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ANALYSIS OF THE CENSUS 2020 COUNT IN DETROIT

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KEY FINDINGS

- Our data suggest the 2020 Census undercounted the number of occupied residential units in 10 Detroit Census block groups we analyzed by 8.1%.

- Detroit is an outlier compared to other U.S. cities in the extent to which its 2020 Census population and housing counts deviate from the Census Bureau's 2019 population and housing estimates.

- Data from our analysis of Census block groups and peer cities offer compelling evidence of a likely undercount of Detroit in the 2020 Census.

- Decennial population counts and annual population estimates are critically important, used to determine the allocation of hundreds of billions of dollars in federal funding to state and local governments.

EXECUTIVE SUMMARY

Each year the Census Bureau releases an official estimate of the residential population of every municipality in the nation. The Census Bureau estimated that in 2019, Detroit had a population of roughly 670,000. However, just one year later, the 2020 Census counted only 639,000 residents living in the city, a decline of roughly 31,000 residents from its 2019 estimate. In the context of the Census Bureau's previous enumerations and estimates of Detroit's population, a single-year decline of 31,000 residents is anomalous and implausible.[2] With such a dramatic discrepancy between the 2019 estimates and the 2020 count, it is possible that the Census Bureau either significantly overestimated Detroit's population in the years preceding 2020 or significantly undercounted the city's population in 2020.

In this report, we lay out preliminary evidence supporting the latter case, suggesting the Census Bureau undercounted Detroit's population in 2020. We present the results of an analysis of 10 block groups in Detroit, comparing the Census Bureau's count of occupied housing units in those block groups with counts from United States Postal Service data from June 2020, when the Census was taking place.[3] For five of these block groups, we also present data from a canvass conducted by Wayne State University (WSU) in September and October 2021 that provides data on the overall number of housing units and the number of occupied housing units in those block groups.

Our analysis suggests the 2020 Census produced an undercount of occupied housing units in the 10 sampled block groups, including one set of five block groups with relatively high rates of residential stability and another set of five block groups with higher vacancy rates and lower rates of self-response in the 2020 Census (we refer to these block groups as "less stable").[4] In the set of more residentially stable block groups we sampled, depending on the data source we use, the 2020 Census appears to have produced an undercount of between 223 and 277 occupied units, counting between 7.6% and 9.5% fewer occupied units. [5]In the five less residentially stable block groups we analyzed, the 2020 Census appears to have produced an undercount of 161 units, or roughly 9% fewer units. In sum, after conducting an audit of the Census counts of residential units and occupied units in a selection of both more stable and less stable Detroit block groups, we find that the 2020 Census appears to have undercounted the number of occupied residential units across these 10 block groups by 8.1%, missing an estimated 964 Detroit residents. If undercounts of a similar magnitude occurred in a majority of the city's more than 600 block groups, the potential undercount could be in the tens of thousands.

In addition to this block group level analysis, we also analyzed other data produced by the Census Bureau, which show

Detroit as an outlier compared to other U.S. cities in the size of the discrepancy between the Census Bureau's 2019 population estimates and its 2020 population count. Given the circumstances of the 2020 Census count in Detroit (e.g., high reliance on internet self-response and abbreviated Non-Response Follow Up (NRFU) period combined with the city's hard-to-count characteristics) these data offer compelling evidence of a likely undercount of Detroit in the 2020 Census.

PRELIMINARY EVIDENCE OF AN UNDERCOUNT IN DETROIT: AN ANALYSIS OF 10 DETROIT BLOCK GROUPS

To better understand whether and to what extent there was an undercount in Detroit in the 2020 Census, the City of Detroit commissioned WSU to conduct a canvass of five Census block groups in which the vacancy rate reported in the 2020 Census was far higher than one would expect based on vacancy estimates from the 2015-2019 American Community Survey (ACS).[6] Researchers from the University of Michigan, in collaboration with city staff, selected a set of five block groups where the counts of occupied housing in the 2020 Census were substantially lower than (a) counts of housing units with active DTE Energy (a Detroit utility provider) accounts and (b) estimated counts of occupied housing units from the 2015-2019 ACS. These five block groups also had relatively high rates of residential stability and homeownership based on 2015-2019 ACS. In short, this set of five block groups was selected to represent areas of the city where it should have been relatively easy to produce accurate population counts—because they have high rates of residentially stability and a preponderance of single-family, owner-occupied homes (2015-2019 ACS)—and yet the 2020 Census produced anomalously low rates of occupied housing. If the 2020 Census inaccurately classified a substantial number of occupied housing units in these areas as vacant, this would translate into a substantial undercount of the population.

The WSU team canvassed these five block groups to count the total number of housing units and determine the occupancy/vacancy status of each housing unit. Canvassers were trained to determine the occupancy status of a housing unit based on physical characteristics of the structure (e.g., car in the driveway, lights on in the home), and, when occupancy status was ambiguous, talk to possible occupants of the housing units and/or neighbors.

