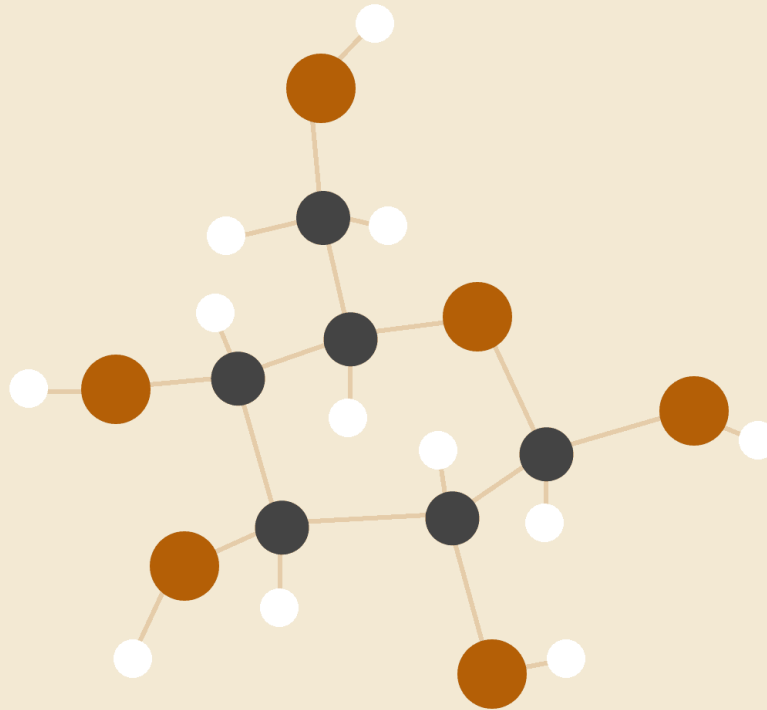# Asian Impact & Equity

Boston Chinatown Neighborhood Center (BCNC)

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1 ABSTRACT

This project, Asian Impact & Equity project, proposed by Boston Chinatown Neighborhood Center (BCNC) organization, is a comprehensive statistical analysis on Asian Americans in Massachusetts, including demographic analysis of population and community analysis of jobs, education, housing. The project is motivated by the insufficient considerations of the Asian community, especially after the 2020 COVID-19 pandemic. As one of the teams working on the project, we focus on the demographic, with the vision of providing basic census analysis for future use.

2 INTRODUCTION

In our part of the project, we explored the impact and equity of Asian communities located specifically in the Massachusetts area. We would like to research the features that show different characteristics of the Asian Americans' population in the specific area and study the trend of the population change and the potential reasons for the change.

Therefore, we examined several datasets to show a clear and reliable trend in the Asian American Demographic in MA over 10 years. Then, according to the trend and our research, we raised some key questions. For example, what are the characteristics that might affect Asian Americans' choice of living in different regions in America? Is the change in the percentage of new immigrants related to the overall trend? Why are some counties highly populated in MA? Finally, by answering these questions, we would like to dissect the potential reasons for the change of population in recent decades.

3 GOALS OF OUR TEAM

1. Collect datasets about the Asian Demographic, retrieve data that is relative to Asian Americans in MA, and clean up the data.

2. Compare and analyze the data to have a big picture about the current situations of Asian Americans in MA, including geographical distributions, growth trends, subdivided ethnic groups, age, and sex distributions etc. Comparisons include vertically through years and horizontally between different subgroups.

3. Collect additional datasets based on financial aspects. Analyze and try to conclude the relationship between the population growth and geographical distribution of Asian Americans in MA. Predict further possible changes in Asian American population in MA.

4 WORKING FLOW

1. Reading research papers
2. Collecting data sets from Census and other sources
3. Cleaning and analyzing data in datasets
4. Plotting graphs about data that clearly show a correlation between the demographic and other social factors
5. Interpreting the reason behind the correlation

5 DATA

	Dataset Name	Description
1	Census race survey(2010&2020)	Total population of each race in the United States and Massachusetts. Can be used to calculate the population change within the last ten years.
2	Comparative Demographic Estimates	Compared data from the American Community Survey about the age distribution and ethnic distribution of the U.S. population in the past ten years.
3	Comparing Poverty Status and language spoken at home	Comparing data of poverty status in the past 12 months by age by language spoken at home for the population 5 years and over among different ethnicities
4	2019 Census Data on Age groups of the total population in MA, and population of different ethnic groups and their subgroups.	Comparative data on different age and sex groups for both Asian and General American in MA. Separating total population into 9 categories: under 5 years old, 5 to 17 years old, 18 to 24 years old, 25 to 35 years old, 35 to 44 years old, 45 to 54 years old, 55 to 64 years old, 65 to 74 years old, 75 years and over old

5	[2019 Census Data on Asian Ethnic groups](#)	Comparative data focus on different Asian ethnic groups including multiple aspects: age groups, household type, school enrollment, employment status, and etc. (limited to Asian Indian and Chinese)
6	[Massachusetts Population study from PopulationU](#) [Pew Research Center: key facts about Asian American](#)	A population study of different Asian ethnic groups in MA, including East Asian, Chinese, Korean, etc.
7	[American Community Survey 1-Year Data (2005-2020)](#)	Datasets that show a change in the Asian population across different years and comparative data with income change.
8	[2013 - 2019 MA Income Change](#)	Study about households in Boston, MA from Census Data, including Median Household Income, wage by gender in common jobs, etc.

6 ANALYSIS

6.1 Total population

The total population in MA increased by around 5 percent during the past 10 years. Based on Figure 1, the total Massachusetts population linearly increased from about 6.55 million to 6.9 million from 2010 to 2019. From 2014, the increased speed slightly drops with the slope becoming smoother.

