EXHIBIT B

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

LA UNIÓN DEL PUEBLO ENTERO, PROMISE ARIZONA, LYDIA CAMARILLO, JUANITA VALDEZ-COX, ROGENE GEE CALVERT; ZEENAT NISHA HASAN; CANDY L. GUTIERREZ; EUGENE WU, DEBORAH CHEN, ORGANIZATION OF CHINESE AMERICANS-GREATER HOUSTON, DAVID CHIU, PHILLIP TING, ALBERT MURATSUCHI, KENNY CHU, YICHENG WU, CYNTHIA CHOI, VINCENT PAN, JOHN PARK, JEFFREY D. HSI, JACINTA TITIALII ABBOTT, VENGHAN TANG, RAJ MUKHERJI, SHARON TOMIKO SANTOS, MIA GREGERSON, JENNIFER REYES, RAYMOND SANCHEZ, MARICELA LECHUGA, MARTY RAMIREZ, FELIPE CRUZ, ALEXANDRA ROSY PALOMO-PUJOL, MARCO ABARCA, COALITION FOR HUMANE IMMIGRANT RIGHTS OF LOS ANGELES, RALPH CARMONA, and JAVIER GASTON-GREENBERG,

Plaintiffs,

v.

DONALD J. TRUMP, sued in his official capacity as President of the United States,

WILBUR L. ROSS, sued in his official capacity as U.S. Secretary of Commerce,

STEVEN DILLINGHAM, sued in his official capacity as Director of the U.S. Census Bureau,

U.S. DEPARTMENT OF COMMERCE, and

U.S. CENSUS BUREAU,

Defendants.

Civil Action No. 8:19-CV-02710-PX

SWORN EXPERT DECLARATION OF HOWARD HOGAN

I. QUALIFICATIONS

1. I am currently retired from the U.S. Census Bureau, where I worked for 39 years in positions of increasing responsibility. During my career I have worked on and studied all aspects of the census process, including coverage and content. This work has included responsibility for key aspects of post data collection processing. I am a recognized expert in how coverage errors occur, their impact on census accuracy, and how post data collection processing can address them. I have supervised a large software development operation.

2. My most recent position at the Census Bureau was as its Chief Demographer, where I served as the Census Bureau's senior scientist on technical and statistical demography. I served as principal consultant to Census Bureau staff on methodological problems, and as a liaison to academic and other outside demographers.

3. Previously as Associate Director for Demographic Programs, I led the Census Bureau's programs that provide demographic, social and economic data about the nation's population and households and led the statistical programs that produce population projections and estimates. I supervised the Population Division where Count Review was redesigned and implemented. I was also responsible for the International Programs Center, the Housing and Household Economic Statistics Division, the Demographic Statistical Methods Division, and the Data Integration Division.

4. Earlier as Chief of the Economic Statistical Method and Programming Division, I managed the development of software for the Census Bureau's economic programs including monthly indicator surveys, annual surveys, and the economic census, successfully moving towards adopting modern software development processes. I provided leadership to all

mathematical statisticians working in the Economic Directorate.

5. During the 2000 Census, I served as Chief, Decennial Statistical Studies Division. I led the group of mathematical statisticians and programmers who were responsible for the statistical design of Census 2000, including statistical quality control design, coverage improvement activities, software quality control, count imputation, content sampling, undercount measurement, and census adjustment. I assisted three U.S. Solicitors General, and provided expert testimony cited in Supreme Court Case: *Utah v. Evans*.

6. Earlier, as Chief of the Undercount Research Staff, Statistical Research Division, I led the Census Bureau's effort to research, develop and implement methods to correct the 1990 Census for undercount. This multiyear research program included developing a research plan to address all issues concerning coverage measurement and adjustment for the 1990 Census. I designed and managed a large and complex survey, the 1990 Post Enumeration Survey, including questionnaire design, processing plan, matching process design, imputation, post-stratification plan, estimation design, and census adjustment.

7. I hold a Ph.D. from Princeton University, studying at its Office of Population Research, and a Master of Public Affairs degree from its Woodrow Wilson School. I have been a Professorial Lecturer at the Department of Statistics of The George Washington University. I served as Chair of the Survey Research Methods Section of the American Statistical Association (ASA), and also served as Chair of its Committee on Professional Ethics. I am an elected Fellow of the ASA, a designation that recognizes an individual's outstanding service to and leadership in the field of statistical science. Each year, ASA's Committee on Fellows, a peer group, can only elect one-third of one percent of the total membership as Fellows. I have consulted with the statistical offices of the UK, India, Sweden, Mauritius, Morocco and Canada, and led a United

Nations task force on demographic statistics.

II. SUMMARY AND CONCLUSION

8. The purpose of this declaration is to describe the grave risks to an accurate enumeration caused by the shortened schedule for post data collection processing. Specifically, the currently proposed schedule, based on my knowledge and experience, will not allow the Census Bureau to meet its stated goal: "The goal of the 2020 Census is to count everyone once, only once, and in the right place."[1]

9. Furthermore, these risks will have a disproportional impact on the poor, the rural, and ethnic and racial minorities. This will result in what is known as a 'differential undercount,' that is, the undercount of some, primarily minority, groups is larger than that of the other groups. For example, the Census Bureau has documented over the decades that the undercount for Blacks, Asians, Latinos (also referred to by the Census Bureau as "Hispanics"), and Native Americans is larger than that for non-Hispanic Whites.[2] Although a differential undercount has been measured in all recent U.S. censuses, the compressed schedule for post data collection processing carries a grave risk of a greatly increased differential undercount.

