The Effect of Gentrification on Community Health Outcomes: Evidence from Three Texas Cities

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Abstract

Gentrification occurs when a low-income neighborhood, with a high minority population experiences a sudden change through the arrival of high income, educated, and white individuals. The effects that gentrification has on residents are still debated. This paper intends to expand on the existing literature by examining the effects that gentrification has on the health outcomes of census tracts in three Texas cities: Austin, Dallas, and San Antonio. I use census tract level data to measure the gentrification status of tracts along with the CDC's 500 Cities/PLACES Project data on health outcomes to find if living in a gentrified census tract is positively or negatively associated with health. I identify the effects of gentrification by employing a difference-in-difference approach to find if living in a gentrified neighborhood is consistent with increased negative health outcomes. Contrary to expectations, I find that the average health profile in gentrified communities is better than that in non-gentrified communities. Whether these differences are attributable to the gentrification process, selection, or other effects remains an open research question.

1 Introduction

The term gentrification was first conceived in the 1950s and 1960s to describe the inflow of gentry (people in good social standing) into previously poor neighborhoods. Today, gentrification is defined as, "the process whereby the character of a poor urban area is changed by wealthier people moving in, improving housing, and attracting new businesses, typically displacing current inhabitants in the process" (Oxford Languages). In economics, gentrification can be understood as the process that happens when there is a rise in the demand of a neighborhood, leading to an increase in housing values in that neighborhood, which in turn makes it so that the initial residents of that neighborhood are no longer able to afford living there, and ultimately, can create outcomes like residential displacement. However, if the original residents of the neighborhood own real estate and the neighborhood undergoes gentrification, their wealth would presumably be positively impacted. Furthermore, an increased demand in a neighborhood could also increase demand for the services and goods provided by existing residents, leading to higher pay and more labor market opportunity. Ultimately, the effects that gentrification can have on neighborhoods are still not very well understood. There are several arguments as to why gentrification is beneficial for neighborhoods, but just as many as to why it is detrimental.

In this paper, I aim to expand on the literature by examining the effect that gentrification has on the health of census tracts in three cities in Texas: Austin, Dallas, and San Antonio. In particular, I am interested in finding if health outcomes improve after tracts are gentrified, and how that differs from health outcomes in gentrifiable (tracts at risk of being gentrified) and non-gentrifiable tracts (tracts that cannot be gentrified due to not meeting any of the classification criteria, or that have been gentrified before the time period I analyze so they are no longer at risk of gentrification). I use census tract data from the 5-year American Community Survey (ACS) from 2010-2019 to define the gentrification status of tracts as

either gentried, gentrifiable, or non-gentrifiable. I define gentrification using four measures: median household income, share of renters, share of minorities, and share of educated individuals in each tract. Then, I use data from the CDC's 500 Cities Project/PLACES Project to get the crude prevalence of eight health measures in each census tract. The eight health measures include two prevention measures, lack of health insurance and visits to the doctor for routine checkups in the past year, two health outcomes, arthritis and asthma, two health risk behaviors, binge drinking and smoking, and lastly, two health status measures, mental health not good for $\geq$ 14 days and physical health not good for $\geq$ 14 days. In order to examine the differences in health outcomes for census tracts in the three cities, I use a difference-in-difference approach and run an ordinary least squares regression with tract and year fixed effects.

I find that except for one health measure, the crude prevalence of binge drinking, gentrification leads to better health in census tracts. However, this study is not able to identify a causal relationship between gentrification and health. Nevertheless, after gentrification occurs, gentrified census tracts show a decrease of 1.45% in the crude prevalence of lack of health insurance, a decrease of .44% in arthritis, an increase of .25% in binge drinking, a decrease of .22% in asthma, an increase of .34% in visits to the doctor for routine checkups, a decrease of 1.5% in smoking, a decrease of .75% in bad mental health, and a decrease of .84% in bad physical health. These results suggest that gentrified neighborhoods experience better health outcomes. However, a limitation in this study is that it is not clear if the positive health outcomes are experienced by the original residents of gentrified neighborhoods, or if neighborhoods trend to positive health outcomes because wealthier, whiter, and healthier residents are displacing the original residents.

2 Background

Urbanization has been rapidly increasing since the Industrial Revolution, and with it have come about many positive and negative effects. City planning initiatives aiming to promote economic development while controlling the negative effects of urbanization must consider unintended consequences, one of which is gentrification. Some scholars argue that gentrification can bring about positive changes because it leads to the revitalization of previously struggling neighborhoods. On a base level, gentrification does not sound like a negative consequence of urbanization. Studies have found that gentrification can lead to the stabilization of previously declining areas by increasing local fiscal revenue, property values, development, and social mixing, while decreasing crime (Atkinson, 2002).

Some scholars argue that many of the positive effects of gentrification are not experienced equally by original residents and new residents of gentrified neighborhoods. These scholars argue that the positive effects of gentrification are only experienced by the new, usually wealthy and white residents who are causing the gentrification. Other scholars argue that gentrification actually is beneficial to the original residents of gentrifying neighborhoods, and in most cases does not actually lead to displacement. In fact, there is evidence that, "on average, the demographic flows associated with the gentrification of urban neighborhoods during the 1990s are not consistent with displacement and harm to minority households. In fact, taken as a whole, our results suggest that gentrification of predominantly black neighborhoods creates neighborhoods that are attractive to middle-class black households" (McKinnish, 2010). Studies have also found that original residents of gentrified neighborhoods who stay in gentrified neighborhoods benefit from declining poverty and rising housing prices in their areas. Other studies have found that children who live in gentrified neighborhoods actually benefit from exposure to higher-opportunity neighborhoods and some may be more likely to attend and complete college (Brummet, Reed, 2019). There is also evi-

dence that moving to low poverty neighborhoods when children are young increases college attendance, increases earnings, and reduces single parenthood rates (Chetty, 2016). One study on residential mobility in Philadelphia found that the most underprivileged residents of gentrified neighborhoods are not more likely to move out, but those that do move out are most likely to move into worse neighborhoods (Ding, 2016). However, these effects may vary by neighborhood or situation.

Scholars also argue that the revitalization and reinvestment that gentrification promises to bring comes at the expense of the vulnerable populations living in gentrifiable neighborhoods (neighborhoods at risk of being gentrified because of their characteristics). The root of the argument as to why gentrification has negative outcomes stems from the fact that if housing prices begin to rise in a neighborhood and the original residents are renters, then those original residents will be forced to move elsewhere; this process is also known as residential displacement. Residential displacement has garnered huge media attention in urban cities. One internet search on gentrification can lead to countless articles on the displacement of poor communities because of gentrification. There is a reason as to why residential displacement attracts so much attention; research has shown that residential displacement has huge negative effects on the original residents of gentrified neighborhoods. One study in New York City found that 23% of residents of gentrifying neighborhoods were displaced. Not only that, but those that were displaced were more likely to visit the emergency department, mostly for mental health reasons (Lim et al., 2016).

Residential displacement does not always look the same. There are three kinds of displacement that can occur: direct displacement, indirect displacement, and cultural displacement. Direct displacement happens when residents are forced to move out of neighborhoods due to rising housing costs or sales of rental properties to become businesses or condo/co-op properties — these situations often create opportunities for investors to capitalize on the new vacancies and drive up rent. Indirect displacement, also known as exclusionary dis-

placement, describes a change in the demographic of residents who are likely to move into a neighborhood after the original residents vacate. In indirect displacement, other low-income residents are not able to move into the neighborhood, leading to an increase in wealthy residents to continue gentrification. Lastly, cultural displacement describes the characteristics of a neighborhood changing from culturally rich into one that is more commercially focused and white. In this instance the shops and restaurants of a neighborhood may change from culturally rich "mom and pop" shops into well known American chains. Displacement can look differently depending on the neighborhood and can result in neighborhood investment or disinvestment. There are challenges in measuring the dimensions of displacement but most research agrees that, "gentrification at a minimum leads to exclusionary displacement and may push out some renters as well" (Zuk et al., 2015).

