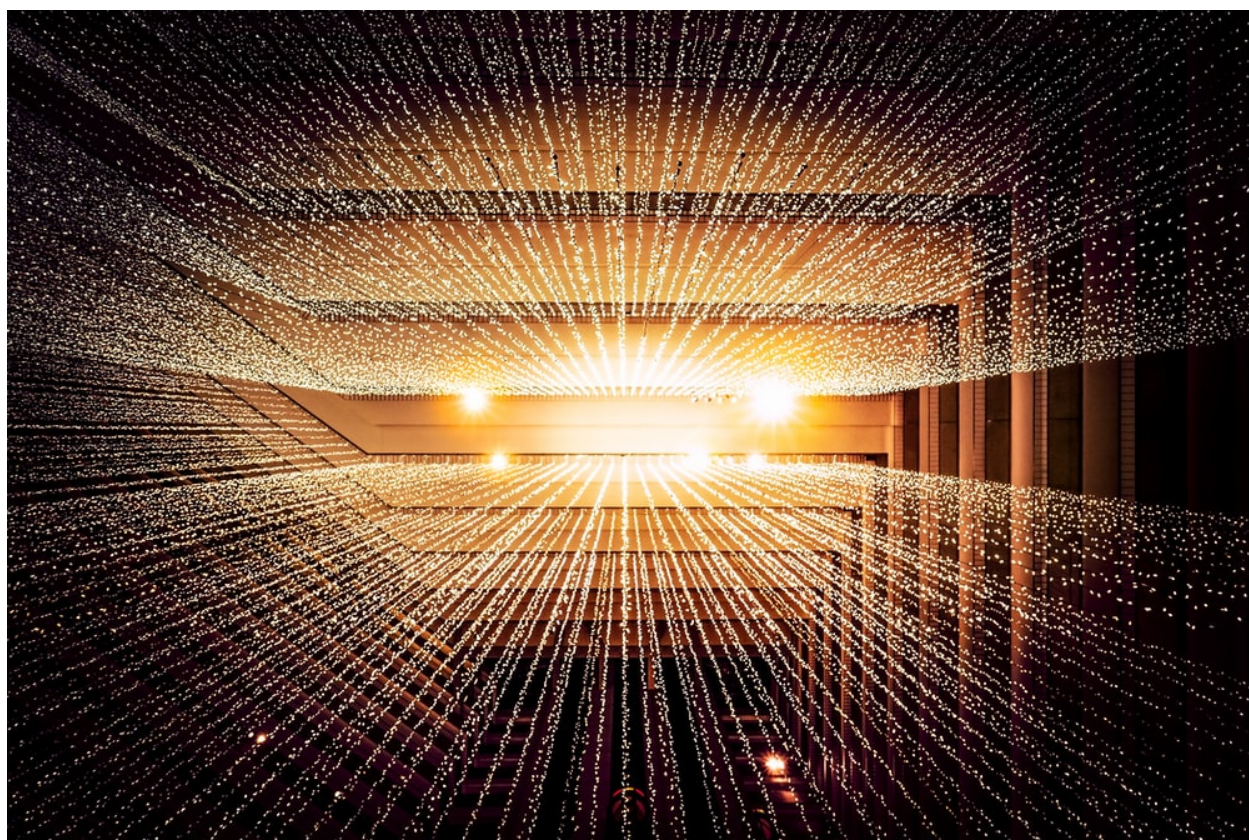


Digital Divide Within Santa Barbara County

Depiction of the Existing Digital Access Within the County and Across Selected Demographic Indicators in Each Zip Code



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Introduction

Santa Barbara County has a large interior bordering several coastal plains on the west and south coasts of the county. The largest number of populations live in southern coastal plain, known as the "south coast" – meaning the part of the county south of the Santa Ynez Mountains.

Technological changes over the last two decades brought fundamental development and growth in the viability of phone and other mobile devices that can be used in various parts of the globe, and enable people from different parts of the world to have access to information and other key digital activities. These activities, over a relatively short period of time, expanded and included remote working, healthcare, education, and resulted in the growth of business sectors, such as e-commerce.¹

The COVID-19 crisis has thrown into sharp focus the importance of digital connectivity in daily life. As many countries underwent lockdown periods, digital infrastructure was critical to mitigate the impact of stay-at-home restrictions. Connectivity players have contributed by taking short-term actions to ensure continued access during the crisis.

There are a number of reasons for the existing gaps in connectivity and access to digital services. A segment of such gaps goes back to the prevailing support for investing in projects strengthening the existing network. The other, even more important, segment of the gaps is due to the inability to purchase devices or to pay for the services through a fast and reliable Internet connection. The importance of digital exclusivity drew considerable attention from the United Nations and other international organizations and entities.

According to the study conducted by the World Economic Forum and Boston Consulting Group (2020), the post-COVID-19 “new normal” will likely include looking for viable ways that can result in increased speeds, better access to devices, and budgets to enable households and businesses to be able to afford having access to such services with the needed quality. As such, connectivity must become the top priority, and stakeholders must aim for United Nations targets: by 2025, broadband Internet user penetration should reach 75% worldwide, and by 2025, broadband should cost no more than 2% of earnings. Such a reduction in the cost of access requires a significant level of investment, which certainly has to take place in the United States.

The UN Secretary-General’s Roadmap for Digital Cooperation is very important to include in any plan of action.² To achieve the goals of the roadmap, stakeholders should aim to drive the adoption of high-speed Internet beyond coverage targets, and take a “tech agnostic” approach, where traditional business cases are insufficient – this incorporates terrestrial and non-terrestrial infrastructure options for providing access to high-quality fixed broadband, wireless and satellite networks.³

¹ For more information, see World Economic Forum in Collaboration with Boston Consulting Group (2020), Accelerating Digital Inclusion in the New Normal.

² For more information see United Nations (2020), United Nation’s Secretary Generals’ Roadmap for Digital Cooperation <https://www.un.org/en/content/digital-cooperation-roadmap/>

³ Ibid.

The California Public Utility Commission's (CPUC) regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises. Their five commissioners are appointed by California's governor and the organization ensures that consumers have safe, reliable utility service at reasonable rates, are protected against fraud, and are able to promote the health of California's economy.

This study takes a thorough review of access and affordability of digital services by household and individuals as a whole and across a selected number of demographic characteristics. In reaching such objectives, we have used and processed the available information and presented the data in two different ways:

- First, the proportion of households which do not have an Internet connection and/or computer. This is a measure of an absolute lack of access to digital services. However, we need to remember that having access does not mean that all households can afford it. When a service or good is not affordable, two possible economic consequences will follow it: firstly, they are using less than a sufficient level of service by opting for an inadequate level of access; secondly, they may be bearing the expenses and cutting back on their other necessities for a basic level of consumption. Either of the two possible developments is detrimental to the wellbeing of the household.
- Second, since affordability strongly correlates with the demographic characteristics of a population, we went further and presented access data based on selected demographic characteristics.

This study includes every zip code in which residents of Santa Barbara County reside. In general, a zip code can consist of general population centers or P.O. boxes. In most P.O. Boxes demographic information through U.S. Census American Community Surveys (ACS) are not collected. There are, however, some zip codes within P.O. Boxes for which data are provided through ACS. There are also zip codes with a relatively small total population. We defined small population size as population under 2000 people. Very small populations have their own statistical problems which may impact the outcome of this study and accuracy of information reported. One important problem with small population zip codes is that we may not be able to cross tabs population of such zip codes across different population characteristics. The information for such zip codes usually have large margin of error, which makes reporting of findings rather inaccurate.

