

<b>Statistical Methods I (MAT152):</b>
This course provides a project-based approach to introductory statistics with emphasis on using real-world data and statistical literacy. Topics include descriptive statistics, correlation and regression, basic probability, discrete and continuous probability distributions, confidence intervals and hypothesis testing. Upon completion, students should be able to use appropriate technology to describe important characteristics of a data set, draw inferences about a population from sample data, and interpret and communicate results.
<b>Exploring Latin American Immigration through Statistics by Amanda Davis</b>
The students will develop and strengthen their understanding of immigration specific to Latin America with a modern global context.
<b>Activity 1:</b>
Assessing the history of Latin American immigration through numbers
<b>Description of Activity:</b>
Students will identify the geography of Latin American countries and create time-series plots of the history of migration from these countries.
<b>Learning Outcomes for Course:</b>
Students will use time-series plots to describe statistics and observe patterns.
<b>Global Learning Outcomes for Activity:</b>
<ol style="list-style-type: none"> <li>1. Investigate and understand global issues through statistical analysis.</li> <li>2. Students will investigate the world beyond their immediate environment, framing significant problems and conducting well-crafted research.</li> </ol>
<b>Time Needed:</b>
50 minutes
<b>Materials:</b>
<p>Paper and pencil  Assignment sheet below  Internet  Map of Latin America and list of countries</p>
<b>Procedure:</b>
<p>The primary emphasis of this activity is for students to familiarize themselves with the historical trends of immigration from Latin America through statistical interpretation.</p> <p>This activity should be used after teaching graphical representations. Students will need to be able to create a time-series plot and interpret variances in data and associate causes for such variances.</p> <ol style="list-style-type: none"> <li>1. Utilizing the Map of Latin America, each student will label each country using the List of Latin American countries to familiarize themselves with the region.</li> <li>2. The students will use the interactive map of United States immigration from Latin America to create a time-series plot for a given state.</li> <li>3. Have students reflect on an essay written by David Gutierrez (see link below in resources) to see if the historical background can be seen in the interactive data, labeling events on the time-series plot for the decade of a spike or decline.</li> </ol>
<b>Assessment:</b>
Students will complete the following activity and submit completed work.
<b>Resources:</b>
<ol style="list-style-type: none"> <li>1. <a href="https://depts.washington.edu/moving1/map_latinx_migration.shtml">https://depts.washington.edu/moving1/map_latinx_migration.shtml</a></li> <li>2. <a href="https://www.nps.gov/heritageinitiatives/latino/latinothemestudy/immigration.htm">https://www.nps.gov/heritageinitiatives/latino/latinothemestudy/immigration.htm</a></li> </ol>

## **MAT 152: Descriptive Statistics – Exploring Latin American Immigration**

### **Activity One: Assessing the history of Latin American immigration through numbers**

For this activity, you will be investigating the pattern of immigration from Latin America throughout history, specifically 1960-present. Prior to class, you will need to read the essay by David Gutierrez in the link below and study the countries on the labeled map attached.

<https://www.nps.gov/heritageinitiatives/latino/latinothemestudy/immigration.htm>

1) Utilizing the blank Map of Latin America and the list of countries, label each country to familiarize yourself with the region. Attach your completed map to this packet for submission.

2) Go to the interactive mapping site and complete the following:

[https://depts.washington.edu/moving1/map\\_latinx\\_migration.shtml](https://depts.washington.edu/moving1/map_latinx_migration.shtml)

- a. Which three states consistently have the highest immigration rates from 1950-present?
  
  
  
  
  
  
  
  
  
  
- b. From the Gutierrez essay, what are possible reasons for these three having the highest immigration rates?
  
  
  
  
  
  
  
  
  
  
- c. In the space below, create a time-series plot from the data on the interactive map for the State of North Carolina from 1950-2017 by decade. Use 2017 as your final data point. (The 2020 data has not been compiled from the current census) Be sure to label your axes.