One issue with comparing data on housing occupancy from the 2021 WSU canvass to the 2020 Census is that housing conditions may have changed in the elapsed time between the Census enumeration and the canvass. To address this limitation, we drew upon a third data source—the United States Postal Service (USPS) Delivery Sequence File from June 2020—that also provides counts of occupied housing in the sampled block groups from a time period that is contemporaneous with the 2020 Census.[7]

RESULTS IN STABLE BLOCK GROUPS
Figure 1 below shows the occupancy rate for each of the five residentially stable block groups we inspected, by data source. Across all five block groups,[8] occupancy rates as measured by the WSU canvass and USPS data are between 6.2% and 15% higher than occupancy rates measured by the Census, with a high degree of similarity in the rates obtained by the two non-Census sources.[9]

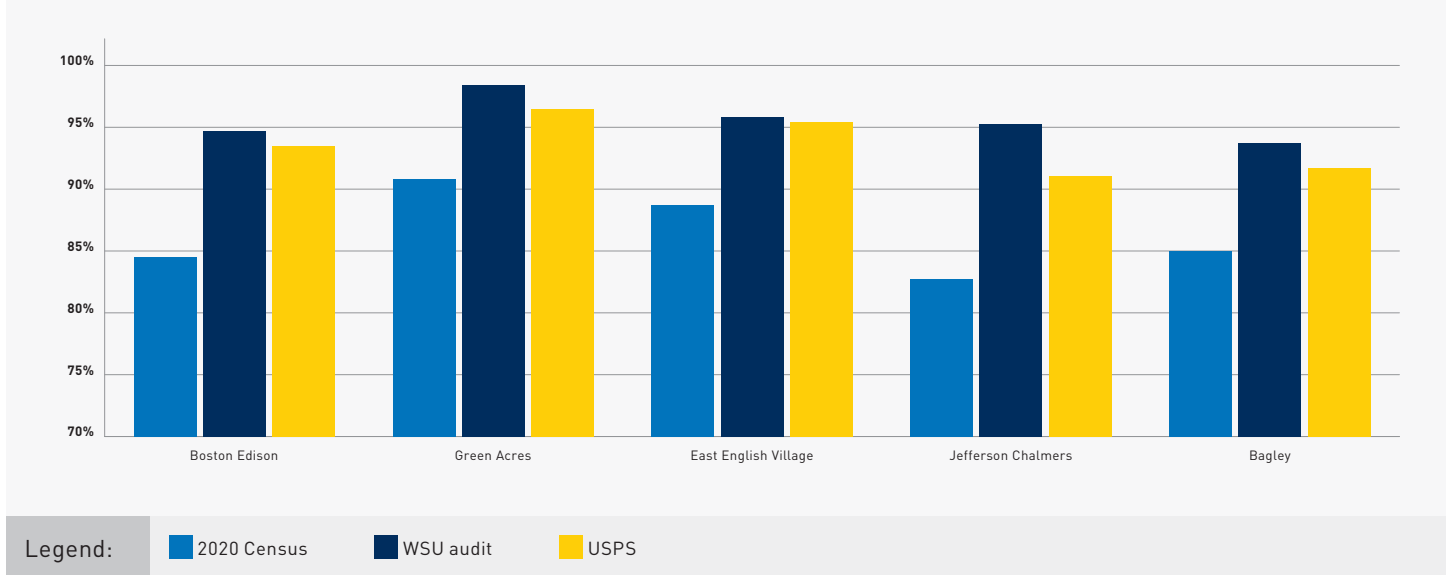## FIGURE 1: ESTIMATED OCCUPANCY RATES IN SELECT STABLE BLOCK GROUPS

Legend: ■ 2020 Census ■ WSU audit ■ USPS

TABLE 1: COUNT OF OCCUPIED HOUSING UNITS IN SELECT STABLE BLOCK GROUPS BY SOURCE OF COUNT

NEIGHBORHOOD/ BLOCK GROUP	2020 CENSUS	WSU CANVASS	USPS	DIFFERENCE (WSU - CENSUS)	% UNDERCOUNT (WSU)	DIFFERENCE (USPS - CENSUS)	% UNDERCOUNT (USPS)
Boston Edison	399	484	478	85	17.6%	79	16.5%
Green Acres	474	500	490	26	5.2%	16	3.3%
East English Village	911	969	965	58	6.0%	54	5.6%
Jefferson Chalmers	459	522	499	63	12.1%	40	8.0%
Bagley	486	531	520	45	8.5%	34	6.5%
TOTAL	**2729**	**3006**	**2952**	**277**	**9.2%**	**223**	**7.6%**

In Table 1, we show these counts by block group and source of count. In each block group, the USPS and WSU data suggest an apparent Census undercount of between 16 and 85 occupied units. In total, the WSU data suggest a Census undercount of 277 occupied units across these five block groups (9.2% fewer occupied units), and the USPS data suggest an undercount of 223 occupied units (7.6% fewer occupied units).[10]

RESULTS IN LESS RESIDENTIALLY STABLE BLOCK GROUPS

In addition to analyzing the count of residential units and occupied residential units in residentially stable block groups, we also conducted an analysis of occupied residential units in five block groups with high vacancy rates and low rates of self-response on the 2020 Census. If the first set of block groups should have been easy to count, this second set of block groups were chosen to understand the potential for an undercount in block groups where it may have been harder to achieve an accurate count.[11] Our suspicion was that we were likely to see a larger undercount in these less residentially stable neighborhoods, given their hard-to-count features. For this second set of block groups we do not have WSU canvassing data, so rely only on USPS data.