In brief, information within this study is presented in two sections.

The first section presents the following:

- Lack of computer and internet connection in households across the geographic location for the latest period of the last five years.

- The percentage of households that cannot afford to have access will be estimated based on the annual household income and average yearly digital spending.
- The estimates will be presented as data tables and graphs.

The second section covers the following data.

- Lack of computer and internet connection for individuals in general data and across the following demographic characteristics.
 - Race
 - Ethnicity
 - Age, particularly children under 18 years of age)

In order to complete both sections of this study and carry them out with regard to the entire region, we need to first look at the availability of devices and connections. They represent an essential need in our new living and working environment. However, we also need to go further and look into the population in each zip code based on their ability to afford the expenses, which consists of acquiring the device, and subscribing to the service needed.

In order to be able to estimate the affordability, we need to calculate a reasonable proportion of household expenses for buying the necessary equipment and having a connection to broadband Internet with reasonable efficiency. For the purpose of reaching such a level of expenditures, we use several sources of information. We first took the latest available information on the average American's spending on utilities in order to find how much on average is spent on Internet and electricity as a proportion of their total utility spending. This can be seen in the following charts and tables.

US Average Cost of Utilities per Month



Table 1: US Average Cost of Utilities per Month

Source: Move.org, 2021

Taking this information, we established the following proportional spending on utilities, on average.

Breakdown of Basic Necessities of American Households (excluding Cable TV)

Electricity	\$110.76	34%
Natural gas	\$72.1	22%

Water	\$70.4	22%
Internet	\$60	18%
Trash/Recycling	\$14	4%
Total	\$327.26	100%

Table 2: Breakdown of Basic Necessities of American Household (excluding Cable TV)

We then used the latest available information for the average American's spending from Howmuch.net.⁴ This can be seen below (the graph is copied and reported from its source). The cost of Internet alone is about 18% of the basic necessities of American households. Using computers and cell phones and taking a moderate proportion of the cost of electricity towards the equipment, and 50% of household equipment as a computer and cell phone, or other electronic devices, we arrived at the following estimated average annual expenditure for an average American household:

	Costs	Percentages	Costs after adjustment
Utility bill	\$ 4,049.00	27%	\$ 1,093.23
Household Equipment	\$ 2,025.00	50%	\$ 1,012.50
			\$ 2,105.73

Source: Move.org and author's calculation

Table 3: Estimated Average Expenditure for an Average American Household

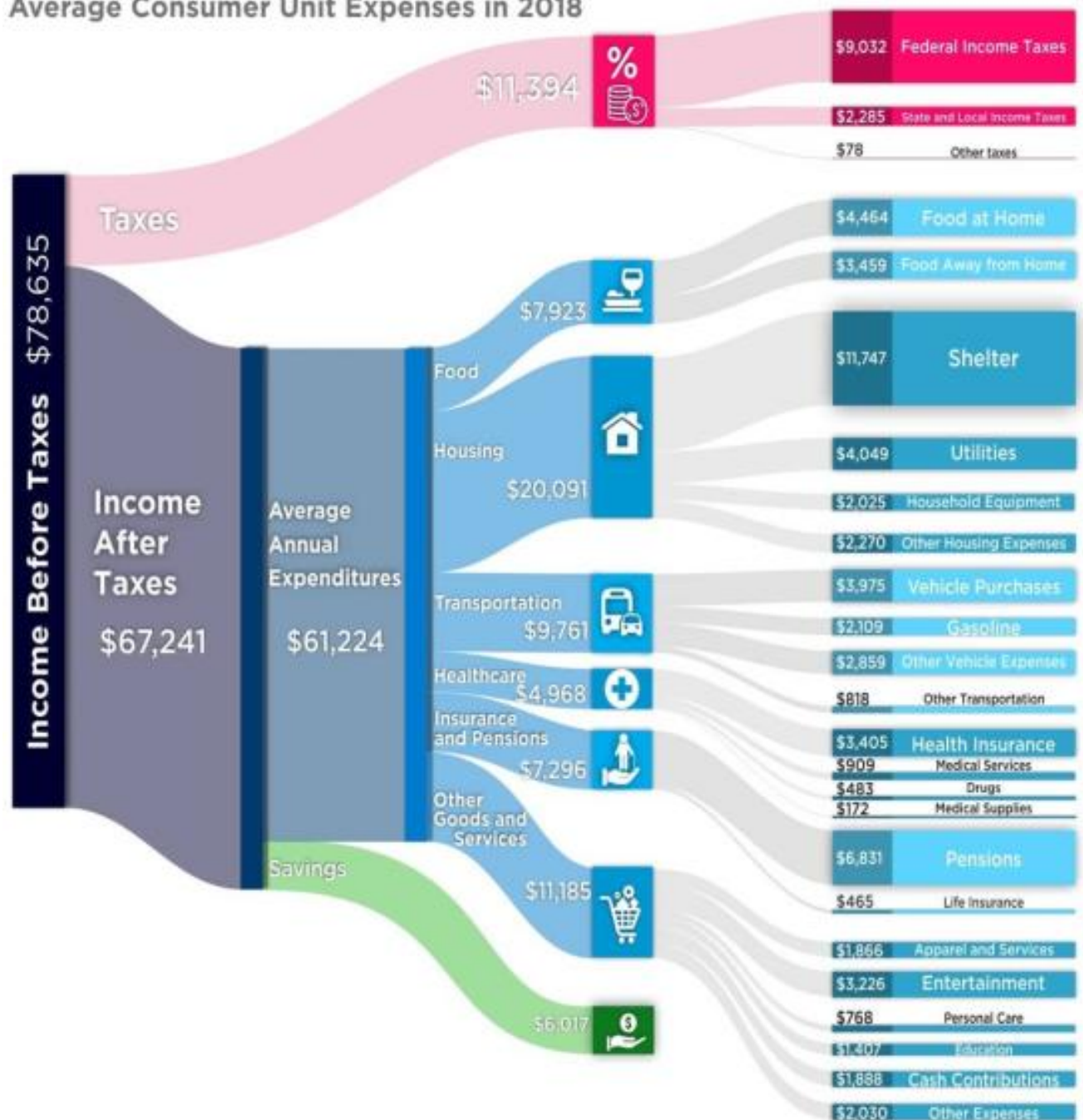
Source: Author's Calculation

This shows that, for an average American household, the cost of paying for Internet and equipment annually will amount to just over \$2,100. This is based on the quantity of just about 3.5% of household income (disposable income). There are, however, other estimations based on the study conducted by the Boston Consulting Group for the World Economic Forum in 2020, which estimates the cost is considerably higher for developed countries and middle-income countries. In order to be mindful of other estimations and bearing in mind that the cost of access to the Internet is not set as a proportion of household income, we used the following several means of estimating the cost as a proportion of household income for our own study. The details can be seen in the respective table.