The impacts of gentrification on health outcomes are still not well understood, mostly due to the complexities in defining gentrification and measuring its consequences, as well as a lack of access to individual level data. Research does find that many of the negative health outcomes that gentrification may cause are consequences of residential displacement, while the positive health outcomes that gentrification may create stem from the novel opportunities that neighborhood revitalization can create. However, most studies find no causalities between gentrification and health outcomes. Gentrification continues to rapidly increase in the United States and it is crucial to understand how it impacts health if policy makers want to appropriately invest in the revitalization of previously declining communities, without creating negative outcomes for residents.

3 Data

3.1 Gentrification Data

To find the gentrification status of each census tract in the three cities, I gathered American Community Survey (ACS) 5 year data for the years 2010-2019 from the IPUMS National Historical Geographic Information System (NHGIS) database. The ACS data covered the time spans of 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, 2012-2016, 2013-2017, 2014-2018, and 2015-2019. Ideally, I wanted data that was yearly but because the five year ranges were the only data accessible that had all the information this study required, I coded the five year ranges to be equal to the last year stated. For example, the data from 2009-2013 became 2013 and the data from 2010-2014 became 2014, and I applied that to all the years from 2010-2019. Ideally, I also wanted a 10-year time span or greater to measure gentrification, as that is the time span the literature recommends to investigate. However, the ACS 2005-2009 had a large amount of missing values and thus was not appropriate to use. Still, I was able to look at gentrification for a nine year time span from 2010-2019.

The ACS data provided information on a total of 2,139 census tracts in the three cities: Austin, Dallas, and San Antonio. There were a total of 358 tracts for the city of Austin, 1,324 for the city of Dallas, and 457 for San Antonio. Census tracts are small subdivisions of counties with population sizes of around 1,200 to 8,000 residents. I used census tract level data to identify gentrified neighborhoods because their small size provides a more accurate representation of neighborhoods, as opposed to using county level data. Ideally, neighborhood level data would have been used in this study. However, data on the gentrification criteria and health outcomes was not available at a neighborhood level, so tract level data was used. Using census tract level data, I defined the gentrification status of each city's tracts using four measures of gentrification. The four measures used to define gentrification

were: share of minorities is at least 10% higher than the metropolitan area median, share of population aged 25+ with a bachelor's degree or higher is at least 10 % lower than the metropolitan area median, share of renters is at least 10% higher than the metropolitan area median, and median household income in the past 12 months is at least 10% lower than the metropolitan area median. These measures can also be found in Table 1.

As of now, there is no standard for defining gentrification in economics or health research (Firth et al., 2020). Since there is no standard in the field, every researcher must develop their own definition of gentrification, which can often lead to inconsistencies and obstacles when drawing conclusion on the effects of gentrification. In this paper, I specifically chose the aforementioned four measures as a way to classify gentrification because I believe they all accurately capture what being gentrifiable (a place that can be gentrified) means. Neighborhoods that are gentrifiable are neighborhoods that are low-income, have low levels of educated individuals, have a large number of renters (which indicates an increased risk of displacement), and have a high proportion of minorities. Additionally, I decided to check for areas that were at least 10% higher or lower in the classifications to ensure that the tracts captured were truly gentrifiable and not simply on the cusp of being more affluent.

Table 1: Gentrification Criteria

Four Gentrification Criteria
1. Share of minorities is at least 10% higher than the metropolitan area median
2. Share of population aged 25+ in with a bachelor's degree or higher is at least 10 % lower than the metropolitan area median
3. Share of renters is at least 10% higher than the metropolitan area median
4. Median household income in the past 12 months is at least 10% lower than the metropolitan area median

To gather the gentrification criteria I used data from the ACS on population race by ethnicity, educational attainment for the population 25 years and over, tenure (owner or renter occupied housing), and median household income in the past 12 months (in the year of the data's inflation adjusted dollars). Then, I calculated the proportions of the population

with bachelor's degrees, renters, and minorities. For this research I classified minorities as only those of Black and/or Latino origin. If I were studying a city with different racial compositions and historical background, such as New York City, I would add other minorities to the list. However, because vulnerable populations in Texas are mostly Black and Latino, it was appropriate to only account for those populations in this study.

I classified tracts as gentrifiable only if they met two or more of any of the gentrification criteria. Then, tracts that were classified as gentrifiable were only classified as gentrified if they experienced a negative change in two or more of the measures sometime between 2010 and 2019. In order to capture that change, I gave each tract a gentrification "level" where they received a 0 if they met none of the criteria and a 4 if they met all of them. Then, subtracted the gentrification level number that tracts were given in 2010 from the number they received in 2019 to find out if they had been gentrified. For example, if a tract met four of the gentrification criteria in 2010 and then only met two of them in 2019, it would be considered a tract that became gentrified. In order to have consistency and simplify the speed and intensity of gentrification, I decided to code 2016 as the year of gentrification for all gentrified tracts. Then, tracts were defined as non-gentrifiable if they met none of the four conditions for gentrification from 2010-2019. Tracts that are non-gentrifiable have low rates of minorities, high rates of educated people, low rates of renters, and incomes higher than the city median. We can assume that tracts that met none of the four criteria are more affluent tracts that were either gentrified long before the years available in the data or have always been primarily wealthy and white. There is evidence of mass gentrification occurring nationwide in the 1990s but that is outside the scope of this paper. After taking these measures, I was left with 54 gentrified tracts, 476 non-gentrifiable tracts, and 1,601 gentrifiable tracts. Of the gentrified tracts, 10 were in Austin, 38 in Dallas, and 6 in San Antonio. Of the non-gentrifiable tracts, 73 were in Austin, 304 in Dallas, and 99 in San Antonio.

3.2 Health Data

To gather health data I used the CDC's 500 Cities Project, which was later expanded into the PLACES Project. The PLACES Project provides data from 2013-2019 on "chronic disease risk factors, health outcomes, and clinical preventive services use for the largest 500 cities in the United States" (PLACES, CDC). From the PLACES data set, I isolated data on Austin, Dallas, and San Antonio. I chose these cities in Texas because they are some of the largest urban metropolitan areas in the state, and they provide a large sample of census tracts. Additionally, gentrification research is often heavily focused on urban cities that are known for experiencing gentrification such as New York City, Washington DC, or Los Angeles, which leads to lesser known cities being understudied despite also experiencing the effects of gentrification. Studying gentrification in areas that are not as well known is not only important for the residents of smaller urban centers, but also could provide a new perspective to the literature. Trends in gentrification and health outcomes in these Texas cities could be used as a model for other gentrification and health research in the United States.

The PLACES Project data includes information on the crude prevalence of 29 health measures at the census tract level. Specifically, the data includes "4 health risk behaviors, 13 health outcomes, 3 health status measures, and 9 prevention practices" (Methodology, CDC). From those measures, I included two outcomes from each of the four categories in my regressions. Two outcomes from each of the categories were used because I wanted to capture all aspects of health; being healthy is not just about not being unwell, rather it is about having good physical, mental, and social health. In order to capture all the aspects of having good health, I used two health risk behaviors, "binge drinking among adults aged $\geq$18 years" and "current smoking among adults aged $\geq$18 years", two health outcomes, "arthritis among adults aged $\geq$18 years" and "current asthma prevalence among adults aged $\geq$18 years", two health status measures, "mental health not good for $\geq$14 days among adults

aged ≥18 years" and "physical health not good for ≥14 days among adults aged ≥18 years", and lastly, two prevention measures, "current lack of health insurance among adults aged 18–64 years" and "visits to doctor for routine checkup within the past year among adults aged ≥18 years" (Methodology, CDC). I specifically chose health measures that are related with social determinants of health (SDoH), but also health measures that are a result of genetic predispositions, because I wanted to capture all aspects of health and see if gentrification has an influence on them.

