Cervical Cancer Incidence and Mortality in New Mexico's Hispanics, American Indians, and Non–Hispanic Whites

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High rates of cervical cancer were reported in New Mexico in the early 1970s, with especially high rates for minority women. We examined data collected from 1970 to 1987 for invasive cervical cancer and cervical carcinoma in situ for New Mexico’s Hispanic, American Indian, and non–Hispanic white women to determine whether changes had occurred in cervical cancer rates since earlier reports. To further characterize the epidemiology of cervical cancer in New Mexico, we reviewed state vital statistics for cervical cancer deaths occurring between 1958 and 1987. From 1970 to 1987, the incidence for invasive cervical cancer among Hispanic (18.9 per 100,000 person-years) and American Indian women (22.0 per 100,000 person-years) was about double that for non–Hispanic white women (10.3 per 100,000). The incidence in each ethnic group decreased over time for both invasive cancer and carcinoma in situ when the data were examined by 2 time periods (1970 to 1978 and 1979 to 1987). These decreases were most dramatic for invasive cervical cancer. Cervical cancer–related death rates for Hispanics and non–Hispanic whites also decreased from 1958 to 1987. Although our data reflect declines in cervical cancer rates during the study period, further rate decreases, especially for minority women, remain an important public health goal in New Mexico.


Cancer incidence and mortality vary markedly for many sites among the racial and ethnic groups living in the southwestern United States.1,2 New Mexico’s Hispanics, American Indians, and non–Hispanic whites—the three major racial and ethnic groups in the state—have substantial differences in rates for one site, cervical cancers.1,3 Reviewing data collected from 1966 to 1975, Jordan and Key found strong differences in age-adjusted rates and in age-specific patterns for cervical cancer among these three ethnic groups in New Mexico, with the highest rates in American Indians, intermediate rates in Hispanics, and the lowest rates in non–Hispanic whites.3 Cervical cytologic data collected during this period also reflected high rates of invasive and in situ cervical cancers among the minority women of the state.1,3

To investigate changes in cervical cancer occurrence in New Mexico that have taken place since these earlier reports, we examined data collected by the New Mexico Tumor Registry for the cervical cancer incidence from 1970 to 1987. During this period, state public health agencies and the Indian Health Service promoted cytologic screening for the early detection of cervical cancer. To assess temporal changes in the rates, we analyzed the registry data for two time periods, 1970 to 1978 and 1979 to 1987, for both invasive and in situ cancers. We also examined state vital records collected from 1958 to 1987.

Methods

The population-based New Mexico Tumor Registry, a member of the Surveillance, Epidemiology, and End Results Program of the National Cancer Institute, has recorded the incidence of cancer in New Mexico since 1969.1 Methods have been described in detail elsewhere.1,3 Cases are ascertained through an active review of medical records including hospital charts, outpatient clinic records, pathology and autopsy reports, and radiation therapy records. Staff members routinely review New Mexico Bureau of Vital Statistics records for death certificates that mention cancer.

The Bureau of Vital Statistics for the state of New Mexico has determined ethnicity of decedents. Both the Bureau of Vital Statistics and the New Mexico Tumor Registry use multiple sources of information to determine ethnicity. Hispanics are identified by designation in medical records, on the basis of surname, and from statements on death certificates. American Indians are identified by statements in medical records, by place of residence, and through Indian Health Service records. Persons designated as white or Caucasian who do not have a Spanish surname are coded as non–Hispanic white. We validated the bureau’s coding of Hispanic and non–Hispanic white ethnicity from data obtained from a recent case-control study of lung cancer in New Mexico, as previously described.4

Denominators for the incidence and mortality rates were derived from US Census Bureau estimates of the New Mexico population.4-8 For numerators of the rates, we used the registry’s surveillance system to identify all cases of in situ and invasive cervical cancers diagnosed among New Mexico residents during the period 1970 to 1987. Because of the small number of cases in other ethnic-racial groups, this
investigation was limited to American Indians, Hispanics, and non-Hispanic whites. Average annual age-specific and age-adjusted incidence was standardized to the 1970 US standard million population by the direct method.1