To be more specific, Figure 2 presents the distribution of the total Asian population in MA and compares the population for each county in 2010 and 2020. Counties with a large population in 2010 also experienced a larger amount of increase in population the past 10 years. While counties with smaller scale like Barnstable, Berkshire, and Franklin have an almost constant rate of increase in population. For example, on the Bureau of Economic Analysis(BEA) website we can refer to the local map and the overall GDP and personal income in 2018 and 2019 from the census, we could conclude that counties with larger commercial-scale have a greater ability to both attract new immigrants and residences, as well as maintain high local population net growth.
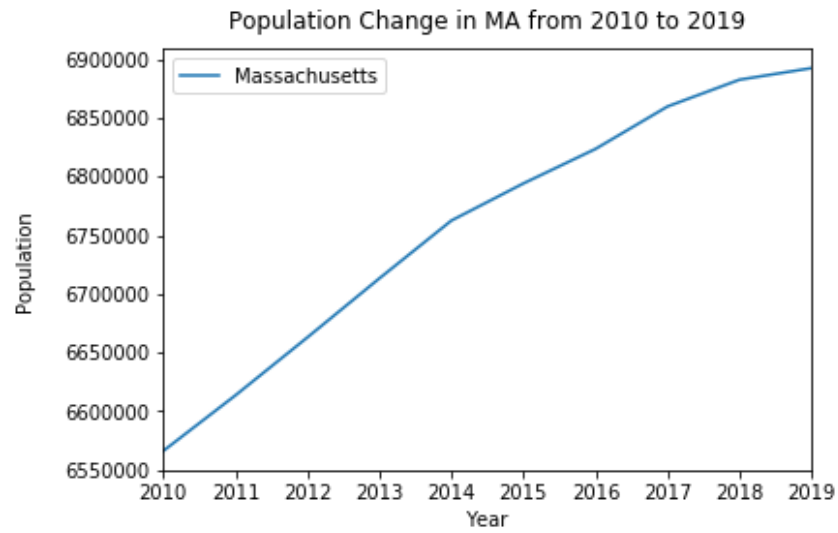
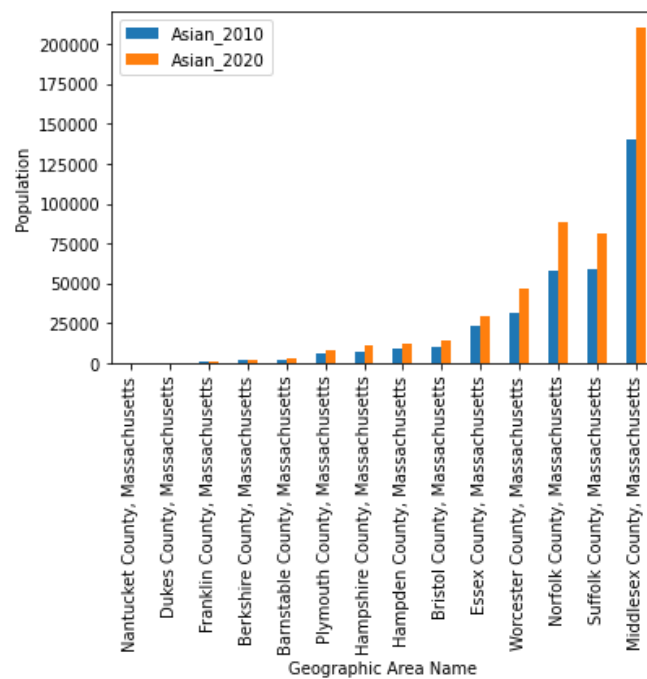*Figure 1: Total Population Change in MA from 2010 to 2019*

Figure 2: Asian Population Different between 2010 and 2020

6.2 Ethnic Groups

With the preliminary analysis of the total Asian population in MA, it is necessary to conduct further research on subgroups to investigate more specific trends. First, we divide the total population into different ethnic groups.

Then, we want to overlook all ethnic groups in MA to have basic knowledge on the population distribution over all Americans. In Figure 3, we see that the US Born Asian population is very minuscule compared to Caucasians and there is a considerable difference between the Caucasian population and the US Born population of other groups. We detect that the Asian population is only 2.4% of the population of US Born, which is almost the last group in the US in 2019. However, according to the fact that Asian American is not a very small group of the total US population, we can reasonably infer that the Asian population comes from Foreign-Born. In Figure 4, the Foreign-Born percentage for different race populations in MA in 2019, we see that the foreign-born Asian is no longer a minority. White, Latino, Black, and Asian take the lead. The Asian population makes up 22.0% of the total population and is one of the largest groups compared to the other minorities. It is close to the percentage of Caucasians (33.1%). Therefore, we can infer that in 2019 and possibly other years, the majority of the Asian population in Massachusetts might be immigrants, which we will discuss in the next section.
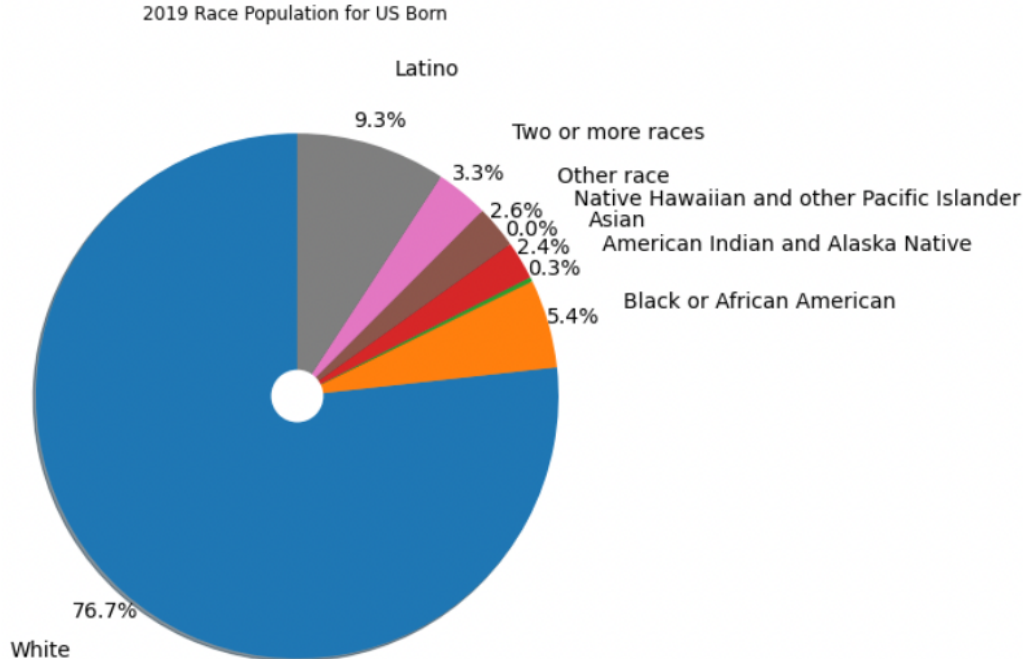

