Short Communication


Larry E. Fields, MD, MBA, FACC

Background and Purpose—The absolute burden of stroke is a major determinant of health care costs and should also be considered when developing and implementing effective health policy. This study evaluated the impact of specific racial-ethnic categorization on absolute stroke mortality burden and population percentages.

Methods—In this population-based analysis, 2001 US data was used to compute absolute values of population and stroke mortality burden for white and black, and other racial–ethnic groups. To test the effect of age-mix, values were age-adjusted using the 2000 US standard population. The z test statistic was computed and a 2-tailed P value of <0.05 was considered significant.

Result—Whites comprised a majority of the 2001 absolute US stroke mortality burden and US population (86% and 82%, respectively). Surprisingly, nHnL whites comprised a much higher percentage of the absolute US stroke mortality burden than expected based on their percentage of the US population alone (81% and 69%, respectively; P<0.001). Age-adjustment indicated a contribution by age-mix, however, an age-independent residual component remained.

Conclusions—Specific race-ethnicity categorization significantly influences comparisons of the proportion of absolute stroke mortality burden to the population proportion. Accordingly, appropriate caution and care are needed when estimating the societal impact of conditions such as stroke. (Stroke. 2005;36:e48-e49.)

Key Words: hypertension ■ mortality ■ stroke

Considerations of burden (absolute number) as well as rate or proportion of health conditions such as hypertension or stroke are important for gauging their impact on community well-being. Put another way, absolute burden, a function of rate or proportion and population at risk, is a major determinant of the impact of health-related conditions on society. Accordingly, absolute burden and rate should be evaluated as a part of health-related planning. An analysis of stroke mortality rate and absolute burden underscores the importance of this approach. In 2001, the age-adjusted US stroke mortality rate was ≈43% higher for non-Hispanic non-Latino (nHnL) blacks compared with nHnL whites, indicating a disproportionately high rate for blacks (79.9 versus 56.0 per 100 000; also see Tables LCWK3_2001 and LCWK4_2001, National Center for Health Statistics Data Warehouse; http://www.cdc.gov/nchs/dawh.htm).1,2 This important and continuing disparity is well known although not as well understood.3 The concomitant assessment of absolute burden is important because it generates additional insights about overall impact. It is the actual or absolute number of persons with specific conditions that directly contributes to consumption of often difficult-to-allocate health resources. Even a low rate of a specific health condition can have a high societal impact if the population at risk is large. Analogously, population-attributable risk (PAR), another important measure of societal impact, is a function of relative risk (RR) and prevalence of the exposure of interest in the entire population.

PAR simply cannot be fully evaluated and understood based on RR alone. The majority of the white population is expected to contribute the largest share of the absolute burden for conditions that affect all or most subpopulations at similar rates or at rates that do not generate absolute numbers of nonwhite persons with such conditions that exceed that of the majority population. Accordingly, whites comprised the majority percentage of the US population as well as the majority of the absolute stroke mortality burden in 2001 (82% and 86% of 284 796 887 and 163 538, respectively; Figure 1A and 1B). Blacks comprised a minority percentage of the US population and the absolute stroke mortality burden (13% and 12%, respectively). Although the aggregate of all other groups comprised 5% of the US population, they comprised only 2% of the absolute stroke mortality burden. In contrast, whites comprised a higher percentage of the absolute stroke mortality burden than of the US population for 2001 (86% and 82%, respectively). To further assess this initial observation, absolute numbers of nHnL and other populations were examined. Surprisingly, the majority of the nHnL white subgroup contributed a higher share of the absolute stroke burden.
mortality burden than expected purely based on their percentage representation among the US population alone. In 2001, nHnL whites represented 69% of the US population but 81% of the stroke mortality burden, indicating a disproportionately high share of the absolute burden for nHnL whites (Figure 1C and 1D; P<0.001). Additionally surprising, in view of the higher stroke mortality rate noted above, nHnL blacks comprised a similar percentage of the US population and the absolute stroke mortality burden (13% and 12%, respectively). Finally, the aggregate of all other groups, including the Hispanic and Latino subpopulations, comprised 18% of the US population but only 7% of the absolute stroke mortality burden. The potential role of age mix in the disproportionate share of the absolute stroke mortality burden borne by nHnL whites was evaluated by age-adjusting data to the year 2000 standard population.4 Age-standardization of stroke mortality burden was considered reasonable because population proportions were being compared. Age-adjusted stroke mortality burden was 3 percentage points lower for others, 4 points higher for blacks, and no different for nHnL whites compared with the US population, indicating that age mix explained most of the proportional difference among whites (Figure 2A and 2B). Interestingly, age-adjusted stroke mortality burden was 8 percentage points lower for others, 3 points higher for nHnL blacks, and 3 points higher for nHnL whites compared with the US population, indicating a contribution by age mix but a residual age-independent difference among nHnL whites (Figure 2C and 2D). Another important driver of health costs and societal impact is complexity of individual or subpopulation circumstances and comorbidities (ie, case mix). Although the role of age mix, a single component of case mix, has been demonstrated, the influence of variation in overall case mix must also be considered when making inferences about societal impact (eg, other factors including access to health care and stage of illness at presentation). Accordingly, the ultimate impact of the higher absolute stroke mortality burden for nHnL whites could likely be influenced upward or downward by age-independent case mix factors. In conclusion, performance of absolute stroke mortality burden- and rate-based analyses generated additional and surprising insights that directly influence subsequent estimation of subpopulation-specific contributions to the societal impact of stroke mortality. First, the stroke mortality rate was higher among US blacks than whites, as well described previously. Second, the absolute stroke mortality burden was higher among whites than blacks, as expected on the basis of the status of whites as the majority US subpopulation. Third, and surprisingly, the absolute stroke mortality burden for nHnL whites compared with nHnL blacks was significantly higher than expected simply based on majority status alone. The potential for significant changes in absolute burden when using differing definitions of race and ethnicity underscores the need for caution when estimating the societal impact of conditions such as stroke. The fact that the absolute burden is a major contributor to health costs, the absolute burden profile differs significantly from the rate profile, and race–ethnicity categorization significantly influences results underscores the need to evaluate absolute burden and rates such as stroke prevalence, incidence, and morbidity as well as mortality, as part of effective health policy development and implementation.

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**References**


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