

2022 NPCR KENTUCKY SUCCESS STORY

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Using the Incidence of Cervical Cancer Precursors to Assess the Impact of HPV Vaccination Efforts in Kentucky

National Program of Cancer Registries SUCCESS STORY

SUMMARY

The Kentucky Cancer Registry (KCR) modified an existing electronic pathology reporting system (E-Path) to capture all reports of the precursors to cervical cancer and successfully used these data to monitor the impact of HPV vaccination efforts in the state.

CHALLENGE

Population-based cancer registries systematically collect information on all cases of invasive cervical cancer. However, most registries do not routinely collect data on precursors to invasive cervical cancer. It takes 15 to 20 years for invasive cervical cancer to occur following HPV infection.¹ Thus, using changes in the incidence of invasive cervical cancer to measure the impact of HPV vaccination in the population is problematic. To evaluate the impact of HPV vaccination in the population, the Centers for Disease Control and Prevention (CDC) sought to establish a system to monitor changes in the more commonly occurring precursors to invasive cervical cancer using population-based cancer registries.

SOLUTION

In 2008, CDC funded the Kentucky, Louisiana, and Michigan central cancer registries to construct an operational definition of precursors to cervical cancer and to determine the feasibility of systematically collecting the cervical cancer precursors. As a result of this effort, invasive cervical cancer precursors were defined as any cases meeting the definition of cervical intraepithelial neoplasia grade III (CIN 3) or adenocarcinoma in situ (AIS), and it was determined that all cases of CIN 3 and AIS occurring in the population could systematically be collected.²

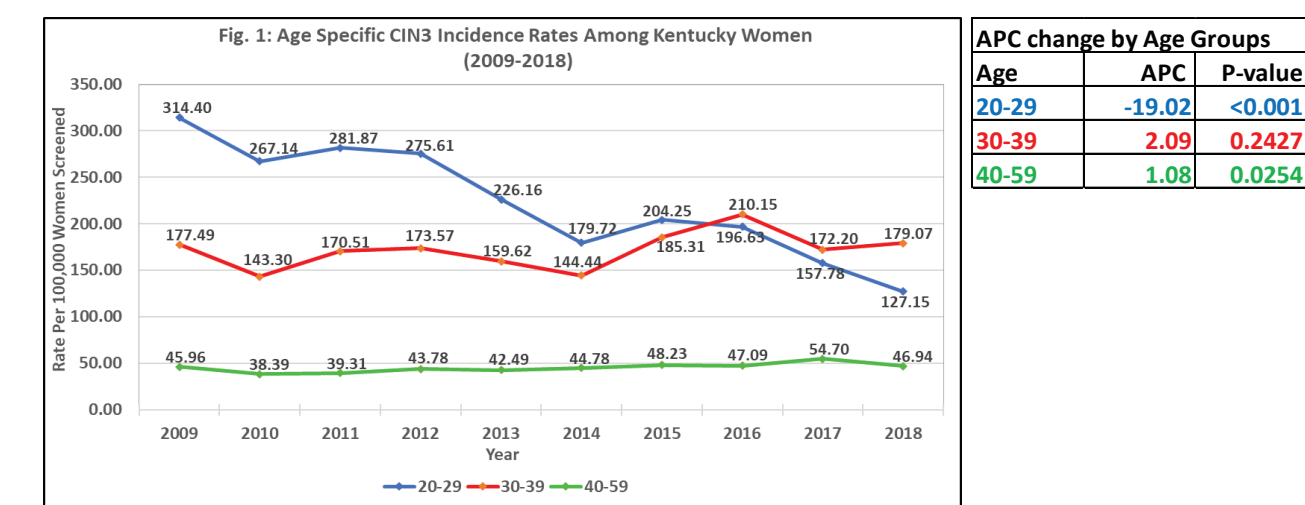
In order to capture all the precursors to cervical cancer in a timely manner, KCR modified an existing electronic pathology reporting system (E-Path).^{2,3} The E-Path reporting programs were successfully installed on the computers in all 54 hospital-based and freestanding private pathology labs both inside and outside the state that evaluate histologic material from Kentucky cancer patients. These E-Path programs read each pathology report, determine if it is for a case that is reportable to KCR, and automatically send all the pathology reports for reportable cases directly to the registry in a secure encrypted format. Thus, in addition to receiving the pathology reports for all cancer cases through the E-Path system, KCR also received pathology reports for all CIN 3 or AIS cases occurring in the Kentucky population at or very near the time of diagnosis. KCR began collecting data on the cervical cancer precursors in 2009. Data from the novel KCR Precursors to Cervical Cancer Surveillance System were used to explore changes in the CIN 3 incidence rates over the ten years from 2009 through 2018.

When calculating the age-specific incidence rates for CIN 3, the population at risk (the denominator) is the women in the population that had a Papanicolaou (Pap) test because CIN 3 would not be detected without a Pap test.⁴ To more accurately capture the true population at risk and avoid the bias introduced by differences in Pap test screening rates among different segments of the population, Kentucky data from the CDC Behavioral Risk Factor Surveillance System (BRFSS) were used to estimate the number of women having a Pap test by 10 year age groups.

The age groups eligible for an HPV vaccination during the ten years covered by this study were 10 through 19 and 20 through 29. There were significant decreases in the number of CIN 3 cases occurring in both the 10-19 age group and the 20-29 age group. However, an adequate number of cases needed to calculate stable age-specific incidence rates for each year were only available for age groups 20-29, 30-39, and 40-59.

RESULTS

There was a significant decline in the CIN 3 incidence rate among the 20-29 age group (the age group with individuals eligible for an HPV vaccination during the period covered by this analysis) as shown in Figure 1. In contrast, there was no decline in the CIN 3 incidence rates among the older age categories. There was, however, a significant increase in the incidence rate for the 40-59 age group.



The CIN 3 incidence rate among the 20-29 age group dropped below the CIN 3 incidence rate for the 30-39 age group in 2016 and was significantly below the 30-39 age group by 2018. The dramatic decline in the CIN 3 incidence rate among the 20-29 age group suggests that efforts to encourage age-eligible women in Kentucky to have an HPV vaccination are having a measurable impact.

SUSTAINING SUCCESS

This has proven to be a very valuable system. Because a substantial proportion of the case finding activities are automated, KCR currently has sufficient personnel to continue capturing all the precursor to cervical cancer cases utilizing the E-Path reporting system, abstract the relevant data, and enter the data into the KCR Precursors to Cervical Cancer Surveillance System.

STORY QUOTE

"It is worth noting that the observed changes represent the underlying population and are not from a sample of convenience. Without the precursors to cervical cancer surveillance system, we would not have seen the changes that occurred in the population, and we would not have had critical information needed to assess the impact of our HPV vaccination efforts" – Dr. Tucker, KCR Associate Director and Principal Investigator for the NPCR Component 2 Project.

REGISTRY CONTACT INFORMATION

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