10. Post data collection processing refers specifically to those activities that take place after the completion of Census field work that are necessary to deliver accurate statistical results. In this declaration, I focus on the Apportionment Counts. These are the total population by state,

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[1] U.S. Census Bureau, *2020 Census Operational Plan: A New Design for the 21st Century*, Version 4.0 (Dec. 2018) https://www2.census.gov/programs-surveys/decennial/2020/program-management/planning-docs/2020-oper-plan4.pdf (hereinafter "2020 Census Operational Plan v. 4.0").

[2] *See, e.g.*, Hogan, *The 1990 Post-Enumeration Survey: Operations and Results*, 88 J AM. STAT. ASS'N 423, 1047-60 (Sept. 1993) http://links.jstor.org/sici?sici=0162-1459%28199309%2988%3A423%3C1047%3ATIPSOA%3E2.0.CO%3B2-8; and Howard Hogan, Patrick J. Cantwell, Jason Devine, Vincent T. Mule Jr. and Vitoria Velkoff, *Quality and the 2010 Census*, 32 POPULATION RES. POL'Y REV. 637 (2013) https://link.springer.com/article/10.1007/s11113-013-9278-5?shared-article-renderer#citeas.

including the overseas federally affiliated population, necessary to allocate the 435 Congressional seats to the 50 individual states.

11. The Census Bureau itself has implicitly admitted that its current schedule is insufficient to conduct the Census with its usual statistical standards. This can be seen in their three different proposed schedules for post data collection processing:

a. *Original Schedule*: five months (August 1 through December 31)

b. *Previous Revised Schedule*: six months (November 1 through April 31)

c. *Current Schedule*: three months (October 1 through December 31)

12. The original schedule was based on decades of experience and years of planning and testing. This schedule was developed to allow five months for post data collection processing before the delivery of the Apportionment Counts. When COVID-19 hit and Census field and processing operations were suspended, the Census Bureau proposed a revised schedule asking for six months; that is, an additional month for post data collection processing. The Census Bureau did not announce its reasons for this additional month, but a reasonable inference is that the special challenges caused by COVID-19 would require extra care in post data collection processing. Thus the current three month schedule allows only half the time that the Census Bureau publicly stated that it needed. Rather than allowing more time to deal with the unique problems and additional challenges of COVID-19, the current schedule gives less time than the Census Bureau planned for before the pandemic.

13. Schematically, post data collection processing needed to produce the Apportionment Counts includes the following activities:

a. Scanning in paper questionnaires.

b. Checking for completeness: e.g. returned blank questionnaires or questionnaires

with insufficient data.

c. Merging the files: internet returns, telephone, paper and results from field enumeration.

d. Processing census responses not directly tied to a census identification number, known as "non-ID Processing." This includes people who took advantage of the opportunity to self-respond even though they did not know their census ID. It also includes people interviewed at locations other than their usual residence, but who provided their usual residence address.

e. Unduplicating multiple responses for the same housing unit: for example from a mailed-back questionnaire and the result of a field visit. This activity is known as the Primary Selection Algorithm (PSA).

f. Unduplicating multiple enumerations for the same person at two or more locations, as necessary: for example college students sent home before April 1 or people who may have left their urban residence for a rural second home.

g. Supplementing response data with administrative records for those cases that had been identified by administrative data as occupied, but for which a nonresponse follow-up attempt was unsuccessful and no subsequent self-response was received.

h. Imputing for missing values, specifically any housing unit where the number of residents was not previously determined, called count imputations.

i. Processing of Group Quarters (GQ) enumerations (college dormitories, nursing homes, etc.).

j. Review of Group Quarters results by state demographers, to identify new or

misallocated group quarters or if a GQ reports an improbable number of residents, known as GQ Count Review.

k. Preliminary tabulations, necessary for review steps. In fact, this is done several times for multiple reviews.

l. Review of the aggregate results by trained demographers to identify "systematic or large anomalies." These are, for example, where the preliminary census population greatly exceeds or greatly falls short of what other sources show.

m. Merging of the overseas federally affiliated population, such as military personnel.

n. Tabulation of the 50 state population totals.

o. Computation, as a courtesy, of the Congressional Apportionment, using the method known as 'Equal Proportions'

p. Submitting the results to the President.

14. Each of these steps is necessary to produce accurate Apportionment Counts. Skipping or rushing one step can impact the next. For example, failure to properly handle non-ID cases can impact the need for the use of administrative records. Failure to implement the administrative records process can lead to higher count imputations. Failure of any of these steps can lead to systematic errors, which the review is designed to catch. Failure to carry out these processes risks not just an undercount, but an undercount that disproportionally affect areas with minority populations. Not only is a particular logical order implied, but also a pre-specified operational order. That is, systems, including software systems, and processes have been developed and tested for a particular order. Skipping steps to save time means running an untested system, with all the inherent risks.

15. In this Declaration, I will focus on those steps with the greatest risk to mis-counting the poor, rural, and racial and ethnic populations. I enumerate problems and risks occurring with this compressed time schedule and the probable impact upon the Black, Latino, Asian, Pacific Islander and Native American populations.

16. The Census Bureau has not fully explained and documented it plans to meet the current truncated schedule, even though OMB Statistical Policy Directive 4 mandates: "Information to help users interpret data accurately, including transparent descriptions of the sources and methodologies used to produce the data, must be equitably available for Federal statistical products."[3] Because of this lack of transparency in current plans, it is impossible at this time to know what steps the Census Bureau will be forced to skip and which steps will be merely rushed. The Census Bureau leadership talks only of "Streamlining backend processing to deliver apportionment counts by the statutory deadline of December 31, 2020."[4] What is clear is that the professionals at the Census Bureau will not have the time to properly carry out the processes that they have deemed necessary for meeting their goal of an accurate enumeration of the U.S. population. And, as mentioned above, on-the-fly "streamlining" of a tested system raises a grave risk of a fatally flawed and failed census.