According to the U.S. Department of Health and Human Services, social determinants of health are "the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks." These SDoH can be grouped into five domains: economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context, all of which are closely related to gentrification. The health risk behaviors chosen are suitable for this study because there are well captured estimates on who drinks and smokes the most, which will be interesting to look at in terms of tracts that are gentrified, gentrifiable, and non-gentrifiable. In fact, binge drinking is most common among men, people aged 18-34, white individuals, and those with incomes greater than or equal to 75,000 dollars (CDC, 2010). Smoking on the other hand, is more prevalent among those living under the poverty level, as well as individuals with low-levels of education, relative to the general population, according to the CDC. The health outcome measure related to arthritis used in this study is not related to social determinants of health. Instead, arthritis is related to aging, injury, and hereditary factors. Asthma, the other health outcome measure, is also in some instances caused due to genetic predispositions, but it can also be caused by health risk behaviors like smoking, and exposure to pollution, which is related to the SDoH. The health status measure used related to mental health is pertinent because there is evidence that mental health disorders, specifically those related to

depression, are correlated with the progression of chronic diseases such as diabetes, cancer, cardiovascular disease, asthma, and obesity (Chapman, 2005). The health status measure used on physical health is relevant because physical health status is closely related to a persons health over time, which can measure well-being and overall health. The prevention health measures used in this study are closely related to health care access and quality, as people who do not have health insurance and do not visit the doctor for routine checkups are more vulnerable to bad health outcomes. These health prevention measures are relevant to gentrification and health studies because they are not determined by genetic predispositions, rather they are controllable outcomes that could be improved if access to health insurance was broadened, and one way in which access to health insurance can be broadened is through economic development.

3.3 Summary Statistics

Figure 1, 2, and 3 show the gentrification level (0-4) of census tracts in the three cities. Looking at Figure 1, 2, and 3, one can see a change in the gentrification level of census tracts before and after gentrification. In Figure 1, which shows the city of Austin, there is a clustering of tracts with a high gentrifiable levels in the middle, but there are also a few tracts with high levels of gentrifiability spread out throughout the city. We can also observe that in Austin there is a clear division of high gentrifiability and low gentrifiability tracts. The southwest area of Austin shows a cluster of tracts with gentrifiable levels of zero, but that changes slightly in 2016, post-gentrification. In terms of San Antonio, Figure 2, there is also a grouping of census tracts with high levels of gentrifiability in the middle of the city, with a few high gentrifiability tracts spread north and south. It is also clear from Figure 2 that tracts with gentrification levels of zero are also grouped next to each other, showing a clear division in the city. In Figure 3, which shows the city of Dallas, there is again a cluster of tracts with high levels of gentrifiability centered in the middle. It is clear that tracts with

high levels (3-4) and low levels (0-1) of gentrifiability are usually in close proximity to each other.

Figure 1: Gentrification level in Austin, TX Census Tracts Before and After Gentrification (2010 left and 2016 right)

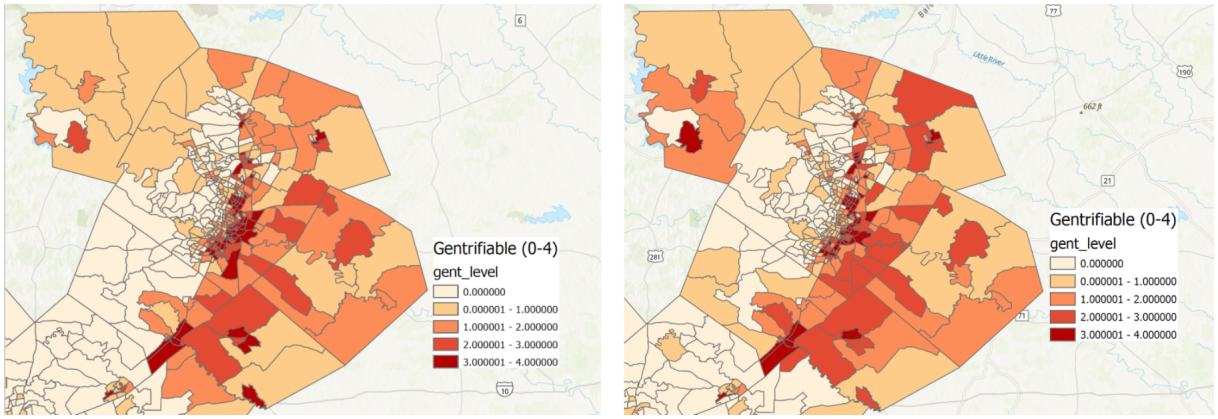


Figure 2: Gentrification level in San Antonio, TX Census Tracts Before and After Gentrification (2010 left and 2016 right)

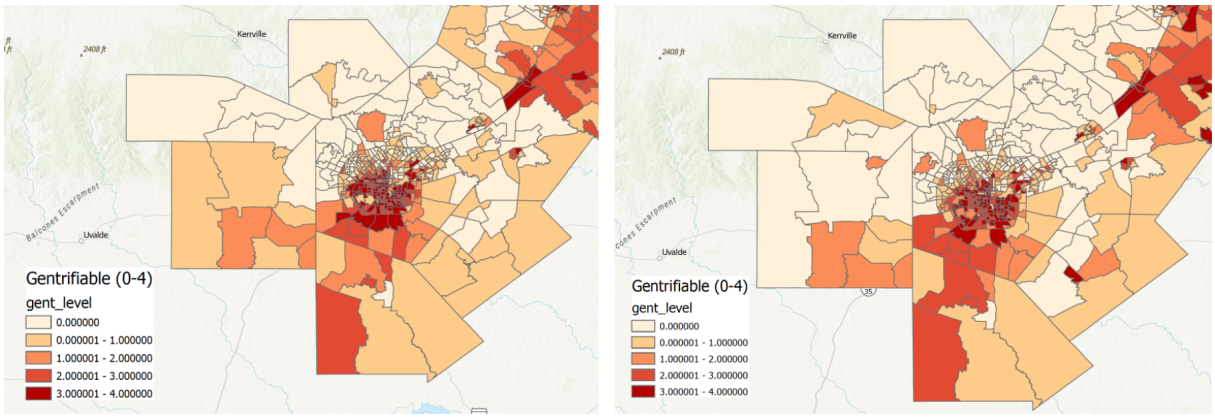
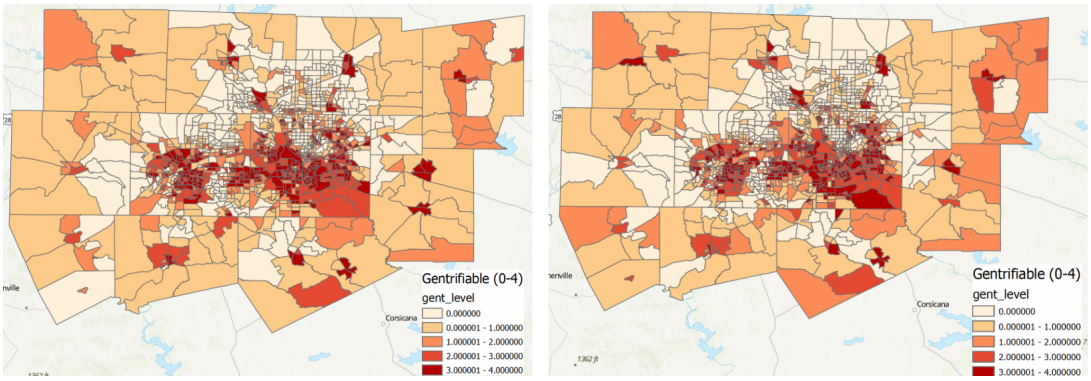


Table 2 shows summary statistics for the gentrification criteria and health measures in the three Texas cities. Table 2 indicates that the median household income in these cities is around $65,000, the median share of renters is 40%, the median share of adults aged 25+ with a bachelor's degree is 30%, and the median share of minorities is 50%. In the health section of Table 2, we can see that the median crude prevalence of lack of health insurance is 23%, the median crude prevalence of arthritis is 19.3%, and the median crude prevalence of binge drinking is 18.3%. Furthermore, the median crude prevalence of asthma is 8.4%, the

Figure 3: Gentrification level in Dallas, TX Census Tracts Before and After Gentrification (2010 left and 2016 right)



median crude prevalence of visits to the doctor for routine checkup is 68.6%, and the median smoking is 16.20%. Meanwhile, the median for the crude prevalence of mental health not being good in the past 14 days is 12.90% and 11.30% for physical health.