# Latin America



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<b>Activity 2:</b>
Exploring the Culture and Lifestyle of Latin America through Statistics
<b>Description of Activity:</b>
Students will explore quantitative and qualitative data for countries in Latin America and study the culture through narratives and numbers.
<b>Learning Outcomes for Course:</b>
Students will use real-world data to describe qualitative and quantitative data.
<b>Global Learning Outcomes for Activity:</b>
<ol style="list-style-type: none"> <li>1. Students will recognize perspectives and way of life of others through anecdotal, quantitative, and qualitative methods.</li> <li>2. Students will investigate the world beyond their immediate environment to bridge cultural barriers.</li> </ol>
<b>Time Needed:</b>
2 hours
<b>Materials:</b>
<p>Paper and pencil  Assignment sheet below  Internet  Excel or other form of technology to create histograms and pie graphs  Easel.ly infographic website</p>
<b>Procedure:</b>
<p>The emphasis of this activity is for students to examine the culture of Latin America through a statistical lens.</p> <ol style="list-style-type: none"> <li>1. Students will brainstorm a list of quantitative and qualitative variables of a country.</li> <li>2. In groups of 4, students will research one quantitative variable and one qualitative variable for all Latin American countries.</li> <li>3. Students will create histograms of their quantitative data and pie graphs of the qualitative data to be included in an infographic display.</li> </ol>
<b>Assessment:</b>
Students will complete the following activity with the grade assessed for the group based on the final infographic project.
<b>Resources:</b>
<ol style="list-style-type: none"> <li>1. <a href="https://data.un.org/">https://data.un.org/</a></li> <li>2. <a href="https://data.worldbank.org/">https://data.worldbank.org/</a></li> <li>3. <a href="https://www.worldometers.info/population/countries-in-latin-america-and-the-caribbean-by-population/">https://www.worldometers.info/population/countries-in-latin-america-and-the-caribbean-by-population/</a></li> <li>4. <a href="https://youtu.be/H2UTh0gyZuQ">https://youtu.be/H2UTh0gyZuQ</a></li> <li>5. <a href="https://fod-infobase-com.proxy068.nclive.org/p_ViewVideo.aspx?xtid=141428">https://fod-infobase-com.proxy068.nclive.org/p_ViewVideo.aspx?xtid=141428</a></li> </ol>

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### **Activity Two: Exploring the Culture and Lifestyle of Latin America through Statistics**

As an introduction to Latin American culture, please watch the video on NC Live entitled Masters of Rhythm at [https://fod-infobase-com.proxy068.nclive.org/p\\_ViewVideo.aspx?xtid=141428](https://fod-infobase-com.proxy068.nclive.org/p_ViewVideo.aspx?xtid=141428). We will discuss in class.

In this section, you will research the culture of Latin America and review the difference between quantitative and qualitative data. Prior to discussing the culture of Latin America, we will watch the video: Hispanic Americans reflect on immigration, culture, and identity - <https://youtu.be/H2UTh0gyZuQ>

1. In small groups at your tables, brainstorm the quantitative and qualitative variables that describe a country. List your ideas here:
2. As a class, we will make a list of all of the variables that we have discovered. List your group quantitative and qualitative assignments here:
3. Each group will have one quantitative variable to find the data for the Latin American countries pertaining to this variable. The resources <https://data.un.org/> and <https://data.worldbank.org/> may be helpful websites to begin.

Create a histogram for your data. (This can be done using Excel or alternative technology for creating histograms)

4. Calculate the following statistics for your quantitative data:  
Mean \_\_\_\_\_  
Median \_\_\_\_\_  
Range \_\_\_\_\_
5. Are there any values that appear to be outliers for your data?
6. Each group will have one qualitative variable to find the data for the Latin American countries pertaining to this variable. Create a pie graph for your data.
7. Finally, upload your histogram and pie graph to an infographic using the website Easel.ly or another free infographic site. Add your titles and background art of food, music, art, or other cultural aspects of the region. Be creative and show the beauty of Latin America

