Cervical cancer prevention in North Carolina: Strengthening health programs and systems

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# TABLE OF CONTENTS

## Executive Summary

## Section I: Background and Context
1. Introduction: Strengthening Programs and Systems for Cervical Cancer Prevention 1
2. Understanding the Problem: Cervical Cancer in North Carolina 2

## Section II: Methods
4. Legislative, Policy and Community Resources for Cervical Cancer Prevention 4
   a. National Efforts 4
   b. North Carolina Initiatives 4

## Section III: Prioritizing Counties through Quantitative Analysis
5. Counties with the Greatest Cervical Cancer Prevention Need 7
   a. Data Sources 7
   b. High Need Areas for Cervical Cancer Prevention 7
   c. Components of Need Index 8
   d. HPV Vaccine Information Provided by Schools 14
   e. Limitations 15
   f. Conclusion 15

## Section IV: Prioritizing Policy Changes through Qualitative Analysis
6. Promising and Best Practices 16
   a. Promising Practices 16
   b. Best practices for increasing vaccination 17
   c. Best practices for increasing cervical cancer screening 18
   d. Sharing Promising and Best Practices 18
7. Promising and Best Practices Applied to North Carolina 19
   a. HPV Vaccination 19
   b. Cervical Cancer Screening 21
   c. Other 24

## Section V: Conclusion
8. Conclusion 26
References

Appendices
Appendix A. 2007 NC Cervical Cancer Elimination Task Force Recommendations 31
Appendix B-1. Index to Prioritize Counties’ Cervical Cancer Prevention Need 34
Appendix B-2. Maps Presenting Cervical Cancer Prevention Need Data 37
Appendix C. NC BCCCP Cervical Cancer Service, Diagnosis, Treatment & Detection Data 38
Appendix D. Counties with High Abnormal Pap Test Results (NC BCCCP 2010-2012) 39
Appendix E. Key Informant Interview List 40
Appendix F. Key Informant Interview Tool 41
Appendix G. Successes and Challenges of School-located Vaccine Efforts--3 NC Counties 43
EXECUTIVE SUMMARY

Together we can prevent cervical cancer from claiming the lives of our mothers, sisters and daughters in North Carolina. Cervical Cancer-Free NC worked with partners to identify strategic actions that could substantially reduce cervical cancer. Recommendations in this report reflect interviews with key stakeholders and data on cervical cancer, HPV vaccination and Pap screening for our state.

Counties with highest cervical cancer prevention need
Highest need counties are in the northeast and south-central regions of North Carolina.

Priority Recommendations (6 of 9 recommendations)

**HPV Vaccination**
1. Reduce missed opportunities for HPV vaccination.
2. Ensure health care providers routinely recommend HPV vaccine.
3. Expand use of alternative settings, like schools, to provide adolescent vaccines.

**Cervical Cancer Screening**
1. Reduce missed opportunities for cervical cancer screening.
2. Recruit women rarely or never screened for cervical cancer.
3. Adhere to US Preventive Services Task Force recommendations for cervical cancer screening.

For each recommendation, this report identifies specific actions that state and local groups can take. These groups include state government public health professionals and health care providers.

Next steps
Cervical cancer truly is preventable. Public health leaders in our state have had a large impact on cervical cancer, but we can do more. CCFNC will host regional meetings in the next six months to help support action planning. We believe that these action plans and coalition partner efforts will make a difference.
CHAPTER 1
Introduction: Strengthening Programs and Systems for Cervical Cancer Prevention

“The key is collective action, leadership at the state level and knowledge about how to effect these changes.”

This report is a collaborative effort to apply a public health framework for cervical cancer prevention to North Carolina programs. The report relies on quantitative analysis of statewide data and qualitative interviews with key coalition stakeholders. This report has two primary objectives:

1) Identify high priority regions of the state most in need of cervical cancer prevention efforts; and
2) Recommend concrete actions to strengthen systems and programs, both statewide and locally.

The target audience for this report is local and state policy makers and program managers. Through statewide and regional coalition meetings, CCFNC will share these recommendations and encourage action planning.

Cervical Cancer-Free North Carolina (CCFNC) is a statewide initiative of government and community partners collaborating to substantially reduce cervical cancer incidence in our state. Funded by a generous contribution from GlaxoSmithKline, CCFNC is a catalyst for change, not a policy or decision-making authority or a health care service provider. As such, CCFNC conducts focused practice and research projects to improve cervical cancer prevention through strengthened health systems and behavior change.

Our approach relies heavily on strengthening existing institutional mechanisms and supports, as no single health system or program statewide covers the many services relevant to cervical health. Many agencies have direct and indirect roles in cervical cancer prevention; so we aim to encourage strategies that facilitate collaboration across agencies. We have used available statewide data from several of these agencies for our quantitative analysis. It is our hope that stakeholder groups will integrate the recommendations from this report into existing agency-wide programs, procedures and work plans. In this way, stakeholders can all strengthen cervical cancer prevention efforts in our state by using existing resources, without having to wait for additional funding.
CHAPTER 2
Understanding the Problem: Cervical Cancer in North Carolina

Cervical cancer is caused by abnormal growth in cells of the cervix—also known as cervical dysplasia. Chronic infection with human papillomavirus (HPV) causes almost all cervical cancers. Two types of HPV (16 and 18) cause over two thirds of cervical cancers.

Cervical cancer strikes women in their prime, thereby disrupting lives and households. Cervical cancer has declined steeply in the US over the last six decades, though some HPV-related cancers are becoming more common. North Carolina has seen similar decreases in mortality due to the success of the state’s public health efforts, primarily in screening.

In North Carolina, about 380 women were diagnosed with cervical cancer in 2011, and 120 died from the disease. Also, African American women are twice as likely to die from the disease as White women (Figure 1), a disparity that has existed for decades and is highly similar to that for the US. Cervical cancer deaths among Hispanic women have shown uneven trends over time, but they do not appear to show disparities seen nationally. Almost half of cervical cancer cases in North Carolina occur in women under age 50.

The tragedy in these statistics is that cervical cancer is now preventable. One focus of prevention efforts should be African American women, who have the highest rates of cervical cancer, and Hispanic women, whose numbers are growing and whose incidence rates suggest a large increase in cervical cancer mortality in the near future.

Figure 1. Cervical cancer mortality in North Carolina. Rates are 3 year rolling averages for annual mortality per 100,000 women. Data from the North Carolina Central Cancer Registry, October 2010.
CHAPTER 3
Guiding Progress: The Carolina Framework for Reducing Cervical Cancer

UNC’s Gillings School of Global Public Health has developed an evidence-based framework for sustainable action to prevent needless deaths from cervical cancer. The Carolina Framework identifies four key challenges to eradication of cervical cancer that are needed to institute meaningful change.

1. **HPV infection.** Nearly all cervical cancers are due to HPV infection. HPV vaccination can protect against two HPV types (HPV 16 and 18) responsible for more than 70% of cervical cancers.\(^5\) HPV vaccines are underused among young adolescent females, with under one in three having received the recommended three doses. In 2011, only about 54% of adolescent females 13-17 years of age in NC had initiated HPV vaccine, while only about 32% are reported to have received the recommended 3 doses. In all, only about 59% of females who initiated HPV vaccination actually completed the 3-dose series.\(^6\) The US recommended males routinely receive the vaccine in 2011.

2. **Lack of screening.** At least half of cervical cancers are due to lack of regular screening.\(^7\)\(^-\)\(^10\) Most of these cancers are in women never screened. According to NC Medicaid claims data for Pap test screenings, about 60% of Medicaid eligible women between the ages of 21-64 years were screened at least once between 2009-2011.

3. **Screening errors.** About one third of cervical cancers are due to Pap screening errors.\(^9\) HPV DNA co-testing may reduce these needless errors. No data source within the state at present assesses the frequency of Pap screening errors.

4. **Not receiving follow-up care.** One in six cervical cancers is due to lack of follow-up care for abnormal Pap smear results.\(^8\)\(^,\)\(^9\) This problem particularly affects women from minority groups and rural areas. Improved access to care can address the barriers experienced in many of these cases. No data source within the state that we are aware of assesses loss to follow-up for abnormal Pap test results.