17. The Census Bureau has an experienced, skilled and dedicated staff, fully capable of addressing these problems if they are given adequate time. Each step takes time and care, with a limited number of staff on-board and trained to accomplish it. Unlike field work, it is not

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[3] Statistical Policy Directive No. 4: Release and Dissemination of Statistical Products Produced by Federal Statistical Agencies, 73 Fed. Reg. 12622, 12625 (Mar. 7, 2008), https://www.govinfo.gov/content/pkg/FR-2008-03-07/pdf/E8-4570.pdf.

[4] Albert E. Fontenot Jr. & Timothy P. Olson, *Review of 2020 Operational Plan Schedule*, U.S. Census Bureau, p. 9 (Aug. 17, 2020) https://www.census.gov/content/dam/Census/newsroom/press-kits/2020/2020-operational-plan-schedule-review.pdf.

possible to bring on additional demographers, statisticians and software engineers in order to speed the post data collection processing. The Census Bureau had developed a plan and adapted it to the challenges created by COVID-19. What the Census Bureau's professional staff needs is to be allowed to carry out the plan developed and announced in April 2020.

III. NON-ID PROCESSING AND OTHER PRE-PROCESSING

18. Each dwelling unit on the Master Address File (MAF) contains a unique ID. The Census Bureau has worked to make it easy for people to self-respond, even if they have not received, or cannot find, their census ID. The plan was to make it easy for people to respond "anytime, anywhere to increase self-response rates."[5] However, when these non-ID cases are received, a series of steps must be undertaken. This includes determining which census block contains the units ('Geocoding') and seeing if the unit is already listed on the MAF. If the unit is on the MAF, then the response goes into the next step (the Primary Selection Algorithm, or PSA, discussed below). If the unit is not already on the MAF, then the Census Bureau must verify whether the unit exists, and if it does, add it to the MAF. Each of these steps takes time. Not conducting this process can result in not counting people who have responded.

19. Additionally, there are some cases where the census asks for "Usual Residence Elsewhere." For example, people interviewed at a marina or campground are to be counted there if they have no other 'usual residence,' known as 'usual residence elsewhere' or URE. However, if they have a usual residence, they are asked to report it. This then generates a non-ID response which again must be geocoded, unduplicated and fed to the next step.

20. Failure to carry out non-ID processing affects coverage in several ways. If that was the only response received from the person, then they will be missed from the census entirely, in

[5] 2020 Census Operational Plan v. 4.0, at 108.

spite of the Census Bureau's advertising this as a valid way to respond. Additionally, in the case of the UREs, this can create two problems. First, the person will be counted at the campground, which is not the person's usual residence. Secondly, the person may be missed at the usual residence.

21. The "respond anywhere" option is new, but is was designed, in part, to enumerate those people with looser ties to a particular unit. Not properly including these non-ID cases can disadvantage minorities, as these options were designed for people with less conventional living arrangements. Counting people at marinas and campgrounds is likely to advantage the well-off, who can afford boats and RV campers.

22. Many steps are needed to prepare the files for further processing, and different files are produced for different purposes. The most important files for our discussion are:

a. Decennial Response File (DRF): This contains all 2020 Census responses for the final enumeration universe after additional data processing, GQ matching and unduplication and application of the Primary Selection Algorithm (explained below)

b. Census Unedited File (CUF): All person and household records for the 50 states and D.C. including group quarters records. If the number of occupants in a housing unit is missing or contradictory, imputation procedures are required to complete the household enumeration record, using a variety of data inputs and statistical processes. When the final enumeration data are determined for all dwelling unit records considered to be valid, the resulting dataset is the Census Unedited File (CUF). The CUF is the baseline for the total count of people.

c. Census Edited File (CEF): All person and household records for the 50 states and

D.C., including GQ records and characteristics (such as race and ethnicity). The CEF is the result of consistency edits and imputation of characteristics as needed.[6]

23. In fact, each of these files may exist in several versions resulting from different stages of processing and review. Thus, there is both a DRF-1 and DRF-2.

24. The Self-Response Quality Assurance (SRQA) process must perform automated and interactive checks to identify potentially suspicious returns from self-response that require analyst investigation and/or field follow-up to ensure quality. As the data are received, write-in responses (i.e., alpha characters for race and ethnicity responses) are coded for tabulation purposes. Coding is conducted by both automated and computer-assisted manual processes.[7] During DRF processing, edits must be performed to normalize data received from multiple data capture operations (internet, telephone, paper or NRFU). That is, data coming from different processing systems will have different software formats and can use different codes. "Normalizing" data puts the data into a common format, so that, for example, a '2' in position '3' always means 'female." The DRF aggregates response data received from data capture operations.[8] This is necessary to prepare a single file containing all accepted responses in a uniform format. Without this step, there is no single place where all the results can be found and analyzed together.

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[6] U.S. Census Bureau, Decennial Census Management Division, *2020 Census Detailed Operational Plan for: 23. Count Review Operation (CRO)*, 11 (July 26, 2019) https://www2.census.gov/programs-surveys/decennial/2020/program-management/planning-docs/CRO-detailed-operational-plan.pdf (hereinafter, "2020 CRO Plan").

[7] 2020 Census Operational Plan v. 4.0, at 133-34.

[8] U.S. Census Bureau, Decennial Census Management Division, *2020 Census Detailed Operational Plan for: 19. Response Processing Operations (RPO)*, Version 2.0, 121 (Nov. 2019) https://www2.census.gov/programs-surveys/decennial/2020/program-management/planning-docs/RPO_detailed_operational_plan-v2.pdf (hereinafter, "2020 RPO Plan v. 2.0").

IV. UNDUPLICATING MULTIPLE RESPONSES FOR THE SAME PERSON

25. It is necessary to address duplicate enumerations of the same person in order to achieve the Census Bureau's stated goal of counting people "only once and in the right place." These have been shown to occur in every census where duplications have been measured.

