



FINAL EXAM

Instructor: Ernesto F. L. Amaral, Assistant Professor, Department of Sociology

Date: December 11, 2019 (Wednesday)

Time: 8–10am

Percent of final grade: 20%

Answer the following 40 multiple choice questions for a total of 20 points, related to material covered in our course. Questions are worth 0.5 points each. Mark your responses on a grey and white 8.5”x11” Scantron testing form. Only No.2 pencils can be used to bubble in answers (not ink). Turn in your Scantron testing form to the professor. The student can keep the pages of this exam.

The correct answers are underlined.

1. Demography is the systematic and _____ study of human _____.

- a. social characteristics
- b. thorough populations
- c. scientific ... characteristics
- d. detailed ... changes
- e. scientific ... populations

2. Demography is the social science that studies:

- a. The size, composition, and distribution of the human population of a given area at a specific point in time.
- b. The changes in population size and composition.
- c. The components of these changes (fertility, mortality, and migration) and the factors that affect these components.
- d. The consequences of changes in population size, composition, and distribution, or in the components themselves.
- e. All of the above.

3. John Graunt (1620–1674) was an English statistician and is considered the founder of demography. He is known for several substantive contributions to demography, except:

- a. He recognized the phenomenon of rural-urban migration.
- b. He observed that the rural death rate exceeded urban death rate.
- c. Male birth rate was higher than female birth rate.
- d. Male death rate was higher than female death rate.
- e. He was the first to attempt to construct a life table.

4. Population structure is defined as:

- a. How many people there are in a given place.
- b. Where people are located and why.
- c. How many males and females there are of each age.
- d. What people are like in a given place.
- e. Geographical location of people.

5. All but one of the following are examples of demographic findings:

- a. The childbearing years for men are 15–49.
- b. The childbearing years for women are 15–49.
- c. Women live longer than men.
- d. People are most likely to migrate when in their 20s.

6. The sex ratio at birth is calculated with this formula:

- a. (male births / female births) *100
- b. (female births / male births) *100
- c. (female births / total births) *100
- d. (male births / total births) *100
- e. (total births / male births) *100

7. The three demographic processes are:

- a. Fertility, mortality, and international migration.
- b. Reproduction, mortality, and migration.
- c. Births, deaths, and marriage.
- d. Fertility, mortality, and migration.
- e. Reproduction, marriage, and divorce.

8. Population growth rate considers the following components on its estimation, except:

- a. Length of a period.
- b. Population at the middle of the interval.
- c. Population at the beginning of the interval.
- d. Population at the end of the interval.

9. By taking logarithms of population at the beginning of the interval and population at the end of the interval, as some of the components to measure population growth rates:

- a. We cannot measure growth rate by graph slope, because slope changes even when B/K and D/K are fixed.
- b. We can project the population at the beginning of the interval.
- c. We can estimate doubling times as the $\log(.69)$ divided by the growth rate.
- d. We can measure growth by graph slope, because slope stays fixed when B/K and D/K are fixed.

10. Usually the general form of balancing equation is illustrated for a closed population, which means that

- a. Births are not considered in the analysis.
- b. Deaths are not considered in the analysis.
- c. Migration flows are not considered in the analysis.
- d. Population at the beginning of the period is not considered in the analysis.

11. The Lexis diagram provides relationships between:

- a. Chronological time t (vertical) and age x (horizontal).
- b. Chronological time t (horizontal) and age x (vertical).
- c. Chronological time x (vertical) and age x (horizontal).
- d. Chronological time x (horizontal) and age x (vertical).

12. The Lexis diagram may provide the following analysis:

- a. Estimation of population in a specific year (cross-sectional).
- b. Comparison of group of individuals followed simultaneously through time and age (cohort).
- c. Comparison of group of individuals within an age group through time.
- d. All of the above.

13. To find the population size for a specific year in a Lexis diagram:

- a. Draw horizontal line across at the height corresponding to an age group, count how many lifelines cross that horizontal line.
- b. Draw vertical line upward from the time point (period), count how many lifelines cross vertical line.
- c. Follow diagonally group of people sharing the same birthdate (cohort) through time and age.
- d. Draw horizontal line across at the height corresponding to a period, count how many lifelines cross that horizontal line.
- e. Draw vertical line upward from the time point (age group), count how many lifelines cross vertical line.

