RedFame

International Journal of Social Science Studies
Vol. 4, No. 4; April 2016
ISSN 2324-8033 E-ISSN 2324-8041
Published by Redfame Publishing
URL: http://ijsss.redfame.com

Who Lives in Hard-to-Count Neighborhoods?

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Received: November 25, 2015 Accepted: December 28, 2015 Available online: March 9, 2016

doi:10.11114/ijsss.v4i4.1441 URL: http://dx.doi.org/10.11114/ijsss.v4i4.1441

Abstract

For more than 20 years the U.S. Census Bureau has engaged in work to identify local areas that are likely to be difficult to enumerate in the Decennial Census. Such areas have been labeled "Hard-to-count." In this study I use the final Mail Return Rates from the 2010 Census to identify a group of Census Tracts that I label Hard-to-Count or HTC. Once HTC Tracts have been identified I examine the demographic characteristics and socioeconomic characteristics of the population living in the HTC Tracts and compare them the population in all Tracts. Demographic characteristics of the HTC Tracts examined here include location, age, race, and sex, along with several socioeconomic measures such as poverty and living arrangements. The distribution of characteristics for the population residing in the HTC Census Tracts is compared to the distribution for all Tracts to develop a HTC concentration ratio. The HTC Tracts are highly concentrated geographically. The 25 counties with the most HTC Tracts account for half of all HTC Tracts. Blacks, Hispanics and American Indian populations are highly concentrated in HTC Tracts. Demographic groups with the highest concentration in HTC Tracts are identified and the net undercount rates for these groups are examined. The relationship between concentration in HTC neighborhoods and Census undercount rates is mixed.

Keywords: census, neighborhoods, undercounts

1. Introduction

For more than 20 years the U.S. Census Bureau has been engaged in research to identify areas (Census Tracts and Block Groups) where it is difficult to get a complete enumeration in the Decennial Census (Bruce et al. 2001; Bruce and Robinson 2003, 2007; Bruce et al. 201; Erdman and Bates, 2014). Such areas are often called "Hard-to-Count" or HTC neighborhoods. According to Erdman and Bates (2014, page 12), " The HTC score is a metric pioneered by the Census Bureau over two decades ago that delineates areas of the country according to the ease of difficulty of enumeration." This study builds on past research and the Census Bureau's most recent rendition of this approach to identify HTC areas. Rather than looking at the entire distribution of Census Tracts, as has been the focus of previous work, the study presented here examines one end of the spectrum by identifying the Census Tracts with the lowest Mail Return Rates in the 2010 Census.

This paper reviews the past efforts to identify HTC (HTC) areas then develops a measure of HTC areas based on Mail Return Rates. Basically the Census Tracts with the lowest Mail Return Rates in the 2010 Census are called HTC neighborhoods.

Information on HTC neighborhoods is used in four ways here. First, I look at where Census Tracts identified as HTC are located. Then I look at the composition of the population residing in HTC Tracts based on the 2010 U.S. Decennial Census. Third, by comparing the percentage of a population living in HTC Tracts to their percentage in all Tracts I identify groups that are concentrated in HTC neighborhoods. Finally, I examine the net Census undercount rates for the groups that are most highly concentrated in HTC Tracts. One would expect groups that are highly concentrated in HTC neighborhoods to have relatively high net undercount rates.

Understanding who lives in HTC Tracts and where such areas are located can help the Census Bureau conduct the 2020 Census more efficiently. Identifying HTC Tracts can also be used to assist in on-going Census Bureau surveys such as the American Community Survey and the Current Population Survey. For example, The Census May want to assign more or better Field Representatives to HTC areas rather than other areas (Erdman et al no date).

2. Background

There has been a stream of research at the Census Bureau since the 1990s aimed at identifying small geographic areas

that are likely to be HTC in the Decennial Census (Bruce et al. 2001; Bruce and Robinson 2003, 2007; Bruce et al. 2012; Erdman and Bates, 2014). Bruce and Robinson (2003) define HTC populations in terms of the characteristics of the Census Tract where they live. The concept of HTC Tracts is closely linked to the Census Bureau's Planning Data Base because this is where the concept of HTC neighborhoods has been operationalized most often.

In the 1990s, the Census Bureau identified 12 characteristics that were used to construct HTC scores for each Census Tract. The characteristics were linked to low mail response rates and the likelihood of being missed in the Census. Documentation for the Census Planning Data Base (Bruce and Robinson, no date, page 1) states, "Variables included in the Tract Level Planning Database with Census 2000 Data (also called the Planning Database or PDB) were guided by extensive research conducted by the Census Bureau and others to measure Census coverage and to identify reasons people are missed in the Census."

The variables were guided by ethnographic research designed to identify reasons why people are missed in Censuses, (de la Puente 1995). Bruce et al. (2012) illustrate the strong correlation between HTC scores and self response rates over three decennial Census.

