testing and treatment, and patient counseling for sexually active patients
Strategies	<ul style="list-style-type: none"> Increase awareness of the quadrivalent vaccine^b Promote the use of the quadrivalent vaccine^b Educate providers about HPV and the benefits of the quadrivalent vaccine^b Support recommendations for distribution and administration of the quadrivalent vaccine^b Monitor emerging technology, such as vaccine trials^a Encourage screening and support development of the HPV vaccine^a Seek funding for vaccination^a Educate the healthcare community and high-risk populations about HPV Provide continuing education programs to providers about screening and, when available, the vaccine^a Provide education and awareness about HPV transmission routes and tests in order to decrease risky behaviors and promote screening (future vaccination) Increase awareness of/educate the public about HPV Promote public knowledge by development and disseminating literature through collaboration with partners Increase the number of HPV infection prevention interventions that target high-risk populations Conduct public education campaigns to promote safer sex and/or vaccines Develop a media plan to educate women on importance of screening and on the connection between HPV and cervical cancer risk
Action steps	<ul style="list-style-type: none"> Support education for women and men on HPV and cervical cancer risk Identify HPV as most important risk factor

^aPlans published before FDA licensure of the quadrivalent vaccine in June 2006.

^bPlans published after FDA licensure of the quadrivalent vaccine in June 2006.

orated to develop and implement CCC programs and strategic plans to help reduce the cancer burden at the local level. Although the plans document different priorities and concerns of states, territories, and tribes, many address common issues. Most of the reviewed plans included at least one reference to HPV and identified it as a risk factor for cervical cancer. There was less information about the epidemiology of HPV, including oncogenic types, prevalence, and groups at high risk for infection with the virus. The amount of technical information (e.g., epidemiological data) included in a plan, however, may depend on whether a specific topic is addressed or a program is writing its first plan. For example, the first plan developed by a program may include data on multiple known and suspected environmental risk factors for cancer. Data in subsequent plans may be limited to surveillance data that describe the burden of cancer. We also found that the plans included more information about the HPV DNA test than about the FDA-licensed quadrivalent HPV vaccine. Although 10 plans were published in 2006, most were probably published before the vaccine was licensed.

To address the changing needs of the populations they serve, CCC programs monitor emerging issues in the continuum of cancer when they develop strategies to reduce the cancer burden. The findings in this content review indicate that information about one timely issue, the association between HPV and cervical cancer, is included in most CCC plans. As plans are updated, information about the recently licensed quadrivalent HPV vaccine and studies to monitor its impact and safety may be added.

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