Figure 3: 2019 Different Race Population Percentage for US Born in MA
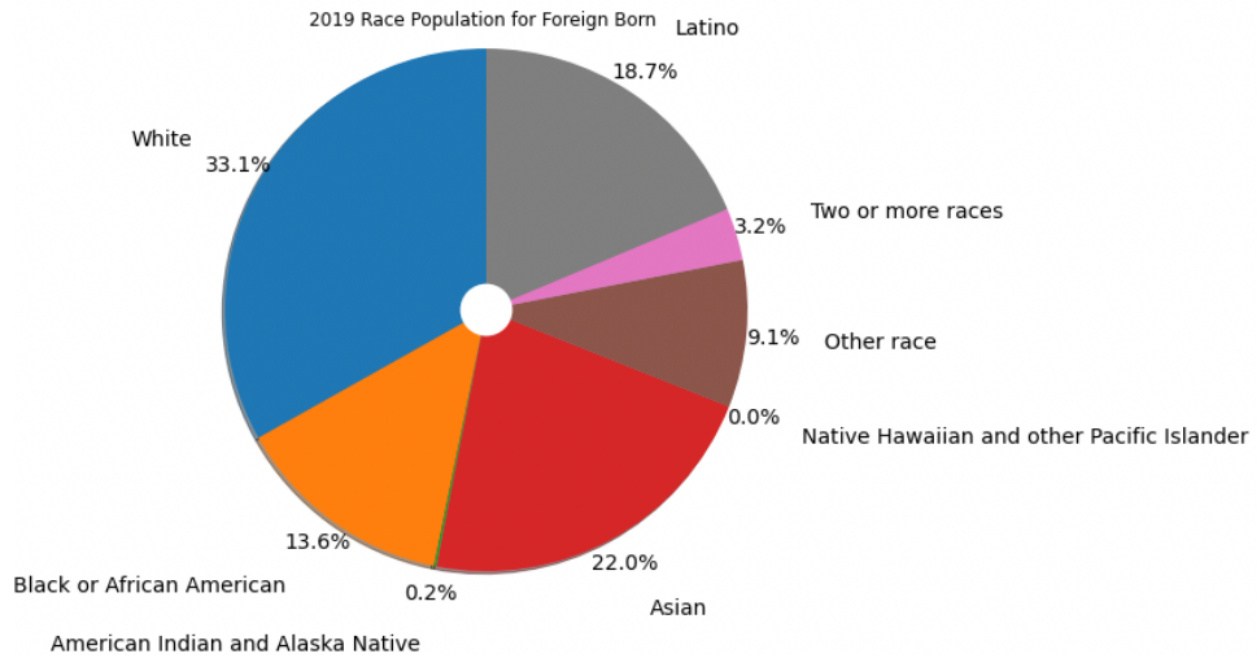
Figure 4: 2019 Different Race Population Percentage for Foreign-Born in MA

Secondly, we want to take a look at ethnic groups within the Asian population. By looking at Table 1, we notice that the five top Asian subgroups make up more than 80% of all Asian Americans. They are Chinese, Indian, Filipino, Vietnamese, Korean. Therefore, we decided to take a deeper look at the five major groups to look for more information about population change within Asian Americans.

	Race	2000	2010	%change
0	Chinese	89,521	131,846	47.3%
1	Indian	48,588	85,441	75.8%
2	Vietnamese	36,685	47,636	29.9%
3	Korean	19,469	28,904	48.5%
4	Cambodian	22,886	28,424	24.2%
5	Filipino	11,661	18,673	60.1%
6	Japanese	13,997	15,358	9.7%
7	Other Asian, not specified	9,025	14,256	160.0%
8	Pakistani	2,864	7,071	146.9%
9	Taiwanese	2,859	5,353	87.2%
10	Thai	2,747	4,712	71.5%
11	Laotian	4,449	4,530	1.8%
12	Nepalese	-	2,865	-
13	Bangladeshi	784	2,387	204.5%
14	Indonesian	1,063	1,379	29.7%
15	Sri Lankan	771	1,254	62.6%
16	Hmong	1,303	1,080	-17.1%
17	Burmese	-	1,072	-
18	Malaysian	346	593	71.4%
19	Bhutanese	-	544	-
20	Other Asian, specified	1,025	490	-

Table 1: Asian American Ethnic Groups' Population in MA in 2000 and 2010
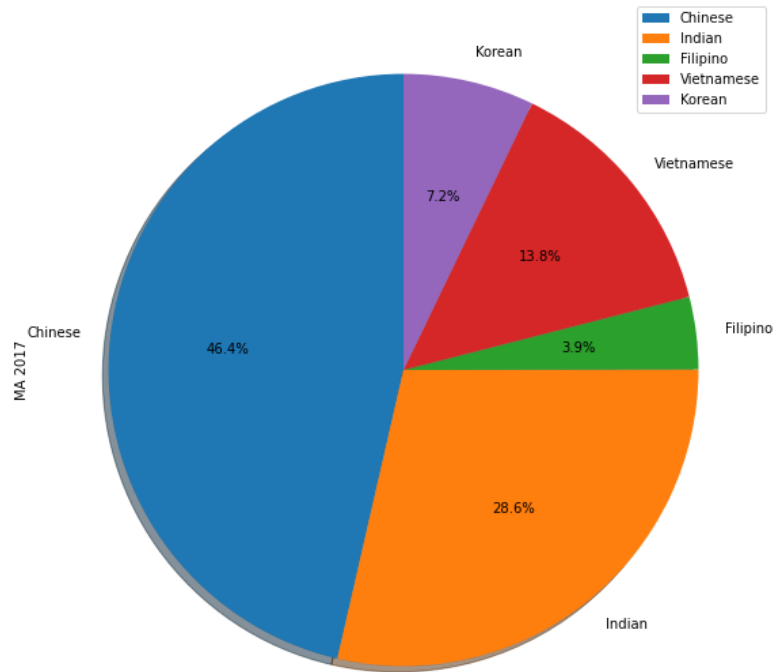
Figure 5: Percentage of Top 5 Asian American Ethnic Groups Population in MA in 2017
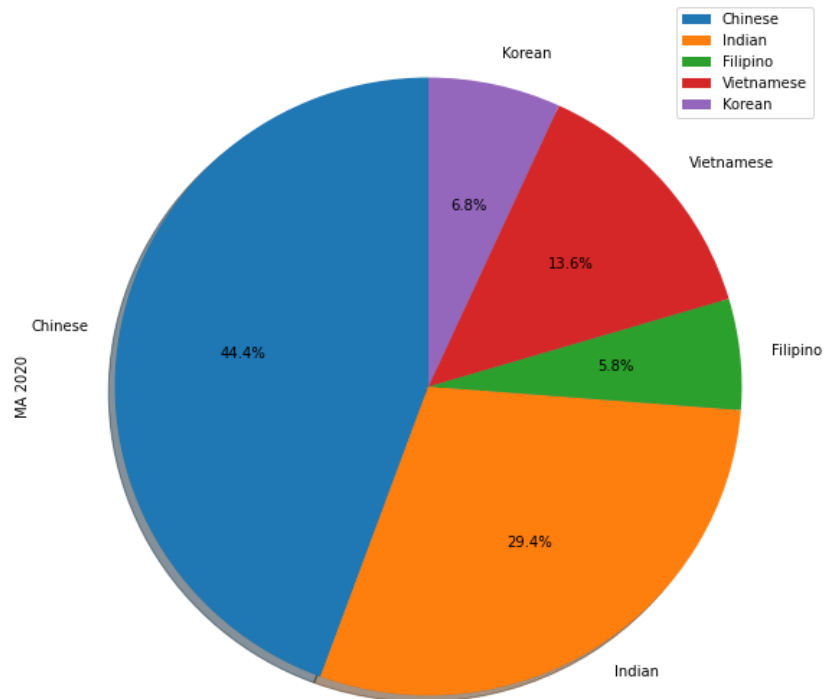