The 12 indicators used by Bruce and Robinson to provide HTC scores for neighborhoods were:

1. Percent of dwelling units that are vacant
2. Percent of dwelling units that are not single-family units
3. Percent of dwelling occupied by renters
4. Percent of dwelling units that are crowded
5. Percent of households that are not husband/wife households
6. Percent of households with no telephone service
7. Percent of population in poverty
8. Percent of households receiving public assistance income
9. Percent of persons age 16+ who are unemployed
10. Percent of households that were linguistically isolated
11. Percent of household that had moved in the past year
12. Percent adults without a high school education.

Based on the 12 characteristics, each Census Tract was given a HTC index score which ranged from 0 to 132. Various cutoff points were used to identify HTC areas. For example, O'Hare (2009) used the Census Bureau's HTC index score of 60 or more to identify the share of three age groups (children-age 0-17, working age 18-64, and elder age 65+) living in HTC areas.

According to Erdman and Bates (2014, page 4), "Since its creation, the HTC score has been used not only in planning the 2010 Census but also in managing daily operations of the many national surveys conducted by the U.S. Census Bureau. Prior to Census 2010, HTC scores were updated each decade and appended to the publicly available PDB. In turn local communities used the score to identify HTC areas in their jurisdiction and then tailor Census outreach activities to those populations."

Many of the variables identified as HTC factors used in the 1990s are also reflected in the recent model designed to identify Census Blocks Groups and Tracts with low Mail Return Rates (Erdman and Bates, 2014). Erdman and Bates (2014) developed an statistical model to show empirical relationships between Tract and Block Group characteristics are related to Mail Return Rates. They refer to this metric as a Low Response Score or LRS. Using the model. Lowe Response Scores were developed for every Block Group and Census Tract.

The top twelve variables in the Erdman and Bates model to predict Mail Return Rates were;

1. Renter occupied units
2. Percent of the Population age 18 to 24
3. Female head, no husband present
4. Non-Hispanic White
5. Ages 65+
6. Related Child under age 6
7. Males

8. Married-Family Households
9. Age 25-44
10. Vacant housing units
11. Median household income
12. College graduates

Unlike the measures used in the Bruce et al model to calculate an HTC score, many variables in the Erdman and Bates model have a positive relationship with the Mail Return Rate.

While the LRS is based on empirical relationships with Mail Return Rates and the HTC score is based on identification of factors through the literature, they both have identification of local areas that are likely to be difficult to enumerate as a key goal. Conceptually the HTC score and the LRS are very similar.

Great Britain also engages in an effort to identify HTC groups in the Census and many of the characteristics used by the U.S. Census Bureau to identify HTC population are also used in Great Britain (Abbott and Compton 2015). Abbott and Compton (2014) describe a similar HTC index used in Great Britain based on the statistical indicators below:

- The proportion of people claiming Income Support or Jobseekers Allowance
- The proportion of young people
- The Proportion of people who are not "White British."
- The relative house price within a local authority, and
- The density of Dwellings in a areas

The study presented here builds on these previous efforts which were aimed at identifying places and characteristics that are linked to being difficult to enumerate. While past efforts have focused on the entire distribution of Census Tracts, this study focuses on one end of the distribution, namely the set of Census Tracts that are likely to be the more difficult to enumerate.

3. Identifying HTC Census Tracts

There is a widespread belief that neighborhoods or groups with low mail-back rates in the Census have high net undercount rates in the Census. Word (1997) states, "Since response rates and net undercount rates may be causally linked, we will use this study as a sounding board for commenting on the Integrated Coverage Measurement (ICM) operation," Also, recent work by Erdman and Bates (2014) implicitly link response rates and net undercount rates. In describing the Low Response Score which is based on analysis of Mail Return Rates, the U.S. Census Bureau (2014, page 4) states, "This score identifies Block Groups and Tracts whose characteristics predict low Census mail return rate and are highly correlated (negatively) with Census and survey participation."

The Mail Return Rate is defined by the Census Bureau (2014, page 36) as:

"The number of mail returns received out of the total number of valid occupied housing units (HUs) in the Mailout/Mailback universe which excludes deleted, vacant, or units identified as undeliverable as addressed."

While there is likely to be a link between Mail Return Rates and net undercount in the Census, it is important to recognize that the Mailout/Mailback operation, which is the basis of the Mail Return Rate, is only the first part of the Decennial Census operations. Households that do not return a mailed Census questionnaire are visited by a Census Bureau enumerator. The Census Bureau makes great efforts to try and get information from every household. About 69 percent of the population captured in the 2010 Census were captured in the Mailout/Mailback phase (Griffin 2014, Table 5).