Because the vast majority of cervical cancers could be prevented through HPV vaccination and cervical screening, targeted efforts in these two areas could realize the greatest impact for future incidence reduction. HPV co-testing may also greatly reduce screening errors. This report will focus on screening and vaccination, consistent with the Carolina Framework.
This chapter provides background on the legal, policy and community resources that inform cervical cancer prevention efforts in North Carolina.

National Efforts

**Cervical Cancer Screening and Treatment**

In 1990, the US launched a new program called the National Breast and Cervical Cancer Early Detection Program (NBCCEDP).\(^{11}\) The purpose of this program is to provide “low-income, uninsured, and underserved women access to timely breast and cervical cancer screening and diagnostic services.”\(^{12}\) NBCCEDP quickly grew to become a nationwide program, which facilitated around 3 million Pap tests in its first decade.\(^{12}\) In 2000, the Clinton administration signed into law the Breast and Cervical Cancer Prevention and Treatment Act.\(^{13}\) This act gives states the option to provide medical assistance through Medicaid to eligible women who were screened for and found to have breast or cervical cancer, including precancerous conditions, through the NBCCEDP.\(^{13}\) Shortly thereafter, President Bush signed the Native American Breast and Cervical Cancer Treatment Technical Amendment Act of 2001, further expanding cover to Native American women.\(^{14}\) The NC Division of Public Health runs our state’s version of this program called the NC Breast and Cervical Cancer Control Program.

**HPV vaccination**

Since 1994, the CDC has been funding stated to provide vaccines through the Vaccines for Children program to children ages 0-18.\(^{15}\) The program funds all vaccines that the Advisory Committee on Immunization Practices (ACIP) recommends for routine administration, including HPV vaccine for teens ages 11 to 18. In North Carolina, the NC Immunization Branch administers the program.

In addition, the President’s Cancer Panel held four workshops between 2012-2013 focusing on ways to address low HPV vaccine coverage.\(^{16}\) The National Vaccine Advisory Committee (NVAC) has also formed a working group on HPV vaccine.\(^{17}\) The function of this committee is to “recommends ways to achieve optimal prevention of human infectious diseases through vaccine development, and provides direction to prevent adverse reactions to vaccines.”

**North Carolina Initiatives**

North Carolina has instituted targeted statewide efforts to reduce cervical cancer incidence in the state for over two decades. Examples of these initiatives are provided below.
North Carolina’s Demonstrated Commitment to Cervical Cancer Prevention and Treatment

In 1990, the NC Department of Environment, Health and Natural Resources Division of Adult Health Promotion formed the NC Cervical Cancer Task Force through a contribution from the Kate B. Reynolds Health Care Trust. The task force’s mission was “to reduce and eliminate cervical cancer morbidity and mortality in North Carolina by the year 2000”. The far-reaching effect of this task force’s work was the establishment in 1993 of the NC Advisory Committee on Cancer Coordination and Control (NC ACCCC), which addresses cancer control issues in our state. Precursors to these efforts date back as early as 1948.

In 2003 the NC General Assembly passed Session Law 2003-176, Senate Bill 648 to create a standing ad hoc task force, the North Carolina Cervical Cancer Elimination Task Force. The bill was the result of lobbying by Women in Government through an educational grant from Merck, maker of HPV vaccine. The task force recommendations were never fully implemented, however, and the group is now defunct. See Appendix A for details of these recommendations.

In 2007, the NC General Assembly expanded Session Law 2004-118: Garrett’s Law to include the HPV vaccine. This act requires schools to provide educational materials to parents and guardians concerning meningococcal meningitis, influenza and HPV and vaccines against these diseases.

In 2009, the NC Institute of Medicine issued Healthy Foundations for Healthy Youth: A Report of the NCIOM Task Force on Adolescent Health. This group hosted an Adolescent Health Summit in November 2012 to share status updates on priority recommendations. Recommendations that relate to cervical health include:

- Fund health services delivered in middle and high schools
- Develop a school health assessment for students in sixth grade
- Increase immunization rates

The report identified funding school-located health services as a priority.

In 2010, Cervical Cancer-Free NC hosted a launch event and gathering of the NC Cervical Cancer Coalition, which was attended and endorsed by State Governor Bev Purdue and State Health Director, Dr. Jeff Engel. This meeting facilitated the partnerships that have informed this health systems and program strengthening report.

Additionally, the National Cervical Cancer Coalition has two North Carolina Chapters, in Raleigh and Charlotte. The coalition is a project of the American Sexual Health Association. Among their activities, they provide materials for promoting awareness of cervical cancer.
Through these initiatives, North Carolina has already demonstrated a commitment to a reduction of cervical cancer incidence and mortality. It is this policy and legal framework which supports state agency, professional association, primary care provider, community health center, quality improvement agency and advocacy group efforts to build and maintain cervical cancer prevention systems and programs in our state. These key stakeholders are tasked to initiate systems change within their respective organization. Through key informant interviews with representatives from each of these groups, we have identified key programs, procedures and strategies for performance improvement. We believe the recommendations resulting from these interviews (Chapter 7) will be easily integrated into existing programs.
CHAPTER 5
Counties with the Greatest Cervical Cancer Prevention Need

Cervical cancer prevention need varies considerably across North Carolina counties. Shrinking public health funding increases the need for carefully targeted interventions in areas with higher cervical cancer mortality and lower screening and HPV vaccination rates. This chapter identifies priority counties using available statewide data sources.

Data Sources

Index of Prevention Need
To create an index of cervical cancer prevention need, we scored each county using the best available data on four criteria. Data were on: 1) cervical cancer mortality (from NC State Center for Health Statistics), 2) Pap screening among Medicaid enrolled women (from Community Care of North Carolina), 3) provision of Pap tests to low-income women rarely or never screened (from NC Breast and Cervical Cancer Control Program), and 4) adolescent females’ HPV vaccine series initiation and completion (from NC Immunization Registry). Appendix B provides data for the counties and their index scores.

Compliance with Garrett’s Law per Parent Self-Reports
In addition to the prevention need index, this section highlights parent self-reported data of school compliance with Garrett’s Law provisions as reported in the State Center for Health Statistics Child Health Assessment and Monitoring Program (CHAMP) database. This data highlights priority need counties based on population yet to be reached, as a result of parent self-reports. While this data it subjective, it provides important perspective about where Garrett’s Law enforcement could achieve meaningful impact.

High Need Areas for Cervical Cancer Prevention
Prevention need scores for the 100 NC counties appear in Map 1. The top ten highest need counties in dark teal are: Tyrrell, Chowan, Robeson, Onslow, Warren, Scotland, Halifax, Duplin, Sampson and Martin.
The next set of counties with higher need in medium teal are: Yancey, Washington, Haywood, Currituck, Cumberland, Anson, Person, Nash, Macon and Harnett. High need counties, with light teal shading are: Edgecombe, Wilson, Rutherford, Polk, Pitt, McDowell, Lincoln, Hertford, Gates and Bertie.

The northeast and the south-central regions stand out as having substantial cervical cancer prevention needs. The next sections describe each component of the need index. The individual maps here and in the appendix may help counties to better understand their specific challenges.

Components of Need Index

**Cervical Cancer Mortality**

About 121 women in North Carolina died from cervical cancer every year between 1998 and 2007. This works out to 2.6 cervical cancer deaths per 100,000 women annually, a rate very similar to the rest of the US. The seven counties with the highest mortality rates are in the southern and eastern regions of the state: Anson, Chowan, Duplin, Montgomery, Robeson, Scotland and Tyrrell (Map 2). In these counties, mortality rates range from 8.0 deaths per 100,000 women annually in Tyrrell to 5.2 deaths per 100,000 women in Robeson. These rates are similar to developing countries like Namibia (8.9) and the Philippines (5.3).
HPV Vaccination

HPV vaccine will have a large impact on cervical cancer within our lifetimes, making it an important preventive service. We analyzed data on females only, as approval of HPV vaccine for boys occurred as late as October 2011 and uptake remains very low in our state and nationally (~1% have received all 3 doses of the vaccine). For this report, the NC Immunization Branch provided NC vaccination data for the state and each county from the NC Immunization Registry (NCIR) as of Dec. 31, 2012.

