

## **Tools of the Trade:**

### **MEASURING PREMATURE MORTALITY USING YEARS of POTENTIAL LIFE LOST (YPLL)**

Measures of mortality are frequently used to identify and quantify public health problems. The most commonly used of these measures are death rates (crude, cause-specific, and age-adjusted) which permit comparison of mortality between population groups and by cause of death. Although these death rates provide an important measure of the public health, they often do not reflect the mortality trends of young persons due to the dominance of many chronic diseases among the elderly. For example, approximately 80 percent of all resident deaths from heart disease in Pennsylvania are to persons 65 years of age and older. While death rates provide an important measure of public health, the occurrence of disease among younger age groups is also indicative of health problems, and there is need for a more sensitive measurement to monitor public health initiatives aimed at reducing premature mortality.

One very useful measurement of premature mortality is "Years of Potential Life Lost" (YPLL). The YPLL is often calculated by subtracting age at death from age 65 (the standard "death age") for each decedent being studied, and then adding all these differences for a total YPLL, usually grouped by cause of death for comparison with cause-specific death rates. This is a relatively simple calculation and effectively emphasizes mortality due to causes of death that tend to be more predominant among younger persons, such as accidents, congenital anomalies, and AIDS.

If each decedent's age is not readily available for computation, an estimated YPLL can easily be computed using aggregate statistics. For example, there were 52 deaths due to heart disease among Pennsylvania residents aged 15-24 in 1985. The mid-point of this age range is 20 and the YPLL for a 20 year-old is 45 (20-65). Therefore, the YPLL for 15-24 year-olds dying of heart disease in 1985 was 2,340 or  $52 \times 45$ . Age-specific YPLL's can thus be computed for all age groups and summed for a total YPLL of all persons dying from heart disease in 1985 in Pennsylvania.

There is an alternative form of YPLL that can be calculated to emphasize life expectancy remaining at the time of death. The age at death is subtracted by the remaining life expectancy for that age, in place of the standard death age of 65. However, use of the standard death age provides for an easier calculation and increases sensitivity to premature mortality. When using the life expectancy method, the YPLL may significantly alter the relative rankings by cause and will more closely resemble the cause-specific death rate order. The remaining life expectancy for a specific population (such as black females 50-59 years of age) can be obtained from abridged life tables that are routinely published by the National Center for Health Statistics for each state (U.S. Decennial Life Tables, Volume II, State Life Tables, Number 39, Pennsylvania).

Limiting your computation of YPLL to particular ages may at times be more appropriate, especially to emphasize the effects of a disease or condition in a population at increased risk. For example, a study of AIDS deaths may be more beneficial if the calculation of YPLL were limited to persons of ages 25-44, the ages with the highest incidence of this illness.

The YPLL can also be represented proportionately and be age, race, or sex- adjusted to facilitate comparative analysis. A good reference source for the computation and use of the YPLL is

"Centers for Disease Control, Premature Mortality In the United States: Public Health Issues in the Use of Years of Potential Life Lost. MMWR 1986; 35 (Suppl No. 2S)."

Below is a table listing YPLL's for selected causes of death in Pennsylvania during 1986. The standard death age-of 65 was used and calculations were computed from the individual ages at death as reported on the death certificate. Cause-specific death rates are also listed for comparison of the relative rankings.

**YEARS OF POTENTIAL LIFE LOST (YPLL) BEFORE AGE 65 AND CAUSE-SPECIFIC DEATH RATES, SELECTED CAUSES, PENNSYLVANIA, 1988**

<b>Cause of Death (ICD-9 Code)</b>	<b>YPLL</b>	<b>Cause-Specific Death Rate*</b>
ALL CAUSES	529,385	1,041.7
Unintentional Injuries E800-E949	93,847	35.2
Malignant Neoplasms 140-208 (except 1739)	93,671	235.5
Diseases of the Heart 390-398, 402, 404-429	77,604	403.7
Suicide, Homicide E950-E978	51,196	17.7
Congenital Anomalies 740-759	28,525	4.5
Newborn Prematurity 765, 769	18,688	2.5
Sudden Infant Death Syndrome 798	13,312	1.8
Cerebrovascular Disease 430-438	11,467	67.0
Chronic Liver Diseases 571	8,339	10.4
Diseases Associated with AIDS 1363, 1739, 2791	7,693	2.6
Pneumonia & Influenza 480-487	6,680	30.5
Diabetes Mellitus 250	6,371	21.0
Chronic Obstructive Pulmonary Diseases 490-496	4,918	35.8

\* Per 100,000 estimated 1986 population.