Given the reliance on internet self-response in the 2020 Census (discussed below), and the ways in which the count may be vulnerable to inaccuracies in areas with low self-response rates, we chose five block groups to analyze based on the following criteria: (a) the Census tract in which the block group is nested had a self-response rate below 40%;[12] (b) the Census 2020 count of housing units was within +/- 10% of the count of housing units based on City of Detroit Property Assessment data, to reduce the likelihood of analyzing a block group with many large multifamily properties;[13] and (c) the number of active DTE energy accounts was larger than the number of occupied units counted by the Census Bureau, again to reduce the likelihood of analyzing a block group with a

large number of multifamily properties.[14] This set of five block groups also had a much higher vacancy rate (average rate of 38.5%) in the 2020 Census than the initial set of five block groups we selected (average rate of 13.7%).

For these five block groups we can only produce a count of occupied residential units, not a count of total residential units. This is because the USPS data only yields reliable counts of occupied units and is less reliable in counting uninhabitable housing units.[15]

Still, given that our main focus is the count of occupied housing units in each block group, the USPS data from June 2020 offer a helpful comparison to the 2020 Census figures. The results of our analysis are summarized in Table 2 below.

TABLE 2: COUNT OF OCCUPIED HOUSING UNITS IN SELECT LESS STABLE BLOCK GROUPS

NEIGHBORHOOD/ BLOCK GROUP	2020 CENSUS	USPS	DIFFERENCE (USPS - CENSUS)	% UNDER- COUNT
Dexter-Linwood	333	365	32	8.8%
Franklin	344	352	8	2.3%
LaSalle-College Park	462	510	48	9.4%
Islandview	238	274	36	13.1%
Virginia Park	239	276	37	13.4%
TOTAL	**1616**	**1777**	**161**	**9.1%**

Our initial hypothesis was that if there was a potential Census undercount, it would be greater in these less residentially stable block groups than in the more stable block groups analyzed above. This hypothesis is borne out by the data, which show that the Census counted 9.1% fewer occupied units than USPS in these block groups, a slightly greater undercount than we found among the more residentially stable block groups (see Table 1), where USPS data suggested that 7.6% of occupied units in those areas were not counted by the 2020 Census.

A potential undercount of this magnitude is not trivial. We used the results from the audit study to project how many people may have been undercounted in the sampled block groups based on the discrepancy between the USPS data and 2020 Census in their counts of occupied housing units. The results are shown in Table 3. We created an estimate of residents living in the ten block groups according to USPS data (column 5) by multiplying the number of estimated occupied units (column 4) by the number of people per occupied housing unit in the sampled block groups (column 3). We express the projected undercount in terms of the number of people we expect were not counted (column 6) and the percentage of the population (as estimated by USPS data) of the sampled block groups who were not counted (column 7). Aggregating across all 10 sampled block groups, we project the Census undercounted these areas by 964 people, equivalent to 8.14% of the estimated population of these areas. The projected undercount was slightly higher in 5 block groups with lower levels of residential stability (9.1% of the estimated population) compared to those with higher levels of residential stability (7.6% of the estimated population). While we can't say for certain the extent to which results from these block groups are generalizable to the rest of the city, if undercounts of a similar magnitude are found in a majority of the city's more than 600 block groups, the ultimate size of a potential undercount could be in the tens of thousands.

These block group audits offer compelling evidence of a likely undercount in Detroit, particularly when paired with additional data on the size of the discrepancy between the Census Bureau's 2019 population estimate and 2020 count, and the unique circumstances of the 2020 Census. We review this additional data in the following pages.

THE DISCREPANCY BETWEEN THE 2019 ESTIMATE AND 2020 COUNT OF POPULATION AND HOUSING

Each year the Census Bureau releases an official estimate of the residential population of every municipality in the nation. Though the annual population figures are estimates, they are generally quite accurate—indeed, federal funds are distributed to states and localities based on these annual estimates.[16] Therefore, we would expect the trend line in annual population estimates to align fairly well with the decennial Census count.

However, as noted above, Detroit's 2020 count diverges significantly from prior estimates. Figure 2 shows that Detroit's population was estimated to have declined each year since the 2010 Census, but the rate of that decline slowed substantially since 2016. The Census Bureau estimated an average annual population decline of 0.9% between 2011 and 2016, and just 0.4% between 2016 and 2019. The decline from 2019 to 2020—a nearly 5% drop in the city's population—is out of line with recent trends, as well as with the discrepancies we see in 2019 estimates and 2020 counts in other U.S. cities.

