WEBSTER UNIVERSITY'S 2016-2020 FALL ENROLLMENT DESCRIPTIVE ANALYSIS

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1. OVERVIEW

As a part of my, Mandy HP Nguyen's, fun 2021 Winter Break data-play projects, I scouted and learn about the enrollment number of my graduate school, Webster University in Saint Louis, Missouri to enhance my data analytics' skills. After extracting and cleaning the desired public data from the National Center for Education Statistics (NCES), I plotted them into different graphs to discover Webster University's demographic features. The analysis reveals the decreasing trend of enrollment from 2016 to 2020, along with the majority of student distributions in terms of genders and races. In particular, female students slightly account for more than half in respect of genders, as well as the race of white regarding races. The current progress of this project by January 05, 2022, is on halt at exploring Races and Genders aspects of Webster University's 2016-2020 Fall Enrollment. Next updates will continue to explore the enrollments in terms of Education levels and comparing to other opponent college and higher education institutions of Webster University within Missouri state.

2. DATA COLLECTION

The data sets in used are synthesized from data extracted from NCES's public database of all academic institutions around the world. As the database is enormous including over 6,000 educational institutions of all academic levels, I filtered my university and handpicked each of its attributes containing the information required (enrollment, year, gender, races). However, the exported .csv data is not well structured into tables so it consumed time to manually clean and classify in Microsoft Excel (MS Excel), and the data sets can be explored on my GitHub repository [1]. After cleaning, the final data set can be found in this repository [2] namely "WU_20_Level_data.csv". The data file includes 90 observations and 5 variables with the descriptions explained in Table 1.

Table 1: Attributes' Descriptions

Attributes	Descriptions
Seq#	Order number of each record
Races	9 categories of classified races
Gender	"Total": Total number of students of each year
	"Men": Total number of male students of each year
	"Women": Total number of female students of each year
Year	Students' fall enrollment years
Student	Total number of enrolled students

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[1] Raw data: https://github.com/mandyhpnguyen/Webster-University_Fall-2020_Enrollment_Analysis/tree/main/Data/Raw_Data

[2] Race data set: https://github.com/mandyhpnguyen/Webster-University_Fall-2020_Enrollment_Analysis/tree/main/Data/Final_WU_Race_2016-2020

3. DATA WRANGLING

3.1. Technology
- **Database Source:** National Center for Education Statistics (https://nces.ed.gov/ipeds/)
- **Analysis Project Repository:** https://github.com/mandyhpnguyen/Webster-University_Fall-2020_Enrollment_Analysis
- **User's Synthesized Extracted Data sets:** https://github.com/mandyhpnguyen/Webster-University_Fall-2020_Enrollment_Analysis/tree/main/Data/Raw_Data
- **Clean Data:** https://github.com/mandyhpnguyen/Webster-University_Fall-2020_Enrollment_Analysis/tree/main/Data
- **Applications:**
  - Microsoft® Excel® for Microsoft 365 MSO (Version 2111 Build 16.0.14701.20254) 64-bit
  - RStudio 2021.09.0 Build 351
- **Programming Languages:** R version 4.1.1 (2021-08-10) -- "Kick Things"

3.2. Cleaning & Harmonization Methods

The extracted data set from the NCES database is first, manually cleaned by the analyst using MS Excel. From then forward, the data set is loaded into RStudio and for data wrangling and analysis. Then the "Total" values are aggregated for each year and ready for plotting.