26. It is important to remember that for many purposes, especially including Congressional Apportionment and redistricting, it is the distributional accuracy of the census that matters. Each state needs to get its 'fair share of the pie.' Because of this, it is not just census omissions that matter. Areas where there are disproportionally more duplicates can gain an improper advantage. Ensuring that everyone is counted "only once, and in the right place," is just as important as ensuring that everyone is counted 'once."

27. One form of potential duplication occurs when more than one return is received for the same dwelling unit. These forms could represent two different families or a single family who sent in two responses, for example one via the internet and one on a paper questionnaire. Perhaps one family member sent in a non-ID response when another member had already responded by telephone. The multiple response options, including the option of a non-ID response, will likely make this more of an issue in 2020. This unduplication is known as the Primary Selection Algorithm (PSA). Given that 2020 Census has greatly increased the range of response options, the PSA will play a central role in post data collection processing. The precise parameters of the PSA are administratively restricted and tightly held. However, the importance of this step has long been recognized in census planning, because without it the same person could be included and counted in a unit more than once or two different families could incorrectly be included together as living in one small unit.[9]

[9] I do not address in this Declaration the actual rules and operations of the PSA as they are administratively restricted.

28. Additionally, unduplication is necessary because the same person can be enumerated at two different locations. There are several reasons for this to occur. Among the reasons are:

a. College students counted at school and at their parents' home.

b. People who move within the period of enumeration, including people who have two or more residences.

c. People counted in two separate housing units because either the Post Office mis-delivered the Census Questionnaire or because the Census follow-up enumerator went to the wrong address, known as Apartment Mix-ups.

d. Other miscellaneous reasons, including for example children in a joint custody arrangement.

29. The Census Bureau has traditionally been conservative in removing probable duplicate enumerations. This reflects essentially a judgment call that the risk of possibly removing a unique enumeration outweighs the benefit of removing probable duplicates. It also reflects the difficulty in many cases of determining which of the two (or more) enumerations is "in the right place."

30. The importance of taking the time to analyze and understand the level of census duplication during post data collection processing is illustrated by a special procedure carried out for the 2000 Census. During the 2000 Census, analysis during the post data collection processing identified an unexpectantly large number of duplicated households enumerated at different addresses. The Census Bureau took, and had the time to analyze these enumerations and determine which one to delete from the Census counts.[10] This was a special operation, not

[10] *See* Fay F. Nash, *Overview of the Duplicate Housing Unit Operations*, Census 2000 Information Memorandum No. 78 (Nov. 7, 2000); Susan M. Miskura, *Results of Reinstatement Rules for the Housing Unit Duplication Operations*, Memorandum for Preston J. Waite (Nov. 21, 2000).

originally planned for 2000, but demonstrates an important point. With sufficient time during post data collection processing, the Census staff is able to identify and correct unexpected problems.

31. Rather than *ad hoc*, as it was in 2000, unduplication across records was a planned activity for 2020, as the Response Processing Operation will use "computer-based person matching software to unduplicate multiple responses for the same person across census records. Then, a Primary Selection Algorithm is run to establish the single enumeration record for a case when multiple responses are received."[11]

32. I now address those special issues that make the level of duplicate enumerations a larger issue for this census than in previous censuses, and the need for sufficient time to assess and, as necessary, correct the level of duplication.

33. Missing characteristics can greatly complicate the process of unduplication. A complete response to all items is not necessary for a response to be counted. Although the exact number of reported characteristics is not publicly known for 2020,[12] in earlier censuses full name and date of birth were not necessarily required. This means that the data required to count a response may be less than what is required to determine whether the person has already been counted. It is highly probable that the level of missing reported characteristics, especially of complete names, is especially high in 2020. For example, the issue with the citizenship question, the Presidential Memorandum on "Excluding Illegal Aliens," the protests across the country, and the general issue of border and immigration enforcement will almost certainly increase the number of people

[11] 2020 Census Operational Plan v. 4.0, at 134.

[12] Albert E. Fontenot Jr. & Timothy P. Olson, *Review of 2020 Operational Plan Schedule*, U.S. Census Bureau (Aug. 17, 2020) https://www.census.gov/content/dam/Census/newsroom/press-kits/2020/2020-operational-plan-schedule-review.pdf.

unwilling to share their name. This will also affect the ability of PSA to be correctly implemented. Carefully understanding these new conditions and their impact on the Census Bureau's ability to 'count everyone only once,' will take extra, not less, time.

College students counted at school and at their parents' home.

34. Since 1950, college students living away to attend school have been counted at their 'college' address. This includes both those living on campus and those living off campus. This makes sense as, even if they are home on break on the Census Reference Date of April 1, they maintain a 'usual' residence at school. Still, even in a 'normal' census, many parents list their college student erroneously with the family at home.

35. However, nothing is usual in 2020. Many schools closed in early March, that is, before the Census Reference Day. Many students, if not most, returned to their parents' home. With colleges failing to re-open for on-site learning, many students are still living at home. Others, no doubt have established independent living arrangements, far from their former college address.

36. The Census Bureau decided to count college students at their college location, essentially where they were living in early March.[13] This modification assumed that the colleges' closure was temporary, and that the college would remain the students 'usual residence' on Census Day, April 1. However, many students left college residences before Census Day, never to return. Others perhaps hoped to return, but established other residences in the months to come. Based on my knowledge and experience, I conclude that these special rules, no longer focused on the residence as of Census Day, April 1, no doubt increased the confusion on the part of many respondents. Again, in my experience many parents' responses ignore the census 'fine print' and

[13] Press Release, U.S. Census Bureau, "Census Bureau Statement on Modifying 2020 Census Operations to Make Sure College Students are Counted (March 15, 2020), https://www.census.gov/newsroom/press-releases/2020/modifying-2020-operations-for-counting-college-students.html

report their family as they conceive it, including their children living away at college. The fact that the student is now semi-permanently living at home can only make the situation worse.