Table 2: Summary Statistics for Gentrification Criteria and Health Measures

	Mean	SD	Min	Median	Max
Gentrification indicators					
Median Household Income	65,012	34,342	7,030	57,284	250,001
Share of Renters	0.438	0.252	0.000	0.403	1.000
Share of Bachelor's Degrees	0.334	0.224	0.000	0.298	0.935
Share of Minorities	0.507	0.282	0.000	0.500	1.000
Health indicators					
Current lack of health insurance	25.733	12.160	5.800	23.100	70.800
Arthritis	19.24	4.82	3.50	19.30	55.50
Binge drinking	18.46	3.28	2.50	18.30	34.60
Current asthma prevalance	8.57	1.17	5.30	8.40	14.40
Visits to doctor for routine checkup within the past year	68.57	4.74	52.90	68.60	89.50
Current smoking	16.49	4.73	4.30	16.20	41.40
Mental health not good for $\geq$14 days	13.03	3.37	4.60	12.90	28.70
Physical health not good for $\geq$14 days	12.05	4.05	3.60	11.30	29.70

Table 3 shows mean and standard deviations for the four gentrification criteria by gentrification status. We can see from Table 3 that there are vast differences in income, renters,

education, and minorities by gentrification status. In terms of income, gentrifiable tracts have the lowest median household incomes ($52,940), while gentrified tracts have slightly higher incomes, and non-gentrifiable tracts have vastly higher incomes than both. In terms of renters, gentrified tracts have the highest shares of renters (58%), indicating a risk of displacement or an influx of new residents into the neighborhoods. Meanwhile, gentrifiable tracts have slightly lower shares of renters and non-gentrifiable tracts have much smaller shares of renters than both gentrified and gentrifiable tracts. In terms of education, non-gentrifiable tracts have the highest shares of bachelor's degrees (56%), gentrified tracts have the second most degrees, and gentrifiable tracts have the least. Lastly, in terms of minorities, gentrifiable tracts have the most minorities (58%), gentrified tracts are closely behind, and non-gentrifiable tracts have the lowest shares of minorities.

Table 3: Mean and SD of Gentrification Criteria by Gentrification Status

	Gentrifiable	Gentrified	Non-gentrifiable
Median Household Income	52940.33 (21573.24)	57916.70 (12917.43)	113299.42 (34752.17)
Share of Renters	0.50 (0.23)	0.58 (0.22)	0.16 (0.09)
Share of Bachelor's Degrees	0.28 (0.20)	0.36 (0.18)	0.56 (0.15)
Share of Minorities	0.58 (0.26)	0.49 (0.17)	0.21 (0.13)

Table 4 displays the mean and standard deviations of the eight health measures by gentrification status. We can observe from Table 4 that gentrifiable tracts have the highest crude prevalence of current lack of health insurance at 28.88%. Gentrified tracts have slightly lower levels of lack of health insurance and non-gentrifiable tracts have the least by far. In visits to the doctor for routine checkups within the past year, non-gentrifiable tracts

have the highest percentage of visits to the doctor 71.33%, while gentrifiable and gentrified tracts have slightly less, 67.94% and 66.76% respectively. In the measure of arthritis, the crude prevalence of arthritis is comparable for all gentrification status, this makes sense as arthritis is not determined by SDoH, in non-gentrifiable tracts the prevalence of arthritis is 19.73%, in gentrified tracts it is 17.41%, and in gentrifiable tracts it is 19.18%. The asthma measures are also very similar in all tracts, regardless of gentrification status, the crude prevalence of asthma in gentrifiable tracts is 8.83%, 8.36% for gentrified tracts, and 7.60 in non-gentrifiable tracts. In terms of binge drinking, gentrifiable tracts have a crude prevalence of 18.21%, gentrified have one of 19.71%, and non-gentrifiable tracts have one of 19.30%. In smoking, non-gentrifiable tracts have the least crude prevalence of current smoking at 11.99%, gentrifiable tracts have the highest prevalence of smoking at 17.64%, and gentrified tracts are in the middle with 16.12%. For the measure of the crude prevalence of mental health being not good for $\geq$ 14 days, gentrifiable tracts have the worst self-reported mental health at 13.84%, gentrified tracts are second with 12.72%, and non-gentrifiable tracts have the least reports of bad mental health at 9.88%. Lastly, for the crude prevalence of physical health being not good for $\geq$14 days, again gentrifiable tract residents have the worst physical health at 12.91%, gentrified tract residents are after that with 11.23%, and non-gentrifiable tract residents are last with 8.81%.

Table 5 shows the mean and standard deviation of the health indicators before and after gentrification. Starting with the crude prevalence of the current lack of health insurance, we can observe that after gentrification occurs, gentrified and gentrifiable tracts see a decrease in the lack of health insurance; gentrified tracts go from a 28.99% to a 24.49% and gentrifiable tracts decrease from 31.28% to 29.13%. Interestingly, there is an increase in the lack of health insurance among non-gentrifiable tracts post gentrification, 12.12% to 14.83%. In the crude prevalence of arthritis, we see an increase in all tracts regardless of gentrification status. For the crude prevalence of binge drinking, there is a slight increase in binge drinking

Table 4: Mean and SD of Health Measures by Gentrification Status

	Gentrifiable	Gentrified	Non-gentrifiable
Current lack of health insurance	28.88	25.69	13.38
	(11.67)	(7.76)	(3.78)
Visits to doctor for routine checkup within the past year	67.94	66.76	71.33
	(4.66)	(4.09)	(4.08)
Arthritis	19.18	17.41	19.72
	(4.98)	(4.18)	(4.15)
Current asthma prevalance	8.83	8.36	7.60
	(1.16)	(0.76)	(0.54)
Binge drinking	18.21	19.71	19.30
	(3.44)	(2.85)	(2.42)
Current smoking	17.64	16.12	11.99
	(4.51)	(3.63)	(2.50)
Mental health not good for $\geq$14 days	13.84	12.72	9.88
	(3.20)	(2.21)	(1.97)
Physical health not good for $\geq$14 days	12.91	11.23	8.81
	(4.10)	(2.87)	(1.56)

in all tracts, despite differing gentrification statuses. For the current prevalence of asthma, there is a slight decrease of .26% in gentried tracts post-gentrification, a small increase of .03% for gentrifiable tracts, and a small increase of .47% in non-gentrifiable tracts.

Table 5 also shows that in terms of the crude prevalence of visits to the doctor for routine checkups within the past year, there is an increase post-gentrification in all tracts regardless of their gentrification status. Gentrifiable tracts experience an increase of 5.17%, gentrified tracts experience and increase of 6.73%, and non-gentrifiable tracts experience an increase of 3.27%. In terms of smoking, results show that gentrifiable tracts have the largest crude prevalence of smoking at 17.62% but that decreases post-gentrification to 17.50%. For gentrified tracts, the crude prevalence of smoking is 17.36% pre-gentrification and it lowers to 14.99% post gentrification. In non-gentrifiable tracts, smoking actually increases post-gentrification from 11.20% to 12.45%. For the health measure, mental health not good for $\geq$14 days, gentrifiable tracts have the largest crude prevalence of bad mental health at

11.68% but that actually increases post-gentrification to 15.17%. In gentrified tracts, bad mental health is 11.25% before becoming gentrified and it increases to 13.65 after these tracts become gentrified. In non-gentrifiable tracts, bad mental health starts the lowest at 7.53% and increases to 11.28 after gentrification. Lastly, for the measure of physical health not good for ≥14 days, gentrifiable tracts start at a prevalence of 12.48% and increase to 13.03% after gentrification. Gentrified tracts start at a crude prevalence of 11.51% and decrease to 10.96%, while non-gentrifiable tracts start at 7.62% and increase to 9.31%. This preliminary analysis shows that the gentrification of gentrifiable tracts might lead to a decrease in the lack of health insurance, no change in arthritis, an increase in binge drinking, a decrease in asthma, an increase in visits to the doctor, a decrease in smoking, an increase in bad mental health, and a decrease in bad physical health.