Figure 6: Percentage of Top 5 Asian American Ethnic Groups Population in MA in 2020

Not only is our region's Asian American population large and growing, it's diverse in the Asian community. Figure 5 and 6 presents the percentage of top 5 individual Asian American subgroups in 2017 and 2020. The top 5 subgroups are Chinese, taking the majority percentage, up to 50%, Indian, up to 30%, Vietnamese, 13.6%, Korean, 6.8% and Filipino, 5.8%. By comparing the two Figures, we found the Chinese population decreased slightly in years 2017 to 2020, from 46.4% to 44.4%, whereas Indians, Korean, Filipino all increased their percentages, and Vietnamese stayed almost the same. Although there is only a 2% decrease for the Chinese population, since the population base is quite large, 2% can somehow mean something as a trend of decrease. For decades reaching back to the 19th century, Chinese Americans overwhelmingly defined the Asian American community in the region. But this has changed rapidly in recent decades. Our region is now home to large populations of Indian, Vietnamese, Korean, Filipino and Japanese—all falling within the category "Asian American."

6.3 Immigrants

Based on our findings in Section 6.2, we infer that the reasons for dramatic development of the Asian population during recent years might not only be from the fertility rate above the replacement level, but also be the growth brought by new immigrants from Asia. However,

Is there any trend of Asian immigrant population growth between the years?

In Figure 7, over the past 40 years, the Asian immigrant population has grown tremendously. In 1990, there were only 116,608 Asian immigrants in Massachusetts, but in the year 2019, there were 363,189 Asians in Massachusetts. The total amount of Asian population has almost tripled over the last 40 years from 1990 to 2020, and those are the years that the Asian population has the most growth rate.
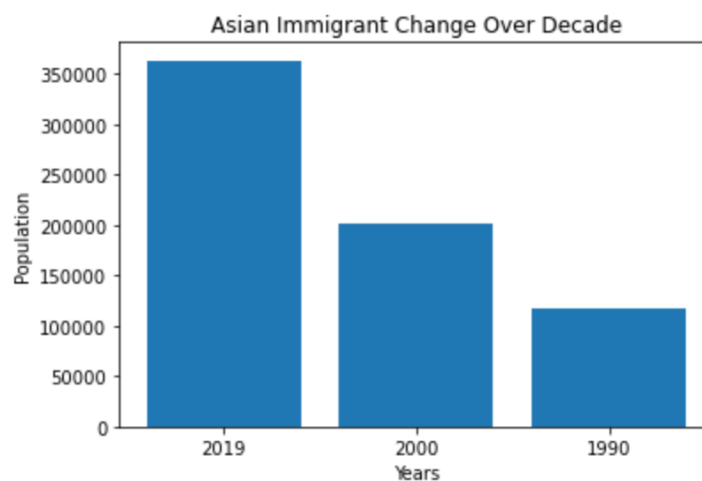

Figure 7: The population change of Asian immigrants over decades in MA

There are various ethnic subgroups of Asian American in MA, and each group contributes differently to the increase in the number of Asian immigrants in the past 40 years. It is valuable to investigate further and figure out which ethnic subgroup contributes the most, which might help us identify the immigration trend for different ethnic subgroups. Connecting with their local culture and current international situations, we might discover valuable broad views. Then, we asked the following question:

What ethnicity is the majority of immigration from?

In Figure 8, we can take a close look at the distribution of different enthic groups of Asian immigrants in 2019. We can see the majority of Asian immigrants were coming from Eastern Asia and China. The second biggest contribution for the increase in Asian immigrants is South Central Asia and India, which corresponds to our results about distribution of ethnic groups in the above section that Chinese takes the most part of Asian Americans and Indian is the second.
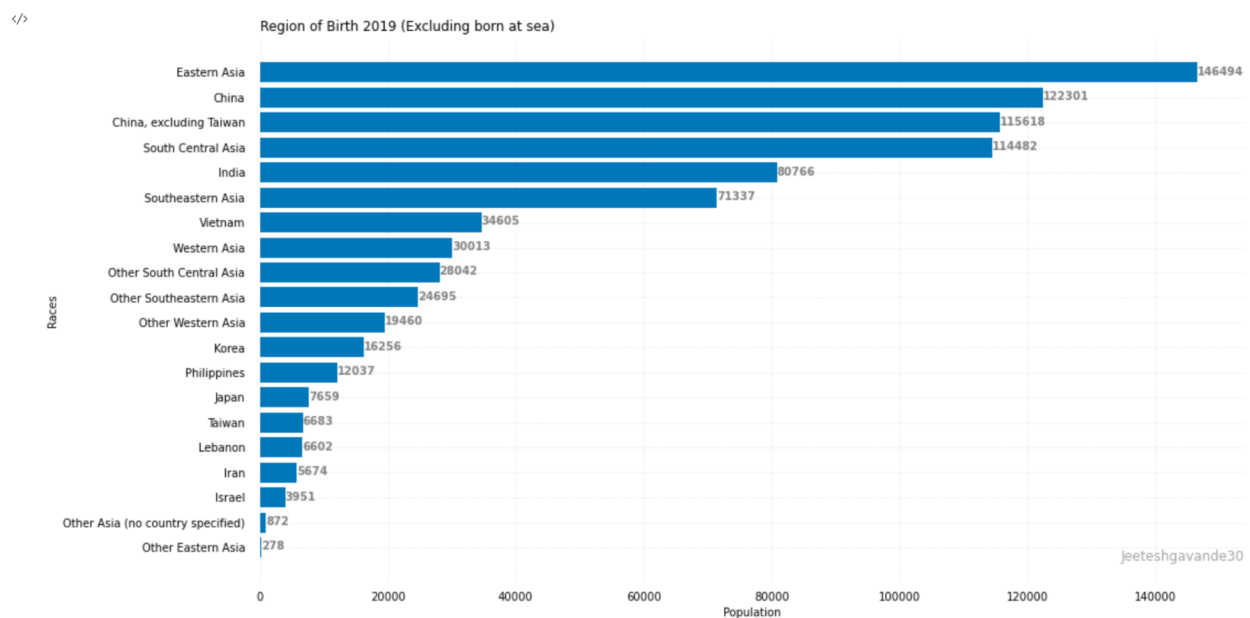