37. Therefore, it seems highly probable that even more parents will include in their Census response, their children as residing permanently at home on April 1. With Non-response Follow-Up (NRFU) restarting five months after the students left college, there is the possibility of significantly increased duplication of these students and former students. These students will have been living away from college for months and, many still not allowed to return. The concept that their old college address remained their 'usual residence' will not be obvious to their parents. Again, in my experience in studying census coverage and residence rules, although the instructions to the respondents and census takers can be clear in the details, respondents often give the answer that most makes sense to them.

38. Besides the general impact on census accuracy, counting these college students twice will tend, obviously, to improperly advantage areas of sufficient resources to send large numbers of their children away to college. This will disadvantage areas comprised of the poor and less educated. Given the structural inequality of American society, this will tend to disadvantage racial and ethnic minorities.

39. Let me note that a large increase in duplicate enumerations included in the final census counts is not inevitable. The Census Bureau has the technology to identify many of these duplicate enumerations. What it will need is the time to study the problem, identify solutions and implement the corrections. It is not enough to simply run the computer programs and go onto the next step. Each census brings unique and unexpected changes to how people respond. Further, this is a new process not previously run on a large scale. It cannot be rushed—if rushed or abandoned, the quality of the census will suffer, particularly for racial and ethnic minorities.

People who move within the period of enumeration

40. Unless, as is done in some countries, the census is conducted all in one day, there will always be some people who move, either individually or as part of a family, during the period of enumeration. This has been shown in every U.S. census where it has been measured. However, there is reason to believe that this problem will be much greater in 2020.

41. For practical purposes, the census began collecting enumerations in early March, when people received a mailer and were asked to respond right away via the internet. Responses came in with a surge before April 1, and slowly levelled off to reach around 64 percent of the eligible households by mid-August.[14] The remaining 36 percent of the 'self-response' universe of housing units is to be contacted during August and September. This creates a five or six month period for people to self-respond at one address, move to a new address, and be contacted by a NRFU enumerator there. This increases the chances of a person or family being counted twice.

42. In addition to true movers, there is the problem of people with two or more residences. A (currently) unknown number of such people will be counted at both their winter and their summer residences. Even though census rules are clear as to which residence is the correct, people do not always follow all the rules. This includes both the respondents and some of the temporary staff hired as census takers.

43. The effect of the double counting of movers on the differential undercount is unclear, although the stretched out schedule in 2020 will increase the problem. The people who are double counted are those who initially respond and move into a housing unit that did not respond. Those who are missed are those who lived in the second unit on April 1. Since initial

[14] U.S. Census Bureau, Response Rates, https://www.2020census.gov/en/response-rates.html (last visited Aug. 20, 2020).

self-response is differential by race and ethnicity, it is likely that this double counting will disproportionately result in minorities being missed. The effect of double counting of people with two or more residence will obviously advantage those with sufficient resources to maintain two residences. People who had the resources to flee the urban areas for their summer homes because of COVID-19 will make the problem worse.

Apartment mix-ups

44. The post-office will occasionally mis-deliver the census package. The family who receives that incorrect package sometimes fills it out and sends it back or otherwise self-responds, for example through the internet. This response is then associated with one Census ID number. Later, a NRFU census taker will visit the unit and, now, correctly enumerate the family, with a second Census ID number. This results in the family being counted twice. Also, occasionally, the NRFU census taker will go to the wrong unit and collect an interview from a family that has already responded. These are colloquially known as "Apartment Mix-Ups" as these have long been known to frequently occur in small apartment buildings with poor or no obvious identification of the individual units. These may also impact non-ID processing (discussed above).

45. The effect of these Apartment Mix-Ups on the differential undercount is unclear. Often the double-counted will have, approximately, the same racial and ethnic characteristics as the missed family. However, it is not always clear that there were two distinct units. It was from carefully studying this situation in the 2000 census that a larger problem was identified and corrected. Given the current schedule, it is doubtful that there is time for an adequate analysis to verify that the problem is under statistical control.

Other miscellaneous reasons

46. There are a number of other reasons that a person can be mis-counted. Historically, the numbers have been small and the impact on the differential undercount unclear. For example, children in a joint custody arrangement are often counted by both parents. Children born after Census Day should not be included but sometimes are.

47. Two historically small problems may be worsened by COVID-19. First, people, including students, living in a foreign country on April 1 are not to be included. (Federally affiliated personnel are included in the Apportionment Counts, but via a separate process based on administrative records for the relevant agency.) Because of COVID-19, many of these people returned to the United States after April 1. It is likely that some will be counted in NRFU. Second, people who were alive and residing in the U.S. on April 1 are, obviously, to be included. It is probable that many, if not most, of those who die between April 1 and NRFU will be missed. And with COVID-19 disproportionately impacting the Black, Latino, Asian, Pacific Islander and Native American populations, this impact of COVID-19 will differentially undercount racial and ethnic communities.

48. Again, these other miscellaneous reasons for erroneous inclusions may be small and either easily ignored or corrected. However, without sufficient time for the Census Bureau staff to analyze the results, no one will know in time to assess, and as necessary, correct for these errors.

V. COUNT IMPUTATIONS

49. At a basic (schematic) level, the main steps of a modern U.S. Census start with carefully preparing a list of dwelling units, known as the Master Address File or MAF. Each unit on the list is contacted by mail and asked to self-respond. In 2020, self-response could be via the internet, telephone or mail. Then census takers, known as enumerators, are sent to each non-

responding unit (NRFU). Among census takers' job is to determine whether the unit is real and that it was a dwelling unit on April 1, then to determine whether it is occupied and vacant on April 1, and ultimately, to determine the number of occupants, if occupied. Finally, the Census Bureau determines the characteristics (such as race and ethnicity) of the occupants. Given the late and rushed dates for 2020 NRFU and, in many communities, a strong mistrust of any government agent, this is sure to prove harder than ever in 2020.