Table 5: Mean and SD of Health Indicators Pre and Post Gentrification by Gentrification Status

	Gentrifiable, Pre	Gentrified, Pre	Non-Gent, Pre	Gentrifiable, Post	Gentrified, Post	Non-Gent, Post
Current lack of health insurance	31.28	28.99	12.12	29.13	25.49	14.83
	(13.68)	(9.28)	(3.41)	(10.89)	(7.14)	(3.67)
Arthritis	18.72	17.35	18.66	19.53	17.65	20.32
	(5.04)	(4.13)	(4.21)	(4.80)	(4.40)	(3.84)
Binge drinking	17.03	18.49	18.27	18.78	20.11	19.53
	(3.43)	(2.79)	(2.40)	(2.94)	(2.50)	(2.05)
Current asthma prevalance	8.80	8.50	7.23	8.83	8.24	7.70
	(1.37)	(0.90)	(0.56)	(1.03)	(0.70)	(0.46)
Visits to doctor for routine checkup within the past year	66.50	64.94	71.16	71.67	71.12	74.43
	(4.00)	(2.86)	(2.80)	(3.23)	(2.37)	(2.65)
Current smoking	17.62	17.36	11.20	17.50	14.99	12.45
	(4.81)	(3.86)	(2.39)	(4.16)	(3.28)	(2.48)
Mental health not good for ≥14 days	11.68	11.25	7.53	15.17	13.65	11.28
	(3.01)	(2.16)	(1.06)	(2.72)	(1.88)	(1.55)
Physical health not good for ≥14 days	12.48	11.51	7.62	13.03	10.96	9.31
	(4.46)	(3.26)	(1.24)	(3.77)	(2.56)	(1.53)

4 Methods

When considering the effect of gentrification on health, it is important to discuss "the need to change our thinking about what keeps us healthy away from an emphasis on medical treatment to focus on upstream factors such as social determinants of health" (Washington

State Department of Health, 2013). It is well documented that poverty is extremely bad for health. A persons income, education, neighborhood, job, etcetera can strongly affect their biology, health related behaviors, environmental exposures, and access to medical help. People born under poverty can have their health affected by low-incomes since before they are born, and staying in poverty will continue to affect their health throughout their life. Where a person lives can also greatly affect health. In fact, neighborhood characteristics that affect health include "the quality of housing and schools; availability of medical facilities, libaries, public transportation and parks; and environmental hazards" (Washington State Department of Health, 2013). The fact that neighborhood characteristics can have an impact on health, indicates that it is becoming increasingly important to study the effects of economic development in previously disinvested areas because the changes gentrification can have on neighborhoods could have a significant impacts on people's health.

In order to determine the effect of gentrification on health outcomes, I apply a difference-in-difference (DiD) approach. Traditionally, difference-in-difference is used to identify the causal impact of the treatment on an outcome. I use DiD to identify the causal impact of the treatment, in this case undergoing gentrification, on health. I am classifying tracts that have been gentrified as a "treatment group" and tracts that are gentrifiable as a "control group". By dividing tracts into gentrified and gentrifiable groups, I am able to examine differences in health outcomes between both groups before and after gentrification occurs. I specifically chose to primarily compare gentrified and gentrifiable tracts because they both met two or more of the gentrification criteria, meaning that they were all vulnerable to gentrification. These tracts differ in that gentrified tracts underwent gentrification, while gentrifiable tracts were vulnerable to it but were never gentrified. As a result, my health outcomes model is:

$$Y_i = \beta_0 + \beta_1 gentrification + \beta_2 post + \beta_3 gentrification * post + \alpha_t + \delta_i + \epsilon \qquad (1)$$

In the health model (1), the estimated outcome of interest is Y which represents one of the health measures of interest: lack of access to health insurance, arthritis, binge drinking, asthma, visit to the doctor for routine checkup in the past year, smoking, mental health not good for ≥ 14 days, and physical health not good for ≥ 14 days in gentrified tracts i. The variable *gentrification* takes a value of 1 if a tract is gentrified and 0 if it is gentrifiable. The variable *post* takes a value of 1 if the year is post-gentrification or post 2016 in this case, and a 0 if it is before gentrification occurred. The key coefficient of interest is β_3, as this is the difference-in-difference estimate that captures how much the average outcome of the gentrification group differs in the period after gentrification, as compared to how the outcome would have changed if gentrification had not occurred. The variable α_t includes year fixed effects and the variable δ_i accounts for tract fixed effects.

It is also important to note that my model does not include any covariates. I decided against including covariates because the difference-in-difference approach captures them, as I am comparing two groups that should be very similar if not exactly the same. For example, covariates I could have included in my model are age, air pollution levels, unemployment, gender, race/ethnicity, and many more. However, since I'm comparing two groups of gentrifiable tracts, they should have very similar levels of those covariates, and thus including them in my model would have been redundant. The choice to not use covariates in this model could potentially lead to bias in the results if there is something about tracts that underwent gentrification that is different from other gentrifiable tracts, such as their location. Furthermore, a limitation in my model is the inability to prove that both the treatment and control group would have experienced the same outcomes in health in the absence of gentrification. This is due to the fact that I cannot be fully certain that the gentrified and gentrifiable tracts are exactly the same. There could be some aspect of the gentrified tracts that gentrifiable tracts do not have, and that could be the reason for gentrification occurring in one group and not the other. In DiD, the identification assumption, "is that the group-specific trends in

the outcome of interest would be identical in the absence of treatment." There is a violation of the identification assumption in my model, which indicates that we cannot find a causal relationship between health and gentrification.

Furthermore, this model cannot track the reason for the change in health outcomes in gentrified tracts. My data only includes the crude prevalence of the health measures by census tract. Thus, the model cannot capture if the change in health is due to residents moving and being displaced by richer and healthier residents, or if most original residents stay and enjoy the benefits of better opportunity neighborhoods. Therefore, the results of my estimates would be biased if a large number of residents are being displaced due to gentrification. Another limitation of this study is that gentrification was defaulted to occurring in 2016 for all gentrified tracts; this is a simplification of the complexities that come with gentrification. Despite limiations in my model, the analysis can provide a rough comparison of how health changes in gentrified and gentrifiable tracts before and after gentrification occurs.

5 Results

Table 6 shows the results of my main regression using ordinary least squares (OLS) with tract and year fixed effects, in order to capture the relationship between gentrification and health. I specifically included tract and year fixed effects because they control for characteristics that are changing over time that affect all tracts equally. The tract fixed effects control for baseline differences between tracts, such as location. The year fixed effects control for factors changing each year that are common amongst all tracts for a given year. Tables 7-9 show the results of running the same regressions but with differing fixed effects. Table 7 shows the relationship between gentrification and health with only tract fixed effects, while Table 8 shows the relationship between gentrification and health with county and year fixed effects. Lastly, Table 9 shows the relationship between gentrification and health with only county

fixed effects. In order to analyze model sensitivity, I ran all the regressions with different fixed effects. I found that despite differing fixed effects, most estimates are very similar. We can see that the key coefficient in all tables, "Gentrified X Post Gent." is similar across all tables regardless of the added fixed effects.

Table 6: Relationship between gentrification and health

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Current Lack of Health Insurance	Visit to doctor for routine checkup	Arthritis	Asthma	Binge drinking	Smoking	Mental Health not good for >= 14 days	Physical Health not good for >= 14 days
Gentrified X Post-Gent.	-1.451***	0.338***	-0.442**	-0.225***	0.252**	-1.526***	-0.756***	-0.844***
	(0.365)	(0.112)	(0.177)	(0.0685)	(0.124)	(0.270)	(0.187)	(0.179)
Constant	28.79***	67.89***	19.13***	8.819***	18.25***	17.62***	13.81***	12.87***
	(0.00590)	(0.00181)	(0.00286)	(0.00111)	(0.00200)	(0.00437)	(0.00302)	(0.00290)
Observations	9,275	9,275	9,275	9,275	9,275	9,275	9,275	9,275
R-squared	0.981	0.940	0.942	0.948	0.943	0.953	0.958	0.963
Tract FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Columns (1) and (2) show the relationship between gentrification and health prevention measures. For the crude prevalence of current lack of health insurance among adults aged 18-64 years, column (1), we can see that the coefficient is negative and significant at the .01 level. Therefore, the crude prevalence of lack of health insurance decreases by 1.45% post gentrification occurring. A typical gentrifiable tract has a crude prevalence of 28.8% of resident lacking access to health insurance, according to the results, after gentrification only 27.35% of residents would lack access to health insurance. This shows a small but positive change in terms of health prevention measures post gentrification. The other health prevention measure included in the regression is the crude prevalence of visits to the doctor for routine checkups within the past year among adults aged $\geq$18 years, column (2). In column (2), the coefficient is positive and significant at the .01 level. The result indicates that the crude prevalence of visits to the doctor for routine checkups within a year increases by .34% post gentrification. These results indicate a small but positive change in preventative health measures taken in gentrified tracts.