<b>Part 3:</b>
In depth study of the six countries with the highest immigration rate
<b>Description of Activity:</b>
This section will look more closely at the factors that affect quality of life. We will analyze the numbers surrounding those variables both in the countries of highest immigration in Latin America and in the United States. Students will examine polling on immigration in the U.S.
<b>Learning Outcomes for Course:</b>
Students will use real-world data to promote statistical literacy.
<b>Global Learning Outcomes for Activity:</b>
<ol style="list-style-type: none"> <li>1. Recognize perspectives of others' and their own, articulating them thoughtfully and respectfully.</li> <li>2. Investigate and understand global issues through statistical analysis.</li> <li>3. Interpret cross-cultural data and communicate results in written, graphical, and verbal formats.</li> </ol>
<b>Time Needed:</b>
50 minutes
<b>Materials:</b>
Paper and pencil Assignment sheet below Internet
<b>Procedure:</b>
<p>The emphasis of this activity is to compare and contrast data from specific countries of Latin America with the United States.</p> <ol style="list-style-type: none"> <li>1. After reading an article and watching a video with Latin American stories, students will consider the variables that best determine quality of life.</li> <li>2. Students will consult a source to determine the six Latin American countries with the highest number of immigrants in the United States.</li> <li>3. Students will look at the variables which most affect quality of life and research the statistics for the six countries in discussion and those same statistics in the United States.</li> <li>4. Students will investigate current polling of Americans with respect to immigration and a path to citizenship.</li> </ol>
<b>Assessment:</b>
Students will complete the attached assignment and display their findings
<b>Resources:</b>
<ol style="list-style-type: none"> <li>1. <a href="https://cis.org/Report/Record-445-Million-Immigrants-2017?gclid=Cj0KCQjwjOrtBRcCARIsAEq4rW7GPN69hDzciPIBYgzvdJOHTq7I9fd9waAv5ggQCHiEgyEthPyzCbQaAhcBEALw_wcB">https://cis.org/Report/Record-445-Million-Immigrants-2017?gclid=Cj0KCQjwjOrtBRcCARIsAEq4rW7GPN69hDzciPIBYgzvdJOHTq7I9fd9waAv5ggQCHiEgyEthPyzCbQaAhcBEALw_wcB</a></li> <li>2. <a href="https://forsythtech.libguides.com/statistics">https://forsythtech.libguides.com/statistics</a></li> <li>3. <a href="https://www.pbs.org/newshour/show/migrants-risk-the-dangerous-trip-to-the-u-s-because-its-safer-than-staying-home">https://www.pbs.org/newshour/show/migrants-risk-the-dangerous-trip-to-the-u-s-because-its-safer-than-staying-home</a></li> </ol>

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### Activity 3: In depth study of the six countries with the highest immigration rate

Prior to class, students should read the article, The Stories of Migrants Risking Everything for a Better Life, found at: <https://time.com/longform/migrants/> Before class begins, we will watch the following video: <https://www.pbs.org/newshour/show/migrants-risk-the-dangerous-trip-to-the-u-s-because-its-safer-than-staying-home>

1. Create a table of the variables that affect quality of life, both positively and negatively, and list how you might measure these variables.

Positive:	How might you measure this variable?

Negative:	How might you measure this variable?

2. Which of the quantitative variables above are discrete variables?
3. Which of the quantitative variables above are continuous variables?

4. Consider the table below. Find the 6 countries from the Caribbean, Central America, and South America with the highest number of immigrant population. List them below the table.