We also examined state death certificates collected from 1958 to 1987 on cervical cancer-related deaths—International Classification of Diseases code numbers 180.0 to 180.9—by five-year time periods and by ethnic group. We calculated age-adjusted mortality using the 1970 US population. For reference, nationwide age-adjusted cervical cancer mortality for whites and African Americans was calculated from National Center for Health Statistics data for the years 1960, 1965, 1970, 1975, and 1980.8-13*

Results

The age-adjusted rate of invasive cervical cancer from 1970 to 1987 in Hispanics (18.9 per 100,000 person-years) was almost double that in non-Hispanic whites. Age-specific data for 1970 to 1987 showed that American Indians and Hispanics had the highest rates of invasive cervical cancer (Figure 1).

![Figure 1.—Cervical cancer incidence by age and ethnic group in New Mexico are shown for invasive carcinomas, 1970 to 1987 (rates per 100,000 person-years).](image)

Decreasing age-adjusted incidence for invasive cervical cancer is apparent for each group from a comparison of the data for the periods 1970 to 1978 and 1979 to 1987. The greatest decrease (38%) occurred among Hispanic women (Table 1).

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*From the New Mexico Tumor Registry.

The age-adjusted rate of cervical carcinoma in situ in each ethnic group and across most age groups, with the highest rates occurring among women aged 25 to 34 years (Figure 2). Among women aged 65 years or older, cervical carcinoma in situ rates were highest in American Indians.

![Figure 2.—Cervical cancer incidence by age and ethnic group in New Mexico is shown for in situ carcinomas, 1970 to 1987 (per 100,000 person-years).](image)

Age-adjusted rates of cervical carcinoma in situ from 1979 to 1987 were only slightly lower than rates in 1970 to 1978 for Hispanics and non-Hispanic whites, but American Indian women showed a 32% decrease in rates (Table 1).

Mortality from cervical cancer in New Mexico declined from 1958 to 1987 (Table 2). Mortality for non-Hispanic whites was comparable with that for US whites; mortality for Hispanics and American Indians exceeded that for New Mexico's non-Hispanic whites but was consistently lower than cervical cancer mortality for US African Americans (Table 2).

Discussion

Although declining in occurrence, invasive cervical cancer in New Mexico remains more common in Hispanics and American Indians than in non-Hispanic whites. Invasive cervical cancer rates among American Indian women in this state remain among the highest reported for cervical cancer for any ethnic or racial group in the United States.14 The high incidence and mortality for cervical cancer documented during the 1950s and 1960s15 have been shown in recent reports to be still elevated among American Indians and Alaska Natives in other states. In western Washington, the incidence for invasive cervical cancer among American Indian women from 1974 to 1983 was high compared with that among the area's whites (standardized incidence ratio, 1.6).16 Cervical cancer mortality among Alaska Natives exceeded that of US whites from 1969 to 1983, with standardized mortality ratios ranging from 2.1 in Eskimos to 4.0 in Aleuts.17 In addition, cervical cancer mortality among the Seneca of New York from 1955 to 1984 and North Carolina's American Indians from 1968 to 1982 doubled the death rates for comparison populations in the respective states.18,19 Risk factors for cervical cancer have not been characterized in American Indian women in analytic epidemiologic studies.

Hispanic women in New Mexico had almost twice the rate of invasive cervical cancer as that of non-Hispanic white women in the state. This high rate is consistent with reports for Hispanic women from other locations in the US20,21 and in Latin America.22,23 So far, no unifying hypothesis has emerged that can explain the consistently high rates of invasive cervical cancer in diverse groups of Hispanic women in
North, Central, and South America. In studies of cervical cancer among US Hispanics, early age at first intercourse, lower socioeconomic status, and a higher number of sex partners have been linked to a higher cervical cancer incidence.20 Studies of cervical cancer in Hispanics living outside the US have suggested additional dietary, behavioral, reproductive, or infectious disease risk factors for acquiring cervical malignancy.22-24-27

