

RACIAL AND ETHNIC DIFFERENCES IN PREMATURE HEART DISEASE DEATHS IN NEW MEXICO: WHAT IS THE ROLE OF DIABETES?

Multiple-cause mortality files from 1999–2001 were obtained to describe premature heart disease (PHD) deaths and the role of diabetes as a contributing cause in heart disease (HD) mortality in American Indians, Hispanics, and non-Hispanic Whites in New Mexico. The proportion and rate of PHD and diabetes-related HD death were calculated and reported by race/ethnicity and gender. Results indicate that from 1999 to 2001, 24% of all deaths in New Mexico reported HD as the leading cause of death. Of these, 16.6% occurred in persons <65 years of age and were therefore classified as premature. The proportion of premature HD deaths was substantially higher in the American-Indian (29.2%) and Hispanic (20.8%) populations compared to Whites (13.7%). Furthermore, diabetes contributed to almost 18% of premature HD deaths in American Indians and Hispanics and to 10% of premature HD among Whites. These findings suggest that American Indians and Hispanics are disproportionately affected by premature HD death and that diabetes as a contributing cause is greater among these populations compared to non-Hispanic Whites. (*Ethn Dis.* 2006;16:85–88)

Key Words: Diabetes Mellitus, Heart Disease, New Mexico, Premature Mortality

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INTRODUCTION

Premature deaths from heart disease, defined as heart disease (HD) death in persons <65 years of age, accounted for almost 17% of all HD deaths in the United States in 2001.¹ The proportion of premature deaths among all HD decedents was lowest in Whites (14.7%) and highest among American Indians (36%). Premature heart disease (PHD) death was also higher in Hispanics than in non-Hispanics, 23.5% compared to 16.5%, respectively. Because HD death rates are higher among persons with diabetes than among those without diabetes,² some of the racial/ethnic differences in PHD deaths may be influenced by underlying differences in the prevalence of diabetes. Both Hispanic and American-Indian populations are at higher risk for diabetes than their non-Hispanic White counterparts.³ However, Hispanic individuals with diabetes may not be as vulnerable to HD as other populations with diabetes, although the data are not consistent across studies.^{4–6} Because the population of New Mexico was 9.5% American Indian, 42.1% Hispanic, and 44.7% non-Hispanic White in 2000 (www.census.gov), New Mexico's diverse population presents an ideal opportunity to examine the potential role of diabetes in racial and ethnic differences in PHD deaths. The overall proportion of PHD deaths was 16.6% in New Mexico, which is similar to the overall proportion for the nation in 2001.¹ Heart disease (HD) mortality rates (per 100,000) in 2001 for non-Hispanic Whites and Hispanics of any race were very similar (202.5 and 234.6, respectively) and were lower among American Indians (170.8) in New Mexico.⁷ Previous reports suggest recent changes in mortality in New Mexico's

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racial/ethnic populations.^{8–11} For example, studies from the 1970s showed that Hispanics in New Mexico had much lower death rates for ischemic or coronary HD compared to Whites, and coronary HD was uncommon in southwestern American Indians.^{8,9} Death rates with diabetes as the underlying cause of death in New Mexico were also lower during this same period among Hispanic and American Indian-populations than among Whites in New Mexico.¹⁰ Although data describing the prevalence of diabetes in New Mexico's racial/ethnic populations are lacking, since the 1970s, diabetes as the underlying cause of death increased in the state, particularly among American Indians and Hispanics.^{10,11} Thus, changes in ischemic HD mortality in New Mexico's White, Hispanic, and American-Indian populations have occurred in conjunction with increasing death rates for diabetes. This report describes current PHD mortality and the relative contribution of diabetes to PHD mortality in New Mexico's multi-racial/ethnic population.