⁴ For more information see: <https://howmuch.net/articles/breakdown-average-american-spending>

A Breakdown of the Average American Spending

Average Consumer Unit Expenses in 2018



Article & Sources:
<https://howmuch.net/articles/breakdown-average-american-spending>
 Bureau of Labor Statistics - <https://bls.gov>

howmuch.net

Table 4: Breakdown of the Average American Spending

	Digital Expenditures (based on calculation)	Assuming \$4,000 as Digital Expenditures (Based on Study)	Assuming \$3,052 as Digital Expenditures (As an average of two previous categories)
Digital Expenses	\$ 2,105.00	\$ 4,000.00	\$ 3,052.00
Average Annual Expenditures	\$ 61,224.00	\$ 61,224.00	\$ 61,224.00
Percentage	3.4%	7%	5%

Table 5: Two Scenarios of Monthly Digital Expenditures

Source: Author's Calculation

The above table shows that if we use Boston Consulting Group's estimate for developed countries, we end up with a percentage of 7% for an average American's annual spending on Internet service. This suggests that the ratio will be higher for the lower-than-average American income earners, and lower for the higher income earners. In order to come to a middle ground, we used the spending as calculated for the average and took the mean value of this and the estimates calculated for the 2020 World Economic Forum. This led to a calculation of 5% of a typical household's budget on equipment, electricity, and the cost of broadband Internet. Bearing in mind that the objective of the current discussion is for facilitating access to digital services to be around 2% of a household budget after considerable investment in the future, having a 5% as a rate of affordability is not far from the reality of today. If we take the level of affordability at 2%, we can certainly come to a clear conclusion that our estimates are a clear overestimation of the affordability by more 100%. In other words, the income level of residents of a county must have income levels more than twice their current levels for the estimated cost to be 2% and not 5% of their income. It may be more realistic to say that the percentage of those who cannot afford it in each location is twice as high than what we estimated and included in this study.

The inevitable conclusion from this study is that by investing in broadband Internet and utilizing a more upgraded technology, the U.S. can enjoy a great return on investment by enabling its population to have greater access to digital services. This will be further elaborated in the following part of this report.

We then used this estimate (an expense of around \$3,000 for average digital spending) and applied it to various levels of household income and set 5% as the dividing line between affordability and unaffordability in a particular zip code. The outcome can be seen in the respective charts. The emerging picture shows a great level of inability to afford such services among residents across different zip codes within Santa Barbara County. The outcomes, as they will be presented within this study, indicate the overall lack of access to the services needed in a large number of areas and among hundreds of households and thousands of individuals across the county.

Findings for the County

Total population of Santa Barbara reached a population of 448,229 in 2020. Its population grew by 5.7% from 2010. Santa Barbara is a diverse county with 46.0% of its population as Hispanic or Latino and a proportion of 43.8 as White alone. Some 22.1% of its population are persons under 18 years of age. Some 10.5% of its population are under poverty.⁵

This report includes all zip codes within the entire county for which we could gather information either based on households or population. They include 23 zip codes, which consists of 19 general zip codes and 4 P.O. Boxes. Out of 19 general zip codes one has a population of less than 2000 and out of 4 zip codes under P.O. Boxes 3 are with population of less than 2000.⁶ We also include basic information on lack of access to computer or Internet connection among households for all other zip codes with population of less than 2000 for which data is available.

1. Digital Divide Within the County

1.1. Households Without Computer and/or Internet Connection

The following two charts present the number and the percentages of families without computer and/or Internet in the county. The raw numbers can be impacted by the size of the population in different parts of the county, and they also in some way reflect the population density in the areas. The percentages show the level of deprivation or isolation when it comes to having access to either a computer or Internet. The percentages vary significantly from the lowest level of 0.8% to 31.9%.⁷

⁵ For more information see US Census (2020) QuickFacts; Santa Barbara County, California <https://www.census.gov/quickfacts/santabarbaracountycalifornia>

⁶ Our zip codes include one P.B. Box zip code for which there are information on its households and population. There are hundreds of P.O. Boxes' zip codes within the state of California for which we cannot find any information through American Community Survey (ACS),

⁷ The zip code with zero number is a small population center and as explained before information from small geographic areas are inaccurate and come with large margin of error.

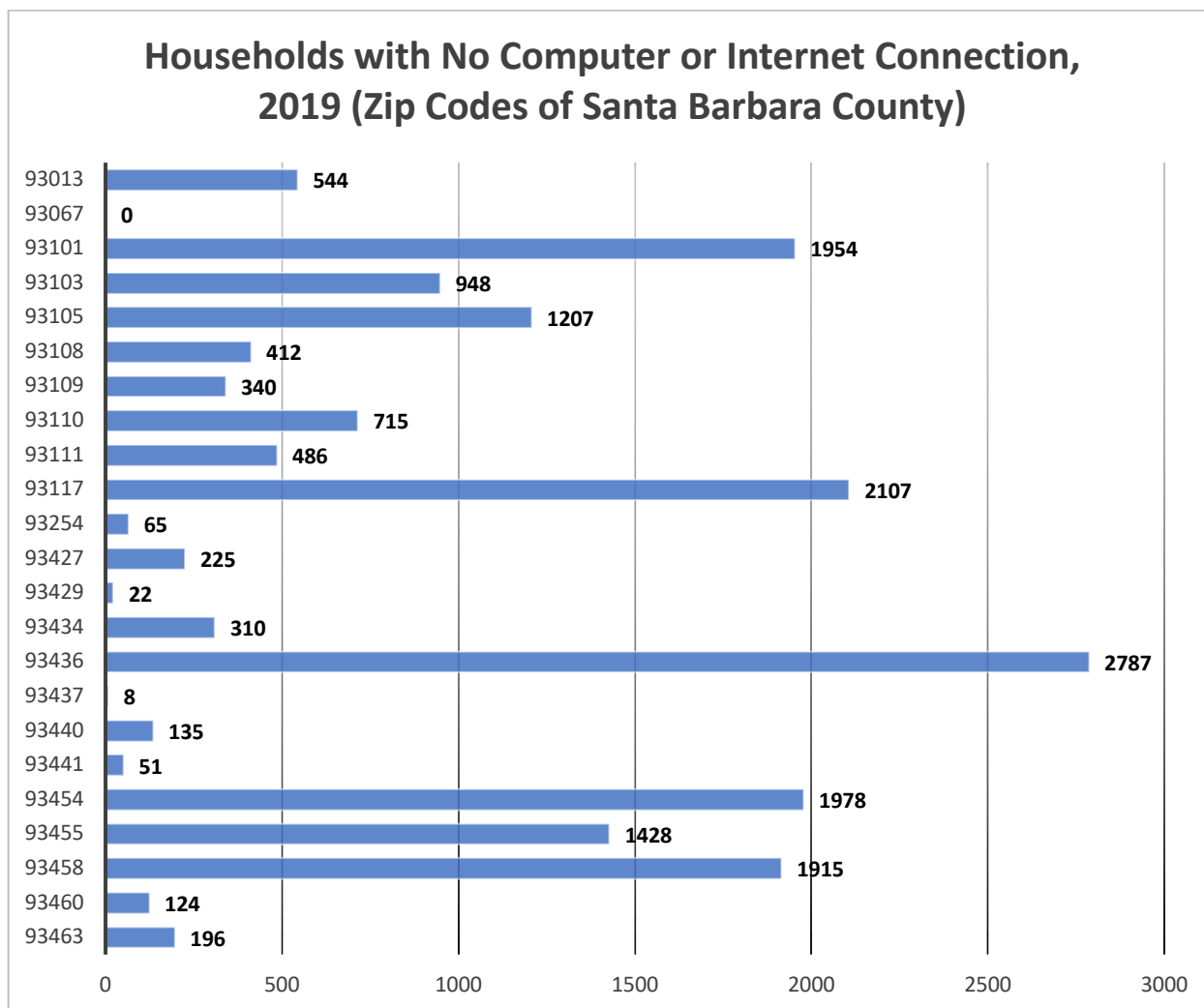


Figure 1: Households with No Computer or Internet Connection, 2019 (Zip Codes of Santa Barbara County)