Nonetheless, the Mail Return Rate is often seen as an indicator of the likelihood of being missed in the Census. In this context, I will examine the association between the concentration of groups in HTC Tracts and the net undercount rates.

The fact that Mail Return Rates are a critical metric for the Census Bureau is reflect in the fact that this is the measure used in Census Bureau Rate Challenge (Erdman and Bates 2014).

It is widely acknowledged that Census Tracts are not the same as neighborhoods, but there is a long history of using Census Tracts as proxies for neighborhoods, The terms neighborhoods and Census Tracts are used interchangeably in this article.

3.1 The Data

Given the perceived relationship between Mail Return Rates and Census coverage, Mail Return Rates at the Census Tract level are used to identify "HTC" Tracts. Data on the Census Mail Return Rates from the 2010 Census have

recently been made available in the 2014 Census Planning Data Base (U.S. Census Bureau 2014) which contains data for more than 73,000 Census Tracts used in the 2010 Census.

The U.S. Census Bureau describes the 2014 Planning Data Base as:

"The 2014 Planning Database contains selected 2010 Census and selected 2008-2012 5-year American Community Survey (ACS) estimates. Data are provided at both the Census block group and the Tract levels of geography. The Planning Database (PDB) assembles a range of housing, demographic, socioeconomic, and Census operational data that can be used for survey and Census planning. In addition to variables extracted from the Census and ACS databases, operational variables include the 2010 Census Mail Return Rate for each block group and Tract.

The 2014 PDB includes percentage calculations based on the counts. In addition, a new Low Response Score (LRS) is provided that is similar in purpose to the HTC scores issued after past Censuses. This score identifies block groups and Tracts whose characteristics predict low Census mail return rate and are highly correlated (negatively) with Census and survey participation.

The Database can be found at the URL below: http://www.Census.gov/research/data/planning_database/2014/

It is worth noting that several demographic characteristics that are associated with high net Census undercounts were not included in the Planning Data Base. For example, young Black (Alone or in Combination) and Hispanic children have high net undercount rates (6.3 percent and 7.5 percent respectively) but were not included in the Planning Database (O'Hare 2014). Likewise, figures for young adult Black males were not included in the Planning Data Base even though this group has displayed a high net undercount over the past several Censuses (West et al. 2014). Data from the 2010 Census on young children by race and Hispanic Origin were merged with the Planned Data Base information, along with data on young adult minority males and females.

Some of the Census Tracts in the Planning Data Base do not have a Mail Return Rate associated with them so they are not included in this analysis. After merging the Planning Data Base with other Tract level data from the 2010 Census there were 71,848 Tracts used in this analysis.

To identify a set of Census Tracts as HTC Tracts, I examined three potential thresholds or cutoff points. The mean Mail Return Rate for Tracts was 78.9 percent with a standard deviation of 7.6 percentage points. Table 1 shows three alternative thresholds one might use the Mail Return Rate to identify a set of Tracts as being HTC.

Table 1. Potential Cut Points for Identifying HTC Census Tracts

	Mail Return Rate Cut Point	# of Tracts	Percent of All Tracts	Population in Tracts	Percent of Total Population
10 Percent of Tracts With the Lowest Mail Return Rates	69%	7,212	10.0	27,245,032	8.9
Tracts That were 1.65 or more Standard Deviations Below the Mean Mail Return Rate	66.4%	4,517	6.3	16,535,101	5.4
Tracts That Were 2 or More Standard Deviations Below the Mean Mail Return Rate	63.8%	2,722	3.8	9,607,152	3.1

Bruce et al (2012) sorted the HTC scores into deciles to examine the relationship between HTC scores and Mail Return Rates in the 1990, 2000 and 2010 Censuses. The lowest decile of HTC scores had lowest Mail Return Rates in each Census. Bruce et al (2012) give no rationale for using deciles rather than some other metric to examine the distribution. Table 1 shows, using the lowest decile of Mail Return Rates to identify HTC areas would result in 7,212 HTC Tracts which include more than 27 million and comprise 8.9 percent of the total national population. While using the lowest decile of HTC scores does not seem unreasonable, it is subjective and judgmental.

The other approach I considered here is to look at the distribution of Mail Return Rates in terms of the standard deviation of the distribution. This approach is more consistent with standards widely used in social science research.

I elected to use the most limiting definition of the three possible definitions suggested in Table 1, namely those Tracts where the Mail Return Rates was two standard deviations below the mean. These are identified here as "HTC" Tracts. It should be noted that preliminary analysis not shown here indicated that the same patterns existed for each of the three definitions shown in Table 1, but the distinctions between all Tracts and HTC Tracts are a little sharper with the most restrictive definition.

4. Results

There were 2,722 Census Tracts where the Mail Return Rate was two or more standard deviations below the mean and these are the Tracts designated as "HTC" or "HTC" in this study. These 2,722 Tracts are 3.8 percent of all Tracts and contain 9.6 million people, which is 3.1 percent of all people counted in the 2010 Census.