FIGURE 2: CENSUS BUREAU COUNTS AND ESTIMATES OF DETROIT'S POPULATION 2010 TO 2020
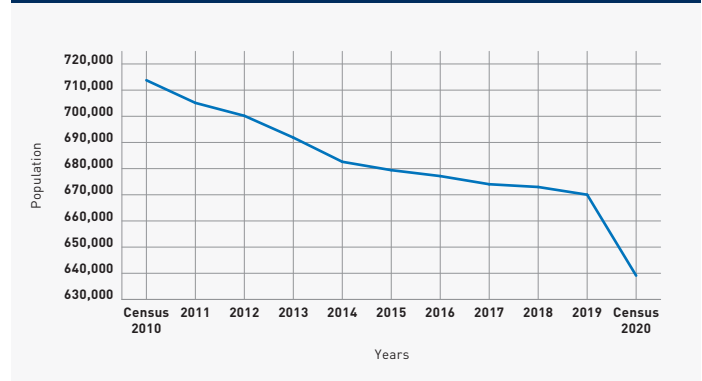

Source: U.S. Census Bureau

TABLE 3: ESTIMATED POPULATION UNDERCOUNT IN 10 DETROIT BLOCK GROUPS

SAMPLE OF BLOCK GROUPS	(1) # PEOPLE: 2020 CENSUS	(2) # OCCUPIED UNITS: 2020 CENSUS	(3) PEOPLE PER OCCUPIED UNIT: 2020 CENSUS	(4) # OCCUPIED UNITS: USPS	(5) # PEOPLE: USPS	(6) PROJECTED POPULATION UNDERCOUNT	(7) PROJECTED UNDERCOUNT (POPULATION) AS A PERCENTAGE OF USPS ESTIMATE
5 block groups with high residential stability	6685	2729	2.4	2952	7231	546	7.6%
5 block groups with low residential stability	4197	1616	2.6	1777	4615	418	9.1%
TOTAL	**10882**	**4345**	**2.5**	**4729**	**11846**	**964**	**8.1%**

In Figure 3 we show the 2020 Census count for the 50 largest U.S. cities as a percent of the Census Bureau's July 2019 estimate of their population.

FIGURE 3: A COMPARISON OF THE 2020 CENSUS COUNT AND 2019 POPULATION ESTIMATES FOR LARGEST 50 U.S. CITIES
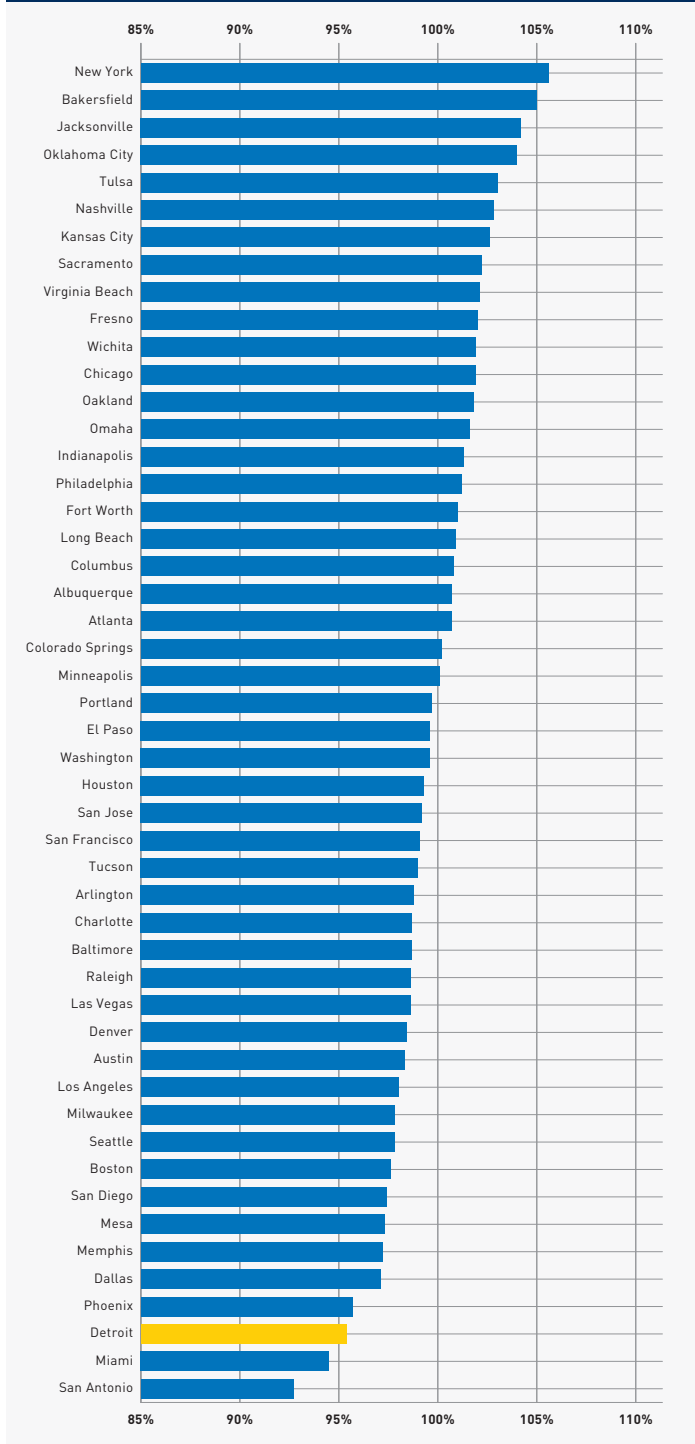
Phoenix, Detroit, Miami, and San Antonio are distinguished from the other 46 large cities, with counts that came in 4% or more below the Census Bureau's 2019 estimate. Of these cities, however, Detroit is the only one that does not have a large foreign-born or non-citizen population (see Table 4). There was great controversy over the efforts to add a citizenship question to Census 2020. Given the attention on this issue, it is reasonable to expect that undocumented persons and citizens living in households with undocumented relatives would be reluctant to respond to Census 2020, leading to a potential undercount in these cities.[17] But this does not help to explain the undercount in Detroit, which has far fewer people who are foreign born or non-U.S. citizens than these other cities.

