Percentage $\frac{\#\text{ deaths}}{\text{population}} \times 100 = \%$ Breannaschuuwe

7. **Neonatal mortality rate-** -number of infant deaths **under 28 days** in a year.
The rate formula uses live births as the denominator

$$\frac{\#\text{ of neonatal deaths under 28 days in the state}}{\#\text{ live births}} \times 1{,}000$$

Two of the specialized **morbidity (disease) rates**:

1. **Prevalence rate-** -measure of **existing** disease in a population at a **particular time**

Example: Rubella $\frac{\#\text{ of cases of a disease from a specific cause for one year for the state}}{\text{Total population of state that year}} \times 100{,}000 = \text{rate}$

2. **Incidence rate**--the number of **new** cases developing in a population **at risk** during a specified time.

Example: HIV $\frac{\#\text{ of new cases of disease over a specific period of time}}{\#\text{ of persons at risk of disease over that specific period of time}} \times 100{,}000 = \text{rate}$

All rates are calculated using a **scaling factor** (multiplier) which is usually between 1,000 to 100,000 to avoid small fractions. This multiplier represents the population base and can vary for different purposes. The results are expressed as the number of deaths per 100,000 persons, or the number of cases or number of new cases of disease per 100,000, With vital statistics they are usually figured per 1,000 population. This is different than a percentage which doesn't give an idea of the actual population base i.e. a rate of illness is 13% in one city and 25% in another but doesn't give an idea of what that might mean in terms of numbers.

The **numerators** in the rate problems represent the persons of interest. For example, in a crude death the numerator is the total number of persons who died within the defined period (usually during the past year). It is necessary to know the persons of interest that the rate requires.

The **denominators** in the rate problems can represent the total population of interest. **It is necessary to know which population figure the rate requires.**

Calculate the following rates using the information provided. Use the scaling factor of 100,000 for all of the problems.

1. The total death in County Z last year was 6,092. The population of County Z last year was 524,263. What was the crude death rate?

$\frac{6092}{524,263} \times 100{,}000 = 1162$ crude death rate

2. There were 4,953 deaths from neoplasms in City B during the past year. The year end population was 3,495,678. What was the specific cancer death rate for last year?

$\frac{4,953}{3,495,678} = \times 100{,}000 = 142$ specific cancer rate

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Rates = Not percentage

3. The population of the US in 2000 was 281,421,906. The number of deaths from heart disease in the US in 2000 was 710,760. The total number of deaths in the US in 2000 was 2,403,351.

   a Calculate the percentage (%) of heart disease deaths for the US in 2000. A.) 710,000 / 2403351 = 291.

   # OF Deaths / Population Death = 710,760 / 281,421,906 = 2403351

   b Calculate the rate of heart disease deaths in the US in 2000 for the US.

   710,760 / 281,421,906 x 100,000 = 253

4. In Illinois in 2000, the population was 12,419,293. The number of Salmonella cases in 2000 was 1,502 in Illinois. Calculate the disease rate for Salmonella for Illinois in 2000.

   1502 / 12,419,293 x 100,000 = 12.1

5. There were 45,238 neonatal deaths out of 5,672,000 live births in City F. Calculate the neonatal mortality (death) rate.

   45,238 / 5,672,000 x 1,000 = 7.9 = 8

6. The population in Sangamon county in 2000 was 188,951

   a The number of live births in Sangamon County in 2000 was 2,646. Figure the Live Birth rate for Sangamon country for 2000.

   2646 / 188,951 x 1000 = 14.0

   b The number of infant deaths in Sangamon County in 2000 was 18. Figure the infant mortality rate for Sangamon country for 2000.

   18 / 2646 x1000 = 6.8

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EPIDEMIOLOGY EXERCISES

INFANT MORTALITY, CHICAGO COMMUNITY AREAS

OF Death / # Live Births

TABLE 1

	COMMUNITY AREA	# of LIVE BIRTHS	DEATHS UNDER ONE YEAR #	DEATHS UNDER ONE YEAR RATE PER 1000 BIRTHS
01.	Rogers Park	1,054	13	12.3
02.	West Ridge	966	5	5.2
03.	Uptown	1,340	26	19.4
04.	Lincoln Square	760	13	17.1
05.	North Center	610	7	11.5
27.	East Garfield Park	763	19	24.9
28.	Near West Park	1,338	34	25.4
36.	Oakland	295	8	27.1
39.	Grand Boulevard	1,209	24	19.9
40.	Washington Park	735	17	23.1
68.	Englewood	1,303	27	20.7
73.	Washington Heights	507	17	33.5
	CHICAGO	55,216	914	16.6
	UNITED STATES	--	--	12.5

OF BIRTHS / Population x 1000

A. Fill in the blank columns in Table 1 using the formula to calculate infant mortality rate. A hand or desk calculator speeds calculations but is not essential.

B. Compare the infant mortality rate you calculated for Lincoln Square with that of East Garfield Park. Are they the same or different?

East garfield park has a higher Rate than Lincoln Square

C. What general trends, if any, are apparent from these data?

The lower the population, the increased in rate

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D. Compare the infant mortality rate of the City of Chicago with that of the United States. Are the rates the same of different? What factors may account, between Chicago and the United States, affect these rates?

The US has a smaller amount.
FACTORS DEPEND ON = # OF DEATHS, POPULATION, E

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