The cervical cancer prevention need index includes HPV vaccine initiation. Most first doses of HPV vaccine were given to NC girls by a pediatrician (59%), by a family physician (17%), or at a local health department clinic (11%). Around half (48%) of first doses of HPV vaccine received by NC girls were delivered through the Vaccines for Children program.

Forty-four (44%) of NC girls ages 13 to 17 had at least one dose of HPV vaccine, according to NCIR. This figure is similar to the CDC estimate of 53% and lies inside the confidence interval (44%-63%). HPV vaccine initiation rates by county ranged between 15% and 62% (See Map 3 in Appendix B-2). The majority of counties had very low vaccine initiation, with 9 counties having the lowest rates of 0-29%, 27 counties with rates of 30-39% and 51 counties having rates of 40-49%. Only 12 counties had HPV vaccine initiation rates for females (ages 13-17) of 50% or more. The county with the highest initiation rate for females was Montgomery County at 62%.
The cervical cancer prevention need index also accounts for completing the three dose series for females who initiated vaccination (completion). We added this measure to the index to have a better understanding of healthcare follow-up independent of the role of initiation, as different forces may shape initiation and completion.

Around 59% of girls had completed the three dose HPV vaccine series, among girls ages 13 to 17 who had at least one dose of HPV vaccine according to NCIR. This figure is below the CDC estimate of 75% and lies just below the confidence interval (62%-87%). HPV vaccine completion rates for females who initiated vaccination were also concerning, with 18 counties having the lowest rates of 0-49%, 45 counties with rates of 50-56% and 34 counties having rates of 57-64% (see Map 4 below). Only 3 counties had HPV vaccine completion rates for females (ages 13-17) of 65% or more. The county with the highest rate was again Montgomery County, at 84%. Also, western, northeastern and south-central to southeastern counties stood out as high-need areas. These regions with lower HPV vaccine completion rates are similar to those with lower cervical cancer screening rates.

HPV vaccine coverage is far below the Healthy People 2020 goal of 80% of teen girls having received all three doses of HPV vaccine. Note that this guideline includes all girls ages 13-17 in the denominator, not just those who got a first dose. Of all NC girls ages 13 to 17, only 26% had received all three recommended doses of HPV vaccine by 2012. Our NC estimate is similar
to the CDC’s 2012 NIS-Teen Survey estimate of 35.5% for females in the same age range, and it is within their stated confidence interval (26% to 45%).\textsuperscript{24} CDC data show NC black and Hispanic teens were more likely to get the first dose of HPV vaccine but less likely to complete the three dose series.

**Cervical Cancer Screening of Medicaid Enrolled Women**

Around 60% of Medicaid enrolled women ages 21 to 64 had received cervical cancer screening using Pap test at least once in the prior three years. These are well below the Healthy People 2020 guidelines of 93%. Community Care of NC provided these data on screening for the 2009-2011 period.\textsuperscript{25} While these data do not represent all women in North Carolina, women with pre-paid insurance are more likely to receive cervical cancer screenings than others.\textsuperscript{26} So, screening in other women may be lower still.

Seven counties (indicated in dark green in Map 5) are screening women at a rate of less than 50%: Cherokee (49%), Haywood (40%), Jackson (49%), Jones (42%), Macon (48%), Swain (42%) and Tyrrell (44%). These counties are located in far western and eastern regions of the state. The lighter regions of the map show **screening was 65% or higher for only 8 out of North Carolina’s 100 counties**: Alleghany (70%), Brunswick (66%), Franklin (71%), Granville (71%), Guilford (67%), Hyde (83%), Pamlico (67%) and Pasquotank (66%). Thirty-eight counties report percentages between 60-64.9%; and forty-six counties report screening between 50-59.9% of Medicaid enrolled women. Data were unavailable for Camden County in the northeast (shaded in grey).
**Cervical Cancer Screening of At-Risk Women through NC BCCCP**

NC Breast and Cervical Cancer Control Program (NC BCCCP) and similar programs in other states target “at-risk” women. They must meet a CDC performance standard that 20% or more of women newly enrolled into the program meet the definition of rarely or never screened (i.e., have not had a Pap test within the past 5 years). The program also targets women ages 40-64, as the mean age for cervical cancer diagnosis and treatment is about 50 years. Of those women screened in the NC BCCCP between 2010-2012, 49% were Caucasian, 27% were African-American, 19% were Hispanic, 2% were Native American and 3% were Other.

Statewide, only about a quarter (25/91) of counties met the CDC performance standard for screening at-risk women every year in the 2010-2012 period. Nine counties did not have NC BCCCP providers. Northern counties, particularly in the central and eastern regions, had programs that missed the target (see Map 6 in Appendix B-2). These counties may benefit from targeted interventions to increase services to women rarely or never screened.

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Note that county data reflected the county of residence for women screened not the location of the BCCCP provider. Counties that

**Success Story: NC Breast and Cervical Cancer Control Program (NC BCCCP)**

The NC BCCCP operates with a federal allocation of approximately $3M. The criteria for program eligibility are women who: are uninsured or underinsured; are without Medicare Part B or Medicaid; are between ages 40 - 64 for breast screening services and 18 - 64 for cervical screening services; and have a household income at or below 250% of the federal poverty level. Overall, these criteria represent a cohort of women most likely to have challenges with access to care.

**Pap Screening: NC BCCCP is successfully identifying about 27% of North Carolina’s cervical cancer cases though serving less than 1% of the population. In addition despite the apparent decline in total percentage of the population served by the program from 2010-2012, cervical cancer diagnosis has increased.**

**HPV DNA Test Results:** HPV DNA testing is becoming more popular in the NC BCCCP. In 2010, only 2.5% of women received HPV testing. In 2011 and 2012, testing increased to 4.2% and 5.3% respectively. While use remains very low, the provision of DNA tests is increasing and the trend is expected to continue. (See Appendix C for data details.)

Through more targeted efforts to consistently achieve the performance target of 20% of women newly screened being rarely or never screened for each county, the program could improve cervical health statistics with little or no increase in program costs. Through increased funding, NC BCCCP could expand to include those thirteen counties not currently served by NC BCCCP providers: Alexander, Anson, Bladen, Burke, Caswell, Franklin, Granville, Harnett, Onslow, Rowan, Montgomery, Scotland and Vance. (See Map 6 for locations.)
consistently achieved the 20% performance target across all three years were: Avery, Bladen, Carteret, Catawba, Clay, Cleveland, Columbus, Cumberland, Dare, Hoke, Iredell, McDowell, Montgomery, Richmond and Stanly. Clay, Dare and Richmond counties had the highest average percentages of women having been rarely or never screened at 43%, 46% and 45% respectively. To better understand best practices around achieving the performance target, we interviewed NC BCCCP staff in Cleveland and Columbus Counties (average across three years was 29% and 36% respectively) for effective strategies and recommendations. While many south central and western counties met the 20% performance target, only two eastern region counties did so (Carteret and Dare). Alexander, Anson, Bladen, Burke, Caswell, Franklin, Harnett, Rowan, and Scotland do not have BCCCP programs. Granville, Onslow, Montgomery and Vance relied on contract BCCCP providers within the community, rather than the local health department.

Map 7 below shows counties that had consistently not met the 20% performance target for NC BCCCP and also had reasonably high percentages of abnormal Pap test results for those women screened. In other words, these counties were well able to identify abnormalities, but they may be able to do so at higher rates if they were to focus more attention on achieving the 20% rarely or never screened performance target.

![Map 7. Counties not meeting “rarely or never” screened target and with high average % of abnormal pap test results (2010-2012)](image)

In the case of Franklin County, the absence of a BCCCP provider in the county meant that the county has high abnormal percentages for residents served by providers in other counties. Counties highlighted are almost exclusively in eastern NC. While the high rates of detection of abnormal Pap results is a positive program outcome, these counties not meeting the 20% target
for rarely or never screened women three years in a row is an indication of a risk of abnormalities going undetected. The NC BCCCP should target program recruitment efforts in these counties to see if it changes the rates of abnormalities, incidence and treatment. Appendix D presents percentages for abnormal screening by county.