Table 2 shows the number of HTC Tracts in each state, as well as what share of all Tracts in a state are identified as HTC and the size of the population living in HTC Tracts in each state. The share of a state's population living in HTC Tracts is also shown.

Table 2 indicates that HTC Tracts are much more prevalent in some states than others. The three states with the most HTC Tracts (New York with 629 HTC Tracts, Texas with 270 HTC Tracts, and Illinois with 164 HTC Tracts) account for 39 percent of all HTC Tracts. There are three states (Maine, Nebraska and Wyoming) with no HTC Tracts.

The states with the largest populations living in HTC Tracts are New York (2.0 million), Texas (1.2 million), and California (660,000). Collectively, these three states account for 41 percent of all people living in HTC Tracts.

Data presented in Table 2 also shows the percent of each states population residing in HTC Tracts. The percentages range from 0 percent to 10.8 percent. The top three states in terms of percent of the state population living in HTC Tracts are New Mexico at 10.8 percent, New York and 10.7 percent and Hawaii at 8.8 percent.

Table 3 shows the 25 counties with the highest number of HTC Census Tracts. The 25 counties in Table 3 contain more than half of all the HTC Tracts in the nation. The five counties with the most HTC Tracts are Kings County New York (Manhattan) with 297, Queens County New York with 160, and Cook County (Chicago) Illinois with 146, Essex County (Newark) New Jersey with 94 and Orleans Parish (New Orleans) in Louisiana with 83. Collectively these five counties account for 29 percent of all HTC Tracts in the country.

It is also worth noting the high concentration of HTC Tracts in the New York City area. Three of the boroughs of New York are in the top 25 counties, as well as Newark and Jersey City, New Jersey, and Westchester County, New York.

Table 2. Number of Tracts and Population in Each State: Total and in HTC Tracts

	All Tracts		HTC Tracts				
	Number of Tracts	Total Population	Number of Tracts	Total Popualtion		Percent of Tracts that are HTC	Percent of Population in HTC Tracts
Alabama	1,172	4,766,464	46	142,158		3.9	3.0
Alaska	148	659,077	12	36,784		8.1	5.6
Arizona	1,458	6,182,117	78	321,758		5.3	5.2
Arkansas	686	2,915,918	30	99,347		4.4	3.4
California	7,947	37,012,740	162	660,648		2.0	1.8
Colorado	1,232	5,000,297	27	88,391		2.2	1.8
Connecticut	826	3,570,663	53	192,375		6.4	5.4
Delaware	214	897,934	3	12,101		1.4	1.3
District of Columbia	179	601,723	4	10,762		2.2	1.8
Florida	4,122	18,654,415	108	424,994		2.6	2.3
Georgia	1,953	9,682,578	93	394,882		4.8	4.1
Hawaii	316	1,359,153	26	119,606		8.2	8.8
Idaho	294	1,555,875	2	3,712		0.7	0.2
Illinois	3,114	12,826,225	164	486,218		5.3	3.8
Indiana	1,506	6,477,005	17	63,432		1.1	1.0
Iowa	822	3,041,227	1	1,670		0.1	0.1
Kansas	761	2,853,026	5	20,009		0.7	0.7
Kentucky	1,107	4,335,510	23	76,223		2.1	1.8
Louisiana	1,125	4,530,302	139	372,041		12.4	8.2
Maine	348	1,323,059	-	-		0.0	0.0
Maryland	1,386	5,757,417	22	88,525		1.6	1.5
Massachusetts	1,445	6,496,807	64	230,143		4.4	3.5
Michigan	2,745	9,860,188	24	58,523		0.9	0.6
Minnesota	1,324	5,285,299	2	5,962		0.2	0.1
Mississippi	657	2,967,208	31	109,429		4.7	3.7
Missouri	1,391	5,988,927	15	44,362		1.1	0.7
Montana	253	932,667	2	7,585		0.8	0.8
Nebraska	527	1,811,651	-	-		0.0	0.0
Nevada	678	2,698,893	43	165,438		6.3	6.1
New Hampshire	288	1,307,450	2	5,170		0.7	0.4
New Jersey	1,996	8,780,063	146	491,307		7.3	5.6
New Mexico	464	1,940,579	54	209,027		11.6	10.8
New York	4,786	19,145,254	629	2,044,756		13.1	10.7
North Carolina	2,160	9,516,735	26	99,419		1.2	1.0
North Dakota	199	657,358	3	8,998		1.5	1.4
Ohio	2,940	11,532,903	96	260,544		3.3	2.3
Oklahoma	1,045	3,751,214	54	179,919		5.2	4.8
Oregon	825	3,831,066	3	14,419		0.4	0.4
Pennsylvania	3,203	12,688,857	52	180,033		1.6	1.4
Rhode Island	240	1,051,516	11	48,756		4.6	4.6
South Carolina	1,085	4,621,669	11	45,697		1.0	1.0
South Dakota	208	772,106	2	4,910		1.0	0.6
Tennessee	1,482	6,338,776	30	112,868		2.0	1.8
Texas	5,197	24,984,891	270	1,225,691		5.2	4.9
Utah	578	2,729,616	6	14,576		1.0	0.5
Vermont	180	619,382	6	20,324		3.3	3.3
Virginia	1,877	7,991,911	26	99,660		1.4	1.2
Washington	1,434	6,673,096	9	32,187		0.6	0.5
West Virginia	484	1,852,994	48	163,324		9.9	8.8
Wisconsin	1,311	5,466,237	42	108,489		3.2	2.0
Wyoming	125	537,296	-	-		0.0	0.0
Total	71,843	306,835,334	2,722	9,607,152	#	173	145