4. ENROLLMENT DESCRIPTIVE ANALYSIS

Figure 1 shows the distribution in the number of enrolled students in the Falls of 2016-2020 regarding race. The grouped bar chart is arranged in order of highest to lowest numbers of students in each race category. In 5 years, the top three most populated races are always the races of White, Black or African American, and Hispanic. The numbers of students of all races gradually decrease every year.
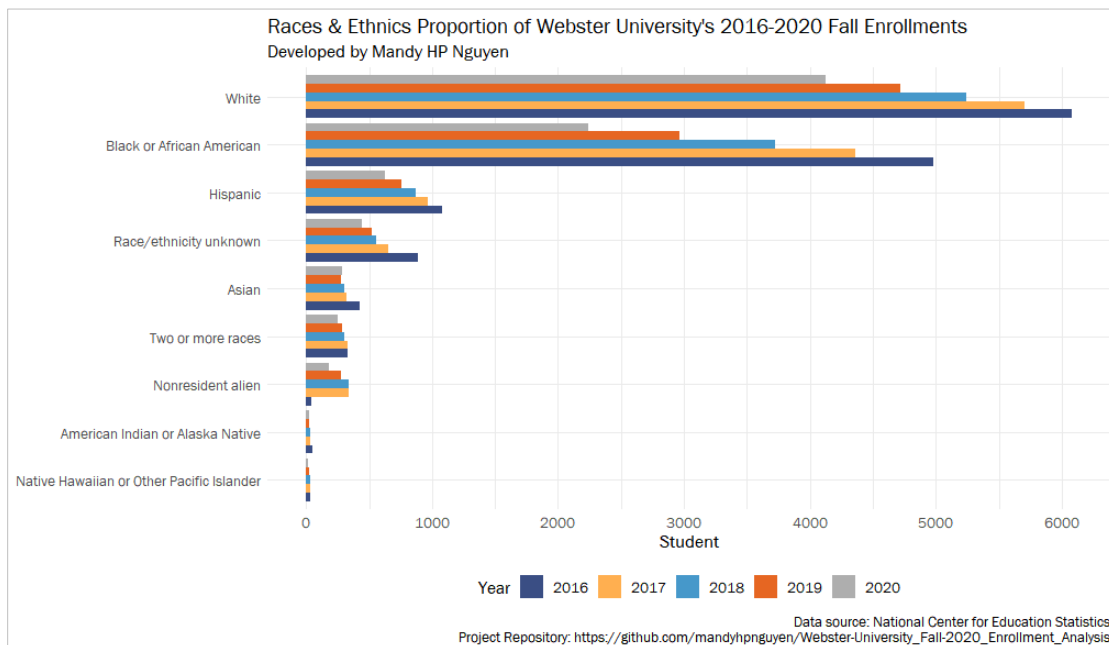
Figure 1: 2016-2020 Fall Enrollments by Races

Figure 2 describes student enrollments of Webster University from 2016 to 2020 grouped by gender. Overall, the total enrollments dropped approximately 33.3% from over 6,000 in 2016 to over 4,000 in 2020. The female students are slightly higher than the male students throughout the 5-year span.