Figure 8: Population of Different Ethnic Groups of Asian Immigrants in 2019

6.4 Age group

Besides ethnic groups and composition of immigrants in recent years, we also checked different age and sex groups and their composition most recently. Then, we asked the following questions:

Is there any trend we can find based on different age groups?

Is there any sudden shift or general pattern we can infer based on different age groups?

First, we checked the distribution of age groups of total population in MA in 2019. We notice that the age group from [25 to 34] years old take the lead in percentages in Massachusetts in 2019. According to the Age distribution pyramid theory, the age distribution of total population in MA is a static type. The proportion of the population of all age groups is roughly balanced. The birth rate is similar to the death rate, and its future population reproduction trend is a stable growth of about zero for the static type. If the birth rate drops one step, it will transition to the third type. The top three population groups have ages from [25 to 54] years, which is considered the middle-aged and the labor force group. The young and middle-aged working-age population accounts for a large proportion of the total population, and the labor resources are relatively abundant.
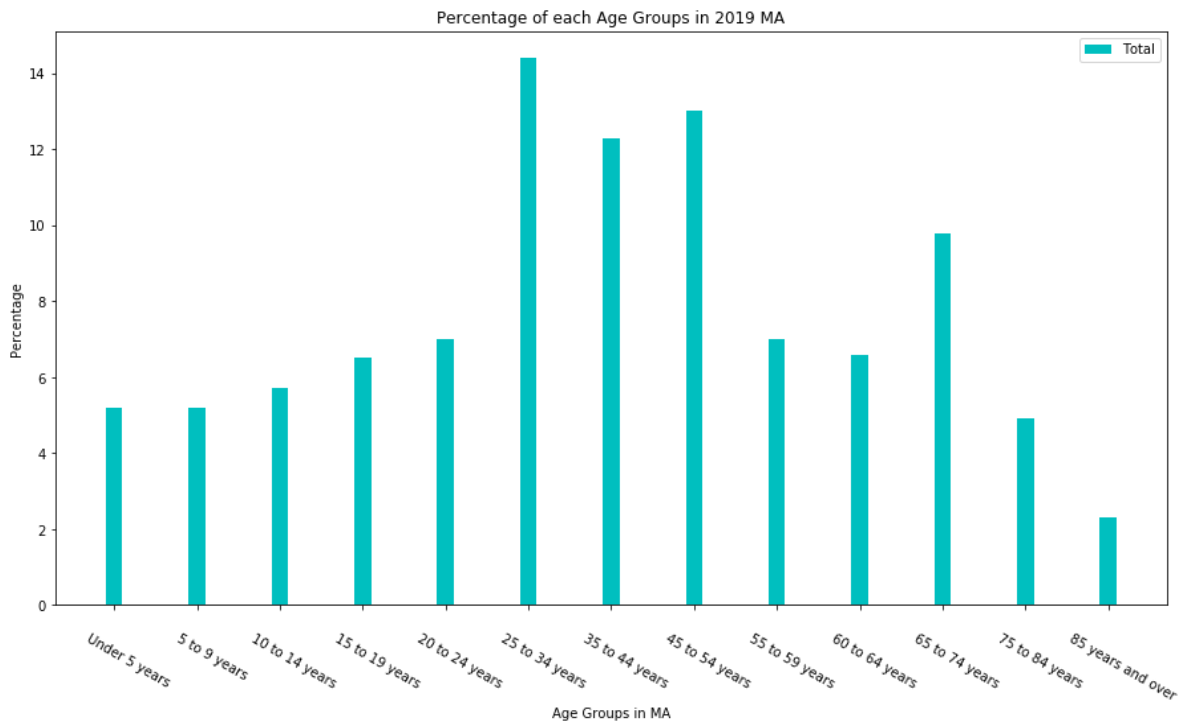

Figure 9: Asian Population Percentage of Different Age Groups in MA in 2019
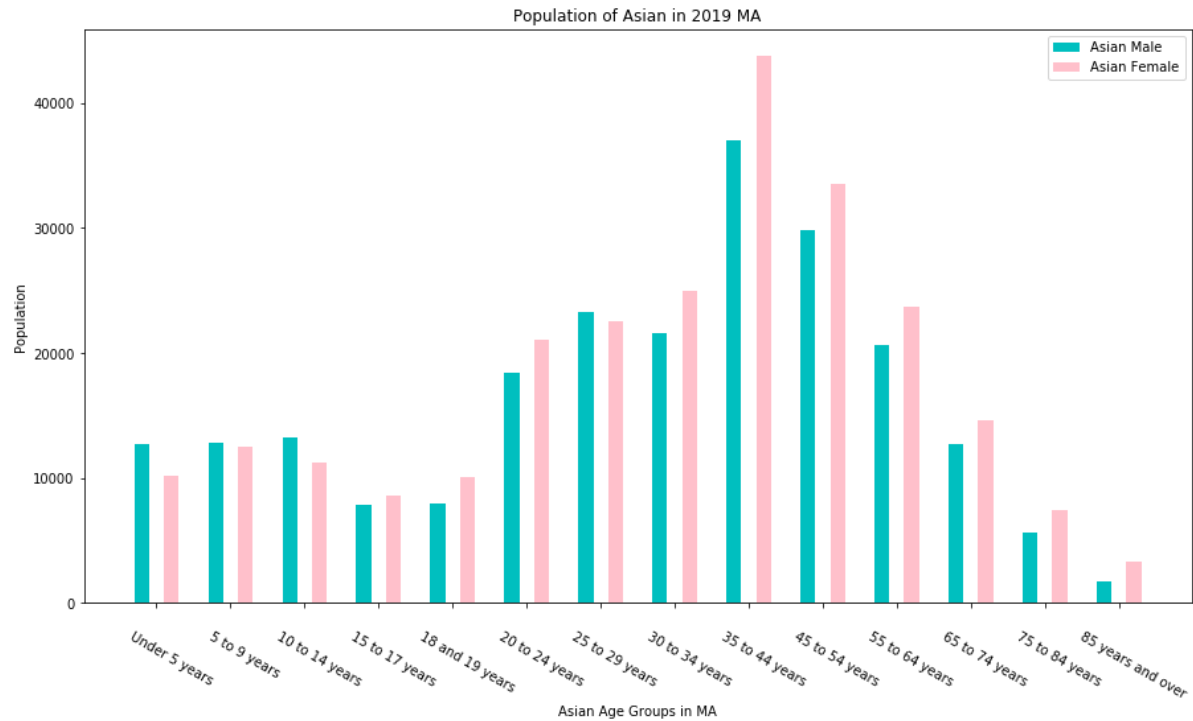
Figure 10: Asian Population Percentage of Different Age Group in 2019 MA (Category by sex)