Table 3. 25 Counties with the Largest Number of Hard-to-Count Tracts

Rank		All Tracts		HTC Tracts		Percent of Tracts that are HTC Tracts	Percent of Population Living in HTC Tracts
		Number of Tracts	Total Population	Number of Tracts	Total Popoluation		
1	Kings County	779	2,639,141	297	963,833	38.1	36.5
2	Queens County	648	2,230,062	160	505,725	24.7	22.7
3	Cook County	1,320	5,217,063	146	412,979	11.1	7.9
4	Essex County	389	1,578,913	94	299,746	24.2	19.0
5	Orleans Parish	172	340,762	83	156,767	48.3	46.0
6	Los Angeles County	2,320	9,801,432	57	197,403	2.5	2.0
7	Bronx County	332	1,373,223	56	174,202	16.9	12.7
8	Dallas County	564	2,502,987	51	198,120	9.0	7.9
9	Maricopa County	905	3,808,802	51	205,972	5.6	5.4
10	Suffolk County	488	2,096,006	41	155,486	8.4	7.4
11	Harris County	789	4,119,430	39	182,819	4.9	4.4
12	Milwaukee County	296	947,735	39	100,777	13.2	10.6
13	Clark County	694	2,748,857	38	152,248	5.5	5.5
14	Cuyahoga County	443	1,280,121	35	69,476	7.9	5.4
15	Franklin County	483	2,091,158	31	103,461	6.4	4.9
16	Philadelphia County	377	1,518,221	31	104,202	8.2	6.9
17	Hidalgo County	104	706,361	28	212,254	26.9	30.0
18	Orange County	934	4,825,075	24	104,923	2.6	2.2
19	Fairfield County	243	1,086,941	22	79,947	9.1	7.4
20	Jefferson County	791	3,147,512	22	79,107	2.8	2.5
21	Hudson County	164	633,553	20	69,284	12.2	10.9
22	San Diego County	623	3,088,439	20	127,671	3.2	4.1
23	Hamilton County	360	1,472,664	19	50,287	5.3	3.4
24	Shelby County	313	1,320,191	19	70,447	6.1	5.3
25	Westchester County	219	945,459	18	69,031	8.2	7.3

4.1 Demographics of the Population in HTC Tracts

Table 4 shows the composition of the population living in all Census Tracts and HTC Tracts by Race/Hispanic Origin Status, age, and sex. The last column in Table 4 shows the ratio of the groups' percentage of the population in HTC Tracts to their percentage in all Tracts multiplied by 100 for readability. This measure is labeled the HTC concentration ratio. Figures above 100 indicate the group is over-represented or concentrated in HTC Tracts. The higher the ratio, the more concentrated the group is in HTC Tracts.

There are large differences among groups in terms of their concentration in HTC Tracts and their proportion of the total population in HTC Tracts. Non-Hispanic Whites are under-represented in HTC Tracts while Black Alone, American Indian/Alaskan Native Alone and Hispanics are highly concentrated in HTC Tracts. Asians are slightly over-represented in HTC Tracts.

Within Race/Hispanic Origin groups there are also substantial differences. For example, among Non-Hispanic White Alone the HTC concentration ratio is three times higher for young adults (age 18 to 29) than it is for the school age population (age 5 to 17). In general, young adults in every group have relatively high HTC concentration ratios.

Several groups shown in Table 4 have concentration ratios above 200. Among the groups examined here, the group with the highest HTC concentration ratio is Black Alone Females age 18 to 29 where the HTC concentration ratio is s 339.

4.2. Socio-Economic Characteristics of the Population in HTC Tracts

Table 5 shows selected socio-economic characteristics of the population in HTC Tracts. The characteristics shown here are ones that are often discussed in the context of Census undercounts (O'Hare 2014; Martin and de la Puente 1993; de la Puente, 1993; Schwede and Terry 2013; Schwede et al 2015).

