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Premature Mortality

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Premature Mortality





Premature Mortality

- Definition: Premature mortality is defined as deaths occurring before age 70.
- The premature mortality rate (PMR) is the number of deaths/100,000 persons, age-adjusted to the 2000 US Standard population.



PMR : Strenghts

- The PMR is considered an excellent, single measure that reflects the health status of a population, and the need for systematic public health approaches to health promotion and disease prevention.
- PMR analyses make clear that community health status is related to many factors.
- Health care is certainly one of these factors, but not the only factor.



PMR : Strenghts

- As our analyses make clear, the **PMR may be related to socioeconomic status and its correlates**: potential issues such as environmental conditions, housing, education, stress, higher rates of smoking, substance abuse, violence, obesity, and lack of access to care.
- However, there are other possible reasons for high PMRs: specific subpopulations of younger persons at risk such as HIV/AIDS in Province town; increased motor vehicle deaths in rural areas; heart attack deaths in persons 45-64 in suburbia, etc.).



PMR Limitation

- it does not identify specific reasons why in some areas may be high or low;
- mortality might not be a good measure of important public health issues (e.g. arthritis, poor housing, etc.)



PMR : Usage

- Ultimately, the PMR is a useful planning tool to begin discussions that allow policy makers, community advocates, public health professionals, and cities and towns **to consider more effective and cost efficient approaches to improving the quality of life and health of the public.**
- Furthermore, the PMR is helpful because it moves us away from considering only **individual diseases**, and directs us towards considering **the overall health of our communities.**



PMR : Calculating

- There are three pieces of data that you will need in order to calculate the PMR.
- They are **mortality data, population data and “standard” population data.**

The following are steps needed to calculate the premature mortality rate.

- The ensuing example will look at the number of deaths to “A” Country residents under the age of 75 during the years 2004-2006.
- The standard population used in the example was the year 2000 United States standard million population age distribution.



PMR : Calculating

- We will use a method of adjusting called “**direct standardization.**”
- It consists of applying specific crude rates to a standard population.
- The method serves the purpose of summarizing a set of specific rates independently of the characteristics of the population being studied.
- (Note: We will use the standard population up to the age group 65-74 for the calculation of premature mortality rates.)



PMR : Step 1

- Using the same age groups as the 2000 U.S. standard population distribution (<1, 1-4, 5-14, up to age group 65-74), record the number of deaths to “A” residents under the age of 75 for the period 2004-2006.

| Ages | Deaths |
|-------|--------|
| <1 | 294 |
| 1-4 | 44 |
| 5-14 | 59 |
| 15-24 | 385 |
| 25-34 | 481 |
| 35-44 | 1,067 |
| 45-54 | 2,640 |
| 55-64 | 3,937 |
| 65-74 | 6,415 |
| TOTAL | 15,322 |

PMR : Step 2

- **Step 2** –List the population of “A” Country residents under the age of 75 for 2004-2006 for each of the age groups.

| Ages | Pop |
|-------|-----------|
| <1 | 38,713 |
| 1-4 | 161,039 |
| 5-14 | 442,149 |
| 15-24 | 505,121 |
| 25-34 | 426,961 |
| 35-44 | 516,469 |
| 45-54 | 558,476 |
| 55-64 | 416,442 |
| 65-74 | 310,068 |
| TOTAL | 3,375,438 |

PMR : Step 3

- Compute age-specific rates (crude rates) for each of the age-groups using data from Steps 1 and 2. (Deaths / Pop = Age-Specific Rate).

| Ages | Deaths | Pop | Age-Specific Rate |
|-------|--------|---------|-------------------|
| <1 | 294 | 38,713 | 0.0076 |
| 1-4 | 44 | 161,039 | 0.0003 |
| 5-14 | 59 | 442,149 | 0.0001 |
| 15-24 | 385 | 505,121 | 0.0008 |
| 25-34 | 481 | 426,961 | 0.0011 |
| 35-44 | 1,067 | 516,469 | 0.0021 |
| 45-54 | 2,640 | 558,476 | 0.0047 |
| 55-64 | 3,937 | 416,442 | 0.0095 |
| 65-74 | 6,415 | 310,068 | 0.0207 |



PMR : Step 4

List the “standard” population as the next column in the table.

(Remember that the standard used in this example was the 2000 U.S. standard million population distribution by age.)

PMR : Step 5

- Multiply each age-specific rate by the corresponding “standard” population. The result is an artificial index displaying the number of deaths each age group would have experienced if the age-specific death rates had actually occurred to the same age group totals found within the "standard" population.

| Ages | Deaths | Pop | Age-Specific Rate | Std Population | Index of Expected Deaths |
|-------|--------|---------|-------------------|----------------|--------------------------|
| <1 | 294 | 38,713 | 0.0076 | 13,818 | 104.9 |
| 1-4 | 44 | 161,039 | 0.0003 | 55,317 | 15.1 |
| 5-14 | 59 | 442,149 | 0.0001 | 145,565 | 19.4 |
| 15-24 | 385 | 505,121 | 0.0008 | 138,647 | 105.7 |
| 25-34 | 481 | 426,961 | 0.0011 | 135,573 | 152.7 |
| 35-44 | 1,067 | 516,469 | 0.0021 | 162,613 | 336.0 |
| 45-54 | 2,640 | 558,476 | 0.0047 | 134,834 | 637.4 |
| 55-64 | 3,937 | 416,442 | 0.0095 | 87,247 | 824.8 |
| 65-74 | 6,415 | 310,068 | 0.0207 | 66,037 | 1,366.2 |

PMR : Step 6

- Sum the “standard” population column, as well as the index of expected deaths column

| Std Population | Index of Expected Deaths |
|-------------------|--------------------------------|
| 13,818 | 104.9 |
| 55,317 | 15.1 |
| 145,565 | 19.4 |
| 138,647 | 105.7 |
| 135,573 | 152.7 |
| 162,613 | 336.0 |
| 134,834 | 637.4 |
| 87,247 | 824.8 |
| 66,037 | 1,366.2 |
| 939,651 | 3,562.3 |



PMR : Step 7

divide the index total by the total “standard” population and multiply that result by 100,000.

$(\text{Total expected deaths} / \text{Total “standard” population}) \times 100,000.$

From the table before, we would compute the age-adjusted rate by dividing 3,562.3 by 939,651 and then multiplying the result (0.003791) by 100,000.

Hence, the premature mortality rate for “A” County residents under 75 for 2004-2006 was 379.1 per 100,000.



Thank you

*Dhanyawaad
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