After having a close look at the distribution of total population in 2019 MA, we conduct further detailed investigations on both age and sex groups of Asian population in 2019 MA, and try to compare between the two trends. In Figure 10, we observed that from age 15 to 85 (teenagers and adults) mostly consists of the Asian population in 2019 MA. Another interesting fact we observed is that the number of Asian females is greater than the number of Asian males in the age group of 30-65, which is just the age of actively participating in the workplace and society. While for ages 5 to 14 (newborns and children), the number of males is slightly greater than the number of females. The number of females in the workforce in MA area outnumbers the male could be another indicator of the local policies and openness to both ethnic groups and gender stereotypes. We noticed that there is a correlation for each age group in the last 10 years that can be used to infer the mobility and general development of one region. After examining the sex and age changes across years for each counties in MA(see Appendix 1), one general trend we found in almost every region was that the population of age group 55-64 for both the male and female was steadily increasing in the last 10 years, which exhibits the aging population or aging immigration. Moreover, in Suffolk county, there is an obvious increase in the male population from 2017 to 2019 for Asians. Some of the abnormal changes are valuable for us to investigate. However, further research and data information from other dimensions like education or employment is needed to give a reliable and general analysis.

Furthermore, understanding the current evidence that is given to us we conclude that Asian immigrants are the major reason for the total Asian population growth over the past two decades.

6.5 Economy

In sections 6.3 and 6.4, we conclude that immigrants take a large account for the increase in total Asian population in recent years. However, what are the reasons for such an increase in immigrants? One of the reasons could be the attraction of the local economy for the new immigrants. The local economies of MA and Boston are always robust and progress at a steady rate.

To what extent does the economy play an important role in the population of immigrants increasing?

In the analysis, we put our focus mainly on the income. We compare income in different dimensions: age groups, ethnic groups, across time span and region groups. Firstly, we compare the income change trend for the United States, MA, and Boston. In Figure 11, we can observe the performance of the average income index for households of MA and Boston is way better than the whole United States. We can conclude that one of the reasons why MA and Boston could attract so many Asian immigrants in recent years could be the much higher average income for all these years than most parts of the United States.

In Figure 12, we use median household Income as a secondary Y-axis and time (2013 to 2019) as X-axis. Based on the graph, we can see that both the Asian population and median household income have steadily grown over time. From 2013 to 2015 and 2017 to 2018, the Asian population grew rapidly. In the following years 2015 to 2016 to 2018 to 2019, MA household income increased tremendously followed by the Asian population increase. The Asian population growth drives MA income growth. Also, we can see that people who live in Massachusetts and Boston have more average household income than the U.S. average household income. Therefore, we infer that the economy might be an important reason that attracts the Asian population and immigrants

In Figure 12, we also noticed that there was a mass increase in the Asian population over the years. We wanted to notice the wages overall for all of the races and try to find out the correlation between wages and demographics. As we see that most of the jobs are under 6,000. That follows our common sense that high wages jobs are limited. We can see that there is a large number of wages under 20,000. Mass jobs that are available for small wages, which might be a reason for the population increase in the nation.
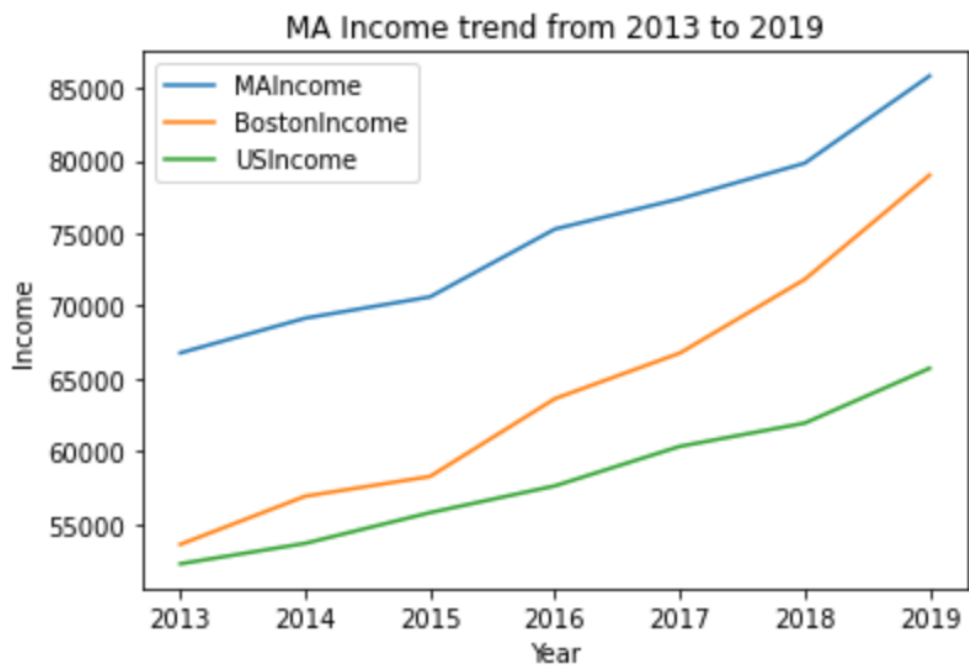
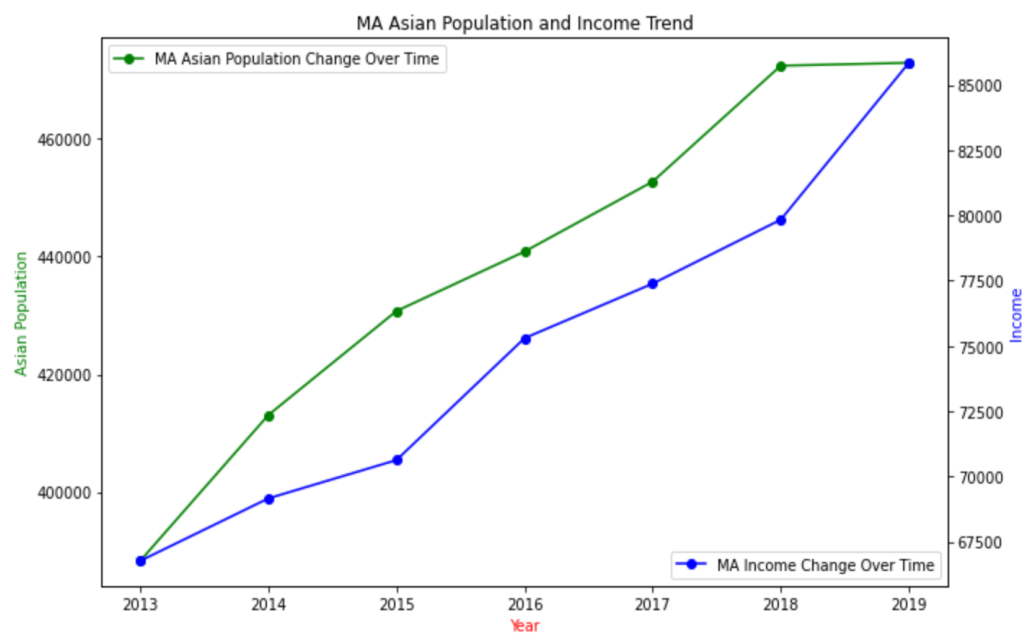*Figure 11: Total MA Income Change from 2013 to 2019*