METHODS

Multiple-cause mortality files were obtained from the National Center for

Health Statistics at the Centers for Disease Control and Prevention for 1999 to 2001. Deaths from HD for New Mexico residents were identified by the International Classification of Diseases, Tenth Revision (ICD-10) codes I00-I09, I11, I13, and I20-I51. These codes include ischemic or coronary HD, valvular HD, cardiomyopathies, and other forms of HD. Premature heart disease (PHD) was defined as any underlying HD death occurring among persons aged <65 years. Diabetes-related HD (DM-HD) death was classified as any death in which the underlying cause of death was HD, and diabetes (ICD-10 codes E10-E14) was reported as any of up to 20 contributing causes of death. The racial/ethnic groupings in this report include non-Hispanic White, Hispanic of any race, and non-Hispanic American Indian. When race or ethnicity was missing from the death certificate data, deaths were excluded from the racial/ethnic-specific analyses only.

All death rates for HD were calculated with bridged-race population estimates as the denominator to bridge the Census 2000 multiple-race resident population to single-race estimates.¹² Heart disease (HD) death rates (per 100,000 New Mexico resident population) include age-specific rates for ages ≤44 years and 45–64 years and age-adjusted death rates that were standardized to the 2000 US Standard Population aged >65 years by using the direct method.^{13,14} For each death rate, 95% confidence intervals (CI) were also calculated.¹⁵

STATISTICS AND RESULTS

In 1999–2001, an aggregated total of 10,065 HD deaths represented 24% of all deaths in New Mexico. Of these HD deaths, 16.6% occurred in persons aged <65 years of age and were thus classified as premature. The proportion of PHD deaths varied significantly

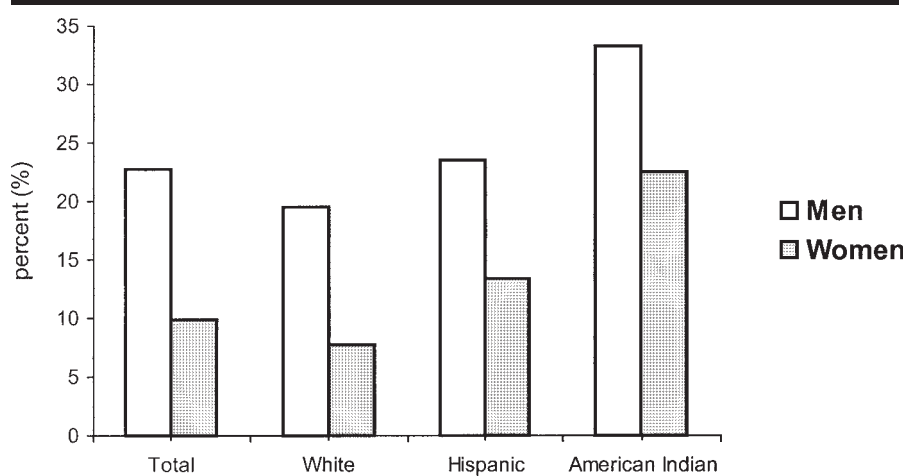


Fig 1. Proportion of all heart disease deaths occurring prematurely at ages <65 years, by sex and race/ethnicity: New Mexico: 1999–2001

by race/ethnicity (chi-square, $P<.001$) among HD decedents. American Indians had the highest proportion of PHD deaths (29.2% of 418) followed by Hispanics (20.8% of 2650), and Whites (13.7% of 6763). In comparison to Whites, both Hispanics (OR 1.6, 95% CI 1.5–1.9) and American Indians (OR 2.6, 95% CI 2.1–3.2) had significantly higher proportions of PHD. Males had a much higher proportion of PHD among HD decedents than females (22.7% vs 9.9%; chi-square, $P<.001$). Gender differences occurred in each of the three racial/ethnic groups (Figure 1).