50. Along the way, mistakes happen. As a result, there is usually a small number of units on the address list for which no response was gathered. At other times, missing or contradictory information occurs during the post data collection processing, for example by errors in scanning a paper questionnaire. In terms of determining the apportionment counts, three situations are especially important:

a. Undetermined Household Size: When Census Bureau records indicated that a housing unit was occupied, but did not show the number of residents. For example, the residents refused to cooperate and all the neighbors would say was that there were people living there.

b. Undetermined Occupancy: When Census Bureau records indicated that a housing unit existed, but not whether it was occupied or vacant. This might occur when the NRFU enumerator sees curtains on the windows but cannot find any respondent or proxy to say whether anyone still lives there.

c. Undetermined Status (referring to housing-unit status): When Census Bureau records demonstrated some evidence of the physical existence of a unit, but conflicting or insufficient information about whether the address represented a valid, non-duplicated housing unit. That is, has the garage been converted into a

> possibly 'illegal' dwelling unit? Is it still a dwelling unit or now only a garage? Does a separate entrance into the basement indicate a dwelling unit or simply another way into the basement? The housing-unit status "nonexistent" includes more than simply a vacant lot. Other possibilities include buildings used only for business purposes and structures that were not (or not yet) fit for habitation.

51. Each of these situations is more likely to occur in older, poor neighborhoods with unconventional housing and distrustful residents, and so more likely to affect areas with large numbers of rural, immigrant, poor, and racial and ethnic minorities

52. The Census Bureau's plans called for "Supplementing response data with administrative records for those cases that had been identified as [Administrative Record] AdRec Occupied but for which a nonresponse follow-up attempt was unsuccessful and no subsequent self-response was received."[15] Accurately linking census returns with administrative records is a multi-step process, and one new to this census. Linkage must be done in a way to fully protect the protected personal information from the administrative records. It is also dependent on the quality of the identifying information (e.g. name and date of birth) collected in the census. Rushing this step could drive up the number of returns requiring count imputations. That is, if a useable response is not collected in the field, gaining the information from administrative records is the only alternative to Count Imputations. However, a rushed administrative records ("AdRec") supplementation has the potential of including the well-off, stable and connected population, and it could potentially make the differential undercount worse because quality AdRecs are disproportionately unavailable for Latinos, Asian Americans, and immigrants.

53. During Count Imputation a value is statistically assigned to each of these records:

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[15] 2020 CRO Plan, at 32.

a. Status Imputation: if status is missing, a status of valid or deleted is imputed.

b. Occupancy Imputation: if the process has determined or imputed to be a valid record and occupancy is missing, a value of occupied or vacant in imputed.

c. Household size imputation: if the process has determined or imputed the record to be valid and occupied, but household size is missing, the number of Census Day residents is imputed.

54. Count Imputation occurs after the response file is generated, merging the different modes of collection (internet, telephone, paper, NRFU) and the responses are unduplicated through PSA or other processes. If, as mentioned above, administrative records are available and used to account for missing response count data, this must also be done before Count Imputation. Units with missing count data most likely occur in areas with high levels of NRFU and with older, less "conventional" dwelling units. Thus, Count Imputation is vital for minimizing, if not avoiding, a differential undercount. In fact the characteristics (such as race and ethnicity) of some respondents will also be imputed, but this is not relevant to the apportionment counts, which only include the number of people by state and not their characteristics.

55. The 1960 Census was the first to use computers to produce the apportionment count. Not surprisingly, it was also the first census to use count imputation to resolve occasional discrepancies between expected and actual numbers of computer records. Count Imputations have been used ever since. The percent of Count Imputations has fluctuated by decade but has tended to be less than 0.5 percent. Still, Count Imputations have been considered an integral part of census post data collection processing. The Census Bureau has long argued that not statistically imputing a number of residents is equivalent to imputing a housing unit size of zero. The legality and constitutionality of count imputations was reviewed and validated by the

Supreme Court in *Utah v. Evans* (2002).

56. Although no one will know until the Decennial Response File (DRF), that is the merged and unduplicated file of responses including housing units and GQ, is prepared, it is probable that the need for Count Imputations will be higher in 2020 than in earlier censuses. This is because NRFU is taking place months after the Census Reference Date of April 1, 2020.[16]

57. The Census Bureau and its field staff face an enormous if not impossible task to meet their goal of counting everyone "once, only once, and in the right place," that is, the usual residence as of April 1, when visiting a housing unit in August and September. A "garage apartment" that existed in April, may now be just a garage. A separate "Mother-in-Law" apartment may now be just a part of the house. A unit may be vacant now, but was it vacant in April? If someone is living in the unit in September, did they live there in April? If not, who did? If respondents and neighbors are not knowledgeable or not cooperative, the NRFU enumerator can be faced with the choice between simply guessing or not reporting a status. Either way, the accuracy of the census is compromised. Therefore it is necessary to not just conduct Count Imputations but to take the time to review the results.

58. The Census Bureau has announced its goal of "[a]chieving an acceptable level of accuracy and completeness, with a goal of resolving at least 99% of Housing Units in every state, comparable with previous censuses."[17] Since the enumeration of Black, Latino, Asian American and other minority communities is differentially pushed to this delayed NRFU and because cooperation by residents and neighbors can be difficult in these situations (for example, because

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[16] Albert E. Fontenot Jr. & Timothy P. Olson, *Review of 2020 Operational Plan Schedule*, U.S. Census Bureau (Aug. 17, 2020) https://www.census.gov/content/dam/Census/newsroom/press-kits/2020/2020-operational-plan-schedule-review.pdf.