Figure 12: Total MA Asian Population Change and their Income Change from 2013 to 2019
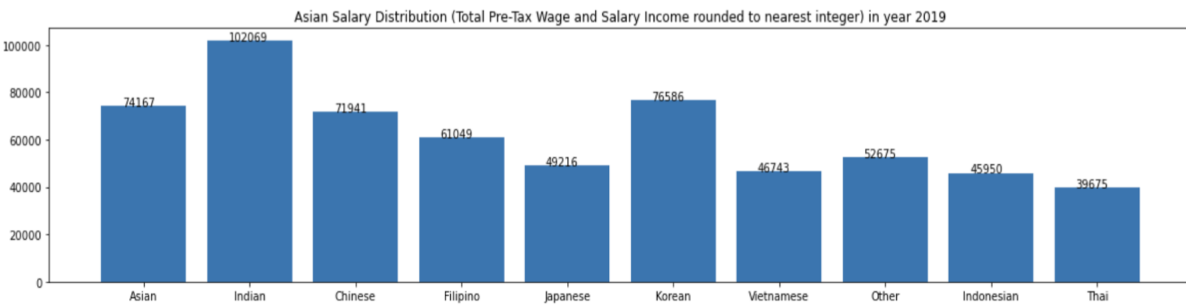
ere are total of 2887 labor force in Asians in 2019

Asian Salary Distribution (Total Pre-Tax Wage and Salary Income rounded to nearest integer) in year 2019

Figure 13: Average wage of Asian subgroups aid with the population growth in 2019
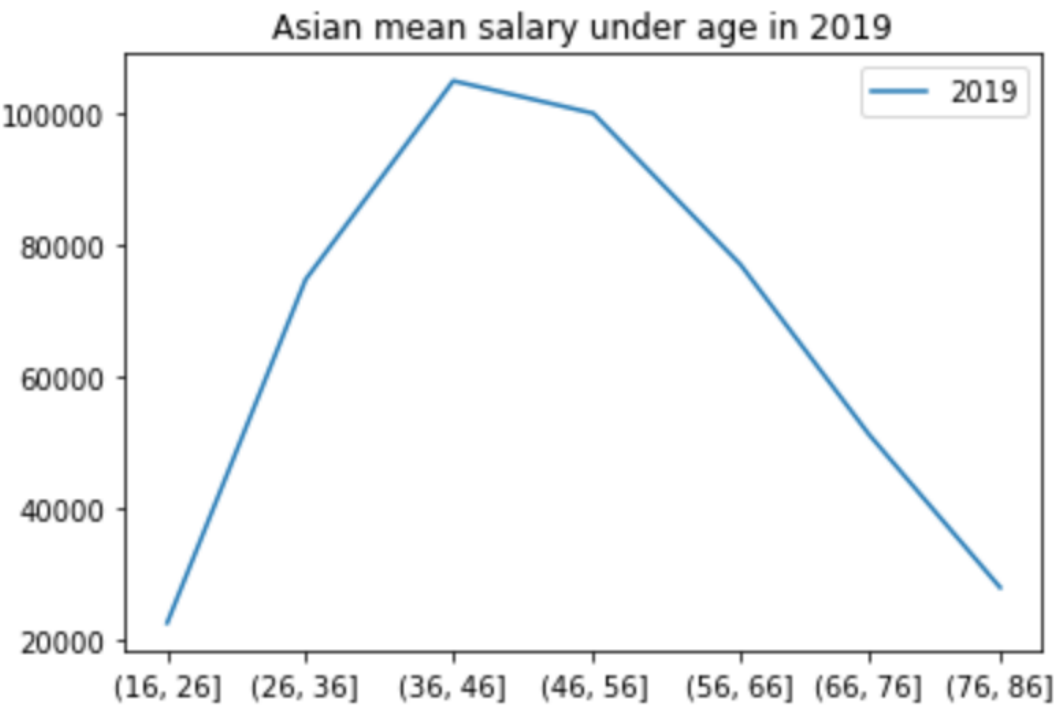