TABLE 4: % FOREIGN BORN AND % NOT U.S. CITIZEN IN HIGH-DISCREPANCY CITIES

CITY	% FOREIGN BORN	% NOT U.S. CITIZEN
Miami	58.4%	28.4%
Phoenix	20.1%	12.4%
San Antonio	14.1%	8.7%
Detroit	6.1%	3.5%

Source: ACS 2019 1-year estimates

Perhaps unsurprisingly given the population figures, we also see a large discrepancy between the Census Bureau's 2019 estimate and 2020 count of housing units in Detroit. In 2010, the Census counted 349,000 housing units in Detroit. To prepare for the decennial enumeration, the Census Bureau develops a Master Address File (MAF), compiled using USPS data and commercial mailing lists. Roughly three years before the enumeration, the Census Bureau shares information with local governments in their Local Update Census Address Operation (LUCA), and local governments may challenge or update the MAF developed by the Census Bureau. In 2018, officials from the Detroit Planning Department provided the Census Bureau with an address file showing roughly 368,000 residential units—occupied or vacant—in the city.

The American Community Survey provides estimates of housing units for each municipality of 65,000 or more residents on an annual basis. The City of Detroit's estimate of 368,000 residential units is very close to the Census Bureau's estimate of 364,000 residential units from the 2017 ACS. By

2019, the Census estimate had fallen slightly, to 359,000 units. But 2020 Census enumerated only 310,000, suggesting a single year decline of nearly 50,000 housing units.

DETROIT'S POPULATION AND HOUSING COUNTS COMPARED TO INDUSTRIAL CITIES IN THE MIDWEST AND NORTHEAST

In addition to comparing Detroit to other large cities, we also narrowed our focus to compare the discrepancy between Detroit's 2019 estimates and 2020 counts with other industrial cities in the Midwest and Northeast, some of which, like Detroit, have also experienced population decline over the past 50 years. Perhaps the discrepancy we see in Detroit is also present in these other peer cities.

Here too, however, Detroit is an outlier. Table 5 shows the Census 2020 population and housing counts and the 2019 estimates in Detroit and other peer cities, including high poverty cities with large shares of Black residents, such as Cleveland and St. Louis.[18] The difference between Detroit's 2020 count and 2019 estimate, at 4.6%, is more than twice the gap of the next closest city, Cleveland (2.2%). The housing discrepancy is even greater, with Detroit's nearly 14% gap more than three times Cleveland's gap of 4.3%.

In any given Census, certain populations—including people of color, immigrants, children, and low-income households—are harder to count, for a variety of reasons.[19] However, other cities that share certain hard-to-count characteristics with Detroit—such as high rates of poverty or large shares of residents of color—did not experience the same discrepancy between 2019 estimate and 2020 count we see in Detroit. Rather, Detroit's circumstances appear unique.

THE SPECIFIC CHALLENGES OF TAKING A CENSUS IN DETROIT IN 2020

Adding to the difficulties of obtaining an accurate count in Detroit in 2020, the 2020 Census for the first time placed significant reliance on households self-reporting information through the internet.[20] The reliance on internet-based self-reporting was likely to present a particularly large obstacle in Detroit, one of the "least-connected" big cities in the country.[21] The map below (Figure 4) shows all the tracts in Detroit in which the self-response rate on the 2020 Census was in the bottom 20% of all Census tracts nationally. As one can see, much of the city falls into this bottom fifth. Indeed, Detroit had the lowest self-response rate among all cities with at least 500,000 residents.[22]

TABLE 5: POPULATION AND HOUSING 2020 COUNTS AND 2019 ESTIMATES IN DETROIT AND INDUSTRIAL CITIES

CITY	POPULATION 2020	HOUSING 2020	POPULATION 2019	HOUSING 2019	POPULATION 2020/ POPULATION 2019	HOUSING 2020/ HOUSING 2019
Detroit	639,111	309,913	670,052	359,623	0.954	0.862
Cleveland	372,624	198,871	380,989	207,813	0.978	0.957
St. Louis	301,578	173,479	300,576	177,400	1.003	0.978
Milwaukee	577,222	257,723	590,157	260,024	0.978	0.991
Boston	675,647	301,702	694,295	303,791	0.973	0.993
Pittsburgh	302,971	157,695	300,281	158,561	1.009	0.995
Baltimore	585,708	293,249	593,490	293,877	0.987	0.998
Cincinnati	309,317	158,773	303,954	158,394	1.018	1.002
Kansas City	508,090	241,949	495,278	238,547	1.026	1.014
Columbus	905,748	415,456	902,073	402,520	1.004	1.032
Minneapolis	429,954	199,143	429,605	192,708	1.001	1.033