14. To find how many people survive to some age through time in a Lexis diagram:

- a. Draw horizontal line across at the height corresponding to an age group, count how many lifelines cross that horizontal line.
- b. Draw vertical line upward from the time point (period), count how many lifelines cross vertical line.
- c. Follow diagonally group of people sharing the same birthdate (cohort) through time and age.
- d. Draw horizontal line across at the height corresponding to a period, count how many lifelines cross that horizontal line.
- e. Draw vertical line upward from the time point (age group), count how many lifelines cross vertical line.

15. When we compare the relative sizes of categories, the indicator shows how many times the first number contains the second. In this case, the denominator is not at “risk” of moving to the numerator. Which of the following options relate to this statement?

- a. Rates.
- b. Ratios.
- c. Person-years.
- d. Probabilities.

16. When we describe the number of occurrences of an event for a given number of individuals per unit of time, the indicator includes time directly in the denominator (time spent at risk). Which of the following options relate to this statement?

- a. Rates.
- b. Ratios.
- c. Person-years.
- d. Probabilities.

17. The sum of each individual’s time at risk of experiencing an event is the ideal denominator to estimate a rate. Which of the following options relate to this statement?

- a. Rates.
- b. Ratios.
- c. Person-years.
- d. Probabilities.

18. An approximation for the denominator of probabilities is to take the:

- a. Difference between the populations at the beginning and at the end of the period.
- b. Population at the beginning of the period.
- c. Population at the end of the period.
- d. Average of the populations at the beginning and at the end of the period.

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- d. Average of the populations at the beginning and at the end of the period.

20. A society with constant birth rates, constant death rates, and growing, constant, or declining population size is an example of a:

- a. Stationary population.
- b. Stable population.
- c. Closed population.
- d. Open population.

21. Below are key terms that demographers use in studying fertility. Which term describes the biological capability of producing live births?

- a. Fertility.
- b. Reproduction.
- c. Childbearing.
- d. Fecundity.
- e. Postpartum fertility.

22. _____ refers to the production of female births.

- a. Fecundity
- b. Reproduction
- c. Male reproduction
- d. Fertility
- e. Sexual activity

23. Replacement-level fertility refers to what?

- a. The fertility rate at which a cohort of women has only enough children to replace themselves in the population.
- b. The fertility rate at which the entire population is replaced by twice as many children.
- c. The calculation of the age-specific fertility rate for a cohort of women who all have at least one child.
- d. The level of fertility for countries with skewed sex ratios at birth.

24. Fertility analyses can be conducted in different ways. If a researcher analyzes the total fertility rate of U.S. women in the single year of 2016, what kind of an analysis is he/she conducting?

- a. Micro analysis.
- b. Cohort analysis.
- c. Cross-sectional analysis.
- d. Cumulative analysis.
- e. Multilevel analysis.

25. Usually age-specific fertility rates are calculated for women in five-year age groups, resulting in a total of:

- a. Four age groups.
- b. Five age groups.
- c. Six age groups.
- d. Seven age groups.
- e. Eight age groups.

26. Natural fertility is the level of reproduction in the absence of deliberate fertility control. Which group is usually used by demographers as an estimate of natural fertility?

- a. Americans.
- b. Canadians.
- c. Hutterites.
- d. Mexicans.

27. Which of the following birth/fertility rates is cross-sectional and measures the number of births in a population in a year per 1,000 individuals in that population?

- a. Crude birth rate.
- b. Total fertility rate.
- c. Net reproduction rate.
- d. General fertility rate.
- e. Gross reproduction rate.

28. If we would like to consider the level of population replacement of a specific region, as well as the factor of mortality among mothers during their childbearing years, we should estimate the:

- a. Crude birth rate.
- b. Total fertility rate.
- c. Net reproduction rate.
- d. General fertility rate.
- e. Gross reproduction rate.

29. If we would like to consider the level of population replacement of a specific region, but not the factor of mortality among mothers during their childbearing years, we should estimate the:

- a. Crude birth rate.
- b. Total fertility rate.
- c. Net reproduction rate.
- d. General fertility rate.
- e. Gross reproduction rate.