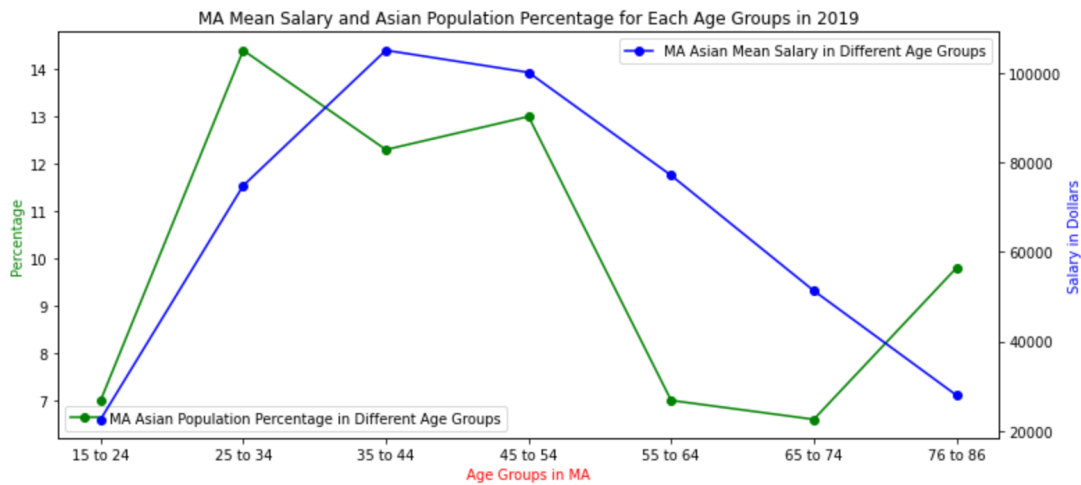*Figure 14. Age Distribution in 2019*

Figure 14: Asian Population Percentage and Mean Salary of Different Age Groups in MA in 2019

In Figure 14, the highest Salary in 2019 is within the [36, 56] range. The highest Asian population in 2019 is within the [25,54] range. We believe that one of the reasons for salary decrease for ages [25, 35] is because the majority of the incoming graduates have a lower starting salary compared to more experienced workers. We can see that from [26, 36] and [36, 46] there is a significant salary increase. As well as the huge numbers of immigrants who come for jobs at the ages of [25, 44] making less money than other age groups.

From the comparisons in multiple dimensions of the financial situation in MA and Boston, we can conclude that the economy plays an important role in attracting new Asian immigrants. The economy develops at a steady pace. Such development also mapped to the general Asian American population in the area. Thus, the Asian population in the area has a positive correlation with the increase in wages and development in the economy. The relationship is also supported indirectly by the correlation between wages for different ethnic groups and populations for each. When the salaries offered to a certain ethnic group are high enough, such a rise in wages will attract more immigrants of this group.

7 CONCLUSION

1. In the above analysis, we dug into total and Asian population change in Massachusetts, and we found a positive correlation in both total population and total Asian population from 2010 to 2020, which follows the common trend. In several specific counties (Norfolk, Suffolk, and Middlesex county), the increase is relatively larger and steeper in positive correlation than others. Not much surprise with their population change.

   Likewise, a large portion of the increased population is due to immigration. The possible reason

for this trend is the growth of the economy during 2019 producing job opportunities for Asian immigrants. We predict that there will be an increase in Asian immigrants in the future because in Figure 3 and 4 we can see that there is a noticeable difference in the incoming population of Asian immigrants compared to all of the minorities. In the future, if the economy becomes better in the US we will most likely see a noticeable increase in the Asian immigrant population than before.

2. Based on the analysis of the Asian population and total population in the Boston Area, we found that the trend of the Asian population in the Boston area is increasing fast. Therefore, we decided to analyze the increasing trend by the factor of wage and income.

   In Boston, the average income is higher than the average income in the United States which is the reason for the apparent increase in the Asian population in the Massachusetts and Boston area. In Figure 5, we can see that the initial average wage in 2013 in MA or Boston is much higher than it in the United States. In addition, the growth rate of the average income is also higher. Thus, the generally high income in MA and Boston could be one reason that attracts so many new Asian residences to MA and Boston.

   Another reason for the rise in the population of Asians in the Boston area could be that Massachusetts offers more jobs with above-average salaries In Figure 6 and 7, it is visible that most of the jobs with high income are offered to the Asian groups. Thus, with the relatively high wage compared to the whole country and the well-paid jobs, whether old or new residents are willing to stay in the Boston area.

   The general trend for the Asian population is promising in the Boston area. From Figure 2 and 3, generally, each Asian subgroup has experienced an increase in the past few years, and the distribution of the age groups is in good shape. Most people are in the age of the workforce, and the aging population is not large.

3. All-inclusive, the trend is that Asian American population in Massachusetts continuously increases from 2000 to 2020. Furthering research we spotted ethnic groups within Asian Americans, including Chinese, Indian, Korean, etc. Figure 1 displaces the population of 21 ethnic groups within Asian American in MA in 2000 and 2010, and their population percentage change in the two years. Looking at all the valid statistics in Figure 1, we found there is only one group's population -Hmong- decreased from 2000 to 2010. All other groups follow the overall trend we discovered in deliverable 1. By only considering increasing speed, we found Bangladeshi population triples in 10 years, which represents the fastest-growing speed. In conclusion, this shows that the Chinese are the racial-ethnic group that has increased by 42,352 in population in 10 years.

8 LIMITATIONS

1. Although most of our population datasets come from Census, we included some other datasets from different research centers. The inconsistencies in data sources cause result bias when analyzing the correlation between different factors.

2. Due to the limitation of data collection, some datasets might not contain sufficient data for analysis. For example, data after covid is seldom involved in recent census data. Some biased conclusions might be made during our study.

3. Difficult to find a large number of Asian participants in Boston datasets compared to other more populated cities.

9 REFERENCES

1. Leblanc, S. (2021, August 12). Census: Massachusetts grew older, less white, more populous. AP NEWS. Retrieved November 17, 2021, from https://apnews.com/article/massachusetts-census-2020-a68aea22812aa71442962cbbbcb11f56.
2. Massachusetts population 2021. Massachusetts Population 2021 (Demographics, Maps, Graphs). (n.d.). Retrieved November 17, 2021, from https://worldpopulationreview.com/states/massachusetts-population.
3. Lo, Shauna, "Asian Americans in Massachusetts: A Census Profile" (2012). Institute for Asian American Studies Publications. 31. https://scholarworks.umb.edu/iaas_pubs/31
4. Bureau of Economic Analysis, "*GDP and Personal Income*.",https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1&acrdn=5.

10 APPENDIX

1. "Graphs of sex and age groups and the changes across years for each county in MA." https://github.com/BU-Spark/ds-bcnc-asian-impact/tree/team-3/Deliverable_4/appendix/1_graphs%20of%20sex%20and%20age%20groups%20and%20the%20changes%20across%20years%20for%20each%20counties%20in%20MA