Source: U.S. Census (2019) Source: B28003

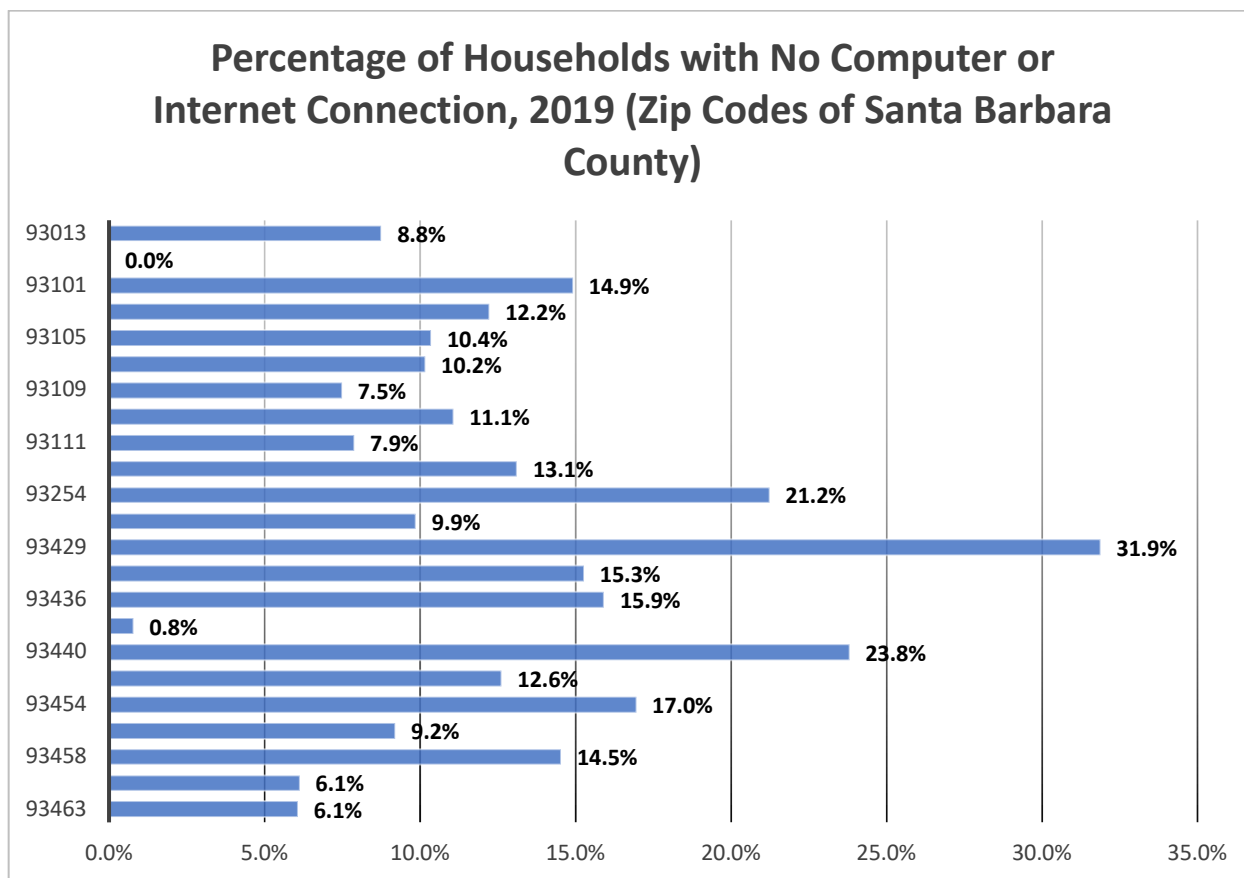


Figure 2: Percentage of Households with No Computer or Internet Connection, 2019 (Zip Codes of Santa Barbara County)

Source: U.S. Census (2019) B28003

1.2. Population Without Computer or Internet Connection Across Race & Ethnicity

Race and ethnicities are unfortunately important bases for observing inequity among different groups of individuals and households. Paying attention to such an important observation will allow better understanding of the existing problems and hopefully lead to determinations of better local and regional policies within a meaningful geographic affirmative and supportive differentiation. The following charts present the prevailing picture with regard to the population without access to the Internet and/or a computer across various races and ethnicities in the county.

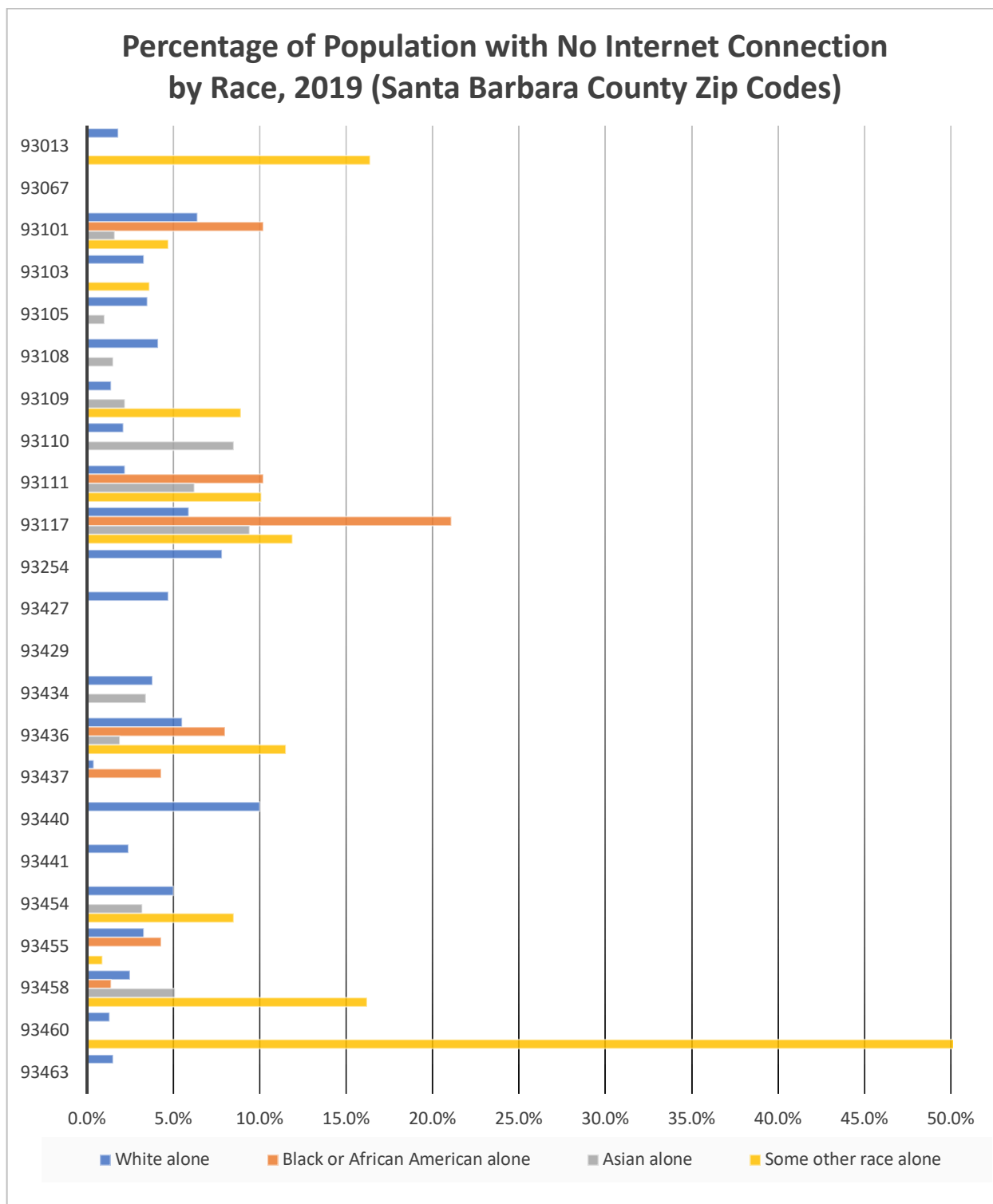


Figure 3: Percentage of Population with No Internet Connection by Race, 2019 (Santa Barbara County Zip Codes)