The group with the highest concentration ratio in Table 5 is the population in Group Quarters. It is not surprising that a large share of the group quarters population live in HTC Tracts, but since many people in Group Quarters do not participate in the Mailout/Mailback Census procedure it is difficult to say what this means. The population that "Does Not Speak English Very Well and Speaks Spanish at Home" has a HTC concentration ratio of 219. This probably

reflects a subset of Hispanics, mostly relatively new immigrants. The only other group in Tables 5 that has a HTC ratio above 200 is the population below the poverty line. This may be a product the concentration of high poverty groups (Blacks, Hispanics and American Indians) in HTC Tracts.

4.3 Composition of HTC Tracts

A small group could be highly concentrated in HTC Tracts yet still only comprise a small share of the total population in HTC Tracts. For example, American Indian/Alaskan Native Alone are highly concentration in HTC Tracts with a HTC concentration ratio of 228, but they comprise only 1.8 percent of the total national population living in HTC Tracts.

Table 6, shows what percent each group is of the total population in HTC Tracts. One-third of the population in HTC Tracts are Black, while Non-Hispanic Whites and Hispanics are a little over 29 percent each. Past research on Census undercounts has shown Blacks and Hispanics have consistently had relatively high net undercount rates in the U.S. Census (Olson et al 2015, Table 29.2).

4.4. Net Census Undercounts for Groups Concentrated in HTC Neighborhoods

One of the premises for developing HTC scores is the belief that groups concentrated in HTC areas have high net undercount rates in the Census. This portion of the analysis tests that assumption by examining the net undercount rates for groups with the highest concentration in HTC areas. Net undercount data from Demographic Analysis and Census Coverage Measures are used.

This section focuses exclusively on the groups identified by Race/Hispanic Origin and Age as shown in Table 4 for two reasons. There are no net undercount rates for most of the groups shown in Table 5, and for most of the groups in Table 5, the HTC concentration ratios are not as high as groups shown in Table 4.

Table 4. Concentration in HTC Tracts by Race,/Hispanic Origin, Age and Sex

	Population in All Tracts (in 1000S)	Percent of Total Population in all Tracts	Population in HTC Tracts (in 1000s)	Percent of Total Population in HTC Tracts	Ratio of Percent in All Tracts/Percent in HTC Tracts
Total Population	308,746		9,607		
White Alone Not Hisapnic Total:	195,953	63.5	2,793	29.1	46
White Alone Not Hispanic Total 0-4	10,222	3.3	141	1.5	44
White Alone Not HispanicTotal 5-17	29,365	9.5	293	3.0	32
White Alone Not HispanicTotal 18-29	29,616	9.6	957	10.0	104
White Alone Not HispanicTotal 30-64	94,699	30.7	1,086	11.3	37
White Alone Not HispanicTotal 65+	32,051	10.4	317	3.3	32
Total:	38,797	12.6	3,196	33.3	265
Black Alone age 0-4	2,901	0.9	261	2.7	289
Black Alone age 5-17	7,934	2.6	618	6.4	250
Black Alone Age 18-29 Female	3,715	1.2	392	4.1	339
Black Alone Age 18-29 Male	3,560	1.2	342	3.6	309
Black Alone age 30-64	17,252	5.6	1,335	13.9	249
Black Alone age 65+	3,435	1.1	248	2.6	232
Total:	14,653	4.7	521	5.4	114
Total Asian Alone 0-4	897	0.3	30	0.3	106
Total Asian Alone 5-17	2,351	0.8	65	0.7	89
Total Asian Alone 18-29	2,743	0.9	176	1.8	206
Total Asian Alone 30-64	7,276	2.4	218	2.3	96
Total Asian Alone 65+	1,386	0.4	32	0.3	75
Total:	2,499	0.8	177	1.8	228
American Indian/Alaskan Native Alone Total age 0-4	201	0.1	17	0.2	275
American Indian/Alaskan Native Alone Total Age 5-17	536	0.2	39	0.4	235
American Indian/ Alaskan Native Alone Total Age 18-29	489	0.2	40	0.4	266
American Indian/Alaskan Native Alone Total age 31-64	1,100	0.4	70	0.7	203
American Indian/Alaskan Native Alone Total age 65 plus	173	0.1	11	0.1	198
American Indian/ Alaskan Native Alone Total	2,499	0.8	177	1.8	228
		0.0			
Total:	50,119	16.2	2,848	29.6	183
Hispanic Total age 0-4	5,083	1.6	307	3.2	194
Hispanic Total age 5-17	11,942	3.9	624	6.5	168
Hispanic Females age 18-29	4,899	1.6	323	3.4	212
Hispanic Males age 18-29	5,477	1.8	388	4.0	228
Hispanic Total age 30-64	19,954	6.5	1,083	11.3	174
Hispanic Total age 65+	2,765	0.9	123	1.3	143

