Calculate the following rates using the information provided.

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? Use 100,000 as the multiplier. Round to the nearest whole number.

$\frac{6,092}{524,263} \times 100,000 = 1,162.0 \rightarrow 1,162$ deaths per 100,000

or 12 per 1,000

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? Use 100,000 as the multiplier. Round to the nearest whole number.

$\frac{4,953}{3,495,678} \times 100,000 = 141.6 \rightarrow 142$ cancer deaths per 100,000

3. The population of the US in 2000 was 99,421,906. 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. Round to the nearest whole number.

$\frac{710,760}{2,403,351} = 0.29 = 29.5$

30% of deaths in the US were from heart disease

   b Calculate the rate of heart disease deaths in the US in 2000 for the US. Use 100,000 as the multiplier. Round to the nearest whole number.

$\frac{710,760}{99,421,906} \times 100,000 = 714.89$

↓ heart disease deaths

715 per 100,000

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 incidence rate for Salmonella for Illinois in 2000. Use 100,000 as the multiplier. Round to the nearest whole number.

$\frac{1,502}{12,419,293} \times 100,000 = 12.09 \rightarrow 12$ Salmonella cases per 100,000

5. There were 45,238 neonatal deaths out of 5,672,000 live births in City F. Calculate the neonatal mortality (death) rate. Use 1,000 as the multiplier. Round to the nearest whole number.

$\frac{45,238}{5,672,000} \times 1,000 = 7.97 \rightarrow$ 8 deaths per 1,000 live births

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. Use 1,000 as the multiplier. Round to the nearest whole number.

$\frac{2,646}{188,951} \times 1,000 = 14.0 \rightarrow$ 14 live births per 1,000

   b The number of infant deaths in Sangamon County in 2000 was 18. Figure the infant mortality rate for Sangamon country for 2000. Use 1,000 as the multiplier. Round to the nearest whole number.

$\frac{18}{2,646} \times 1,000 = 6.80 \rightarrow$ 7 infant deaths per 1,000

7. A city has a population of 250,000. Of these, 10,000 have disease X, which is incurable. There are 1,000 new cases and 400 deaths each year from this disease. There are 2,500 deaths per year from all causes. What is the prevalence rate based on a multiplier 100,000. Round to the nearest whole number.

$\frac{10,000}{250,000} \times 100,000 = 4,000$ people with disease X per 100,000

	Quintile of CRP Level				
	1	2	3	4	5
	0.49 mg/dL	>0.49-1.08 mg/dL	>1.08-2.09 mg/dL	>2.09-4.19 mg/dL	>4.19 mg/dL
Relative Risk	1.0	1.8	2.3	3.2	4.5
Number of women	6000	6000	6000	6000	6000

equal → greater risk →

8. Based on the relative risk data above, one can conclude:
   a There is no risk of heart attack/stroke for women with CRP levels in the first quintile.
   b Decreasing CRP level appears to increase the risk of heart attack/stroke.
   (c) Increasing CRP level appears to increase the risk of heart attack/stroke.
   d There appears to be no association between CRP levels and heart attack/stroke.

9. In 2020, the population of Illinois is 12.63 million. Total cases of COVID-19 is 900,370. Using 100,000 as a multiplier, what is the period prevalence rate? Round to the nearest whole number.

$$\frac{900{,}370}{12{,}630{,}000} = 0.0712 \times 100{,}000 = 7{,}128.8$$

7,129 COVID-19 cases per 100,000

10. In 2020, the population of Illinois is 12.63 million. The total deaths from COVID-19 is 128,000. Using 100,000 as a multiplier, what is the cause-specific mortality rate? Round to the nearest whole number.

$$\frac{128{,}000}{12{,}630{,}000} \times 100{,}000 = 1013.4 \rightarrow 1{,}013 \text{ COVID-19 deaths per } 100{,}000$$

EPIDEMIOLOGY EXERCISES
INFANT MORTALITY, CHICAGO COMMUNITY AREAS

TABLE 1

	COMMUNITY AREA	# of LIVE BIRTHS	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

A. Fill in the blank columns in Table 1 using the formula to calculate infant mortality rate. Use 1,000 as your multiplier and round the answer to the nearest tenth. ✓

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

LS < EGP
The infant mortality rate is greater in East Garfield Park than it is in Lincoln Square

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

WR ↓
WHTT ↑

West Ridge has the lowest infant mortality rates at 5.2 deaths per 1,000 births. Washington Heights had the highest infant mortality rate at 33.5 deaths per 1,000 births.

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

Chicago infant mortality rates are higher than the U.S. Birth defects, preterm birth, low birthweight, and SIDS can cause infant deaths. Chicago residents may have less access to prenatal care and receive less education.