HPV Vaccine Information Provided by Schools
Garrett’s Law requires schools to send parents information about adolescent vaccines. CCFNC assessed the effectiveness of current efforts by paying for survey items on the State Center for Health Statistics’ Child Health Assessment and Monitoring Program (CHAMP) annual survey of NC parents. Table 1 presents 2008-2010 data for counties where CHAMP interviewed at least 50 parents about whether they had heard about HPV vaccine through their children’s schools. As we did not have reliable data on all 100 NC counties, we could not include Garrett’s law adherence in the cervical cancer prevention need score.

Table 1. The Limited Impact of Garrett’s Law

<table>
<thead>
<tr>
<th>County</th>
<th>Parents who had heard of HPV vaccine thru schools (2008-2010)</th>
<th>County’s teen population</th>
<th>Teens with parents not reached by schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wake</td>
<td>15%</td>
<td>93,703</td>
<td>80,012</td>
</tr>
<tr>
<td>Mecklenburg</td>
<td>11%</td>
<td>87,342</td>
<td>78,170</td>
</tr>
<tr>
<td>Guilford</td>
<td>10%</td>
<td>46,008</td>
<td>41,603</td>
</tr>
<tr>
<td>Union</td>
<td>12%</td>
<td>26,217</td>
<td>23,144</td>
</tr>
<tr>
<td>Durham</td>
<td>0%</td>
<td>21,407</td>
<td>21,407</td>
</tr>
<tr>
<td>Buncombe</td>
<td>16%</td>
<td>19,545</td>
<td>16,327</td>
</tr>
<tr>
<td>Cabarrus</td>
<td>19%</td>
<td>19,602</td>
<td>15,844</td>
</tr>
<tr>
<td>Onslow</td>
<td>3%</td>
<td>14,541</td>
<td>14,051</td>
</tr>
<tr>
<td>Alamance</td>
<td>17%</td>
<td>14,178</td>
<td>11,813</td>
</tr>
<tr>
<td>Orange</td>
<td>4%</td>
<td>11,931</td>
<td>11,428</td>
</tr>
<tr>
<td>Catawba</td>
<td>26%</td>
<td>14,751</td>
<td>10,843</td>
</tr>
<tr>
<td>Burke</td>
<td>23%</td>
<td>8,502</td>
<td>6,558</td>
</tr>
<tr>
<td>Caldwell</td>
<td>23%</td>
<td>7,772</td>
<td>5,976</td>
</tr>
</tbody>
</table>

Note. Data from Child Health Assessment and Monitoring Program (CHAMP) surveys, 2008-2010. Teen population data is based on teens (11-17 years) reported in NC Immunization Registry. Counties selected were those with 50 or more parents surveyed by CHAMP.

The clear finding is that no county is having much success with informing parents about HPV vaccine. At best, only about a quarter of parents had heard through schools. At worst, none. The median was 15%. The table also shows state population data as well as a comparison between percent and population data. This comparison highlights those counties in which the
greatest impact could be achieved with targeted effort around Garrett’s law implementation. Targeted effort to improve parent awareness of adolescent vaccines in Wake, Mecklenburg, Guilford, Union and Durham county school districts would dramatically improve statewide immunization rates. CCFNC used these data to inform policy recommendations in Chapter 7.

**Limitations**

Before closing this chapter, it is important to note some limitations of data sources we used to identify cervical cancer prevention need. We are confident in the generalizability of the mortality data reported by the State Center for Health Statistics as it represents the entire population. The remaining data sources however are less comprehensive.

NC BCCCP does not represent all cervical cancer screenings statewide, as it does not serve all women in the state. The criteria for eligibility for the NC BCCCP program are women who are uninsured or underinsured and are at or below 250% of the federal poverty level. The women it serves, therefore, are most likely to have the greatest challenges in access to follow-up care.

Secondly as the immunization branch requires providers to enter data into the NCIR only for children enrolled under the Vaccines for Children (VFC) program, some vaccines paid for by private insurance may not be in the registry. The NCIR estimates for the state were mostly within the confidence interval for CDC’s estimates, giving us greater confidence in their accuracy. Furthermore, the NCIR is the only source for immunization data on all of NC’s 100 counties.

**Conclusion**

Prevention efforts should pay particular attention to northeastern and south-central North Carolina. However, interventions in population dense counties like Guilford, Wake and Cumberland will continue to be necessary as these counties have most of the cervical cancer deaths.

Cervical Cancer-Free NC will host regional meetings with community stakeholders in south-central and the northeast. The goal is to create a forum for coalition partners and community groups to plan strategic and sustainable action that is consistent with their public health mission and easily integrated into their current program operations. The meetings’ aim will be to facilitate identifying targeted cervical cancer prevention efforts that require minimal financial investment or disruption to existing program structures and operations.
CHAPTER 6

Promising and Best Practices

CCFNC solicited new promising practices for cervical cancer prevention from key stakeholder groups who could create meaningful changes in cervical cancer prevention and treatment in our state. We also looked to evidence from evaluation research on well-established best practices.

Promising Practices

CCFNC developed a list of representatives for key agencies that do work related to cervical cancer prevention. The stakeholder groups included: state government health agencies, regional and local health agencies, professional associations, national non-profits and quality improvement agencies. We conducted interviews with the representatives to garner support for this initiative and to establish a more detailed understanding of things that are or could be happening in our state to reduce cervical cancer.

We conducted key informant interviews with 19 program contacts in April and May 2013. (See Appendix E for details on the agency representatives we interviewed.) A structured survey addressed core factors impacting low screening and vaccination rates and core functions and operations of the stakeholder groups (Appendix F). The survey also assessed existing and planned strategies for increased cervical cancer screening and HPV vaccination in their respective programs. Core themes that emerged from these discussions are below and inform recommendations in Chapter 7.

Improve In-reach Efforts

One clear message that emerged from key informant interviews was the importance of improved cervical cancer prevention efforts among provider populations already being served by their clinics and providers. The cost of reaching a wider cohort of clients for screening and vaccination efforts may be unrealistic given financial and staffing resources. So, key informants highlighted the need to expand in-reach recruitment efforts by devising systems to more efficiently identify at-risk women and adolescents who may benefit from prevention services.

Strengthen and Improve Quality

All providers and programs aspire to offer high quality service. But without proper guidance and strategies to achieve strong outcomes based on promising or best practices, the goal can be a difficult one to achieve. Stakeholders believed that provider recommendations for quality improvement should include strategies to increase cervical cancer screening and HPV
vaccination. Training and quality improvement agencies like NC Area Health Education Centers (AHEC), Community Care of NC (CCNC) and the NC Center for Public Health Quality all take an active role in strengthening the quality of North Carolina’s public health infrastructure through their program operations. In addition to these efforts, professional healthcare associations also prioritize quality improvement around professional certification requirements.

**Increase Providers’ Awareness of Guidelines**

Stakeholders often mentioned the importance of keeping providers abreast of changes to vaccination and screening guidelines. If physicians are not aware of new guidelines for HPV vaccine or cervical cancer screening, they cannot revise their procedures to incorporate these best practices. Contacts from professional healthcare associations and state and local health agencies identified the need to improve providers’ adherence to clinical guidelines. They noted that funding challenges always make quality improvement in this area difficult, but they also said that organizations should, at every available information sharing opportunity, review longstanding and new practice guidelines and encourage providers to adhere them.

