

Spring 2023

ASSIGNMENT 4 Due by May 02, 2023 (Tuesday) at 11:59pm Percent of final grade: 20%

Instructor information

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Submission

This assignment should be submitted through Turnitin within Canvas. Turnitin is an online database system designed to help instructors <u>detect plagiarism</u>, track citations, facilitate peer reviews, and provide paperless grading markup in written assignments. Students should develop this assignment <u>individually</u>.

Answers to substantive questions should be around <u>150 words</u> (for each question) and be written in <u>Microsoft Word</u>. The Word document should be on US Letter paper size, one-inch margins, Arial font, size 11, 1.5 line spacing. Answers to methods questions should be solved in <u>Microsoft Excel</u>, but the final results and interpretations should be exported and properly formatted in the Word document. Students should include <u>detailed formulas</u> utilized to answer the questions in Word and Excel. Students should <u>submit both</u> the Word file and the Excel file on Canvas.

Look at examples of how to properly format tables and figures in Word at http://www.ernestoamaral.com/docs/soci633-23spring/Examples_tab_fig.pdf.

See examples of how to place tables and figures in your document, as well as of how to cite them throughout the document on this link (http://www.ernestoamaral.com/drafts.html).

Purpose

The purpose of this assignment is to test the knowledge about topics on <u>period mortality</u> and <u>migration</u>, as discussed in the classroom and course material. These topics are the foundation to understand a series of demographic methods discussed throughout this course.

Main references

Poston, Dudley L.; Bouvier, Leon F. 2017. **Population and Society: An Introduction to Demography**. New York: Cambridge University Press. 2nd edition.

Wachter, Kenneth W. 2014. Essential Demographic Methods. Cambridge: Harvard University Press



Period mortality (14 points)

Questions 1.1 and 1.3 are worth 5 points each. Question 1.2 is worth 4 points.

1.1. Collect death and population data for two U.S. states in 2017 by sex and five-year age groups. In order to download this data, visit the CDC WONDER data website (<u>https://wonder.cdc.gov/</u>), provided by the Centers for Disease Control and Prevention.

a) Under the tab "WONDER Systems," topic "Deaths," sub-topic "All Ages," click on the link "Underlying Cause of Death".

b) In the new page, click on "2018–2021: Underlying Cause of Death by Single-Race Categories."

c) In the new page, under the tab "About," click on button "I Agree."

d) Under the tab "Request Form:"

d.1) Indicate table layout:

L. Organize table	e layout.	
Group Results By	State	~
And By	Year	~
And By	Gender	~
And By	Five-Year Age Groups	~
And By	None	~

d.2) Select two states. You can repeat these steps for one state at a time. Or you can use Ctrl+Click to select multiple states. When you click on the left window, the state will appear on the right window:





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d.3) Select "Five-Year Age Groups" and keep "All Ages," "All Genders," "All Origins," "All Races:"

d.4) Select years 2019 and 2021. When you click on the left window, the year will appear on the right window. You can use Ctrl+Click to select multiple states:

Finder Tool Hel	p Advanced Finder (<u>Options</u>	
Browse Search	Details		
Year/Month *All" (All Date: + 2018 (2018) + 2019 (2019) + 2020 (2020) + 2021 (2021)	Currently selected: 2019 (2019) 2021 (2021)		
Open Close Clo	se All		

d.5) Keep "all weekends," "all values," "all places" selected:

5. Select weekday, autopsy and place of death:

Hint: Use Ctrl + Click for multiple selections, or Shift + Click for a range.

<u>Weekday</u>	<u>Autopsy</u>
All Weekdays	All Values
Sunday	No
Monday	Yes
Tuesday	Unknown
Wednesday	
Thursday	
Friday	
Saturday	
Unknown	

Place of Death
All Places
Medical Facility - Inpatient
Medical Facility - Outpatient or ER

Medical Facility - Decipation of Erc Medical Facility - Status unknown Decedent's home Hospice facility Nursing home/long term care Other



d.6) Keep "all causes of death" selected:

. Select cause of death:	
Click a button to select ICD codes by Chapters or by Groups. © ICD-10 Codes CICD-10 130 Cause List (Infants) Drug/Ald ICD-10 113 Cause List (Infants) Drug/Ald Injury Intent and Mechanism Growse or search to find items in the ICD-10 Codes Finder Tool, then highlight the items to The Currently selected box displays all current request items.)	o use for this request.
Finder Tool Help Advanced Finder Options	
Browse Search Details	
ICD-10 Codes	Currently selected:
 "All" (All Causes of Death) + A00-B99 (Certain infectious and parasitic diseases) + C00-D48 (Neoplasms) + D50-D89 (Diseases of the blood and blood-forming organs and certain disorders involving the in + E00-E88 (Endocrine, nutritional and metabolic diseases) + F01-F99 (Mental and behavioural disorders) + G00-G98 (Diseases of the eye and adnexa) + H00-H57 (Diseases of the eye and adnexa) + H60-H93 (Diseases of the ear and mastoid process) + I00-I99 (Diseases of the circulatory system) 	"All" (All Causes of Death)
Open Fully Close Close All Browse the list by opening and closing items. Use Ctrl+Click to multiple select, Shift+Click for a range.	

d.7) Select "Export Results" and "Show Totals:"



d.8) Click on the "Send" button at the bottom of the page to save the table as a TXT file. You can also check the results of your selection by going back to the top of the window and clicking on the tab "Results." You can also click on the "Export" button to save the table as a TXT file. Columns are separated by tabs, a format that allows this file to be imported into a wide variety of programs, such as Microsoft Excel.

Underlying Cause of	Death Data	Dataset Doc	umentation Other Data Access Help for Re	sults Printing Tips Help with I	Exports	Save Export Rese
Quick Options Messages:	More	e Options				Top Notes Citation Query Crite
 Totals are not Rows with su 	t available ppressed l	for these re Deaths are h	sults due to suppression constrai idden. Use Quick Options above t	ints. <u>More Information.</u> to show suppressed row	/5.	
State 🦊	Year	Gender	Five-Year Age Groups	➡ Deaths 🛧 🖡	🟅 Population 🔒	🗢 Crude Rate Per 100,000 🔒
California (06)	2019	Female	< 1 year	841	225,948	372
California (06)	2019	Female	1-4 years	132	937,683	14
California (06)	2019	Female	5-9 years	102	1,211,976	8
California (06)	2019	Female	10-14 years	112	1,236,285	9
California (06)	2019	Female	15-19 years	258	1,241,516	20
California (06)	2019	Female	20-24 years	484	1,287,528	37
California (06)	2019	Female	25-29 years	632	1,494,297	42
California (06)	2019	Female	30-34 years	909	1,432,403	63
California (06)	2019	Female	35-39 years	1,166	1,363,988	85
California (06)	2019	Female	40-44 years	1,478	1,245,533	118
California (06)	2019	Female	45-49 years	2,212	1,263,078	175
California (06)	2019	Female	50-54 years	3,306	1,236,296	267
California (06)	2019	Female	55-59 years	5,339	1,276,289	418
California (06)	2019	Female	60-64 years	7,580	1,178,827	643
California (06)	2019	Female	65-69 years	9,012	1,002,526	898
California (06)	2019	Female	70-74 years	11,338	807,409	1,404
California (06)	2019	Female	75-79 years	13,187	564,629	2,335
California (06)	2019	Female	80-84 years	16,447	391,601	4,199
California (06)	2019	Female	85-89 years	19,722	Not Applicable	Not Applicab
California (06)	2019	Female	90-94 years	19,818	Not Applicable	Not Applicab
California (06)	2019	Female	95-99 years	11,202	Not Applicable	Not Applicab
California (06)	2019	Female	100+ years	2,847	Not Applicable	Not Applicab
California (06)	2019	Female	Not Stated	11	Not Applicable	Not Applicab



e) Open Microsoft Excel and open the TXT file:

e.1) On step 1, indicate that the file has "delimited" columns:

Text Import Wizard - Step 1 of 3						
The Text Wizard has determined that your data is Delimited. If this is correct, choose Next, or choose the Data Type that best describes your data.						
 Delimited - Characters such as commas or tabs separate each field. Fixed width - Fields are aligned in columns with spaces between each field. 						
Start import at row: 1 🗘 File origin: Macintosh						
Preview of selected data: Preview of file /Users/amar/Underlying Cause of Death, 2018-2021, Single Race.txt. 1"Notes" "State" "State Code" "Year" "Year Code" "Gender" "Gender Code" "Five-Year Age Groups" "Five-Year						
I'Notes" 'State" 'State Code" 'Tenn' Code" 'Gender 'Gender						
Cancel < Back Next > Finish						

e.2) On step 2, indicate that columns are delimited by tabs. Then click on "Finish." You do not have to go to step 3.