Age-specific death rates (per 100,000) for HD were 6.3 (95% CI 5.5–7.1) at ages ≤44 years, 117.8 (95% CI 111.7–123.9) at ages 45–64 years, and 1313 (95% CI 1285.6–1341.8) for ages ≥65 years. When stratified by race/ethnicity, HD rates varied by age. In

the <35 category, the highest rate was among Hispanics (2.3), followed by American Indians (1.9) and Whites (1.8). In the ≥65 category, the highest rate was among Whites (1411.4), followed by Hispanics (1136.5) and American Indians (1026.1) (Table 1). The age-adjusted PHD death rate (per 100,000) among Whites aged <65 years was 34.5 (95% CI 32.3–36.8). Rates for Hispanics (33.3, 95% CI 30.5–36.1) and American Indians (37.1, 95% CI 30.5–43.8) were similar. However, the HD death rate for males aged <65 years was significantly ($P<.05$) higher than among females for each racial/ethnic group (data not shown).

Approximately 1% of all deaths in this dataset are recorded as symptoms not elsewhere classified (R00-R99), regardless of race/ethnicity. Diabetes was an underlying cause of death in 3.7% of all deaths; American Indians (7.2%) and

Table 1. Age-specific Heart Disease Death Rates by race/ethnicity: New Mexico, 1999–2001

Age Category	Whites Rate* (n)	Hispanics Rate (n)	American Indians Rate (n)
<35	1.8 (18)	2.3 (31)	1.9 (6)
35–44	20.9 (83)	15.0 (52)	31.6 (23)
45–64	118.5 (826)	113.0 (467)	115.5 (93)
≥65	1411.4 (5836)	1136.5 (2100)	1026.1 (296)

* Rate per 100,000 population.

Table 2. Proportion of all deaths with heart disease, diabetes, or other unclassified symptoms as the underlying cause, by race/ethnicity: New Mexico, 1999–2001

Underlying Cause of Death	Total n (%)	Whites n (%)	Hispanics n (%)	American Indians n (%)
Total deaths	41,230 (100.0)	25,045 (100.0)	12,478 (100.0)	2759 (100.0)
Heart disease (I00-I09, I11, I13, I20-I51)	10,065 (24.4)	6763 (27.0)	2650 (21.2)	418 (15.2)
Diabetes (E10-E14)	1540 (3.7)	643 (2.6)	652 (5.2)	200 (7.2)
Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	471 (1.1)	266 (1.1)	140 (1.1)	43 (1.6)

Hispanics (5.2%) had a higher percentage of deaths due to diabetes (Table 2). Diabetes was reported as a contributing cause of death in 7.9% of all HD deaths from 1999 to 2001. The percentages of all HD deaths with diabetes reported as a contributing cause were greater in American Indians (15.1%) and Hispanics (11.5%) than among Whites (6.0%). Among HD deaths occurring prematurely, 13.1% had a report of diabetes compared to 6.9% of HD deaths at ages ≥ 65 years (Figure 2). In comparison to HD deaths among Whites aged < 65 years, the proportion of HD decedents with diabetes was much higher among Hispanics and American Indians. Premature diabetes-related HD deaths varied by race/ethnicity significantly ($P=.016$); American Indians had the highest proportion

(35%), followed by Hispanics (32%) and Whites (23%). The proportion of premature deaths remained significantly different between males and females ($P=.018$), but the female proportion rose.

DISCUSSION

In New Mexico, the proportion of PHD death was substantially higher in the American-Indian and Hispanic populations than in Whites and also higher in males than females in all ethnic groups. Diabetes contributed to almost 18% of PHD deaths in American Indians and Hispanics, in contrast to 10% of PHD deaths among Whites.