**Best practices for increasing vaccination**

Successful strategies for increased vaccine uptake, taken from the CDC Guide to Community Preventive Services, appear below in Table 2.²⁸

<table>
<thead>
<tr>
<th>Approach</th>
<th>Examples</th>
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</thead>
<tbody>
<tr>
<td>Provider- or System-Based Interventions</td>
<td>Reminders to physicians</td>
</tr>
<tr>
<td></td>
<td>Provider assessment and feedback, including AFIX</td>
</tr>
<tr>
<td></td>
<td>State immunization information systems including registries</td>
</tr>
<tr>
<td>Increasing Community Demand for Vaccination</td>
<td>Client reminder and recall systems</td>
</tr>
</tbody>
</table>

**Table 2. CDC-Recommended Strategies to Increase Adolescent Immunization**

Note. From Machta, Sharwar and Shah, 2012 pg. 6.²⁹

**Provider-based Strategies**

Through extensive research efforts nationwide and within North Carolina, we now know that:
- The majority of adolescent vaccine administration occurs during routine preventative care visits with pediatricians or family physicians.\(^30\, 31\)
- One of the most important determinants of HPV vaccine uptake is the recommendation made by healthcare providers.\(^32\)
- Despite the power of their influence, providers often fail to provide effective recommendations for HPV vaccine.\(^33\, 34\)
- Providers’ hesitance to recommend HPV vaccine reflects both ambivalence about the vaccine and lack of skills and confidence about how to recommend it.\(^35\)
- Providers need education and support in order to provide consistent and effective recommendations for HPV vaccine, but few evidence-based interventions are available.\(^36\)
- Training providers to more effectively communicate about HPV vaccination is a promising approach.\(^37\, 38\)

**Best practices for increasing cervical cancer screening**

To increase cervical cancer screening, the CDC’s Guide to Community Preventive Services recommends interventions that are client and provider-based. Client-based recommendations include: provider assessment and feedback systems, which inform providers of performance and provide feedback for improvement, as well as provider reminder and recall systems. Client-based recommendations include: client reminder systems and one-on-one education to encourage and motivate screening. The Guide also recommends that programs and/or providers use small media, like brochures, newsletters and letters, to inform clients and encourage screening.\(^28\)

**Sharing Promising and Best Practices**

To facilitate sharing best practices strategies, the Center for Public Health Quality, in partnership with several federal agencies, is developing and pilot testing a new data system called iMAP to house evidence-based strategies for quality improvement in public health programs. This web-based database will help local health departments and community organizations quickly select best practices for local implementation.\(^56\) Agencies, clinics and providers should forward best practice recommendations for improved recruitment strategies or streamlined internal procedures to the NCCPHQ for inclusion in the database. Healthy NC 20/20 Objectives guide the framework of this new data system, which allows local health departments to identify evidenced based interventions in line with the objectives that the health agency wants to target.
CHAPTER 7
Promising and Best Practices Applied to North Carolina

HPV Vaccination
One way to increase HPV vaccine coverage is to decrease missed opportunities for providers to vaccinate, through system changes, education and training to combat practice inertia. It is also important to increase parent awareness of recommendations to get HPV vaccine for all teen boys and girls, but especially those ages 11 and 12, and vaccine safety.\(^{39}\)

As pediatricians and family practitioners deliver three quarters of HPV vaccine doses to adolescents in our state, they play a pivotal role in ensuring high coverage. Physician associations expressed several concerns around adolescent health care, specifically about the many missed opportunities as well as the lack of whole child health care and intervention services. As adolescence is a time when people are least likely to visit a doctor, it is important to take every opportunity to address adolescent needs when they present. One approach is to develop a package of preventive health services specifically for adolescents when they visit the provider’s office.

**Recommendation 1.** Reduce missed opportunities for HPV vaccination among eligible adolescents.

- **State health department:** Train providers how to reduce missed opportunities by offering more adolescent AFIX trainings (CDC’s quality improvement program for childhood vaccination) and expanding the training to focus more on HPV vaccine.
- **State and local health departments:** Develop recruitment materials and best practice strategies, and disseminate via the NC Center for Public Health Quality iMAP database.
- **Local health departments and healthcare providers:** Increase use of the NCIR’s reminder/recall function for routine and catch-up adolescent vaccines. Consider centralizing reminder letters.
- **Local health departments:** Offer HPV vaccination to adolescents who receive care in other health department programs, including STD and family planning clinics, WIC, and dental clinics.
- **Healthcare providers:** Modify patient intake procedures to identify adolescents who are eligible for preventive health services, including HPV vaccination, and monitor performance on the reduction of missed opportunities.
- **CCNC:** Use patient care alerts for adolescent vaccination, especially during summer months when they can more easily access healthcare services.
- **NCIR:** Update NCIR to permit reminder/recall for the first dose of HPV vaccine.

**Recommendation 2.** Encourage pediatricians and family practitioners to recommend HPV vaccine.
• **Healthcare providers:** Recommend HPV vaccine during all preventive care visits.

• **Healthcare providers:** Always offer HPV vaccine when offering Tdap and meningitis vaccines to adolescents.

• **Healthcare providers:** Access training opportunities, at annual conferences and through maintenance of certification opportunities, for learning to make more efficient and effective recommendations of HPV.

• **Professional healthcare associations:** Disseminate tools that train healthcare providers to make more efficient and effective recommendations of HPV and other adolescent vaccines.

• **All coalition members:** If you conduct short-term “pushes” to increase vaccination, do them during the summer when HPV vaccination is highest.

Successful strategies to increase adolescent vaccination include alternative settings like schools. Counties and school districts across the nation have looked to school-located vaccination programs as an important strategy for adolescent service delivery. Programs that yield high adolescent vaccine uptake are in countries like Australia, the UK and Canada, where they typically use voluntary mass vaccination programs in middle and high schools.

“The rationale for this model of care has been predicated on improving access to much needed care for children and adolescents where they spend the majority of their hours. As such, almost 2 million racially and ethnically diverse students receive their health care in schools largely located in urban and rural communities. These young people tend to be underserved, uninsured or underinsured, and are often most in need of support and care to complete the school day.”

The CDC’s Guide to Community Preventive Services recommends school-located provision of vaccines. North Carolina is actively engaged in this model of delivering health care to adolescents.

Pharmacies are another promising alternative setting, as pharmacists administer vaccines in all 50 states and the District of

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**Success Story: School-located Mass Vaccination Programs**

In February and March 2012, CCFNC interviewed NC mass vaccination program administrators to learn of program successes and challenges. Lessons include:

• Importance of being able to bill public and private insurance

• Importance of strategic community partnership and an immunization champion

• Functional parent consent forms

• Public education and awareness

• Critical attention to on-site clinic logistics

Full details are available in the report: “Successes and Challenges of School-located Vaccination Efforts in Three North Carolina Counties” (See Appendix G).

CCFNC also partnered with the NC Institute for Public Health and several local health departments to develop and pilot the UNC Mass Vaccination Management Academy. The program guides local health departments through the process of planning and implementing a school-located mass vaccination program in their county.
Adolescents may receive HPV vaccine from pharmacists in over 60% of US states. However, NC pharmacists generally cannot provide HPV vaccine to adolescents ages 11-17, although they can administer HPV vaccine to adults who have a prescription. In a national survey of opinions of alternative settings for vaccinating children ages 5-18, most physicians were willing to have joint community clinics with public health entities (76%) and to recommend to some patients that they receive vaccine via alternative settings, including public clinics or pharmacies (76%). North Carolina medical associations encourage sound, effective strategies that will increase adolescent vaccination coverage. However, some physician associations are cautious about endorsing widespread in-pharmacy administration of vaccine to adolescents, as they are concerned that it could have an impact on the medical home. They highlight the critical importance of comprehensive wellness screenings of adolescents, as teens are more likely to initiate risky behaviors during this critical period of life. Teens are also at increased risk of poor nutrition, physical inactivity, mental health concerns and injuries. These physician associations thus view comprehensive wellness screening as an important opportunity to initiate discussion of HPV vaccination in addition to other healthcare needs.

Recommendation 3. Expand use of alternative settings, including schools, to provide adolescent vaccines (HPV, Tdap and meningitis).

- **Local health departments**: Develop and implement school-located mass vaccination programs for adolescents (e.g., as demonstrated in Brunswick County) through collaboration with the NC Institute for Public Health.
- **School health centers**: Stock adolescent vaccines and encourage adolescents to seek these services in school health centers.
- **School health centers**: Promote adolescent vaccines, but not HPV vaccine specifically, as this can undermine program effectiveness in schools.
- **NCSCHA**: Encourage school health centers to stock HPV vaccine, in addition to other adolescent platform vaccines. Share successful strategies to improve the return of parent consent forms.
- **Professional healthcare associations**: Encourage physicians to make use of new pharmacist authority to deliver catch-up doses of HPV vaccine to adults by writing prescriptions to women ages 18-26 years and men ages 18-21.
- **Pharmacies and CCFNC**: Research the benefits and problems associated with providing HPV vaccine to adolescents and adults in NC pharmacies. Better understand the successes that pharmacists have had in other states.

Universal coverage, meaning the state covers costs for a group of vaccines, increases vaccine uptake. North Carolina used to have a universal vaccine coverage program which increased our state’s performance on immunization performance measures. As of December 2009 however, the program, now called the North Carolina Immunization Program (NCIP), began experiencing budget cuts that narrowed the scope of coverage to primarily VFC and Medicaid-eligible
These changes mean that children who are underinsured are at increased risk of not being immunized against vaccine preventable diseases.