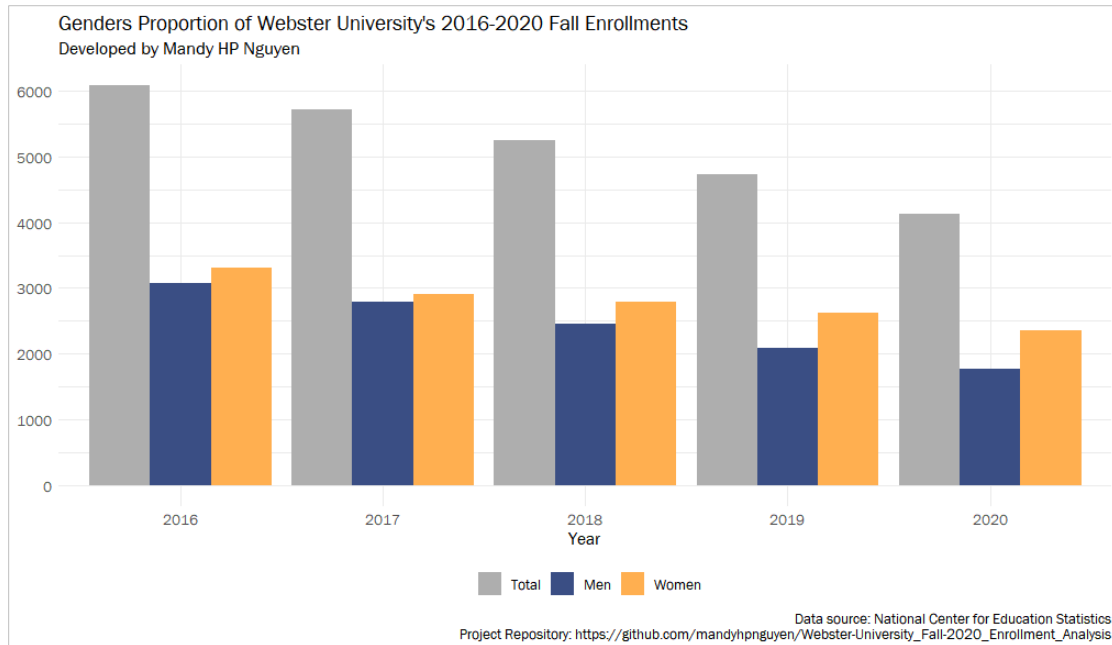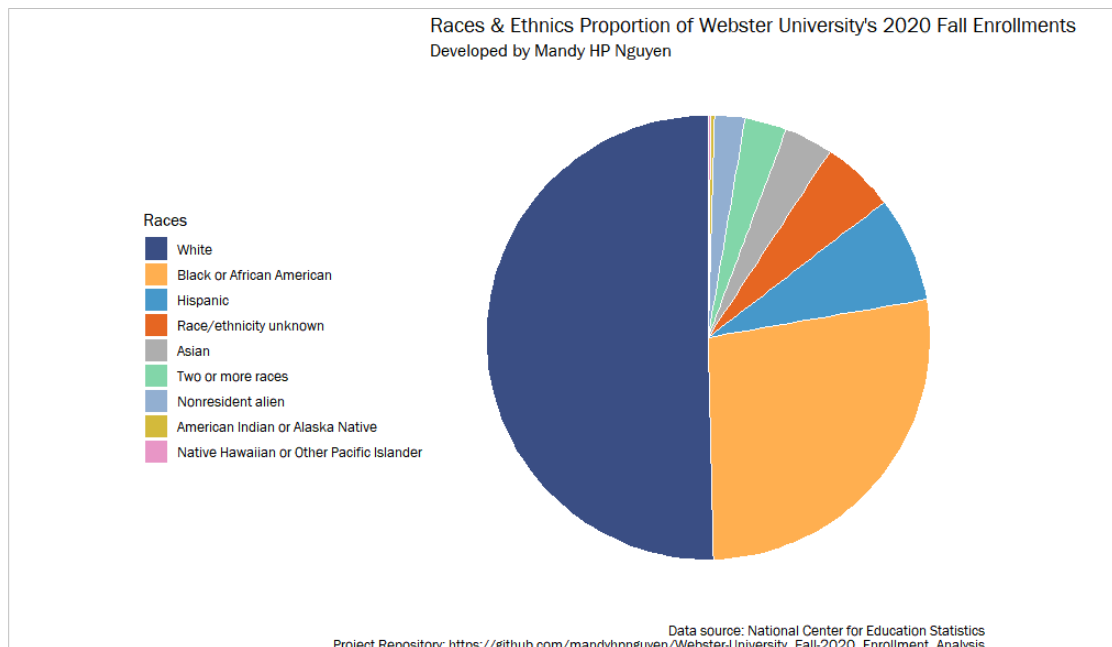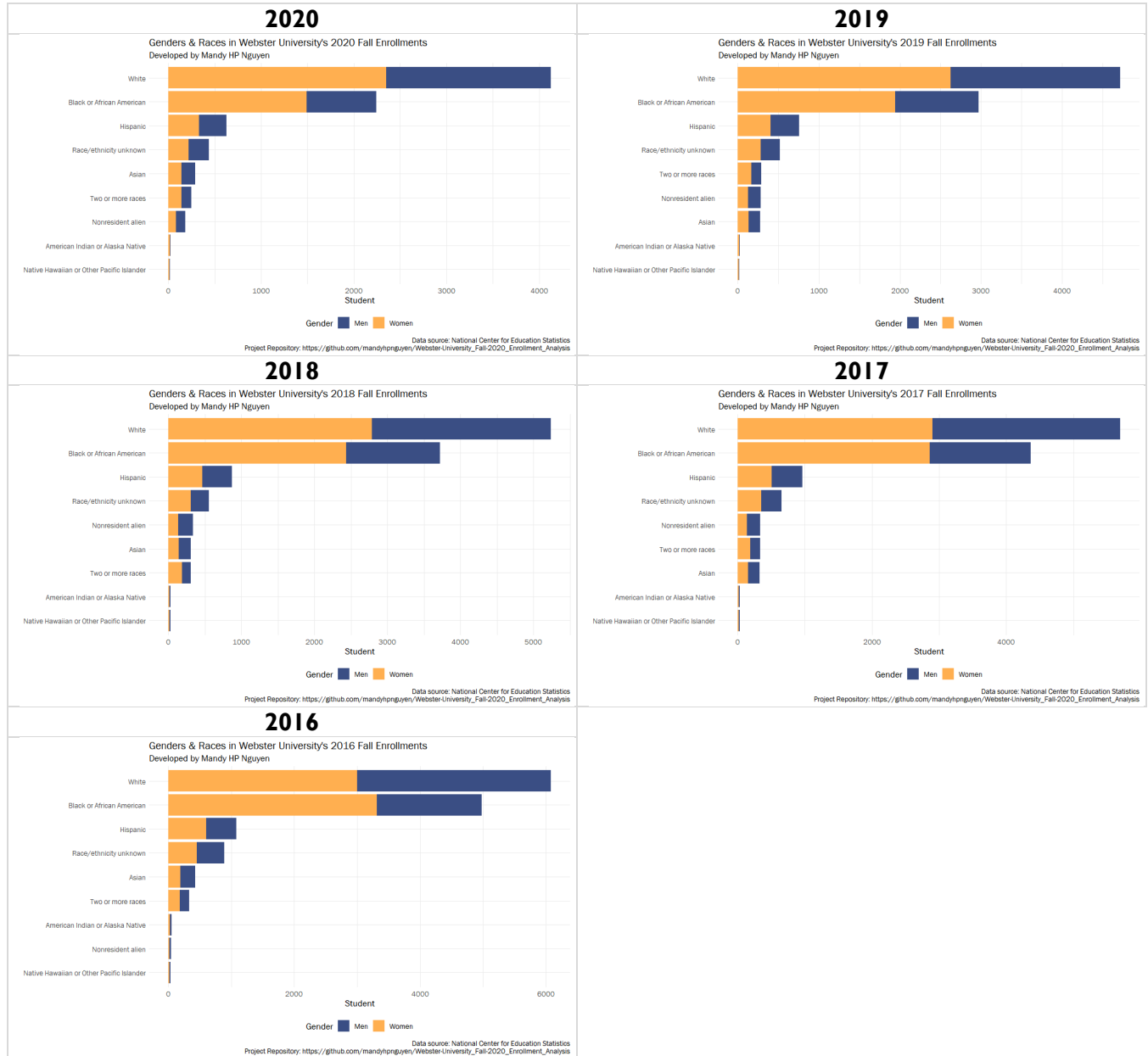**Figure 2: 2016-2020 Fall Enrollments by Genders**