Actual PHD mortality rates were about the same for each group. Differ-

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ences in the age distributions of different populations and the prevalence of diabetes may explain why the PHD death rates were similar. The population structures of the Hispanic and American-Indian population, with median ages of 28.4 and 25.6 years, respectively, are much younger than the White population, with a median age of 42.0 years (www.census.gov). In the 2001 US population, 87% of Whites, 95% of Hispanics, and 94% of American Indians were aged < 65 years.¹⁵ In addition, aggregated New Mexico Behavioral Risk Factor Surveillance System (BRFSS) data from 1999 to 2001 indicate that diabetes has a younger age of onset in Hispanics and American Indians (47.4 and 40.9 years, respectively) compared to Whites (50.5 years).¹⁶ Because the prevalence of diabetes is higher in these groups at much earlier ages^{17,18} and the risk of coronary HD is higher with increased duration of diabetes,¹⁹ these populations would be likely to experience earlier HD death. Indeed, in the mortality dataset, the mean age at HD death is younger among Hispanics (75.6) and American Indians (72.3) compared to Whites (78.5). This finding is also reflected in the age-specific rates, where Hispanics and American Indians have lower rates at older ages compared to Whites.

The contribution of diabetes to PHD mortality is striking; these mortality results provide further evidence that Hispanics with diabetes do not appear to have been spared the HD

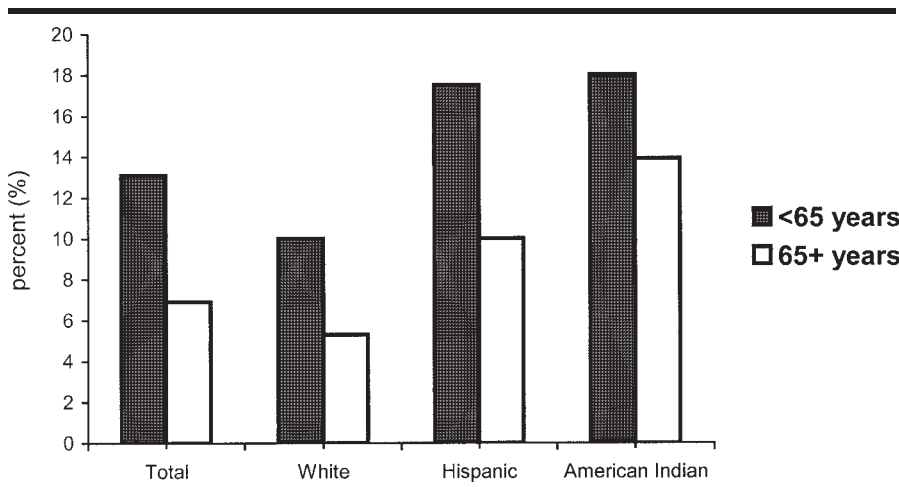


Fig 2. Percentage of all heart disease deaths with diabetes reported as a contributing cause of death, by age group and race/ethnicity: New Mexico: 1999–2001

sequelae as had been speculated. Thus we found no evidence of a “Hispanic paradox” in the proportion of PHD among HD decedents.

These data have several limitations. Differences in reporting patterns for underlying cause of death may have existed among different ethnic groups. A previous study in New Mexico showed that between 1958 and 1982, deaths among American Indians and Hispanics were more likely to be attributed to “symptoms, signs, and ill defined conditions,” and for all ethnic groups in New Mexico, non-specific causes were coded more frequently in New Mexico than in the United States.²⁰ However, this fact no longer appears to be the case. Although we do not have any current data about the accuracy of cardiovascular death coding by race/ethnicity in New Mexico, a recent study in Montana found that American Indians known to the Indian Health Service with cardiovascular disease deaths were not miscoded as non-Indian in the state’s mortality dataset.²¹ In New Mexico diabetes is known to be common in American Indian and Hispanic persons, which could explain why diabetes is reported more frequently as the underlying cause of death for Hispanic and American Indian populations compared to Whites. Finally, because proportionate cause analyses were used to compare data, a note of caution is warranted.

Despite the limitations of the data, our findings suggest that the contribution of diabetes to premature HD death is greater among Hispanics and American Indians than among Whites. These data further underscore the growing threat of diabetes to disparate communities in the United States. Much of the progress in decreasing cardiovascular disease in the United States may be lost

as increasing obesity and diabetes lead to PHD death in many populations.

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Manuscript draft: Krapfl, Gohdes, Croft
Statistical expertise: Krapfl, Croft
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