Columns (3) and (4) show the relationship between gentrification and health outcomes.

Column (3) shows the crude prevalence of arthritis among adults aged $\geq$ 18 years. We can see that post-gentrification, the prevalence of arthritis decreases by .44%, and the result is significant at the .05 level. Column (3) indicates that the baseline prevalence of arthritis is around 19% and that after gentrification occurs in gentrifiable neighborhoods, it decreases by .44%. In terms of column (4) - the crude prevalence of asthma among adults aged $\geq$ 18 years - the result is negative and significant at the .01 level. In this case, the prevalence of arthritis decreases by .22% after gentrification. The baseline prevalence of asthma is around 8% and it decreases by .22% post-gentrification. The results here are not very large but they do show an improvement in health outcomes after gentrification occurs.

Columns (5) and (6) show the relationship between gentrification and health risk behaviors. In column (5), we can observe the crude prevalence of binge drinking among adults aged $\geq$ 18 years. The result of column (5) shows that the relationship between binge drinking and gentrification is positive and significant at the .05 level. In this case, the prevalence of binge drinking increases by .25% after gentrification. On average 18% of residents report binge drinking but that number increases when gentrification occurs. In terms of column (6), we can observe that the prevalence of smoking decreases by 1.5% after gentrification, and the result is significant at the .01 level. More specifically, the baseline average of smoking is 12.62% and that would decrease to 11.12% after gentrification.

Lastly, columns (7) and (8) show the relationship between gentrification and self-reported health status among adults aged $\geq$ 18 years. In terms of self-reported mental health status, the relationship between bad mental health and gentrification is negative and significant at the .01 level. The results indicate a decrease in bad mental health of .75% post-gentrification. The average crude prevalence of self-reported bad mental health is 13.8%, but that would decrease to 13.05% after neighborhoods undergo gentrification. In terms of self-reported physical health status, the relationship between bad physical health and gentrification is also negative and significant at the .01 level. Results show a decrease of .84% in bad physical

Table 7: Relationship between gentrification and health, Tract FE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Current Lack of Health Insurance	Visit to doctor for routing checkup in the past year	Arthritis	Asthma	Binge drinking	Smoking	Mental Health not good for >= 14 days	Physical Health not good for >= 14 days
Post-Gent.	1.104***	3.130***	-0.420***	0.00796	1.091***	-0.220***	2.142***	0.206***
	(0.0584)	(0.0244)	(0.0374)	(0.00957)	(0.0230)	(0.0401)	(0.0281)	(0.0312)
Gentrified X Post-Gent.	-1.454***	0.330***	-0.442**	-0.225***	0.252**	-1.526***	-0.757***	-0.844***
	(0.370)	(0.116)	(0.176)	(0.0686)	(0.124)	(0.269)	(0.189)	(0.180)
Constant	28.26***	66.37***	19.33***	8.815***	17.73***	17.72***	12.77***	12.77***
	(0.0281)	(0.0116)	(0.0178)	(0.00462)	(0.0110)	(0.0193)	(0.0135)	(0.0149)
Observations	9,275	9,275	9,275	9,275	9,275	9,275	9,275	9,275
R-squared	0.968	0.742	0.938	0.940	0.921	0.951	0.902	0.962
Tract FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Relationship between gentrification and health County FE and Year FE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Current Lack of Health Insurance	Visit to doctor for routine checkup	Arthritis	Asthma	Binge drinking	Smoking	Mental Health not good for >= 14 days	Physical Health not good for >= 14 days
Gentrified	-0.675	-1.102***	-0.981	-0.338	0.986***	-0.519	-0.469	-0.634
	(1.891)	(0.338)	(0.744)	(0.277)	(0.315)	(1.171)	(0.675)	(0.813)
Gentrified X Post-Gent.	-1.598**	0.576***	-0.214	-0.215**	0.101	-1.615***	-0.776***	-0.796**
	(0.657)	(0.156)	(0.303)	(0.105)	(0.154)	(0.500)	(0.249)	(0.293)
Constant	28.82***	67.92***	19.16***	8.830***	18.22***	17.64***	13.83***	12.89***
	(0.0570)	(0.0108)	(0.0229)	(0.00811)	(0.0109)	(0.0332)	(0.0197)	(0.0239)
Observations	9,275	9,275	9,275	9,275	9,275	9,275	9,275	9,275
R-squared	0.171	0.463	0.208	0.164	0.329	0.141	0.244	0.186
County FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

health post gentrification. Here, the average crude prevalence of bad physical health is 12.87% but that would decrease to around 12% post-gentrification. These results show a decrease in bad self-reported mental and physical health after gentrification occurs.

Tables 6-8 also show the results of the relationship between gentrification and health, but with different fixed effects. All tables have similar coefficients for the crude prevalence of current lack of health insurance of adults aged 18-64. All tables also have similar results for the crude prevalence of visits to the doctor for routine checkups in the past year, although we see slightly smaller estimates for the tables with tract fixed effects. The tables also show similar estimates for the crude prevalence of arthritis for adults aged $\geq$ 18 years, the only difference is that estimates are not significant in Tables 7 and 8. We can also observe very

Table 9: Relationship between gentrification and health, County FE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Current Lack of Health Insurance	Visit to doctor for routine checkup	Arthritis	Asthma	Binge drinking	Smoking	Mental Health not good for >= 14 days	Physical Health not good for >= 14 days
Gentrified	-0.680	-1.126***	-0.982	-0.338	0.986***	-0.517	-0.472	-0.634
	(1.891)	(0.323)	(0.743)	(0.277)	(0.314)	(1.171)	(0.675)	(0.812)
Post-Gent.	0.657**	3.468***	-0.266	-0.0102	1.142***	-0.281	2.101***	0.121
	(0.271)	(0.172)	(0.355)	(0.0751)	(0.169)	(0.286)	(0.0942)	(0.0734)
Gentrified X Post-Gent.	-1.605**	0.546**	-0.214	-0.215**	0.101	-1.613***	-0.780***	-0.796**
	(0.667)	(0.202)	(0.304)	(0.105)	(0.154)	(0.495)	(0.256)	(0.294)
Constant	28.50***	66.24***	19.28***	8.835***	17.67***	17.77***	12.81***	12.83***
	(0.169)	(0.0831)	(0.193)	(0.0405)	(0.0912)	(0.154)	(0.0623)	(0.0556)
Observations	9,275	9,275	9,275	9,275	9,275	9,275	9,275	9,275
R-squared	0.160	0.247	0.204	0.156	0.307	0.139	0.190	0.184
County FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

similar results for the crude prevalence of asthma among adults aged $\geq$ 18 years in all tables. For column (5), the crude prevalence of binge drinking among adults aged $\geq$ 18 years, we can see comparable results in all tables, except in the tables with county fixed effects where the estimates are not significant. In terms of the crude prevalence of smoking, column (6), smoking decreases in all tables post-gentrification and it is also significant at the .01 level in all tables. For the results of crude prevalence of self-reported mental health not being good for $\geq$ 14 days among adults aged $\geq$ 18 years, we see almost identical results in all tables. Lastly, for the crude prevalence of self-reported physical health not being good for $\geq$ 14 days among adults aged $\geq$ 18 years, we also see very similar results on all tables, and all results are significant at the .01 or .05 level.

5.1 Discussion

The results of the regressions show positive health trends in gentrifiable neighborhoods after they become gentrified for all health measures except the crude prevalence of binge drinking among adults. There are several possible reasons as to why we see an improvement in health after gentrification. For the health prevention measures - lack of health insurance and

visits to the doctor for routine checkups - gentrification leads to more health insurance and more visits to the doctor. It could be that these health prevention measures see improvements post-gentrification because whiter, more educated, and healthier residents are moving into gentrifiable neighborhoods. It could also be that these health prevention measures see improvements because the renovation and reinvestment occurring leads to more health insurance and doctor visits for original residents. Regardless of the reason for improvement, these two health prevention measures are related to social determinants of health, so it is important to note that they see a statistically significant improvement after neighborhoods become gentrified. Ideally, we would have individual level data to see if it is new or original residents who are benefiting from the positive health after gentrification.