**Table 1. Immigrant Population in the U.S. by Country & Region 1990-2017**

Region	1990	2000	2010	2016	2017	Growth 2010-2017	% Growth 2010-2017
<b>East Asia</b>	<b>3,759,346</b>	<b>5,822,450</b>	<b>7,516,059</b>	<b>8,408,268</b>	<b>8,634,996</b>	<b>1,118,937</b>	<b>15%</b>
China	921,070	1,518,652	2,166,526	2,716,548	2,843,838	677,312	31%
Korea	568,397	864,125	1,100,422	1,041,727	1,063,074	(37,348)	-3%
Vietnam	543,262	988,174	1,240,542	1,352,760	1,342,568	102,026	8%
Philippines	912,674	1,369,070	1,777,588	1,941,665	2,008,080	230,492	13%
Burma	19,835	33,905	82,200	142,494	160,275	78,075	95%
Thailand	106,919	169,801	222,759	253,585	256,136	33,377	15%
<b>South Asia</b>	<b>579,993</b>	<b>1,341,323</b>	<b>2,346,637</b>	<b>3,236,515</b>	<b>3,453,010</b>	<b>1,106,373</b>	<b>47%</b>
India	450,406	1,022,552	1,780,322	2,434,524	2,610,537	830,215	47%
Pakistan	91,889	223,477	299,581	382,852	391,976	92,395	31%
Bangladesh	21,414	95,294	153,691	234,640	248,696	95,005	62%
Nepal	2,262	11,859	69,458	129,450	152,685	83,227	120%
<b>Caribbean</b>	<b>1,947,435</b>	<b>2,961,737</b>	<b>3,738,920</b>	<b>4,293,823</b>	<b>4,414,943</b>	<b>676,023</b>	<b>18%</b>
Cuba	736,971	872,716	1,104,679	1,271,618	1,311,803	207,124	19%
Dominican Republic	347,858	687,677	879,187	1,085,321	1,162,568	283,381	32%
Jamaica	334,140	553,827	659,771	736,303	744,658	84,887	13%
Haiti	225,393	419,317	587,149	668,223	679,752	92,603	16%
<b>Central America</b>	<b>1,133,978</b>	<b>2,026,150</b>	<b>3,052,509</b>	<b>3,455,293</b>	<b>3,527,013</b>	<b>474,504</b>	<b>16%</b>
El Salvador	465,433	817,336	1,214,049	1,387,022	1,401,832	187,783	15%
Guatemala	225,739	480,665	830,824	935,707	958,842	128,018	15%
Honduras	108,923	282,852	522,581	651,059	655,362	132,781	25%
<b>South America</b>	<b>1,037,497</b>	<b>1,930,271</b>	<b>2,729,831</b>	<b>2,979,491</b>	<b>3,213,187</b>	<b>483,356</b>	<b>18%</b>
Colombia	286,124	509,872	636,555	704,587	783,032	146,477	23%
Peru	144,199	278,186	428,547	427,445	458,785	30,238	7%
Ecuador	143,314	298,626	443,173	439,123	454,178	11,005	2%
Brazil	82,489	212,428	339,613	409,595	451,084	111,471	33%
Venezuela	42,119	107,031	184,039	290,224	351,144	167,105	91%
Guyana	120,698	211,189	265,271	266,368	268,577	3,306	1%
<b>Middle East</b>	<b>728,682</b>	<b>1,187,692</b>	<b>1,611,897</b>	<b>2,082,926</b>	<b>2,084,451</b>	<b>472,554</b>	<b>29%</b>
Iran	210,941	283,226	356,756	386,073	395,429	38,673	11%
Iraq	44,916	89,892	159,800	221,587	232,418	72,618	45%
Egypt	66,313	113,396	137,799	181,677	184,359	46,560	34%
Israel	86,048	109,719	127,896	142,078	142,934	15,038	12%
Lebanon	86,369	105,910	121,000	128,608	124,847	3,847	3%
Saudi Arabia	12,632	21,881	45,016	99,849	82,201	37,185	83%
Syria	36,782	54,561	59,554	96,694	104,234	44,680	75%
Afghanistan	28,444	45,195	54,458	94,726	100,367	45,909	84%
<b>Europe</b>	<b>4,360,463</b>	<b>4,980,837</b>	<b>4,906,698</b>	<b>4,876,213</b>	<b>4,913,608</b>	<b>6,910</b>	<b>0%</b>
United Kingdom	640,145	677,751	669,794	696,896	702,567	32,773	5%
Russia	n/a	340,177	383,166	397,236	403,670	20,504	5%
Italy	580,592	473,338	364,972	335,763	333,911	(31,061)	-9%
Ukraine	n/a	275,153	326,493	347,759	354,494	28,001	9%
Germany	711,929	706,704	604,616	563,985	552,640	(51,976)	-9%
<b>Sub-Saharan Africa</b>	<b>264,775</b>	<b>690,809</b>	<b>1,326,634</b>	<b>1,783,623</b>	<b>1,933,469</b>	<b>606,835</b>	<b>46%</b>
Nigeria	55,350	134,940	219,309	306,874	344,979	125,670	57%
Ethiopia	34,805	69,531	173,592	244,924	249,991	76,399	44%
Ghana	20,889	65,572	124,696	171,428	164,610	39,914	32%
Kenya	14,371	41,081	88,519	129,670	138,150	49,631	56%
Somalia	2,437	36,139	82,454	93,020	106,525	24,071	29%
<b>Mexico</b>	<b>4,298,014</b>	<b>9,177,487</b>	<b>11,711,103</b>	<b>11,573,680</b>	<b>11,269,913</b>	<b>(441,190)</b>	<b>-4%</b>
<b>Canada</b>	<b>744,830</b>	<b>820,771</b>	<b>798,649</b>	<b>783,206</b>	<b>809,267</b>	<b>10,618</b>	<b>1%</b>
<b>Oceania/Elsewhere</b>	<b>912,303</b>	<b>168,362</b>	<b>216,736</b>	<b>265,863</b>	<b>271,601</b>	<b>54,865</b>	<b>25%</b>
<b>Total</b>	<b>19,767,316</b>	<b>31,107,889</b>	<b>39,955,673</b>	<b>43,738,901</b>	<b>44,525,458</b>	<b>4,569,785</b>	<b>11%</b>
<b>Predominantly Muslim Countries</b>	<b>840,595</b>	<b>1,518,755</b>	<b>2,184,664</b>	<b>2,824,272</b>	<b>2,864,397</b>	<b>679,733</b>	<b>31%</b>
<b>Latin America</b>	<b>8,416,924</b>	<b>16,095,645</b>	<b>21,232,363</b>	<b>22,302,287</b>	<b>22,425,056</b>	<b>1,192,693</b>	<b>6%</b>
<b>Latin America other than Mexico</b>	<b>4,118,910</b>	<b>6,918,158</b>	<b>9,521,260</b>	<b>10,728,607</b>	<b>11,155,143</b>	<b>1,633,883</b>	<b>17%</b>