Source: U.S. Census (2019) S2802

Percentage of Population with No Internet Connection by Ethnicity, 2019 (Santa Barbara County Zip Codes)

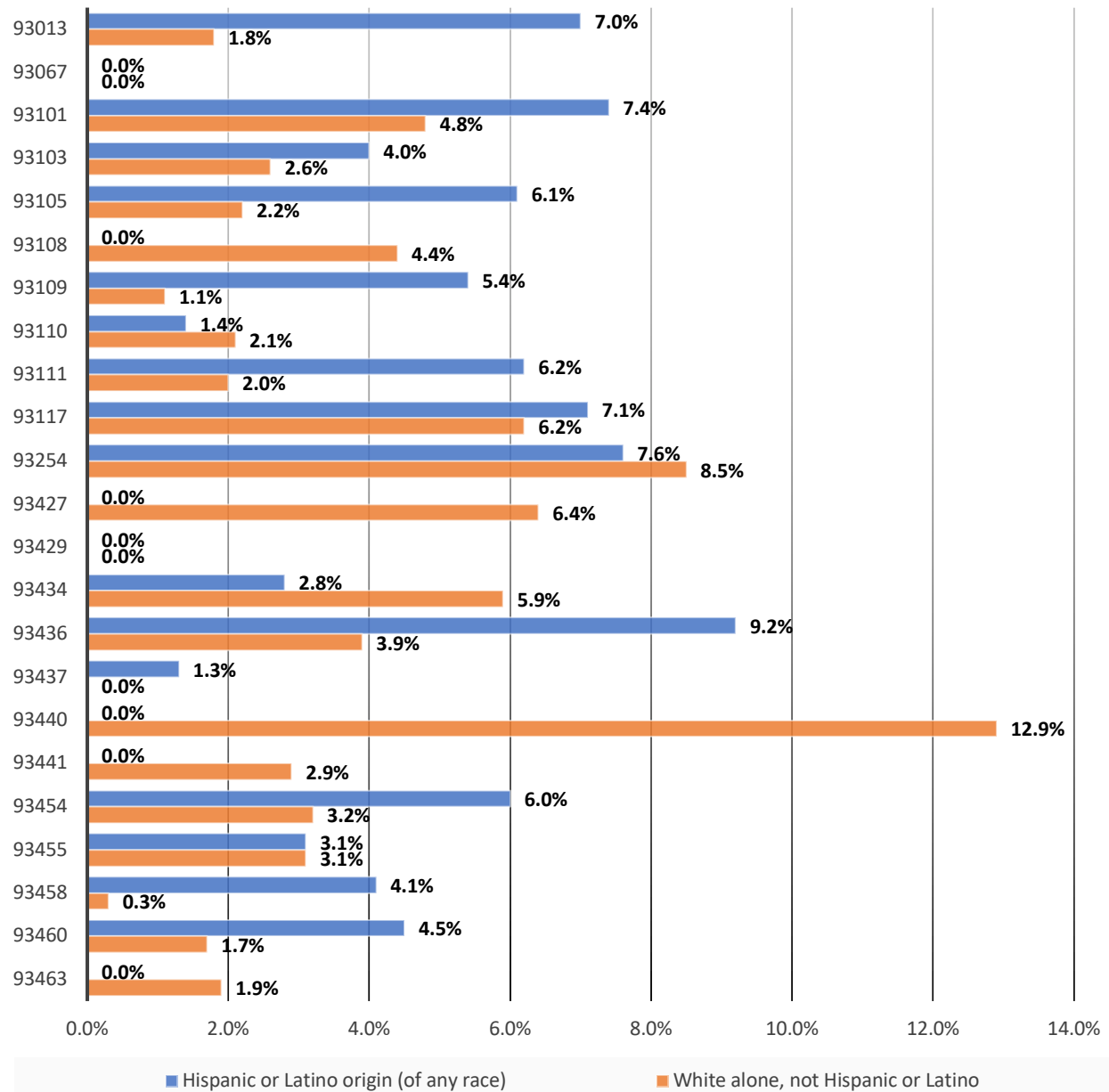


Figure 4: Percentage of Population with No Internet Connection by Ethnicity, 2019 (Santa Barbara County Zip Codes)