Mortality for cervical cancer declined substantially in New Mexico from 1958 to 1987 for Hispanic and non-Hispanic white women, consistent with decreases in cervical cancer mortality nationwide among African Americans and whites (Table 2). Nonetheless, despite the decrease, Hispanic women had almost twice the cervical cancer mortality as non-Hispanic white women throughout the study period. We lack data to determine if these ethnic differences in mortality are due to differences in cervical cancer screening or to other factors. Furthermore, we lack the necessary information to determine if the declines in cervical cancer mortality in these ethnic groups (as is observed nationwide) are a result of changes in cervical cancer screening. Temporal changes in cervical cancer mortality were not consistent for American Indian women (Table 2); the small number of cervical cancer deaths for American Indian women caused rates to fluctuate when examined by five-year time periods. Cancer mortality reflects cancer incidence in addition to survival. Previous research from the New Mexico Tumor Registry indicates poorer survival from cervical cancer among American Indians than among non-Hispanic whites in this state28: 52% of American Indian women survived five years after diagnosis, whereas 63% of Hispanics and non-Hispanic whites survived five years after the diagnosis of cervical cancer. For both Hispanic and American Indian women, larger proportions of cervical cancer cases were diagnosed with regional or distant disease compared with non-Hispanic white women, and larger proportions of Hispanic and American Indian women did not receive treatment of cervical cancer compared with non-Hispanic whites.29 Thus, the survival data for cervical cancer patients in New Mexico suggest that inadequate care and a delay of treatment among minority women may contribute to the higher mortality from cervical cancer than in the non-Hispanic majority.

Possible sources of bias in the data bases used in this analysis have been previously discussed.4-20 In addition, about 15% of deaths from cervical cancer are misclassified to the uterus as the primary site.30 Furthermore, we have shown that disproportionate numbers of all deaths of minority people in this state are attributed to "symptoms, signs, and ill-defined conditions,"31 and it is reasonable to assume an unknown percentage of all cervical cancer deaths is assigned to this category. Finally, another possible source of bias lies in the absence of data on hysterectomy in New Mexico's Hispanic, American Indian, and non-Hispanic white women.

Data are not yet available to explain the high cervical cancer incidence in New Mexico's Hispanic and American Indian women. Ongoing research in New Mexico has not yet shown striking risk profiles for cervical disease among local minority women. In a recent pilot study of factors causing cervical dysplasia in American Indian women (n = 100), those with dysplasia actually had fewer lifetime sex partners and fewer episodes of sexually transmitted diseases than control women with normal Papanicolaou smears.32 Human papillomavirus (HPV) infection has also been investigated in association with Papanicolaou smear abnormalities. In a prevalence survey of cervical HPV infection in New Mexico, non-Hispanic whites had a higher prevalence of cervical HPV (13%) compared with Hispanic (9.7%) and American Indian women (6.6%).33 This pattern is inconsistent with the expected pattern of the prevalence of HPV if HPV were carcinogenic.34 Nonetheless, a large proportion of the New Mexico women with cervical HPV infection had HPV types that are more strongly associated with cervical cancer.35

The descriptive data that we have presented show that minority women in New Mexico remain at high risk for cervical cancer; unfortunately, we are lacking information on risk factors for the development of cervical disease in these ethnic populations. The scant information collected so far for cervical cancer risks in New Mexico does not indicate unusual risk profiles for American Indian and Hispanic women with high rates of cervical disease. Comprehensive analytic studies focused on the high-risk minority women of this state are needed to provide information on the causes of cervical cancer in New Mexico.

REFERENCES


### Table 2—Cervical Cancer-Related Mortality Among New Mexico's Hispanics, American Indians, and Non-Hispanic Whites, 1958 to 1987†

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NM = New Mexico, US = United States

†Age-adjusted rates per 100,000 person-years.

†The numbers in parentheses indicate the number of deaths over the 5-year period.


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