**Source:** Data for 1990 and 2000 is from the decennial census. Data for 2010 and 2017 is from the American Community Survey from American Factfinder at Census.gov. Figures for 1990 are from Table 3 [here](#). Data for 2000 for Burma, Nepal, Saudi Arabia, Kenya, and Somalia are from the 2000 Decennial Census (5% sample) public-use data. See end note 6 for a list of all countries that can be identified in Census Bureau data and the region to which they are assigned.

List the six countries here:

5. Looking at the bottom of the table, what is the percentage of Latin American immigrants who are Mexican?
  
6. Calculate the percentage of Latin American immigrants who are not Mexican.
  
7. Sketch a pie graph of the last two results.
  
8. Choose three of the variables discussed in question number one and research the numbers for the six countries with the highest immigrants and also for the United States. Create three tables below:

For example: If a measure of health care is infant mortality, find the numbers for all of the countries, list and compare.

9. How does this data compare between the Latin American countries and the United States?

10. Go to the website: <https://forsythtech.libguides.com/statistics> and choose the category politics. Research 2 polls regarding U.S. opinion regarding immigration or a path to citizenship. Record your poll and the results below:

11. Discuss your results with your table.

<b>Activity 4:</b>
Analyzing the current state of Latin American immigration for future trends
<b>Description of Activity:</b>
The purpose of this activity is to summarize the current state of immigration from Latin America and make predictions about the future.
<b>Learning Outcomes for Course:</b>
Students will use real-world data to promote statistical literacy. Students will interpret data to analyze future trends.
<b>Global Learning Outcomes for Activity:</b>
<ol style="list-style-type: none"> <li>1. Reflect critically on their role as a member of the global community and pursue ways to create positive change</li> <li>2. Interpret cross-cultural data and communicate results in written format.</li> </ol>
<b>Time Needed:</b>
30 minutes
<b>Materials:</b>
Paper and pencil Assignment sheet below Internet
<b>Procedure:</b>
<p>The emphasis to put all of the parts of the module together and summarize the findings.</p> <ol style="list-style-type: none"> <li>1. Students will predict what population and immigration will look like in the future using the graph provided.</li> <li>2. Students will reflect on all the data surrounding the history of Latin American immigration, the culture of the region, the quality of life data, and trends in U.S. opinion to write a final conclusion of their ideas.</li> </ol>
<b>Assessment:</b>
Students will complete the attached assignment and write a serious reflection of their personal views on immigration based on their research.
<b>Resources:</b>
<ol style="list-style-type: none"> <li>1. Gonzalez, Juan (2011). Harvest of Empire (Revised Edition) New York, NY.</li> <li>2. <a href="https://www.nps.gov/heritageinitiatives/latino/latinothemestudy/immigration.htm">https://www.nps.gov/heritageinitiatives/latino/latinothemestudy/immigration.htm</a></li> <li>3. <a href="https://www.pbs.org/video/latino-americans-immigration-and-education/">https://www.pbs.org/video/latino-americans-immigration-and-education/</a></li> </ol>