[17] *Id*.

of government distrust and the pandemic), these communities will be differentially affected. Given the difficulty of the task, based on my experience and knowledge, it is hard to see how the Census Bureau will meet this goal.

59. Count Imputations will likely mainly impact areas where the population is poor, rural, non-English speaking or of racial and ethnic minorities. This is because Count Imputations most often arise from problems in NRFU. Areas with a higher NRFU workload are at greater risk of a relatively high number of cases requiring Count Imputations. Also, the census takers will have greater difficulty in resolving a case in areas where distrust of government is high. Given the controversies over the "Citizenship Question" and the Presidential Memorandum to exclude "Illegal Aliens," distrust of the Census may be heightened in areas with a large Latino and Asian American population.[18] This could easily lead to a much higher number of unresolved cases requiring Count Imputations, with a quite skewed distribution disfavoring areas with poor, rural, and racial and ethnic minority populations.

60. The shortened time for post data collection processing will likely mean that Count Imputations cannot be carefully and accurately done or that there may be pressure to skip this step in order to meet the December 31st deadline.

61. If Count Imputations is not done properly, this result will distort both the Apportionment Counts and the statistics needed for redistricting (PL-94-171 files).

VI. COUNT REVIEW

62. Another important part of post data collection processing is the Count Review Operation (CRO). In Count Review, the preliminary results of the census are compared with outside

[18] U.S. Census Bureau, McGeeney, Kyley et al., *2020 Census Barriers, Attitudes, and Motivators Study Survey Report: A New Design for the 21st Century* (January 24, 2019) https://www2.census.gov/programs-surveys/decennial/2020/program-management/final-analysis-reports/2020-report-cbams-study-survey.pdf.

information to detect anomalies, and if possible correct any large errors that are identified.

63. Post data collection Count Review has two components:

a. In the Census Count and File Review (CCFR), previously known simply as Count Review, Census Bureau demographers review the files for "systematic or large anomalies."[19] This review includes the DRF 1 and 2, Census Unedited File (CUF), and the Census Edited File (CEF). These files are compared against results from the 2000 Census, the 2010 Census, the recent results from the Population Estimates Program and recent results from the American Community Survey.[20]

b. Additionally, Census Bureau demographers were to work with State Demographers to review the results from the Group Quarters Enumeration. The Census Bureau has a long-standing working relationship with state demographers selected by their respective governors. These State Demographers bring an important and unique level of local knowledge to the census. This post data collection review of GQ addresses was designed to identify those GQs that are still potentially missing from the MAF or allocated to the wrong census block, and this was to be done in time for the errors to be corrected.[21]

64. Count Review is an important step in ensuring census accuracy and completeness. As the 2010 Assessment report stated: "The program did improve the accuracy of the census by identifying 73,716 missing housing units and having them counted in the census. It also identified 310 missing group quarters and had them counted in the census. Additionally, 173

[19] 2020 Census Operational Plan v. 4.0., at 145.

[20] 2020 CRO Plan, at 11.

[21] 2020 Census Operational Plan v. 4.0., at 145.

group quarters misallocated to the wrong collection block were identified and updated."[22] The current plan is for NRFU to run through September 30 compared to the original schedule of ending on July 31 and the first revised schedule proposed by the Census Bureau of October 31. The current schedule has GQ enumeration lasting until September 3 compared to the original date of June 5.

65. The Census Bureau has only a limited number of trained demographers ready to carry out this vital quality check. Similarly, there are only a limited number of State Demographers, who certainly have other commitments as well. It is unclear that GQ Count Review can even be run due to the truncated schedule.

66. Count Review is not a process where one can double the resources and complete in half the time, nor is it a step that can be safely skipped.

VII. OTHER RISKS

67. Any changes to the planned work-flow to postpone steps bring increased risk. Any change to the tested processing flow, such as postponement, curtailment, or abandonment, in order to save time increases risk of a 'failed' census. As mentioned above, the Census Bureau's plans to 'streamline' the process increases the risk not only of errors along the way, but also, by implementing an untested system, catastrophic failure. "There is no such thing as a small software change."

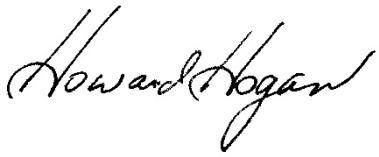
68. Finally, the Census Bureau has traditionally provided not just the population totals but the allocation of Congressional seats to the states. This allocation is done by a complex algorithm known as the "Method of Equal Proportions." Since only whole seats can be allocated, this is

[22] U.S. Census Bureau, 2010 Census Planning Memoranda Series No. 203, Memorandum from Burton Reist on 2010 Census Count Review Program Assessment Report (June 26, 2012) https://www.census.gov/content/dam/Census/library/publications/2012/dec/2010_cpex_203.pdf.

known as an integer problem. As such, it must be carefully programmed and the program is extensively tested. Even small 'rounding' errors can mis-allocate a Congressional seat. The Census Bureau takes great pride and extreme care in this responsibility. As long as the Census Bureau is able to carry out the allocation of Congressional seats using rigorously-tested programs and long established quality checks, there is no reason to believe that it will not be properly done.

69. In this Declaration, I have described the risks of a greatly increased differential undercount and an inaccurate census that arise from the compressed time schedule being forced upon the Census Bureau professionals. These risks are not speculative, but real. Not all risks will result in a failure, but small failures can add up and cascade into a major crisis. If failures occur, the nation will suffer for the decade to come. The Census Bureau staff has worked a decade or more on its original plan, only to see it disrupted by COVID-19 and other developments. The Census Bureau's professional staff has clearly stated that the current schedule is unworkable. It does not take into account the extra challenges caused by COVID-19 and the current climate of distrust of government. The Census Bureau staff have been given three months where they clearly stated that they need six. The consequences for the nation of a badly flawed census are enormous. The consequences for racial and ethnic minorities are graver still. Given sufficient time and independence, the Census Bureau professional staff have a long history of working to produce accurate statistics and to minimize the differential undercount. Unfortunately, based on my knowledge and expertise, the truncated schedule does not provide sufficient time.