Table 7 shows the concentration of groups in HTC Tracts juxtaposed with the net undercount rates. The U.S. Census Bureau has two primary methods for measuring undercounts in the Census (Mulry 2014; Hogan et al. 2013). Census Coverage Measurement (CCM) involves using a Post-Enumeration Survey to gauge undercounts and overcounts (Mule 2010; O'Hare et al; 2012). Demographic Analysis (DA) compares the Census counts to the expected population based primarily on birth and deaths to gauge undercounts and overcounts (O'Hare 2014). Data from both Census Coverage Measurement and Demographic Analysis are used in Table 6, although the groups for which data from DA are available are limited.

The relationship between concentration in HTC neighborhoods and high net undercounts is mixed. Of the thirteen groups for which there are data from CCM, only five have an estimated net undercount that is statistically significantly different from zero at the 90 percent level. Of the thirteen groups for which there are data from CCM, two actually have estimated net overcounts although both overcounts are very low. For four of the groups, data had to be added together from groups shown in the CCM publication so it was not possible to calculate statistical significance. However, the CCM net undercount rate for two of these groups is less than 1 percent. For the nine groups for which statistical significance of the net undercount estimate could be calculated, five were statistically significantly different zero and four were not.

DA undercount estimates were only available for five groups. Four of the five groups had an estimated net undercount but two of those were very low (under 1 percent). There is no statistical significance testing with DA estimates, but only two of the five groups had a net undercount rate above 2.3 percent from DA.

In summary, of the fourteen groups with the highest level of concentration in HTC neighborhoods, many do not have high net undercount rates. The relationship between being concentrated in a HTC neighborhood and having a high net undercount rates can best be described as mixed.

5. Discussion

Since one of the premises for developing ways to identify HTC areas is the presumed relation between HTC areas and Census coverage, this relationship deserves some attention. The relationship between HTC Tracts and Census coverage is not a straightforward as one might imagine.

One of the most interesting findings is the top two groups shown in Table 6. Black Males and Black Females age 18 to 29 both have very high rates of being concentrated in HTC neighborhoods. Both groups are more than three times as likely to live in a HTC neighborhood as they are to live elsewhere. But the estimated net undercount rates for these two groups are very different. There is no significant net undercount rate for Black Females age 18 to 29, but for Black Males age 18 to 29, the estimated net undercount rate is almost six percent. The situation is similar for Hispanic Males and Females age 18 to 29. Hispanic Males and Females age 18 to 29, have similar HTC concentration ratios, but very different net census undercount rates.

This signals that living in a HTC neighborhoods does not necessarily lead to being missed in the Census. Obviously there is something more than concentration in HTC neighborhoods driving the high net undercount for Black Males age 18 to 29.

If Black Males and Females age 18 to 29 are equally concentrated in HTC neighborhoods, what accounts for their very different net census undercount rates? I suspect the difference between the experiences of young Black men and young Black women is linked to their living arrangements.

The "usual place of residence" is a key concept used by the in the Census, but Martin (1999 and 2007) argues that concept is not always clear to respondents and attachment to a single household may be more of a continuous concept rather than a dichotomous one. According to West and Robinson, (1999, page 10),

"The Census rules of residence instruct that the person in whose name the house or apartment is owned, being bought or rented be listed as person 1 on the form. The respondent is then asked to identify members of the household in relation to person 1. This often contradicts the respondent's notion of family or household."

Martin (1999, 2007) argues that attachment to a housing unit or a household is not a dichotomous variable, but more of a continuous one. Qualitative studies of the Decennial Census also show the tenuous relation many people have with a housing unit (Schwede et al 2013; 2015).

Many people are clearly attached to one household, but others may be attached to more than one household or none at all. This may account for the difference between young Black men and young Black women. There is a rich literature that depicts many young black men as only marginally attached to a household (Liebow 2003: Gibbs 1988).

6. Conclusion

Examination HTC neighborhoods based on Low Mail Return Rates found that they are concentrated in certain states

and in certain counties. The 25 counties with the largest number of HTC neighborhoods collectively account for half of all HTC neighborhoods.

The demographics of the 9.6 million people who live in HTC neighborhoods, shows some groups are highly concentrated there. In particular, young adults (age 18 to 29) and minorities (Black, Hispanic and American Indians) are over-represented in HTC neighborhoods. Young adult minorities have particularly high HTC concentration ratios.

The relationship between a group's concentration in HTC neighborhoods and their net undercount rate in the 2010 Census is mixed. Many of the groups with the highest HTC concentration ratios do not have relatively high net undercounts. The juxtaposition of Black Males and Black Females age 18 to 29 illustrates. The HTC concentration ratio for both group are very similar and very high, yet there is not statistically significant net undercount for Black Females age 18 to 29, but a relatively high net undercount for Black Males age 18 to 29.

