Trends in Respiratory System Cancer Mortality in Louisiana: Geographic Distributions in 1950–1969 and 1967–1976 Compared

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Introduction

Louisiana became of epidemiological concern because mortality rates due to respiratory system cancers (RSC) in white males were the highest in the nation according to Mason and McKay's 1950–1969 data.[1] Of Louisiana's 64 parishes (counties), 34 had rates in the top 10 per cent nationally. To update parish-specific rates of mortality attributable to RSC in Louisiana, and to investigate clustering and the stability of geographic trends over time, we determined rates for 1967–1976.

Methods

From death certificates signed by physicians in Louisiana, and supplied by the State of Louisiana, Department of Health and Human Resources, Office of Health Services and Environmental Quality, we obtained data on deaths resulting from RSC during 1967 to 1976 in each of the state's 64 parishes. Respiratory system cancers were represented by the 8th revision of the International Classification of Diseases code numbers 162-163,[2] which are consistent with the categories of the 6th revision used by Mason and McKay.[1] Audit of Louisiana death certificates during 1967–1976 showed that approximately 94 per cent of deaths listed as caused by RSC were reported as lung, bronchus, and trachea cancer.* We included the last three years of Mason and McKay's study in our data to achieve more stability in our estimates of rates. Age-specific denominator data for each parish were based on the April 1972 population linearly extrapolated from the 1960 and 1970 census data, for each race and sex. We age-adjusted the average annual rates of mortality due to RSC by the direct method, using the 1960 U.S. population as a standard.[3]

For each parish, the observed age-adjusted average annual rates of mortality attributable to RSC for 1967–1976 were compared with expected rates based on the increase in the state since 1950–1969. The expected mortality rate for 1967–1976 in each parish was calculated as follows: the ratio of Louisiana's 1967–1976 mortality rate to its 1950–1959 rate was multiplied by the 1950–1969 parish rate: we then divided the rate observed for 1967–1976 by the rate expected for this period, and tested the quotient for statistical significance, assuming the Poisson distribution according to the Bailar and Ederer formula.[4]

Results

When the average annual mortality resulting from RSC in Louisiana for 1950–1969 was compared with that for 1967–1976, an increase in rate was noted for each of the four race-sex groups (Table 1). Although the age-adjusted rate for males continues to be strikingly higher than that for females, the rates for females increased more than those for their corresponding male groups. The rates increased more for white than for nonwhite groups. White males had increased rates in every parish except West Feliciana; white females, in all but four parishes; nonwhite males, in all but four parishes; nonwhite females, in all except 13 parishes.

We used Bailar and Ederer's formula[4] to assess the significance of fluctuations in rates in individual parishes, especially in those having sparse populations or small numbers of deaths resulting from RSC. The total of 26 deviations from the 95 per cent confidence interval was twice as many as one would expect by chance.** In 19 instances, the observed

TABLE 1—Age-Adjusted Average Annual Mortality* Due to Cancers of the Respiratory System in Louisiana

Race-Sex Group	1950–1969‡‡	1967–1976**	Per Cent Change‡
White Males	51.97	71.04	36.7
White Females	6.97	15.39	120.8
Nonwhite Males	38.64	50.55	31.4
Nonwhite Females	6.13	9.60	56.6

*Deaths per 100,000 persons.

$$\text{‡Per Cent Change} = \frac{(\text{1967–1976 rate}) - (\text{1950–1969 rate})}{(\text{1950–1969 rate})} \times 100$$

‡‡Based on the 1960 census population of the United States.
**Based on the April 1972 population of Louisiana linearly extrapolated from the 1960 and 1970 census data.

*Authors' unpublished data.

**Detailed data are available upon request.

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