Difference/Ratio Comparisons

Note: There were lots of "numbers flying around" on this assignment, so if you think I misread your number, let me know!

Please submit answers (preferably by uploading a Word or PDF file) for the following questions:

1) In the **article** ⤷ **(https://onlinelibrary.wiley.com/doi/epdf/10.1016/j.pmrj.2018.05.003)** by Rebecca Nuzzo,

(a) What was meant by the phrase "is not affected by reversing the direction of comparison" and why is it an important consideration?

(b) Why does she propose the symmetrized percent difference?

Focus on how the "impression" (size/magnitude) of the comparison doesn't depend on how you set up the calculation.

2) The Youth Risk Behavior Surveillance Survey (YRBSS) collects data on high school students through the United States. Here are counts from the 2017 YRBSS report, comparing youths in Arizona and California on how often they (say that they) wear a seat belt when riding in a car driven by someone else:

	Arizona	California
Rarely or never	173	103
Sometimes, most of the time, or always	1966	1675
Total	2139	1778

(a) What percentage of youth in each state claim to wear a seat belt?

(b) Is it correct to say that Arizona youths in the sample were about 2.3% more likely to wear a seat belt rarely or never than California youths in the sample? If not, write an appropriate comparison of these values.

Note, 8.1 - 5.8 = 2.3

We could say the percentage not using seat belts in AZ was 2.3 percentage points than in CA (for this sample). If you want to say X% higher, then calculate the percentage difference ((8.1-5.8)/5.8) x 100% = 39.7% higher. (The percentage/rate/changes of not wearing a seat belt regularly...). (Check: In other words 2.3 is about 1/3 of 5.8)

3) For each of the phrases listed below

(a) identify other phrases on the list that have the same meaning; 1 with 6, 3 with 5, and 2 with 4, 7, 8.

(b) write the equivalent dollar value, assuming comparison against a price of $200; 50, 250, 150

(c) write the corresponding ratio. For statement 1, for example, the ratio would be 0.25. .25, 1.25, .75

1. "25% of the original price"
2. "costs 25% less than . . ."
3. "costs 25% more than . . ."
4. "priced 25% off "
5. "125% of the original price"
6. "marked down 75%"
7. "75% of the original price"
8. "costs 75% as much as . . ."

4) The homicide rate in the US dropped from 5.6 homicides per 100,000 persons in 2002 to 4.2 per 100,000 in 2012. Calculate and write sentences to describe

(a) the differences between the homicide rates in the two periods; wanted a *difference* of 1.4 homicides per 100,000 persons (difference has units)

(b) the ratio of the homicide rates in the two periods; e.g., 5.6/4.2 => the *homicide rate* was 1.33 **times** higher in 2002 than in 2012 (ratio does not have units but make sure you have **direction** and the right "variable" - what numbers are being compared)).

(c) the percentage change between the two periods using (i) the 2002 rate as the denominator and (ii) the average of the two rates as the denominator (the "symmetrized percent difference").

Putting 2002 in the denominator (4.2 - 5.6)/5.6 x100% => -25%. The 2012 homicide rate is 25% smaller than the 2002 homicide rate.

Note if you use 4.2/5.6 (using 2002 rate as the comparison value), the 2012 homicide rate is 0.75 times smaller than the 2002 homicide rate, and then subtract one and multiply by 100% to convert to the percentage change.

You can also say (5.6 - 4.2)/5.6 x 100% => The increase in the homicide rate (2012 to 2002) is 25% higher than the 2012 homicide rate. Probably makes more sense to go forward in time, the point is to make sure it's clear what you are comparing to.

If we compare to the 2012 homicide rate instead (change the reference value), the 2002 homicide rate was 33% higher than the 2012 homicide rate. (not symmetric)

For symmetrized difference, she uses the sum (4.2 + 5.6) in the denominator, but then in the article never interprets this. You need to at least use s% as the "units," to clarify that you have done something a little different here.

Alternatively, could use the average (4.2 + 5.6)/2 as the denominator. Personally this makes a little bit more sense to me, but then the interpretation would need to say something like 1.4 is 29% of 4.9... or the 2002 homicide rate is 29% larger than the overall or the average homicide rate. Or, taking advantage of the symmetry, the 2012 homicide rate is 29% smaller than the average homicide rate. The point is, be clear what is being compared, even if it takes a few more words :)

Points	10
Submitting	a text entry box or a file upload
File Types	pdf, doc, and docx

Due	For	Available from	Until
Apr 30, 2020 at 5pm	Everyone	-	-

+ **Rubric**