**Recommendation 4.** Increase funding to establish universal coverage of all ACIP recommended vaccines, including HPV vaccine, through age 18.

- **State health department:** Prepare evaluation data and report to justify program expansion from current state allocation.
- **Coalition partners:** Advocate for an increase in the state budget allocation for the North Carolina Immunization Program.

**Cervical Cancer Screening**

As with HPV vaccine, lack of a physician recommendation is a common reason women give for not having been screened for cervical cancer. This issue is one that is best resolved within the physician’s office. Through more streamlined and strategic in-take procedures within health care clinics, fewer missed opportunities to identify at-risk women and direct them towards cervical screening resources (or other relevant screening services) would be realized. Providers can create internal procedures to quickly identify at-risk women (ages 25-64 who have not been screened recently) and refer them to screening services. The NC Cervical Cancer Resource Directory can help providers find low-cost services for their clients.

**Recommendation 5.** Improve recruitment of women rarely or never screened for cervical cancer, with a focus on African American women.

- **State health department:** Recruit NC BCCCP providers in un-served counties, particularly those with high rates of abnormal Pap test results and African American women.
- **State and local health departments:** Develop recruitment materials and disseminate via the iMAP and other appropriate channels.
- **Local health departments:** Recruit into screening programs high-risk women who receive care in other health department programs, including STD and family planning clinics, WIC, dental clinics, and immunization clinics.
- **Healthcare providers:** Use recruitment materials from iMAP and best practice strategies to identify and provide Pap tests to women without recent screenings.
- **CCFNC:** Update and disseminate the Cervical Cancer Resource Directory to local health departments, primary care providers, and community based organizations.

Community Care of NC (CCNC) assists with practice improvement to clinical systems. Through CCNC efforts, “physician leaders from participating networks come together to design and develop clinical improvement pilots. The most successful initiatives are then rolled out statewide.” One useful quality improvement strategy that CCNC has developed is the generation of patient care alerts from Medicaid/Medicare claims data. CCNC sends care alerts
to providers to alert them when screenings and treatment services are overdue. In this way, physicians are better able to target outreach efforts where the need exists. CCNC quality improvement specialists then function to help practices digest the volume of care alert data. CCNC has already identified comprehensive screening care packages as a best practice for scale-up throughout CCNC networks.

Another way to streamline procedures and operationalize best practice around physician reminders to recommend patients for regular screenings is the development of performance measures for quality improvement. The most systematic and comprehensive approach involves the approval of Maintenance of Certification Part IV requirements around patient care reminder systems and follow-up action steps. This approach would encourage application by all physicians and would therefore apply to all women, regardless of insurance status. These quality improvement efforts would need to be collaborative, as approval by professional medical associations will be important.

**Recommendation 6.** Reduce missed opportunities for cervical cancer screening.

- **State health department:** Work with WISEWOMAN program planners to develop age-specific packages of preventive services including screening for breast and cervical cancer, blood pressure, body mass index, and other cardiovascular disease risk factors.
- **State Health Information Systems Office:** Work with state BCCCP staff to develop information technology applications that facilitate in-reach recruitment efforts and comprehensive packages of health screening services.
- **Healthcare providers:** Modify intake procedures to identify women who should receive comprehensive screening packages.
- **Professional healthcare associations:** Develop a Maintenance of Certification (MOC) Part IV quality improvement project for implementing comprehensive screening packages.
- **CCNC:** Use care alerts to promote comprehensive screening packages.

Other best practice efforts include application of the US Preventive Services Task Force (USPSTF) recommendations for cervical cancer screening which were released in March 2012. These recommendations suggest cervical cancer screening every three to five years and DNDA co-testing for most women. NC BCCCP has adopted the new recommendations and is working to incorporate them into existing program operations. Efforts to publish and disseminate these recommendations are underway. Additionally, primary care providers need greater awareness of and adherence to these recommendations. Of course, cervical screening recommendations

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1 Professional medical boards require physicians to maintain their certification through: 1) professional standing; 2) life-long learning; 3) cognitive expertise; and 4) performance in practice. Part IV is the process whereby physicians demonstrate competence in systematic measurement and improvement in patient care.
do not apply to women under 21 years of age or women without a cervix (i.e., who have had a full hysterectomy).

**Recommendation 7.** Encourage adherence to USPSTF recommendations for cervical cancer screening.

- **State health department:** Finalize, publish, and disseminate new BCCCP program manual for local program providers.
- **Professional healthcare associations:** Use professional conferences, association newsletter updates, and other information sharing opportunities to educate providers on USPSTF recommendations for cervical cancer screening and discourage over-screening.
- **Healthcare providers:** Provide Pap tests and DNA co-testing to women in accordance with USPSTF recommendations, i.e., only once every three to five years, if results are negative.

In addition to these recommendations, funding to maintain and improve successful state and local screening programs is very important.

**Recommendation 8.** Expand BCCCP funding.

- **State health department:** Prepare evaluation data and report to justify program expansion from current $3M allocation from the Centers for Disease Control and Prevention.
- **Coalition Partners:** Advocate for legislation to allow individuals due a state income tax refund to contribute all or part of their tax refund to the state Breast and Cervical Cancer Control Program.

**Other**

Public awareness and knowledge management efforts can support cervical cancer prevention efforts. Efforts around public awareness should target African-American and Hispanic women for Pap screening and should educate parents about the safety and effectiveness of the HPV vaccine for boys and girls.\(^{59,60}\)

The Office of Minority Health and Health Disparities encourages improved access to care for minority women through Community Focused Eliminating Health Disparity Initiative (CFEHDII) grant funds. This grant provides community organizations with support for “education, prevention, and implementation of an evidence-based medical home model to improve health outcomes in underserved and minority populations.”\(^{61}\) While the grants encourage cancer prevention efforts, cervical cancer is not specifically mentioned in the current scope of work.
Finally in the area of knowledge management, the Central Cancer Registry received funding from the CDC for the July 2012-July 2017 period to ensure that “at least 90% of the medical oncologists, radiation oncologists, and hematologists report to the CCR by the end of the five year period.” As such, data should be used to regularly report on cervical cancer and HPV-related cancer outcomes, consistent with program expectations.

**Recommendation 9.** Increase awareness of the importance of adolescent HPV vaccination among parents and of cervical cancer screening among higher-risk women, especially among populations at higher risk for cervical cancer.

- **Central Cancer Registry:** Prepare periodic evaluation reports of women’s cancers to inform NCDPH public awareness activities, the State Five Year Cancer Plan as well as the Centers for Disease Control and Prevention federal reporting requirements.
- **State health department:** Seek and direct funding and technical support for health communication campaigns.
- **State health department:** Use Child Health Assessment and Monitoring Program (CHAMP) parent survey data to report county school district compliance with Garrett’s Law and make recommendations for improvement.
- **Local health departments:** Share health communication materials with appropriate local populations.
- **Schools:** Provide printed information to parents of adolescent ages 11-18 on adolescent vaccines including HPV vaccine to meet Garret’s Law requirements.
- **OMHHD:** Expand the scope of the Community Focused Eliminating Health Disparities grants to include: 1) cervical cancer as a priority area; and 2) public awareness activities. Screening messages should target Hispanic and African American women, particularly those who have been in the US less than 5 years, and HIV-positive women.
CHAPTER 8
Conclusion

This policy and practice report on cervical cancer in North Carolina reflects input from key stakeholders on vaccination and screening as well as several years of work by CCFNC in these areas. A key finding is that the northeast and south central regions have the highest prevention needs in the state.

Across cervical cancer screening and HPV vaccination, key recommendations include reducing missed opportunities and delivering services to high-need populations. For vaccination, priorities include ensuring health care providers routinely recommend HPV vaccine and expanding use of alternative settings to provide adolescent vaccines. For screening, priorities include recruiting women rarely or never screened for cervical cancer and improved provider practices that better match USPSTF guidelines.

