Age-standardized death rates by the indirect method: A program for use on a computer terminal

JERRY W. WICKS

Department of Sociology, Bowling Green State University
Bowling Green, Ohio 43403

Description. In comparing, for example, the health conditions of two or more countries, the demographer is faced with the ponderous task of collating the numerous age-specific death rates of each of the countries. What is needed is one single rate which applies to the whole population. The crude death rate is often used for this purpose. But the crude death rate is highly affected by the demographic composition of the population under study. In particular, age composition can have a strong bearing on the rate. For instance, if a population has a high proportion of young people, the crude death rate may be comparatively low. Conversely, the crude death rate of a population will be high if there is a large proportion of persons in the older ages.

One way of controlling for age composition is through the use of the agestandardized death rate calculated by the indirect method. The formula for indirect standardization is:

$$M_2 = \frac{(d)}{(\Sigma M_a P_a)} M$$

where, for the "standard" population, M_a represents age-specific death rates, and M signifies the crude death rate; and, for the population being studied, d represents the total number of deaths and P_a represents the population at each age. (Shryock, Siegel, & Associates, 1973).

Input. The user is requested to indicate if he wishes to use 1960 United States age-specific death rates as his "standard" population. If he chooses to do so, the user must then specify exactly which population in the U.S. he desires (e.g., total U.S. population, total male population, nonwhite female population, etc.). The program then acquires from disk the appropriate data

(i.e., crude death rate, age-specific death rates, and registered deaths). If the user wishes to utilize another time period or country as his standard, he is requested to enter the crude death rate, age-specific death rate, and registered deaths for that population. The user must then specify the number of countries (limit four) involved in his study; the registered deaths in each of the countries; and finally the population figure for each of the nineteen age groups in each country (i.e., under 1 year, 1-4 years, 5-9 years, etc.).

Output. There is a choice of two forms of tables. The complete table outputs age-specific death rates for the "standard" population, the age-group figures for each country which were entered by the user, and also what is given in the short table. The output in the short table includes for each country: the total population, the expected deaths, registered deaths, the ratio of registered deaths over expected deaths, the age-adjusted death rates and finally, the percentage difference of the age-adjusted death rate from the "standard" rate.

Computer and language. The program, called ISTANDR, is written in Fortran IV and is currently being used on an IBM 360/75 with an IBM 2741 terminal.

Limitations. The program requires population data for 19, and only 19, age groups in each country. Therefore, the user must have age data for "under one year of age' up to "eighty-five years and over.' A further limitation is that a maximum of only four countries can be compared at one time. Finally, due to the size of the tables, the terminal must have a carriage size of 130 spaces.

Availability. A listing of the program and the "standard" populations stored data may be obtained free by contacting the author at: Department of Sociology, Bowling Green State University, Bowling Green, Ohio 43403.

REFERENCES

Shryock, H. S., Siegel, J. S. et al. *The methods and materials of demography.* U.S. Bureau of the Census, Washington, D.C: U.S. Government Printing Office, 1971. Pp. 418-422.