30. The crude death rate is the number of deaths in a population in a given year per _____ members of the population.

- a. 100
- b. 1,000
- c. 10,000
- d. 100,000

31. What is the main similarity between the procedures of standardizing death rates and estimating life tables?

- a. They estimate life expectancy at birth.
- b. They take the population distribution from one group as the standard for the other group.
- c. They account for immigration and emigration flows in their estimations.
- d. They consider differences in age structure for different years, areas, or sub-groups of the population.

32. When studying the death rates patterns of a population, why do demographers usually analyze age-specific death rates instead of the crude death rate in their research?

- a. Because death rates vary considerably by age.
- b. Because we cannot accurately measure deaths per year.
- c. Because the Centers for Disease Control and Prevention won't release annual death rates in a timely manner.
- d. So that we can standardize death rates and exclude deaths related to acts of violence.
- e. Because the U.S. became much older between the 1960's and 2016.

33. The following statistical concepts are directly used to calculate life expectancy, except:

- a. Age-specific death rate.
- b. Age-adjusted death rate.
- c. Probability of dying between two different ages.
- d. Number of years lived.

34. The following measures are included in a life table, except:

- a. The probability of dying between age x and age $x+n$.
- b. The number of survivors at each age x .
- c. The number of births for women at age x (when $x = 15$ to 49).
- d. Life expectancy at each age x .

35. Which of the following symbols is the life table symbol for life expectancy at birth?

- a. l_x
- b. l_0
- c. e_x
- d. e_0

36. Why should we not think of life expectancy at birth as a modal age at death?

- a. Because death rates vary due to socioeconomic variables in countries and regions.
- b. Because mortality rates of mothers can be misleading when calculating the death rates of infants.
- c. Because acts of war and violence in areas with low life expectancy at birth can impact modal age at death.
- d. Because high infant mortality rates can cause life expectancy at birth to be low.
- e. Because the numbers of deaths vary so much according to their causes.

37. In relation to period life tables, it is correct to affirm that:

- a. The life table always assumes an initial population of 100,000 births, which is subjected to the mortality schedule.
- b. The higher the death rates, more people will survive through an entire age interval.
- c. The number of people dying during the age interval equals the probability of death times the number of people alive at beginning of the age interval.
- d. The cumulative number of years lived is the total number of years lived in a given age interval and all younger age intervals.

38. In relation to period life tables, it is correct to affirm that:

- a. The probability of death (${}_nL_x$) relates the number of deaths during any given number of years to the number of people who started out being alive and at risk of dying.
- b. The probability of surviving from birth to age x is designated as $p_x = l_x / l_0$.
- c. The number of years lived (${}_nQ_x$) has to consider that some people die before the end of the age interval.
- d. The life expectancy (e_x) is the division of the number of people dying during the age interval (${}_nd_x$) by the cumulative number of years lived (T_x).

39. In a life table with $l_0=100,000$; $l_{30}=98,429$; $l_{70}=82,012$; and $T_0=8,103,588$, it is correct to affirm that:

- a. The crude death rate equals 8,103,588 divided by 100,000.
- b. The probability of surviving from birth to age 30 equals to 100,000 divided by 98,429.
- c. The crude birth rate equals 100,000 divided by 8,103,588.
- d. The probability of surviving from age 30 to age 70 equals to 98,429 divided by 82,012.

40. A life table can be interpreted as the experience of a synthetic cohort or as a stationary population. Which of the following statements is incorrect?

- a. A life table can inform the lifetime mortality experience of a single cohort of newborn babies, who are subject to specific age-specific mortality rates. This relates to the synthetic cohort approach about the history of a hypothetical cohort.
- b. A life table can be used as an estimation of a stationary population, in which results are interpreted as coming from unchanging schedule of age-specific mortality rates and a constant annual number of births/deaths.
- c. In the stationary population approach, ${}_nL_x$ is the number of person-years that would be lived within the indicated age interval by the cohort of births assumed at the radix of the table.
- d. In the synthetic cohort approach, l_x is the number of persons living at the beginning of the indicated age interval out of the total number of births assumed as the radix of the table.