For the health outcomes measures - arthritis and asthma - there is an observable decrease in the prevalence of these disease after census tracts undergo gentrification. However, these diseases are not related to social determinants of health. Besides the exacerbation of asthma due to air pollution, arthritis and asthma are largely genetic. Hence, it might be that we see a decrease in these health outcomes post-gentrification because younger new residents are creating the gentrification of vulnerable neighborhoods, while older and wealthier residents are more likely to reside in non-gentrifiable neighborhoods.

For the health risk measures, binge drinking and smoking, there is an increase in binge drinking and a decrease in smoking after gentrification. It is well documented that richer people are more likely to binge drink and poorer people are more likely to smoke. Therefore, the results suggesting that post-gentrification binge drinking increases by .25% and that smoking decreases by 1.5% are consistent with previous understanding of these health risk behaviors. Binge drinking is the preferred health risk behavior of wealthier people, as opposed to other substance abuse. Alcohol is also an expensive habit and a legal drug, which indicates more "high-class" people would prefer it. Smoking is also much less common among educated individuals so it could be that post-gentrification, original residents become more educated

and change their behaviors. It could also be the case that new residents are displacing old ones and we see a decrease in smoking because the new residents who move in are non-smokers.

For the health status measures, mental and physical health not good for $\geq$14 days, there is a small decrease in both after gentrification happens. The results indicate better self-reported mental health and physical health for residents post-gentrification. Again, these results could be due to the displacement of original residents, or simply an improvement for everyone after neighborhoods undergo reinvestment. Something of note is that since these regressions did not include covariates, there could be other confounders leading to these results.

6 Conclusion

Understanding the relationship between gentrification and health is essential in making informed policy decisions related to urban economic growth and neighborhood reinvestment. Although urban reinvestment may seem like a positive measure to take, it could have unintended consequences which could prove detrimental to the health and livelihood of urban residents. The results of this paper show that for all researched health measures, except for the crude prevalence of binge drinking among adults aged $\geq$ 18 years, there is a positive trend in health after census tracts in Austin, Dallas, and San Antonio are gentrified.

In this paper, I used a difference-in-difference approach with gentrified tracts as my treatment group and gentrifiable tracts as my control, along with OLS regressions with year and tract fixed effects in order to analyze the relationship between gentrification and health. The results of the regressions show positive improvements in the crude prevalence lack of health insurance, visits to the doctor for routine checkups, arthritis, asthma, smoking,

self-reported mental health, and self-reported physical health. Based on the results of this study, it seems like gentrification is beneficial to the residents of gentrified neighborhoods. However, these results do not offer a clear picture of how or why health is changing post-gentrification. Although there is not a clear picture of who is benefiting from gentrification, the improvements in health seen here can be compared to the costs of gentrification in order to assess the costs of benefits of gentrification and health in urban areas.

One obstacle in studying gentrification in large populations such as the Texas cities that this study focuses on is that it is impossible to track if these positive health outcomes post-gentrification are experienced by all residents of gentrified neighborhoods (old and new), or if they are only experienced by new residents who are causing the gentrification. This study looks at aggregate community health, and thus was not able to identify which individuals are benefiting from the positive relationship between health and gentrification. Future studies should focus on understanding how gentrification impacts health on an individual level. A challenge in finding the relationship between health and gentrification on an individual level is the lack of individual data related to gentrification measures and health. Future research could link detailed census data to a national representative health survey and make progress on answering this question.

The results of this paper can be applied to evaluating the efficacy of economic policy looking to drive reinvestment in previously dis-invested neighborhoods. It is always essential for policy to consider the implications that gentrification could have on health, especially in areas where economic development occurs rapidly. A policy that looks to drive reinvestment while taking into consideration the complexity of the relationship between gentrification and health could lead to fruitful outcomes for old and new residents of gentrifiable, gentrifying, and gentrified neighborhoods.

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Appendix

Figure 4: Map of Census Tracts in Austin, Dallas, and San Antonio

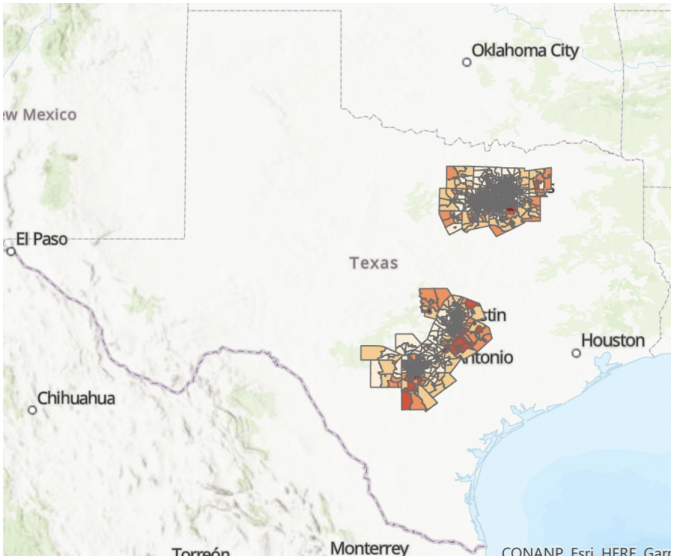

Figure 5: Crude Prevalence of binge drinking among adults aged $\geq$ 18 years in San Antonio Census Tracts in 2016

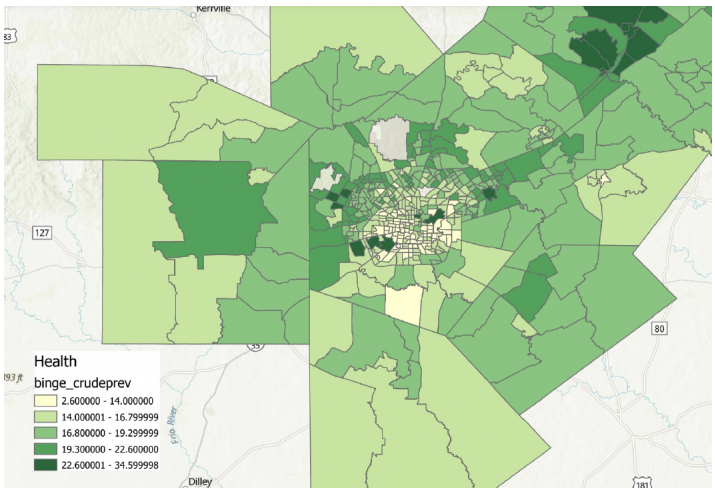

Table 10: Relationship between gentrification and health with gentrified tracts as treatment and non-gentrifiable as control

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Current Lack of Health Insurance	Visit to doctor for routine checkup	Arthritis	Asthma	Binge drinking	Smoking	Mental Health not good for >= 14 days	Physical Health not good for >= 14 days
Gentrified X Post-Gent.	-2.461***	0.895***	-1.162***	-0.320***	0.624***	-2.041***	-0.576***	-1.229***
	(0.367)	(0.124)	(0.196)	(0.0694)	(0.133)	(0.271)	(0.187)	(0.180)
Constant	15.03***	70.72***	19.50***	7.708***	19.31***	12.61***	10.26***	9.174***
	(0.0212)	(0.00713)	(0.0113)	(0.00400)	(0.00768)	(0.0156)	(0.0108)	(0.0104)
Observations	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600
R-squared	0.973	0.943	0.920	0.907	0.880	0.942	0.962	0.939
Tract FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 6: Trends from 2013-2019 in the Crude Prevalence of Lack of Access to Health Insurance by Gentrification Status

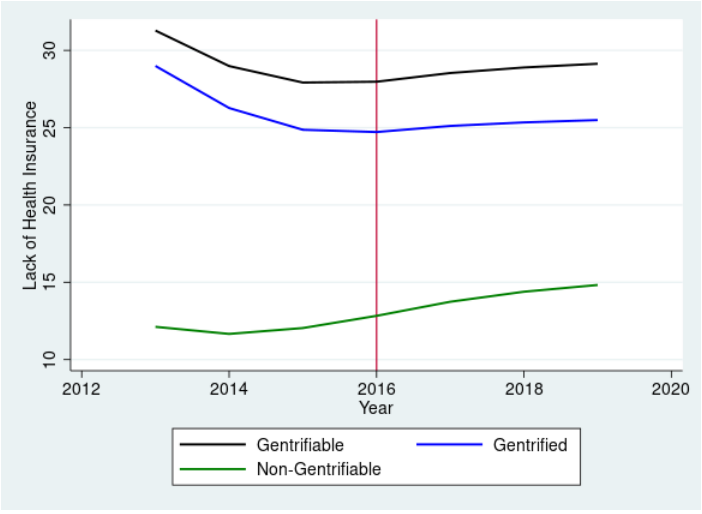

Figure 7: Trends from 2013-2019 in the Crude Prevalence of Visits to Doctor for Routine Checkup within the past year by Gentrification Status

