



Appendix D: Computing Rates

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According to the Webster's New Collegiate Dictionary, a *Rate* is:

- a quantity, amount, or degree of something
- measured per unit of something else

In public health, we commonly use rates that are the number of health events (such as motor vehicle crash deaths or influenza cases) per some number of persons in the population. Examples of rates commonly used in public health include the following:

- 21.5% of Hispanic or Latino persons had no usual source of medical care (a percent is the quantity per 100)
- 34.8 diabetes deaths per 100,000 Utah Black/African American persons
- 5.0 infant deaths per 1,000 births among American Indian/Alaska Native mothers

In the above examples, the rate has been expressed as the number of events per 100, 1,000 or 100,000 persons in the population. This is done as a convenience, so that we do not have to read and interpret small fractions. For instance, the diabetes deaths per 100,000 Black/African American Utahns in the above example could also be expressed as .000348 risk per person. It is merely easier to read and compare the rate expressed as 34.8 per 100,000 persons.

The following table contains information on the number of coronary heart disease (CHD) deaths by race and ethnicity. The actual number of health events is not very useful because the populations are so different in size. We expect to see many more deaths in the White race group because Utah's White population is much larger than the others. By calculating a rate, we can make a meaningful comparison across race and ethnic groups.

Coronary Heart Disease Deaths by Race and Hispanic Ethnicity,
Utah 1998-2003

	Average Annual # Deaths	Total 2000 Population	Rate per 100,000 Persons
All Utahns	1,490	2,233,169	66.7
AIAN	9	33,733	28.2
Asian/PI	7	59,348	11.5
Black	7	23,063	32.5
White	1,459	2,117,025	68.9
Hispanic	32	201,559	15.8

Rates are calculated using a simple formula. For instance, for Asian or Native Hawaiian/Pacific Islanders in the above table, there were 41 CHD deaths 1998–2003 (6 years), or an average of 6.833 annual deaths (rounded to 7 for display in table). There were 59,348 persons in the population.

$$\text{Computation: } 6.833 / 59,348 = .000115 \text{ (risk per person)}$$

We multiply by 100,000 to make it easier to read, and the result is 11.5 per 100,000 persons.