Source: U.S. Census (2019) S2802

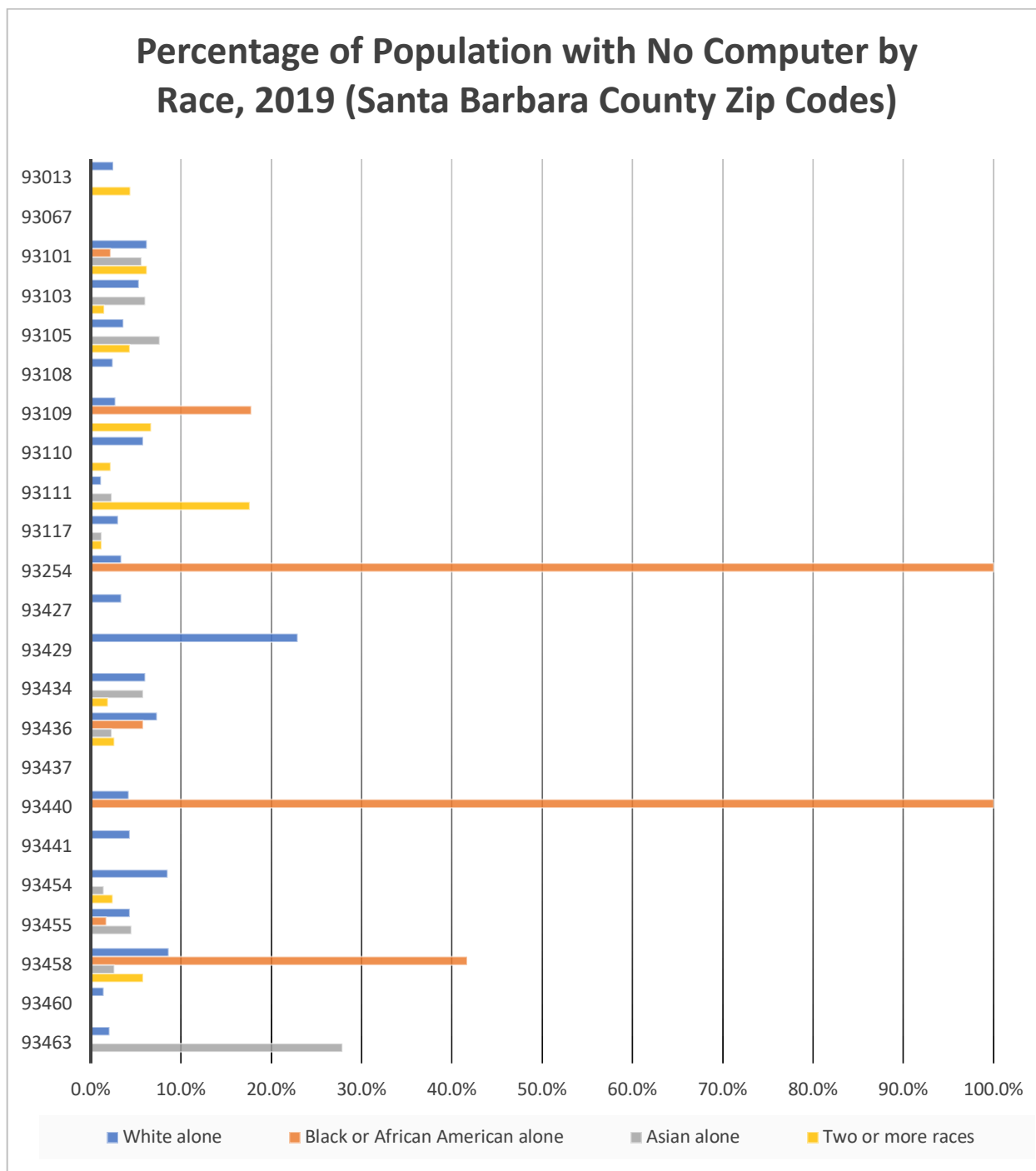


Figure 5: Percentage of Population with No Computer by Race, 2019 (Santa Barbara County Zip Codes)

Source: U.S. Census (2019) S2802

Percentage of Population with No Computer by Ethnicity, 2019 (Santa Barbara County Zip Codes)

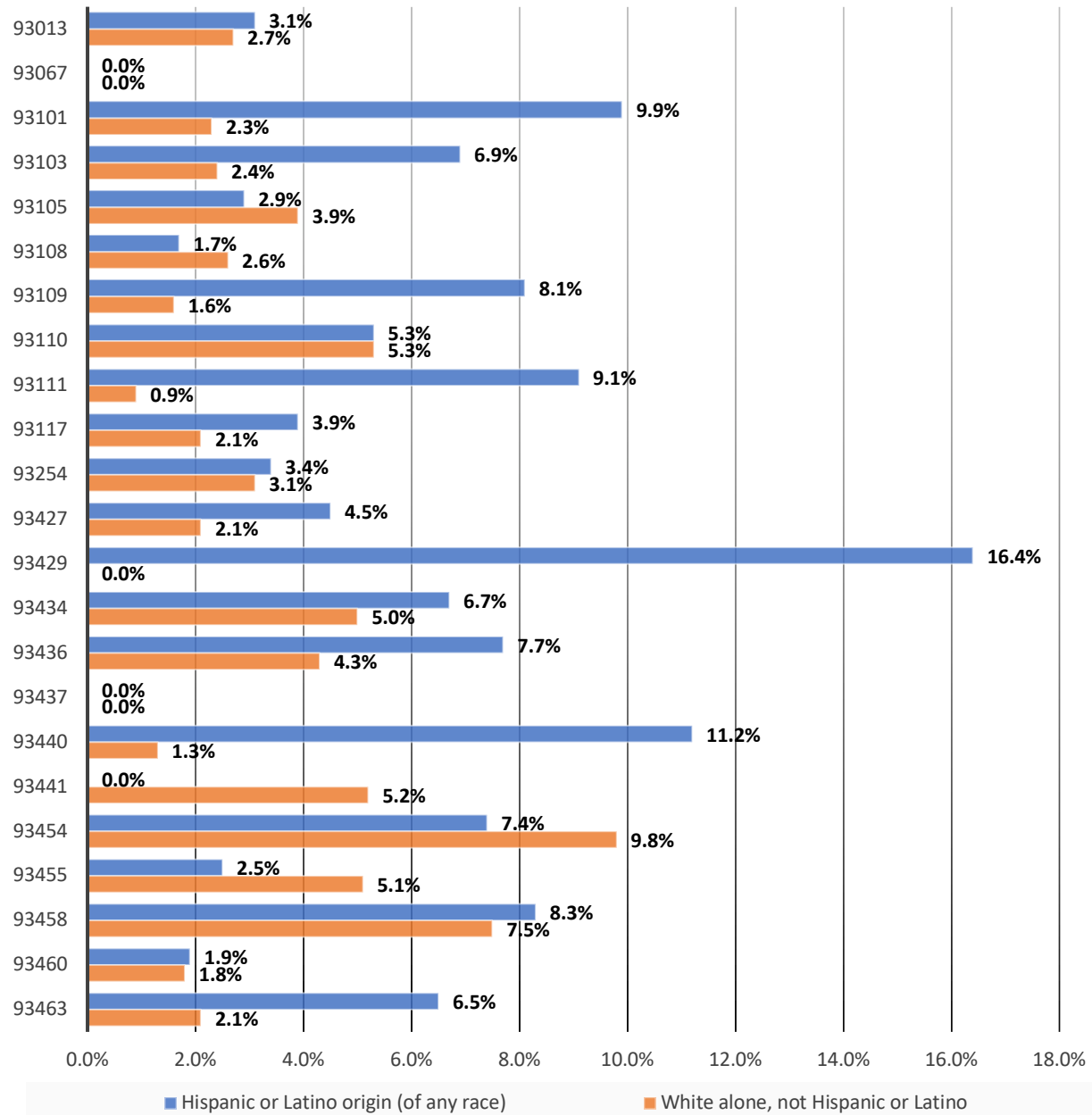


Figure 6: Percentage of Population with No Computer by Ethnicity, 2019 (Santa Barbara County Zip Codes)

Source: U.S. Census (2019) S2802

The above charts show some level of disparity among race and ethnicities with regard to having a computer or access to the Internet in Imperial County. However, there is an important observation which may have been impacting the proportions: the impact of small populations in some races or ethnicities. These numbers and percentages also come with a large margin of error.

1.3.Lack of Access to Computer & Internet Connection Among Children Under 18 Years of Age

The digital divide is debilitating for any population group, regardless of their age, race, ethnicity or other determining demographics. The focus on the population under 18 years of age has emerged as a more pressing shortcoming since, for a considerable part of the recent past, the ability to receive educational services has been a function of one's ability to access the needed devices and a high-speed broadband connection in various parts of the county. The following chart brings attention to these prevailing conditions in the county.

Percentage of Population Under 18 Years Old with No Computer or Internet Connection, 2019 (Zip Codes of Santa Barbara County)