Table 5. Concentration in HTC Ttracts by Selected Characteristics

	Total in All Tracts (in 1000s)	Percent of Total Populatino in All Tracts	Total in HTC Tracts (in 1000s)	Percent of Total Population in HTC Tracts	Ratio of percentages (Percent in HTC/Percent in all)
Total	306,835	100.0	9,607	100.0	100
Males	150,707	49	4,814	50	102
Females	156,129	51	4,793	50	98
Not High School Graduate	28,923	14	1,409	26	184
College Graduate	57,967	29	938	17	61
Below Poverty Line	44,492	15	2,715	31	206
Above Poverty Line	158,599	53	2,647	30	56
Unemployed	14,447	10	592	15	151
Employed	18,303	81	769	79	97
Different House One Year Ago	46,103	15	2,138	23	151
	286,748		8,838		
Lanuage Other Than English	58,843	21	3,135	35	173
EnglishOnly	228,312	80	5,583	63	79
English Not Very well Spanish At Home	16,259	6	1,104	12	220
Born in the U.S.	267,576	87	7,197	76	87
Foreign-Born	39,602	13	2,287	24	184
Married Couple Households	56,243	48	1,066	33	67
Non-Married Couple Households	59,919	52	2,211	67	131
Female-Headed Households	15,172	13	694	21	162
Households with Related Child Under age 6	17,276	22	633	32	142
Group Quarters	7,602	2	669	7	281

Table 6. Share of Total population in HTC Tracts by Race Age and Sex

	Percent of Total Populatino in HTC Tracts
Total Population	
White Alone Not Hisapnic Total:	29.1
White Alone Not Hispanic Total 0-4	1.5
White Alone Not HispanicTotal 5-17	3.0
White Alone Not HispanicTotal 18-30	10.0
White Alone Not HispanicTotal 30-64	11.3
White Alone Not HispanicTotal 65+	3.3
Total:	33.3
Black Alone age 0-4	2.7
Black Alone age 5-17	6.4
Black Alone Age 18-29 Female	4.1
Black Alone Age 18-29 Male	3.6
Black Alone age 30-64	13.9
Black Alone age 65+	2.6
Total:	5.4
Total Asian Alone 0-4	0.3
Total Asian Alone 5-17	0.7
Total Asian Alone 18-29	1.8
Total Asian Alone 30-64	2.3
Total Asian Alone 65+	0.3
Total:	1.8
American Indian/Alaskan Native Alone Total age 0-4	0.2
American Indian/Alaskan Native Alone Total Age 5-17	0.4
American Indian/ Alaskan Native Alone Total Age 18-29	0.4
American Indian/Alaskan Native Alone Total age 31-64	0.7
American Indian/Alaskan Native Alone Total age 65 plus	0.1
American Indian/ Alaskan Native Alone Total	1.8
	0.0
Total:	29.6
Hispanic Total age 0-4	3.2
Hispanic Total age 5-17	6.5
Hispanic Total age 18-29	7.4
Hispanic Females age 18-29	3.4
Hispanic Males age 18-29	4.0
Hispanic Total age 30-64	11.3
Hispanic Total age 65+	1.3

Table 7. Net Census Undercount Rates for Groups Most Highly Concentrated in Hard-to-Count Neighborhoods

	Concentration Ratio (Percent in HTC Tracts/Pecent in All Tracts)	Net Undercount Rate from CCM	Statistical Significance of CCM measures	Net Undercount Rate from DA
Black Alone Age 18-29 Female	339	0.38	not significant	
Black Alone Age 18-29 Male	309	-5.93	*	
Black Alone Age 0-4	289	-3.42	*	-4.38
American Indian/Alaskan Native Alone Total Age 0-4	275	-1.56	not significant	
American Indian/ Alaskan Native Alone Total Age 18-29	266	-2.34	unknown	
Total Black Alone	265	-2.06	*	-2.29
Black Alone Age 5-17	250	-0.06	unknown	0.83
Black Alone Age 30-64	249	-4.25	unknown	-4.25
American Indian/Alaskan Native Alone Total Age 5-17	235	0.02	unknown	
Black Alone Age 65+	232			-0.91
Total American Indian/Alaskan Native Alone	228	-0.15	not significant	
Hispanic Males Age 18-29	228	-5.18	*	
Hispanic Females age 18-29	212	-2.14	*	
Total Asian Age 18-29	206	-0.02	not significant	
In some cases CCM data from the published source had to be added together to get data for the reference group. In these cases there were no statistical signficance testing was not possible.				
*statistically significantly different from zero at 90 percent level				
the plus and minus signs shown in this table are reversed from the way they are presented in the Census Publication , in order to make this table consistent with others shown in this paper				

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