		Text Im	port V	Vizard	- St	ep 2 of 3				
This screen le	ets you se	t the delim	niters y	/our da	ata c	ontains.				
Delimiters										
🗸 Tab					Treat	consecut	ive de	limiters	as one	
Semicolon				Text	t qua	alifier:		0		
Comma										
Space										
Other:										
Design										
Preview of sel	ected data	a:								
Notes Štate California California California California California California	State Code Y 26 2 26 2 26 2 26 2 26 2 26 2 26 2 26	ear Year Code 019 2019 019 2019 019 2019 019 2019 019 2019 019 2019 019 2019 019 2019	Gender Female Female Female Female Female Female Female	Gender C F F F F F F	ode F 1 5 1(2) 2) 2)	ive-Year Age 1 year -4 years -9 years 0-14 years 5-19 years 0-24 years 5-29 years	Groups	Five-Year 1 1-4 5-9 10-14 15-19 20-24 25-29	Age Groups	G
			Car	ncel		< Back	Ne	ext >	Finis	h



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f) Your data will appear in an Excel spreadsheet. For this assignment, you will use data from columns "Deaths" and "Population" (not from "Crude Rate").

You will notice that the "Population" column does not have information for the 85–89, 90–94, 95–99, and 100+ age groups (it ends on 80–84, which is actually 80+ for population counts). Thus, in the "Deaths" column, you should add rows for the 80–84, 85–89, 90–94, 95–99, and 100+ age groups. This information will become the 80+ age group (the final age group in your life table).

Organize death and population counts in a table by five-year age groups (ending with 80+ age group) and sex for each of the two selected states, such as illustrated below. Generate age pyramids for each state and year. Interpret the results.

	2019					2021				
Age group	Width	dth Females		м	ales	Fe	males	Males		
		Deaths	Population	Deaths	Population	Deaths	Population	Deaths	Population	
0	1									
1-4	4									
5-9	5									
10-14	5									
15-19	5									
20-24	5									
25-29	5									
30-34	5									
35-39	5									
40-44	5									
45-49	5									
50-54	5									
55-59	5									
60-64	5									
65-69	5									
70-74	5									
75-79	5									
80+	00									

Table 1. Total deaths and population by age group and sex, State 1

Source: CDC WONDER data website (https://wonder.cdc.gov/), provided by the Centers for Disease Control and Prevention.



1.2. Calculate crude death rates for each state using data organized on question 1.1 (both sexes combined and up to 80+ age group). Provide a graph with age-specific death rates (such as Figure 1) and a graph with ratio of proportion population between the two states (such as Figure 2) comparing the selected states for each year. Figures 1 and 2 were used as examples during lectures. Taking the population counts of one state as a standard, calculate an age-standardized death rate for the other state for each year. Interpret the results.





Source: Poston and Bouvier (2017).





Source: Poston and Bouvier (2017).



1.3. Utilizing the data organized on question 1.1 (up to 80+ age group), calculate all the columns of a period lifetable by sex for each of the two selected states and for each year. Use the formula specifications provided by the course textbook (Wachter, 2014).

(a) Interpret the results for each sex, state, and year.

(b) Generate age pyramids for the stationary population based on the life table calculations for each state and year. Interpret these age pyramids, comparing to the age pyramids with observed population counts from question 1.1.

(c) What do the different interpretations of a life table mean (synthetic cohort and stationary population)? What are the interpretations of these terms (I_x , nd_x , nL_x , T_x) using the two different approaches?

Migration (6 points)

All questions below are worth 1.5 points each.

2.1. Give three examples of measures of migration. What is meant by the concept of migration efficiency? How do demographers measure this phenomenon?

2.2. Explain the main differences of estimating migration rates by age group with: (1) last-move data (previous residence) and duration of residence; or (2) place of residence at a fixed date in the past.

2.3. Why mathematical models are useful to analyze migration rates? What are their limitations?

2.4. Why gravity models and spatial models are useful to understand factors associated with migration?