Next steps
In September 2013, CCFNC will share these results with local and state policy makers and regional stakeholders at the NC Cervical Cancer Coalition summit. Later in 2013 and early 2014, we will host regional stakeholder meetings to facilitate community action plans to implement these recommendations in priority need counties. We hope that these stakeholders can use our report’s findings to refine existing prevention programs and to plan new work to prevent cervical cancer. We encourage all stakeholders to apply these recommendations within the scope of their existing programs for improved cervical health outcomes for North Carolina.

Cervical cancer truly is preventable. Public health leaders in our state have had a large impact on cervical cancer; together we can do more.
REFERENCES


APPENDIX A
Recommendations of the 2007 NC Cervical Cancer Elimination Task Force Report

Cervical Cancer Prevention Plan: Recommendations and Strategies

1: Increase and maintain public knowledge and awareness efforts regarding cervical cancer—risk, screening and prevention—through widespread public information distribution.

- Provide educational activities on prevention of cervical cancer and HPV vaccination to a broad audience, encompassing all North Carolinians.
- Fund awareness projects and campaigns to increase knowledge about preventing cervical cancer.
- Provide educational materials and discussion within groups such as faith-based organizations, girls’ clubs, retail stores, ethnic and non-ethnic grocery stores, YWCAs, YMCAs, athletic clubs, day-care providers, WIC agencies, beauty and nail salons, medical clinics and others.
- Collaborate with ASHA, CDC and other agencies that have made progress in the cervical cancer prevention arena.
- Continue and build upon efforts made by NC Comprehensive Cancer Program.
- Partner with ACS and CIS for cervical cancer and HPV educational materials.
- Ensure physician offices and clinics have appropriate printed materials for talking to and educating parents, adolescents and teens about HPV and the vaccine.
- Work with community leaders, local agencies and local physicians to determine how best to provide awareness in the local community and how to work with the local schools or youth organizations.
- Expand the health education campaigns in public schools via DPI to integrate knowledge of sexually transmitted infections (STIs), especially HPV occurrence, spread and prevention, roles of males and females in the disease spread, and screening in health curriculum.
- Educate the public regarding:
  - Some cancers are caused by a virus or virus type
  - Some cancers are spread by behaviors
  - Vaccines can stop the occurrence or spread of some viruses, prevent cancer from starting and prevent some cancers.

2: Improve cervical cancer screening rates and follow-up abnormal results through expansion and enhancement of cervical cancer screening programs that target underserved and disparate populations, as well as work towards reduction of cervical cancer incidence and mortality across all groups.

- Encourage statewide and local programs to focus on women who rarely or have never been screened (defined by CDC as those with no cervical screening test in five or more years and those who have not been screened in the last two years).
• Improve follow-up rates by education of patients regarding the importance of abnormal test findings, and the consequences of non-compliance with follow-up.
• Encourage HPV DNA testing availability at the State Laboratory to improve follow-up rates.
• Expand NC Breast and Cervical Cancer Control Program (NCBCCCP) education and screening services to community agencies and private physicians that serve an uninsured population.
• Conduct focus groups of vulnerable populations to learn the reason(s) they are not getting screened.
• Use an outreach plan that is appropriate for the population to be reached in order to promote screening among varied groups.
• Provide culturally appropriate health information guidance.
• Consider community-based participatory research in communities that continue to have low screening and follow-up rates.
• Expand NCBCCCP to create more places for women to be screened for cervical cancer.

3: Provide continuing education to health professionals about cervical cancer risk, screening, prevention, treatment and follow-up.

• Provide education to all health care professionals through CME and CEU presentations, Web sites and links, journal articles in state professional society newsletters, professional meetings, and other forums.
• Provide funding for development and implementation of CME curriculum targeting all physicians and nurses who provide cervical cancer screening and treatment in North Carolina.

4: Support informed choice regarding provision of HPV vaccination by providing public and provider education, advocating for third party coverage for vaccine(s) and development of a public health infrastructure that supports vaccine distribution and administration.

• Provide HPV vaccination for 9 to 12 year old females in adherence with the American Academy of Pediatricians, Academy of Family Physicians, and the Center of Disease Control and Prevention recommendations.
• Begin male vaccination with FDA approval and Advisory Committee recommendation.
• Require all NC insurers to pay for the HPV immunization in accordance with NC Advisory Committee Recommendations.
• Develop programs that target the most vulnerable populations.
• Initiate local case management systems to improve compliance with the vaccine schedule.

5: Request additional funding from the North Carolina General Assembly to enhance cervical health programs.
Provide funding to the North Carolina Comprehensive Cancer Program to implement the Cervical Cancer Prevention Plan.

- Provide state funds to the federally funded North Carolina Breast and Cervical Cancer Control Program to enable the program to screen and serve more underserved women.
- Provide matching state funds to the Breast and Cervical Cancer Medicaid program to allow more women to be assisted in cancer treatment.
- Provide additional funding to eligible women for diagnosis and treatment of cervical cancer through the Cancer Assistance Program of the Division of Public Health.
APPENDIX B
County Cervical Cancer Prevention Need

1. Source Data Used to Calculate County Cervical Cancer Prevention Need

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<th>County</th>
<th>Total Score</th>
<th>HPV Vax Dose 1</th>
<th>HPV Vax Completion</th>
<th>CCNC (Medicaid Cancer Screening) Rate</th>
<th>CCNC (Medicaid Cancer Screening) Rank</th>
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*Score based on sum of rankings.

*Ranking based on percent ranges: 1 = 50% or more; 2 = 40%–49.9%; 3 = 30%–39.9%; and 4 = 0–29.9%.

*Ranking based on percent ranges: 1 = 65% or more; 2 = 60%–64.9%; 3 = 50%–59.9%; and 4 = 0–49.9%.

*Ranking based on percent ranges: 1 = 25% or more; 2 = 20%–24.9%; 3 = 11%–19.9%; and 4 = 0–10.9%.

*Ranking based on rate ranges: 0 = 0-2.4; 2 = 2.5-2.9; 4 = 3.0-3.9; 6 = 4.0-4.9; and 8 = 5.0 or higher.
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*Ranking based on percent ranges: 1 = 50% or more; 2 = 40%-49.9%; 3 = 30%-39.9%; 4 = 0-29.9%.

*Score based on sum of rankings.

*Ranking based on percent ranges: 1 = 65% or more; 2 = 60%-64.9%; 3 = 57%-64.9%; 4 = 50%-56.9% and 4 = 0-49.9%.

*Ranking based on percent ranges: 1 = 25% or more; 2 = 20%-24.9%; 3 = 11%-19.9% and 4 = 0-10.9%.

*Ranking based on rate ranges: 0 = 0-2.4; 2 = 2.5-2.9; 3 = 3.0-3.9; 4 = 4.0-4.9; and 8 = 5.0 or higher.
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<td>3</td>
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<td>17.8%</td>
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<td>4</td>
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<tr>
<td>Sampson</td>
<td>18</td>
<td>32.8%</td>
<td>3</td>
<td>44.6%</td>
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<td>2</td>
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<td>4</td>
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<tr>
<td>Stanly</td>
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<td>45.9%</td>
<td>2</td>
<td>71.2%</td>
<td>1</td>
<td>64.5%</td>
<td>2</td>
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<td>1</td>
<td>2.6</td>
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<tr>
<td>Stokes</td>
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<td>16.7%</td>
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<td>62.7%</td>
<td>2</td>
<td>42.3%</td>
<td>4</td>
<td>16.3%</td>
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<td>Transylvania</td>
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<td>39.0%</td>
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<td>Tyrrell</td>
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<td>3</td>
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<td>Union</td>
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<td>42.8%</td>
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<td>44.6%</td>
<td>3</td>
<td>53.6%</td>
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<td>64.2%</td>
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<td>Yadkin</td>
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<td>4.1</td>
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</tbody>
</table>

*Score based on percent ranges: 1 = 50% or more; 2 = 40%-49.9%; 3 = 30%-39.9%; 4 = 0-29.9%.

