BRIEF COMMUNICATION

NIOSH Life Table Program for Personal Computers

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NIOSH has recently completed development on a personal computer version of its life table analysis program (PC LTAS, Version 1.0). The PC LTAS is analogous to the mainframe version of NIOSH LTAS [Steenland et al., 1990], although it includes some new features and has more flexibility. NIOSH PC LTAS uses demographic and work history data to calculate person-time at risk and corresponding mortality (or incidence) rates for an exposed population. Person-time for each individual either begins at first exposure, or at a user-specified calendar date, or at a user-specified date specific to each subject in the study. Person-time may end as a common user-specified date for all subjects, or at a user-specified subject-specific date for each subject. Calculated rates for the cohort under study are stratified by age (5-year categories), calendar time (5-year categories), race (white/nonwhite), and gender before being compared to rates for a nonexposed population. Rates for several nonexposed populations are provided with the program and are also appropriately stratified by age, calendar time, race, and gender. PC LTAS calculates standardized mortality ratios (SMRs) comparing exposed to nonexposed rates for a large number of causes of death (or disease), as well as the associated confidence limits based on a Poisson distribution. SMRs are also calculated separately by user-specified categories of either duration of exposure or cumulative exposure (up to 30 categories). In addition, directly standardized rate ratios (SRRs) may be calculated when requested, as well as associated tests for trend across duration or cumulative exposure categories for the directly standardized rate ratios.

Comparison rates for the U.S. population are provided for 92 NIOSH death categories (grouping similar causes of death) from 1940 to 1999 (actual data through 1996, later years are duplicates of 1996). More detailed rates with 99 categories of death for the U.S. population are also provided for the years 1960–1999. New death categories not previously available include the pneumoconioses, HIV-related causes, cardiomyopathy, arrythmia, and testicular cancer. In addition, multiple cause mortality rates for the US population (92 death categories) cover the period 1960–1999, allowing analysis of any mention of a cause of death on the death certificate, rather than traditional analyses limited to underlying cause [Steenland et al., 1992]. Surveillance, Epidemiology, and End Results (SEER) cancer incidence rates covering 1970–1999 for 37 cancer categories are also provided with PC LTAS. Proportionate mortality analyses (PMRs) are also available via PC LTAS, with nonexposed comparison proportions provided for the U.S. population as described above for the rates. Users may also create their own rates for use with PC LTAS, as explained in the manual.

PC LTAS was designed for use with occupational data, although it can be used to analyze any cohort as long as date of first exposure (or first date at risk) is known for each subject. Required demographic data include date of birth, gender, race, date of death or disease if applicable, and date last observed. Work history data can be as limited as only the date of first exposure, or can be as detailed as information on plant, department, and job for each job held across time for each subject, including estimates of exposure level (either area or personal exposure) for each combination of plant, department, job, and calendar period (a job exposure ma-

trix). PC LTAS also permits lagging exposure, i.e., discounting exposure that takes place during a specific number of years prior to the end of follow-up.

PC LTAS can export data on person-time and observed deaths for use in Poisson regression, appropriately grouped by age, race, gender, calendar time, time since first exposure, and duration or cumulative exposure categories. PC LTAS also provides a report listing subjects observed to have died, along with their cause of death and NIOSH death category, as well as a report listing the duration of exposure and/or cumulative exposure for all subjects. PC LTAS provides summary reports on how many individuals were accepted into the analysis, and provides a listing of those rejected along with reasons for rejection. Convenient help screens are available when running the program. An easy-to-read manual with illustrations accompanies the program. The program and the manual are free; we plan to make them available to be downloaded from the Internet (NIOSH home page via www/cdc.gov/niosh/homepage.html), or they may be obtained by contacting us directly. We would appreciate hearing from users regarding the program—it is virtually impossible to try all possible combination of parameters so that there are inevitably types of life table runs we have not been able to test. Furthermore, there are numerous computer systems on which PC LTAS has not been tried. We therefore anticipate that users will find unexpected problems; we ask that they report them to us.

PC LTAS is a DOS application that requires DOS 3.0 or higher. It will run as a DOS application under Windows and, as such, can use virtual memory if needed and available. PC LTAS can be used with or without a mouse; a mouse is highly recommended. Installation of PC LTAS requires 7 megabytes of hard disk space. The minimum required memory is 4 megabytes, and the maximum memory used by PC LTAS is 16 megabytes. The processor should be an 80286 or higher, and a numeric coprocessor is recommended. PC LTAS is relatively interactive and generally provides fast turnarounds. It is written in C language.

REFERENCES

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