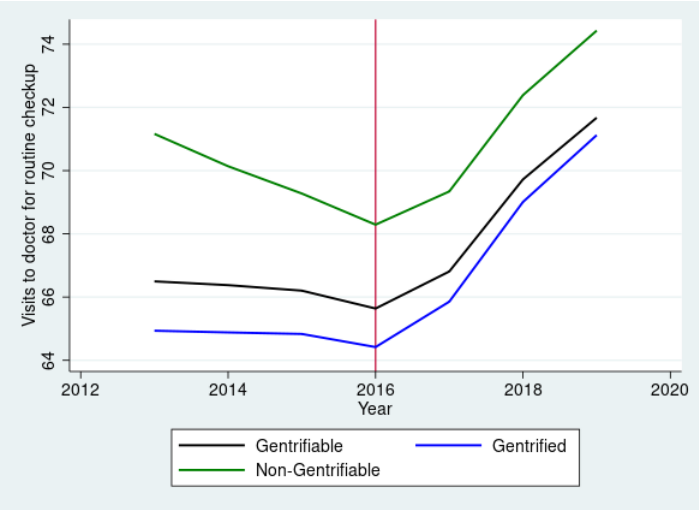

Figure 8: Trends from 2013-2019 in the Crude Prevalence of Arthritis by Gentrification Status

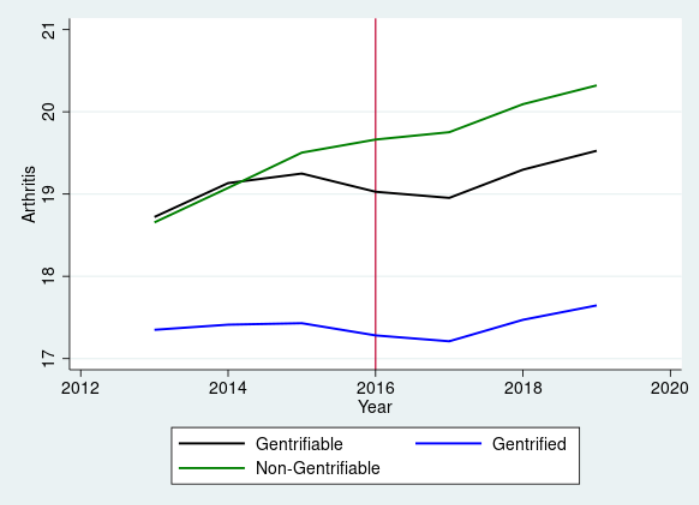

Figure 9: Trends from 2013-2019 in the Crude Prevalence of Asthma by Gentrification Status

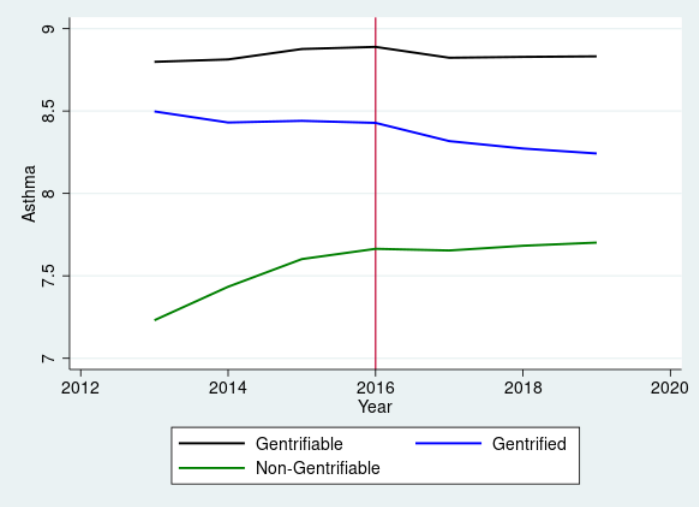

Figure 10: Trends from 2013-2019 in the Crude Prevalence of Binge Drinking by Gentrification Status

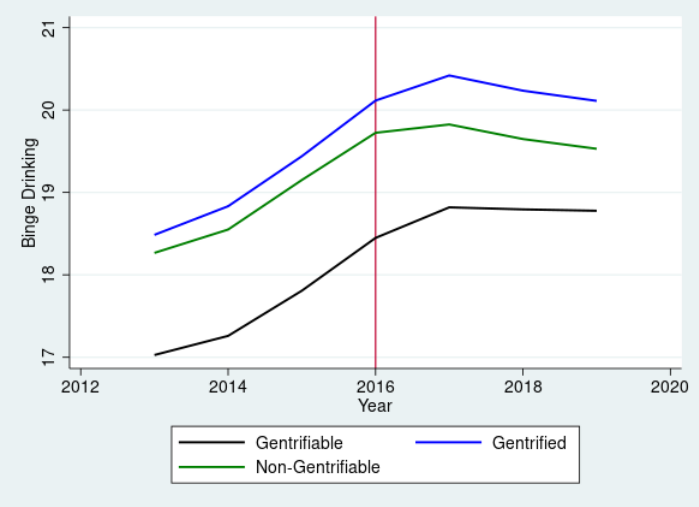

Figure 11: Trends from 2013-2019 in the Crude Prevalence of Smoking by Gentrification Status

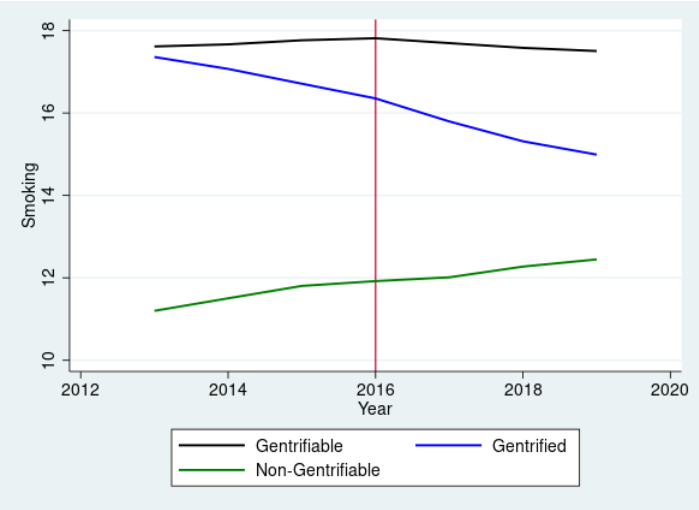

Figure 12: Trends from 2013-2019 in the Crude Prevalence of self-reported Mental Health Status not good for $\geq$ 14 days by Gentrification Status

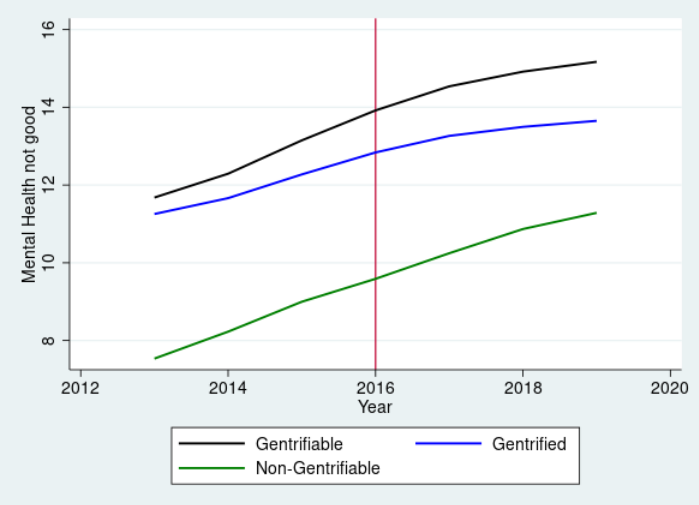

Figure 13: Trends from 2013-2019 in the Crude Prevalence of self-reported Physical Health Status not good for $\geq$ 14 days by Gentrification Status