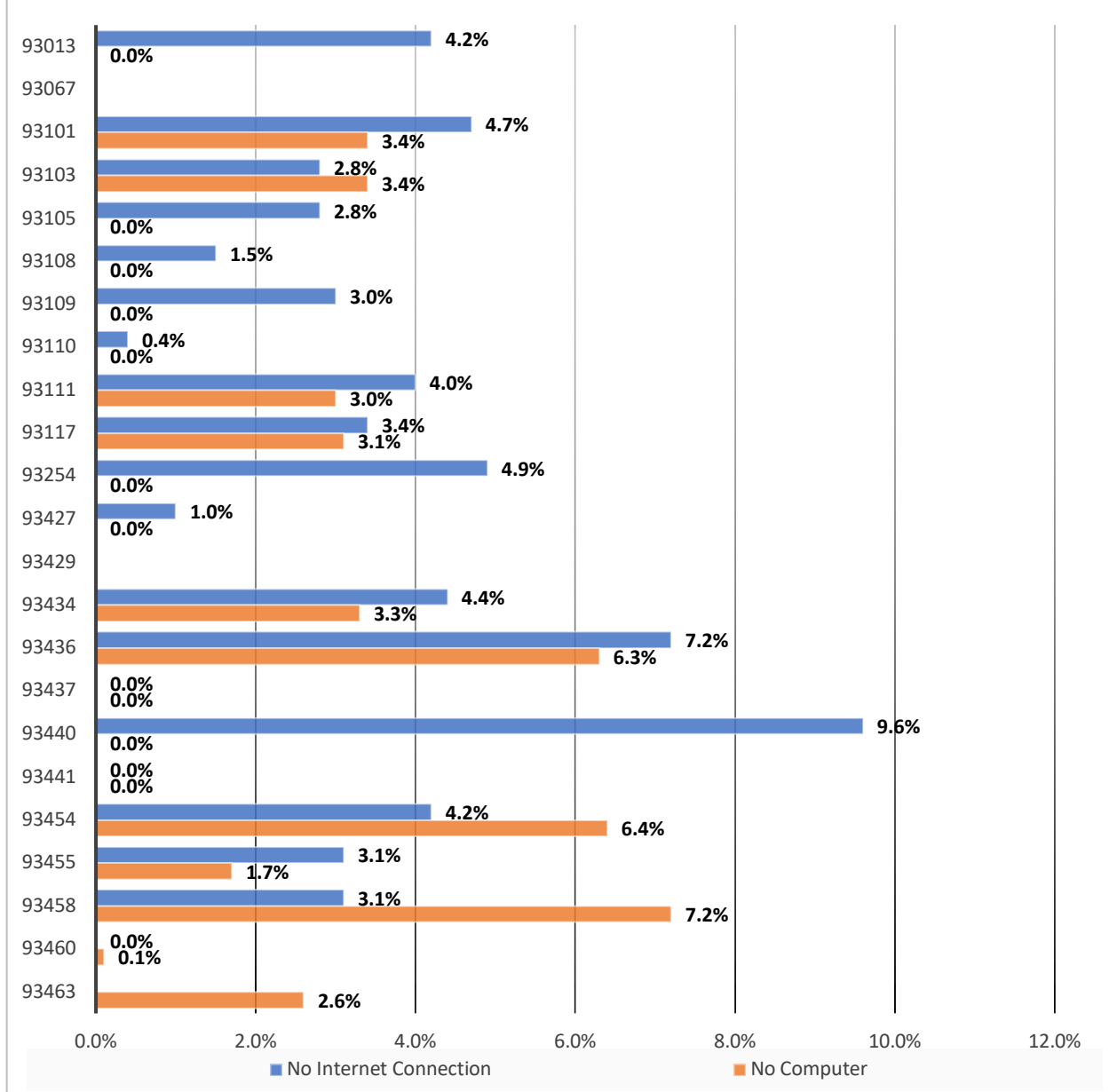


Figure 7: Percentage of Population Under 18 Years Old with No Computer or Internet Connection, 2019 (Santa Barbara County Zip Codes)

Source: U.S. Census (2019) S2802

The proportion of population under 18 years of age without a computer or an Internet connection is significant in some zip codes. We have known that socioeconomic conditions have an important impact on children's ability to learn. Food, housing, environmental quality, violence in neighborhoods, and many other socioeconomic constraints have traditionally been identified as impediments for children to meet their potential from a young age. The inability to have access to broadband Internet and a standard quality of equipment for a good connection is a new additional element, which deserves urgent attention. Addressing the digital divide is now an important part of creating greater equity in our communities and success for our children in their academic lives.

1.4. Affordability of Access to Necessary Devices and Internet Connection Across Neighborhood

The following chart shows the rate of affordability for digital expenses based on setting it as 5% of household incomes across the county.

The above picture is rather alarming. It shows that in some location around as high as 62% of the households cannot afford to enjoy digital services within the new normal.⁸

⁸. The "new normal" refers to the social and economic conditions that made having access to digital services among the basic needs of the population. Having access to the Internet and digital service can be compared with having access to electricity in the decades before. In the turn of the 20th century, electrification of population centers was rare. However, by 1920s most cities and towns were covered and had access to electricity, either through private companies, or their own municipalities. Having access to Internet services and being able to enjoy this service is the new normal.

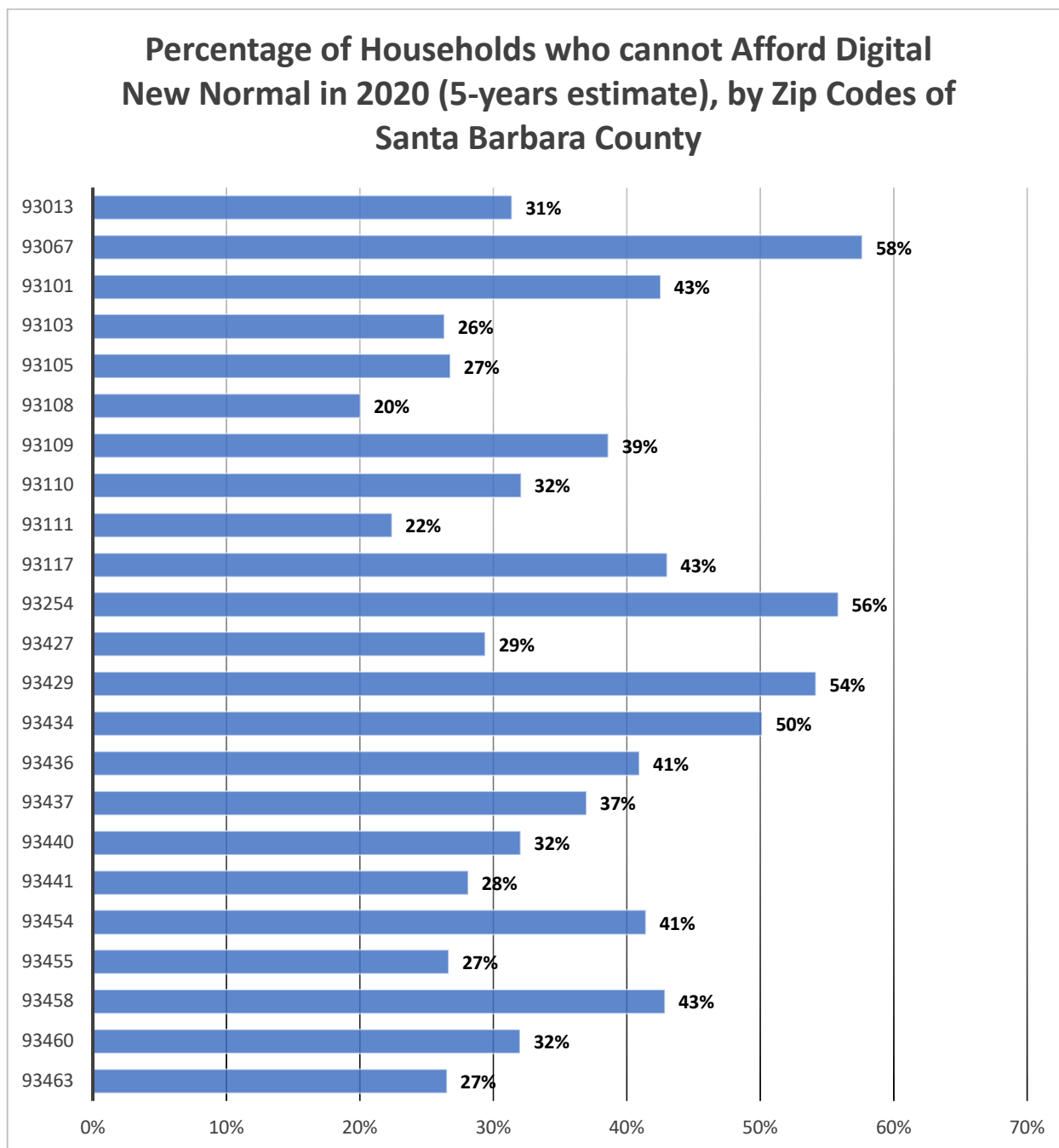


Figure 8: Percentage of Households who cannot Afford Digital New Normal in 2020 (5-years estimate), by Zip Codes of Santa Barbara County

Source: U.S. Census S1901 and Author's calculation

The above chart shows that there is significant lack of access to computer and Internet connections among the households within these low populated areas in Santa Barbara County. The inability to afford digital services and devices can go as high as 58%.