## MAT 152: Descriptive Statistics – Exploring Latin American Immigration

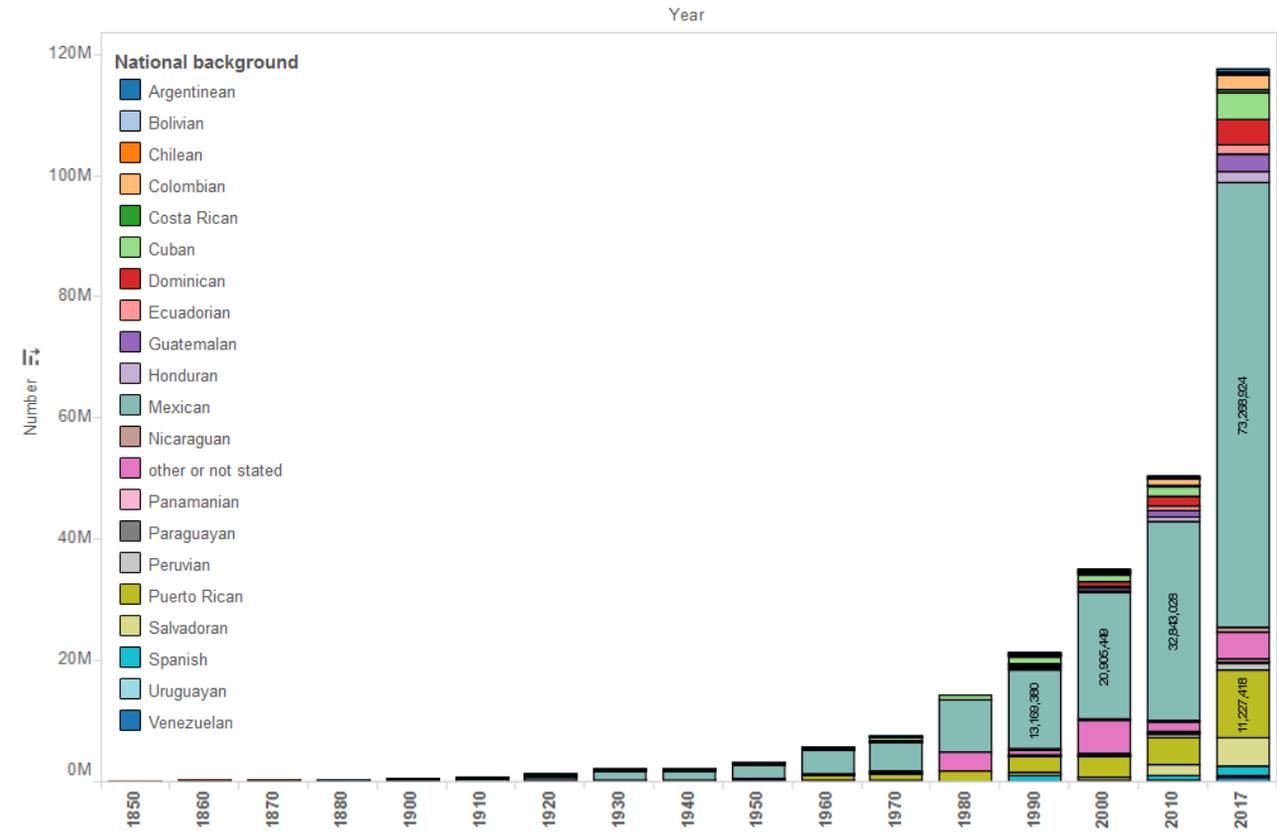
### Activity Four: Analyzing the current state of Latin American immigration for future trends

In this section, we will look at the current state of immigration and use our research and the data to predict future trends. Prior to class, please watch the video: <https://www.pbs.org/video/latino-americans-immigration-and-education/>

1) Consider the graph below and the article you read by David Gutierrez.

#### Latinx population in United States by decade

Chart shows the population of Latinx decade by decade with national backgrounds represented in different colors. Mouse over chart for numbers. Select a national background to see population numbers. Select a state to see the Latinx profile by decade.



a) What type of growth is shown in this graph?

b) What historical events could be attributed to the spike from 2010 to 2017?

c) Based on your reading and the graph, what would you predict the Latinx population to be in 2030?

d) In the text, Harvest of Empire: A History of Latinos in America the author Juan Gonzalez states:

“The Census Bureau, for instance, has had to repeatedly revise upward its projection for the future growth of the Latino population. Its most recent estimate predicts the country’s current Hispanic population, which was 46 million in 2009, will nearly triple to 132 million in 2050. At that point, Latinos will comprise *nearly one-third of the entire U.S. population.*”

Based on your readings and the above graph, is this a reasonable claim? Defend your response in complete sentences.

2. Considering all of the data and your research throughout this module, give a clear and comprehensive analysis on the issue of immigration in the United States from Latin America. What can we expect in the future? Explain your ideas for solutions for our regions to co-exist peacefully.