Source: U.S. Census Bureau

FIGURE 4: DETROIT CENSUS TRACTS IN THE BOTTOM 20% OF TRACTS NATIONALLY IN RATE OF SELF-RESPONSE
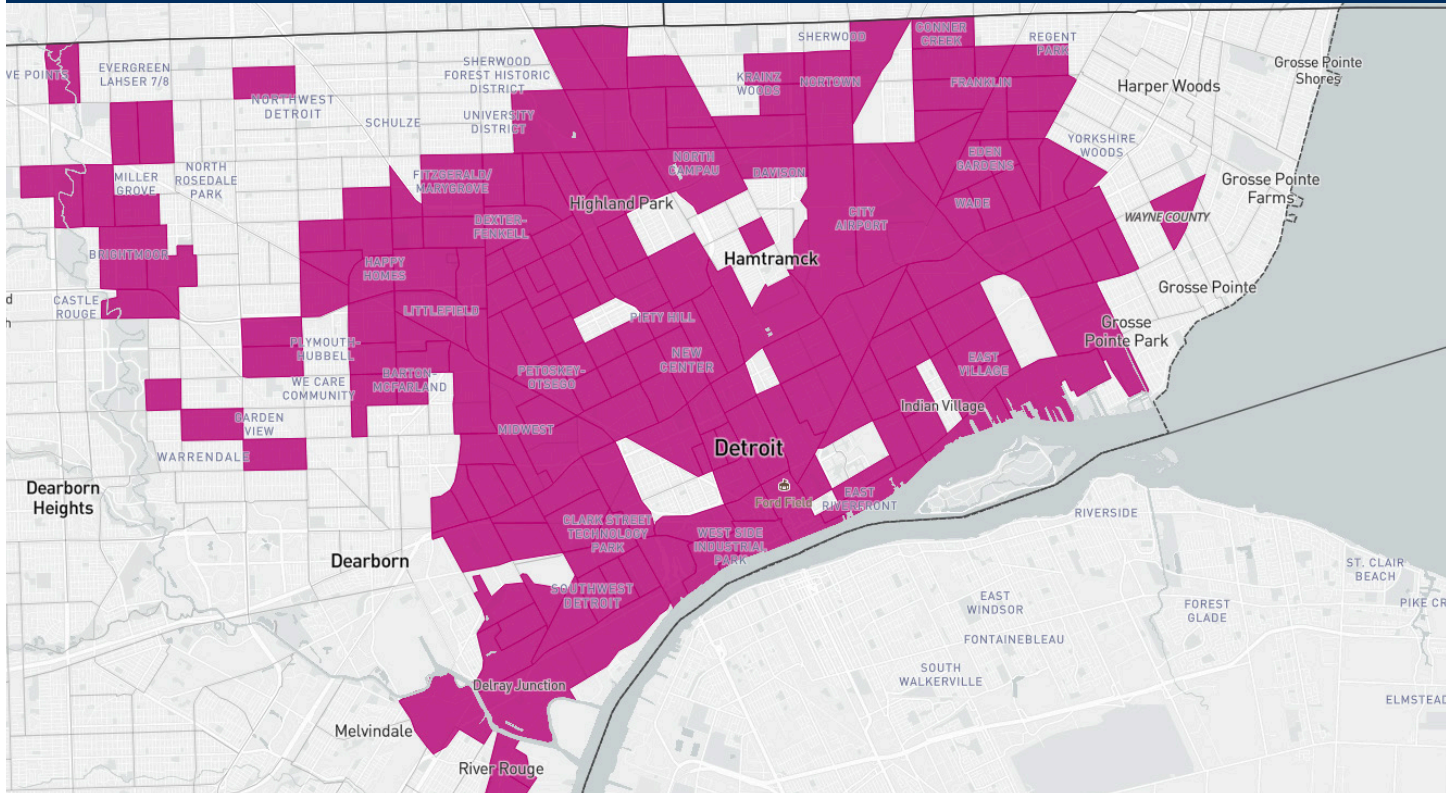
Source: www.censushardtocountmaps2020.us

When a household fails to self-report, the Census tries to ascertain information about the household through a Non-Response Follow Up (NRFU) process. The Census Bureau first seeks to ascertain occupancy/vacancy status of a residence through high-quality administrative records. Residential units deemed vacant are supposed to receive a home visit from a Census enumerator to confirm vacancy, while most of those deemed occupied are supposed to receive a number of visits, with the goal of making contact with a household member, or, after a certain number of visits, a proxy (e.g. neighbor, landlord, etc.). If an enumerator is still unable to make contact with a member of the household, the Census Bureau may try to return to administrative records to enumerate the household, or rely on a count imputation procedure.[23] In 2020, the Census Bureau relied to a significant degree on the use of administrative records, both in a bid to reduce costs as well as out of necessity, as traditional enumeration activities began late and were cut short by the Trump administration.[24] Though many experts note that increased reliance on administrative records has the potential to improve accuracy and reduce costs, others find that administrative records are prone to inaccuracies, particularly for traditionally hard to count populations.[25]

The low rate of self-response in Detroit means that the Census Bureau had to enumerate a large share of Detroit's population through the NRFU process. It is possible this impacted the accuracy of the count in Detroit, given the unprecedented reliance on administrative records and truncation of traditional NRFU activities. In short, in a year in which the Census was particularly reliant on internet self-response, and the NRFU process was abbreviated, the city's hard-to-count features may have been heightened.[26]

CONCLUSION

Every year, hundreds of billions of dollars flow to state and local governments based on decennial Census counts and annual estimates. Attaining an accurate count is therefore critically important. This report lays out compelling evidence of a likely undercount in Detroit in the 2020 Census. After reviewing data on the extent to which Detroit was an outlier in the discrepancy between its 2019 population estimate and 2020 count, we engaged in a block group-level analysis to learn more. The magnitude of the potential undercount in these block groups, when combined with the other data we've accumulated here, provide sufficient evidence to warrant further investigation, both by researchers and government officials, to ensure the city's count is accurate.