Summary of Findings

Technological changes over the last two decades brought fundamental development and growth in the viability of phones and other mobile devices that can be used in various parts of the globe, and enable people from different parts of the world to have access to information and other key digital activities. These activities, over a relatively short period of time, expanded and included remote working, healthcare, and education, and resulted in the growth of multiple business sectors, such as e-commerce.

The digital divide, and its impact on different demographic groups of individuals and families, has never been deeper than it is today. The gap between those with and without reliable digital access showed its face during current pandemic, and rose to the level of becoming a major indicator of prevalence of social and economic equity in our communities.

During the height of the pandemic, those with broadband Internet access could continue distance learning, seeing their doctor virtually, working remotely, and connecting with loved ones on video calls. It cannot be denied that it is the “new normal.” But while it’s become normal to assume that everyone has access to something as ubiquitous as the Internet, that couldn’t be farther from the truth.⁹ It is difficult to imagine that with COVID becoming less of a danger to our lives, the need for digital services and connectivity is going to diminish. Our communities need to meet this urgent need by ensuring everyone has the opportunities that access to broadband Internet affords. Essential computing devices will allow us to make use of digital services for our health, education, employment and social connection, and for receiving essential information and services that we depend on.

There are a number of reasons for the existing gaps in having connectivity and access to digital services. A possible remedy for such gaps goes back to the prevailing support for investing in projects that strengthen the existing network. The inequalities are caused by the inability of individuals and families to purchase the devices or to pay for the services through a fast and reliable Internet connection. The importance of digital exclusivity drew considerable attention from the United Nations and other international organizations and entities. The world community called for connectivity to become the top priority, and stakeholders must aim to reach the target set by the United Nations: by 2025, broadband Internet user status should reach 75% worldwide, and broadband Internet access should not cost more than 2% of household earnings. Such a reduction in the cost of access requires a significant level of investment, which certainly has to take place in the United States.

This study took a thorough review of access status and affordability of digital services by household and individuals as a whole and across a selected number of demographic characteristics within the county and in its all 23 zip codes.

The study looks at the digital divide from several perspectives. They are highlighted below:

⁹ For more information, see New America <https://www.newamerica.org/the-thread/an-old-problem-in-the-new-normal-the-digital-divide/>

- The first perspective is on having Internet connectivity or a computer together across all the zip codes based on households. This by itself is a good indicator of the digital divide within the county as it pertains to households.
- It then goes further and looks at the rate of having a computer or an Internet connection separately by individuals across the county and each zip code based on race and ethnicity. This angle serves a twin purpose. Measuring the rate of access to the Internet and/or a computer by individuals allows us to see the impact of the digital divide on each segment of the population, highlighting both the availability or deprivation on their own. However, it satisfies a second purpose, which is showing the extent of the deprivation according to location and our racial and ethnic makeup.
- The third angle is focusing solely on the lives of children under 18 years of age. As COVID has shown us, our social and economic status is a precursor of the extent of the loss suffered by adverse societal development. The impact of poverty is undeniable, and shows its face as an impediment of our progress and an enhancer of greater misery and suffering that people and communities have to endure. A lack of access to educational services has already been an important element impacting the school performance of our children. Lower educational performance is highly correlated with level of income and median income of household.¹⁰ COVID made this distinction far clearer, as students living in the deprived side of the digital divide had to suffer much greater because of their inability to access educational services in a virtual environment. But having access to the Internet and the ability to use the necessary devices with high performance is, and will remain, as a condition for receiving educational services not for an indefinite period of time.
- Finally, the study brings attention to the importance of the ability of households to pay for their devices and Internet connections. We took the latest available information on the average American's spending on utilities in order to find how much, on average, is spent on Internet connections and electricity as a proportion of their total utility spending. Using computers and cell phones and taking a moderate proportion of the cost of electricity towards the equipment and 50% of household equipment as a computer, cell phone, or other electronic devices, we arrived at an average monthly expenditure per household. We then computed that level of spending as a percentage of household income in every zip code, and measured what proportion of households in that zip code pass the 5% mark, which is considered a rate of great unaffordability. It is true to say that in many such households the level of unaffordability is far greater than 5%, and we did not make any attempt to measure those additional as various levels of unaffordability. But the numbers can be incredibly, and sadly, high.

Our findings are sobering, and can be found in different sections of the report for each zip code. There is no good substitute for reading the entire report and making notes of the zip codes wherein the information is reported in its detail. The following table provides a summary of our findings which can draw attention to the existing landscape of the digital divide in Santa Barbara County.

¹⁰ See Anna J. Egalite (2016), How Family Background Influences Student Achievement, Journal of Education Next <https://www.educationnext.org/how-family-background-influences-student-achievement/>

Summary of Selected Findings Within Santa Barbara County

Findings	Number
# of Zip Codes with 20% or more of Households Without Computer and Internet Connection	3
# of Zip Codes with White Alone Not Hispanic or Latino Population When 10% or More Are Without Computer	0
# of Zip Codes with White Alone Not Hispanic or Latino Population when 10% or More Are Without Internet Connection	1
# of Zip Codes with Hispanic/Latino Population when 10% or More Are Without Computer	2
# of Zip Codes with Hispanic/Latino Population when 10% or More Are Without Internet Connection	0
# of Zip Codes with More than 5% Under 18- Year-Old Are Without Computer	3
# of Zip Codes with More than 5% of Under 18-Year-Old Are Without Internet Connection	2
# of Zip Codes with More than 30% of Households Who Cannot Afford to Pay for Devices and Internet Connection	15
Total Zip Codes Within the County	23

Table 6: Summary of Selected Findings Within Santa Barbara County

The above table bring a number of important deductions which can help to form pertinent public policies with the aim or reducing and finally eliminating digital divide in all communities. It should also be mentioned that more detailed observations within each zip code is essential and can be reached by looking into the charts provided in this report. Within the county there are a large number of communities that suffer from far greater than 30 percent of their households suffering from lack of affordability to have Internet connection or devices. The condition of various ethnic and racial groups in some counties are graver than not having only 10% of its population unable to afford purchasing computers or Internet connection. The condition of young people in a few zip codes shows higher proportion of only 5% of them being unable to have computer or Internet connection. The report can be used to reach a number of other conclusions and in every case one is able to list the zip codes with more challenges from the information provided.

Here is a list of the deduction that can be made from the table 6.

- Hispanics are in greater disadvantage than While alone.
- Taking zip codes in where 30% or more of its households cannot afford to pay for devices and Internet connection shows that more than 65% of household in Santa Barbara County are faced with this problem.
- As mentioned earlier in a significant proportion of zip codes the percentage of households faced with unaffordability is much greater than 30%.