Figure 3 shows the distribution of races in 2020 Fall enrollments. The race of White accounts for the highest number of Fall enrolled students for slightly more than half, while the race of Native Hawaiian or Other Pacific Islander accounts for the lowest number. The race of Black or African American takes over a quarter of total and the number of the race of Hispanic ranked third in the population of Webster University in 2020.

Figure 3: 2020 Fall Enrollments by Races

In Figure 4, throughout 2016 to 2020, the population ranking in terms of race is the same. The gender proportions of each race are relatively equivalent with slightly more than half of the numbers being female and nearly half of which are male. The White, Black or African American, and Hispanic races are in the top 3, however, only in 2020, the number in the race of Black or African American was reduced to half of the race of White.

Figure 4: 2016-2020 Fall Enrollments by Genders & Races

5. CONCLUSION

During the past five years from 2016 to 2020, the enrollment in the Fall semesters of Webster University appears to decrease gradually despite the impact of the COVID-19 pandemic since the beginning of 2020. The female population is slightly higher than the male, while the students in the race of White account for more the half among nine-race classes.

REFERENCES

- **National Center for Education Statistics** (https://nces.ed.gov/ipeds/use-the-data)
- **Integrated Postsecondary Education Data System** (https://nces.ed.gov/ipeds/use-the-data)
- **Webster University's Our Editorial Style — Color Palette & Typography** (https://webster.edu/website-training-resources/editorial-style-color-palette.php)
- **Grouped, stacked and percent stacked barplot in ggplot2** (https://www.r-graph-gallery.com/48-grouped-barplot-with-ggplot2.html)
- **Project GitHub repository** (https://github.com/mandyhpnguyen/Webster-University_Fall-2020_Enrollment_Analysis)

CONTACTS

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- **GitHub:** github.com/mandyhpnguyen/Webster-University_Fall-2020_Enrollment_Analysis