APPENDIX

DIFFERENTIAL PRIVACY ANALYSIS

In an effort to protect the identities of Census takers, the Census Bureau deployed a technique known as differential privacy in the 2020 Census, in which random noise is inserted in the data.[27] While this may enhance privacy protections, it can also make the data imprecise at small geographies.[28] If the low Census occupancy counts in our chosen neighborhoods were the result not of an undercount but of the differential privacy procedure, then conducting an audit of those counts would be useless, as the counts would be incorrect on purpose.

To understand the impact the differential privacy procedure might have on vacancy rates at small geographies, we applied the differential privacy procedure to Detroit's 2010 Census counts at the census tract and block group levels. If the vacancy rate in a given tract or block group as reported in the 2010 Census was similar to the vacancy rate in that tract or block group after differential privacy was applied, we can assume that differential privacy does not impact the accuracy of the count of occupied and vacant units.

In the two figures below, the x-axis shows the vacancy rate of a given geography in the 2010 Census before differential privacy is applied, and the y-axis shows the vacancy rate after differential privacy is applied. Figure 1 shows this comparison at the census tract level, and Figure 2 shows it at the block group level.

At the Census tract level, differential privacy has virtually no impact on vacancy rates. At the block group level the data are a bit noisier, but the impact of differential privacy still appears to be minimal, with an average difference between pre- and post-differential privacy vacancy rates of plus or minus 2.6 percentage points. Therefore, while it's possible that the count of total and occupied units in a block group would be impacted by differential privacy and yield an artificially incorrect count, we can be reasonably confident that for most block groups in Detroit, the counts reported by the Census Bureau are quite close to the actual Census counts. This also means that if we see discrepancies in the vacancy rates between the WSU/USPS counts and the Census count, we can be reasonably confident that these represent evidence of a potential miscount in the 2020 Census in these neighborhoods, particularly if the discrepancies are large.

FIGURE 1: THE EFFECT OF DIFFERENTIAL PRIVACY AT THE CENSUS TRACT LEVEL
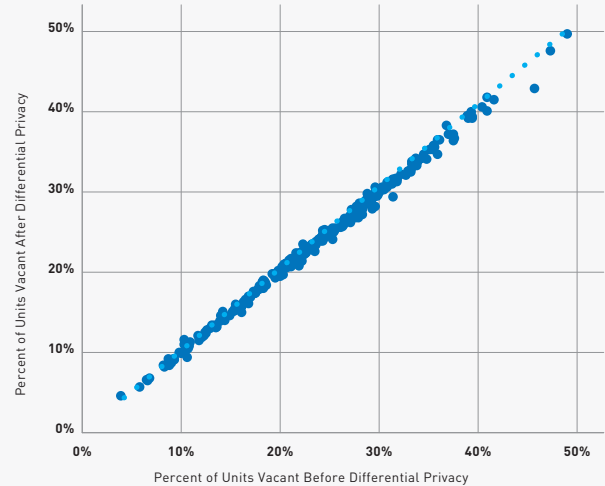
Source: David Van Riper, Tracy Kugler, and Jonathan Schroeder. IPUMS NHGIS Privacy-Protected 2010 Census Demonstration Data, version 20210608 [Database]. Minneapolis, MN: IPUMS. 2020.

FIGURE 2: THE EFFECT OF DIFFERENTIAL PRIVACY AT THE BLOCK GROUP LEVEL
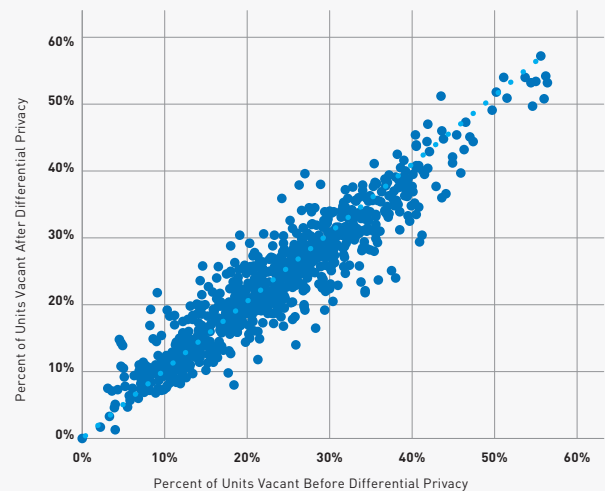
Source: David Van Riper, Tracy Kugler, and Jonathan Schroeder. IPUMS NHGIS Privacy-Protected 2010 Census Demonstration Data, version 20210608 [Database]. Minneapolis, MN: IPUMS. 2020.