*Ranking based on percent ranges: 1 = 65% or more; 2 = 60%-64.9%; 3 = 50%-59.9%; and 4 = 0-49.9%.
2. Maps Presenting Cervical Cancer Prevention Need Data

Map 3. HPV vaccine initiation (1+ doses)

Map 6. Women screened by BCCCP were previously “rarely or never screened” (2010-2012)
APPENDIX C.
NC BCCCP Cervical Cancer Testing, Diagnosis, Treatment

Table C. Women Who Received Cervical Cancer Testing, Diagnosis, or Treatment Through NC BCCCP

<table>
<thead>
<tr>
<th>Disposition</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Average</th>
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<tbody>
<tr>
<td>Diagnostic Tests Given</td>
<td>381</td>
<td>347</td>
<td>375</td>
<td>368</td>
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<tr>
<td>Treatment Given</td>
<td>108</td>
<td>78</td>
<td>86</td>
<td>91</td>
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<tr>
<td>Cervical Cancer Detected</td>
<td>101</td>
<td>70</td>
<td>84</td>
<td>85</td>
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<tr>
<td>Served by BCCCP</td>
<td>8,758</td>
<td>7,727</td>
<td>7,584</td>
<td>8,023</td>
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<tr>
<td><strong>NC Female Population ages 18-100+</strong></td>
<td>3,794,200</td>
<td>3,843,992</td>
<td>3,896,034</td>
<td>3,844,742</td>
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<tr>
<td>% of NC Population Served</td>
<td>0.23%</td>
<td>0.20%</td>
<td>0.19%</td>
<td>0.21%</td>
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<tr>
<td>Cervical Cancer Incidence (per 100,000 Women Annually)</td>
<td>2.66</td>
<td>1.82</td>
<td>2.16</td>
<td>2.21</td>
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*Note.* NC BCCCP data generated in April 2013.

Figure C. NC BCCCP Service Data 2010-2012

## APPENDIX D

### Counties with High Rates of Abnormal Pap Test Results in BCCCP Clinics

<table>
<thead>
<tr>
<th>County Name</th>
<th>Abnormal Results 2010</th>
<th>Screened n</th>
<th>Screened %</th>
<th>Abnormal Results 2011</th>
<th>Screened n</th>
<th>Screened %</th>
<th>Abnormal Results 2012</th>
<th>Screened n</th>
<th>Screened %</th>
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<tr>
<td>Chowan</td>
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<td>7</td>
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<td>6</td>
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<tr>
<td>Craven</td>
<td>10</td>
<td>84</td>
<td>12</td>
<td>12</td>
<td>55</td>
<td>22</td>
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<tr>
<td>Duplin</td>
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<td>4</td>
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<td>Rutherford</td>
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<td>21</td>
<td>11</td>
<td>117</td>
<td>9</td>
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<td>102</td>
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<td>15</td>
<td>4</td>
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## APPENDIX E
Key Informant Interview List by public health sector and Carolina Framework pillar

<table>
<thead>
<tr>
<th>Public Health Sector</th>
<th>Agency Name</th>
<th>Carolina Framework Pillar</th>
<th>Contact</th>
</tr>
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<tbody>
<tr>
<td>State Government Health Agencies</td>
<td>BCCCP</td>
<td>Screening</td>
<td>Debi Nelson - Branch Head, Cancer Prevention and Control Branch - NCDPH; Dianah Bradshaw - Regional Nurse Consultant-BCCCP; Vicki Deem - Regional Nurse Consultant-BCCCP</td>
</tr>
<tr>
<td></td>
<td>NC Immunization Branch</td>
<td>Vaccination</td>
<td>Andrea Held - COPD Unit Head, NC Immunization Program; Jenny Snow - Immunization Consultant</td>
</tr>
<tr>
<td></td>
<td>Office of Minority Health</td>
<td>Screening and Vaccination</td>
<td>Belinda Pettiford, Interim Director</td>
</tr>
<tr>
<td>Regional and Local Health Agencies</td>
<td>Local Health Departments, FQHCs</td>
<td>Screening and Vaccination</td>
<td>Danny Staley, NCDPH; John Morrow - Chair of the NC Association of Local Health Directors and Pitt County Health Director; Elizabeth Kinlaw - BCCCP/Wisewoman Coordinator and STD/HIV Coordinator Columbus County; Laura Spivey, RN – Family Planning Unit Cleveland County (former BCCCP/Wisewoman Coordinator)</td>
</tr>
<tr>
<td>Professional Associations</td>
<td>NC Pediatric Society</td>
<td>Vaccination</td>
<td>Steve Shore, Executive Director</td>
</tr>
<tr>
<td></td>
<td>NC Academy of Family Physicians</td>
<td>Screening and Vaccination</td>
<td>Greg Griggs, Executive VP</td>
</tr>
<tr>
<td></td>
<td>NC School Community Health Alliance, school-based</td>
<td>Vaccination</td>
<td>Connie Parker, former Director</td>
</tr>
<tr>
<td></td>
<td>health centers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National non-profits with NC Chapters</td>
<td>National non-profits, like the National Cervical</td>
<td>Screening and Vaccination</td>
<td>Christine Weason, Director of Government Relations (ACS); Pat Curl, Health System Director (ACS)</td>
</tr>
<tr>
<td></td>
<td>Cancer Coalition, the American Social Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Association, and the American Cancer Society</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Improvement Agencies</td>
<td>Community Care of NC, NC Center for Public Health</td>
<td>Screening and Vaccination</td>
<td>Tom Wroth, VP and Deputy Chief Medical Officer (CCNC); Deb Aldridge - QMAF Project Manager (CCNC); Amanda Cornett - Associate Director (NCCPHQ); Laura Brown - Quality Improvement Manager (NCAHEC)</td>
</tr>
<tr>
<td></td>
<td>Quality, NC Area Health Education Centers</td>
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</table>
APPENDIX F

Key Stakeholders Interview Tool

_Interviewers omitted questions from the interview if they were outside the scope of a given agency’s public health portfolio._

Cervical Cancer-Free NC (CCFNC) is preparing a status and policy report on cervical cancer in North Carolina, by reporting on cervical cancer burden, screening and vaccination. We will identify: 1) geographical areas of greatest need, with special attention to Hispanic and African-American communities; and 2) gaps and opportunities for concrete policy changes, particularly those in legislation and state public health systems, related to cervical cancer. The report results will be shared with stakeholders to ensure that plans for new and existing programs are informed by the most up-to-date data on cervical cancer in North Carolina. As a strategic coalition partner, we need your thoughts and opinions around those policy recommendations needed to strengthen cervical cancer preventive services in our state. Please answer the following questions in relation to your public health agency.

1. What is your name and job title?

2. What agency do you represent?

Current work

3. How does your agency work towards the improvement of cervical health in NC? Please indicate current best practices or program strengths in mitigating cervical cancer incidence.

4. What can you or your organization do to improve cervical cancer screening or HPV vaccination rates consistent with your agency’s mission and objectives?

5. From your agency’s perspective, what are the most significant policies, laws or regulations that support cervical cancer screening or HPV vaccination in NC? Why are they most important?

6. What about Garrett’s Law? Does your agency take action to support statewide implementation of Garrett’s Law?

7. If relevant, where do policies, laws or regulations fall short in fostering increased cervical cancer screening or HPV vaccination in NC? Why do they fall short?
Taking action
8. If relevant, how can/does your agency improve access to cervical cancer screening OR HPV vaccination services for underserved women and teens?

9. If relevant, how can/does your agency advocate for full coverage of evidence-based screening, diagnostic and treatments for underserved women OR full coverage of CDC recommended vaccines, including HPV, for underserved teens?

Cervical Cancer Screening and HPV Co-testing
10. If relevant, how can your agency expand reach to unscreened women when they come into contact with the healthcare system to receive other services?

11. If relevant, how can/does your agency encourage and reinforce the need for providers to follow current screening guidelines?

HPV Vaccination
12. Does your agency support the expansion of school-located programs for providing adolescents with CDC-recommended vaccines, including HPV vaccine? Why or why not?

13. Does your agency support the idea that all school health centers stock and administer the HPV vaccine? Why or why not?

14. Does your agency support allowing pharmacists to give adolescents CDC-recommended vaccines, including HPV vaccine? Why or why not?

15. Does your agency support mandatory middle school health assessments (similar to kindergarten health assessments) to ensure that adolescents have CDC recommended vaccinations and/or wellness check-ups in advance of middle school enrollment? Why or why not?

Closing
16. Do you have any other thoughts that you would like to share for consideration in the development of this status and policy report on cervical cancer in NC?
APPENDIX G

Successes and Challenges Of School-Located Vaccination Efforts
in Three North Carolina Counties