ENDNOTES

1   Patrick Cooney is the assistant director of policy impact at the University of Michigan's Poverty Solutions initiative; Ren Farley is a research scientist at the Population Studies Center, the Dudley Duncan Professor Emeritus of Sociology, and a lecturer at the Ford School of Public Policy, all at the University of Michigan; Samiul Jubaed is a data and policy analyst at Poverty Solutions at the University of Michigan; Kurt Metzger is the founder and director emeritus of Data Driven Detroit; Jeffrey Morenoff is a Professor in the Department of Sociology, Professor at the Ford School of Public Policy, and Research Professor in the Population Studies Center and Survey Research Center, all at the University of Michigan; Lisa Neidert is a lecturer in the Department of Sociology at the University of Michigan; Ramona Rodriguez-Washington is a program director at the Center for Urban Studies at Wayne State University.

2   According to previous enumerations and estimates, Detroit lost an average of roughly 8,000 residents each year from 2010 to 2014, and just 2,000 residents each year from 2014 to 2019.

3   A "block group" is a geography defined by the Census, consisting of a collection of Census blocks. Throughout, we will sometimes refer to the block groups we analyzed as "neighborhoods," though the geographic boundaries of the units under analysis remain the same.

4   U-M researchers and City officials identified five stable neighborhoods where the 2020 Census produced higher than expected vacancy rates. These more residentially stable neighborhoods were characterized by high rates of homeownership, relatively high median income, and low vacancy rates in previous Census estimates. U-M researchers also identified five less residentially stable neighborhoods to audit, prioritizing neighborhoods with low self-response rates on the 2020 Census, a proxy for a number of other measures of disadvantage. Block groups chosen for analysis also had a small discrepancy in total residential units as counted by the Census and by the City of Detroit assessor's office, and a count of active utility accounts larger than the Census count of occupied units, both to reduce the likelihood of our selecting a block group with a large number of multifamily properties.

5   The WSU canvassing figures showed a larger Census undercount, hence the range of estimates.

6   One limitation of analyzing block-group-level counts of vacant and occupied housing units in the 2020 Census is the Census Bureau intentionally added noise to these counts in an attempt to reduce the risk of disclosing the identity of individuals and households, through a process called differential privacy. To understand the impact the differential privacy procedure might have on vacancy rates at small geographies, we applied the differential privacy procedure to Detroit's 2010 Census counts at the Census tract and block group levels and found it had very little impact on this measure at these geographies, giving us more confidence in the block group audits. See the appendix for more details on our analysis of the impact of differential privacy on estimates of vacancy rates.

7   As an additional check on the accuracy of the USPS data, for some selection of addresses which were marked as occupied in the USPS data and vacant in the WSU data—or vice versa—we looked at Google Street View images of the property from a pre-Census and post-Census time period. For the properties we analyzed, the USPS data appear accurate. For example, the Google Street View image of a property marked vacant in the WSU data and occupied in the USPS data might show a property that in June 2019 had a maintained yard and people on the porch, but in an August 2021 image, the property appears boarded up. In addition, staff from Detroit's Land Bank Authority (DLBA) have conducted analyses comparing USPS occupancy data with neighborhood-level surveys, and found the USPS data set to be the most accurate administrative data for determining the occupancy/vacancy status of one- to four-family residential units.

8   The specific "stable" neighborhoods we chose to canvass were: tract 5321 block group 1 (Boston Edison); tract 5381 block group 1 (Green Acres); tract 5018 block group 1 (East English Village); tract 5133 block group 2 (Jefferson Chalmers); tract 5386 block group 4 (Bagley).

9   Because we used the USPS data as a check on the WSU data, the denominator for total residential housing units in the USPS occupancy rate calculation comes from the WSU data set.

10 Throughout the report, we calculate the percent difference between Census and non-Census data by using the non-Census estimate as the base figure.

11 The specific "less stable" neighborhoods analyzed were: tract 5315.02 block group 1 (Dexter-Linwood); tract 5034 block group 1 (Franklin); tract 5054 block group 2 (LaSalle-College Park); tract 5193 block group 1 (Islandview); and tract 5327 block group 1 (Virginia Park).

12 Self-response rates are reported at the tract level, so we chose block groups that were inside of tracts with low self-response rates.

13 The City parcel data codes all apartment buildings with the same code and a single entry, so if there were many more units counted in a block group by the Census Bureau than is shown in the parcel data, it could be that the Census Bureau is counting many apartments that don't show up in the parcel data. We wanted to analyze block groups with relatively few apartment buildings because City staff informed us that USPS occupancy data is most accurate for single-family homes up to four-unit buildings.

14 In some block groups, the number of occupied units reported by the 2020 Census is much larger than the number of active DTE accounts because a single DTE hookup may be reported for a large apartment building, for example.

15 While the USPS data appropriately marks some vacant lots as neither occupied nor vacant, in other instances the vacant code is applied to vacant lots, yielding this code insufficient to help us understand the total number of habitable units in a geography.

16 Nora Gordon and Krista O'Connell, "Why Does the Census Matter for State and Local Governments?" *Georgetown University McCourt School of Public Policy*, February 18, 2020. Available at: https://mccourt.georgetown.edu/news/why-does-the-census-matter-for-state-and-local-governments/

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