I declare under penalty of perjury that the foregoing is true and correct.



Howard Hogan

Executed on August _27___, 2020 at Owings, Maryland.

APPENDIX 1

Howard Hogan

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PROFESSIONAL EXPERIENCE

U.S.CENSUS BUREAU, Washington, DC **1979 – 2018**

Chief Demographer 2011 - 2018

The Chief Demographer served as the Census Bureau's senior scientist on technical and statistical demography. He served as principal consultant to Bureau staff on methodological problems, and as a liaison to academic and other outside demographers. His research included the measurement of population change using the population estimates and the American Community Survey, the classification of race, and the measurement of coverage error. Served as mentor to junior staff.

Associate Director for Demographic Programs 2005 - 2011

As Associate Director, Dr. Hogan led the U.S. Census Bureau's programs that provide demographic, social and economic data about the nation's population and households and leads the statistical programs that produce population projections and estimates. He is responsible for the International Programs Center, the Population Division, the Housing and Household Economic Statistics Division, the Demographic Statistical Methods Division and the Data Integration Division. Under his leadership, important advances were achieved in the small area estimation of poverty, in the production of population estimates, and in the use of administrative records for statistical estimation. As the U.S. Government spokesman for 300 million population event, he dealt effectively with television, radio and print media.

Chief, Economic Statistical Methods and Programming Division 2002 - 2005

Dr. Hogan managed the development of software for the Census Bureau's economic programs including monthly indicator surveys, annual surveys, and the economic census, successfully moved towards adopting modern software development processes. He provided leadership to all mathematical statisticians working in the Economic Directorate. He led the international group that organized the Third International Conference on Establishment Surveys.

Chief, Decennial Statistical Studies Division 1998 - 2001

Dr. Hogan led the group of mathematical statisticians and programmers who are responsible for the statistical design of the Decennial Census, including statistical quality control design, coverage improvement activities, software quality control, content sampling, undercount measurement and census adjustment. He assisted three U.S. Solicitors General, and provided testimony cited in Supreme Court Case: *Utah v. Evans*. He successfully dealt with national print media on sensitive statistical issues, concerning Census methodology.

Assistant Division Chief, *Research and Methodology, Business Division* 1993 - 1998

He developed a program of research to apply statistical principles and methods to the Census Bureau's surveys of retail trade, wholesale trade, service industries and transportation. He developed methods to eliminate the area sample from the business establishment frame, saving millions annually. He led his team to develop new estimation methods for transportation survey, to revised the sample design for retail and wholesale surveys, and to improve sampling process, reducing the needed time by one year. Additionally, he developed exploratory and graphical methods to improve editing.

Chief, *Undercount Research Staff*, Statistical Research Division 1983 - 1993

He led the Census Bureau's effort to research, develop and implement methods to correct the 1990 Census for undercount. This multiyear research program included developing a research plan to address all issues concerning coverage measurement and adjustment for the 1990 Census. He designing and managing a large and complex survey, the 1990 Post-Enumeration Survey, including questionnaire design, processing plan, matching process design, imputation, post-stratification plan, estimation design, and census adjustment. He developed innovative methods to measure the uncertainty in demographic analysis estimates of population. He was called on to consult for the Swedish, UK and India statistical offices and to give legal depositions in Federal litigation.

Principal Researcher, Statistical Research Division 1979 - 1983
He developed alternative methods to measure the number of people missed in censuses and surveys, and conducted three statistical projects including an administrative records match and a longitudinal tracing study. He evaluated the population statistics system in Mauritius. He advised the Government of Morocco on census evaluation methods, designed a coverage measurement survey, and aided with the testing and development, with all consulting work was conducted in French.

ACADEMIC EXPERIENCE

GEORGE WASHINGTON UNIVERSITY, Washington, DC 1998 - 2015
Adjunct Professor, Department of Statistics
He teaches survey sampling.

WASHINGTON STATISTICAL SOCIETY, Washington, DC 1997
Instructor
He developed and twice taught a well-attended two day course on "Exploratory Data Analysis Using S-Plus."

GRADUATE SCHOOL, USDA, Washington, DC 1984 - 1996
Instructor
He taught courses on data analysis and on demography.

UNIVERSITY OF NORTH CAROLINA, Chapel Hill, North Carolina 1978 -1979
Visiting Scholar, Department of Biostatistics
He evaluated a family planning research project in Bangladesh on behalf of the Agency for International Development. He collaborated on statistical models in demography.

MACQUARIE UNIVERSITY, North Ryde, NSW, Australia 1978
Visiting Research Associate, Department of Statistics,
He conducted research into standard mortality tables.

UNIVERSITY OF DAR ES SALAAM, Tanzania, East Africa 1976 - 1978
Head, Demographic Unit
He taught courses in demography. He wrote and published articles on the demography of Tanzania. He was demographic advisor to the 1978 Census of Population and Housing.

EDUCATION

Pomona College	BA: Economics/Mathematics
Stockholm University	Certificate: Economics
The Woodrow Wilson School	MPA: Public Affairs
Princeton University	MA: Economics
Princeton University	Ph.D.: Economics (Demography) Dissertation: *Age Patterns of Infant Mortality*

PROFESSIONAL RECOGNITION

Jeanne E. Griffith Mentoring Award (2018): The award recognizes the mentoring of junior staff in the statistical community and is awarded annually based on advising, counseling, and motivating junior staff in their career to development, and serving as a role model through expertise, information and insight. The award is supported by the American Statistical Association Government Statistics and Social Statistics Sections, NORC, The Council of Professional Associations on Federal Statistics, Washington Statistical Society, and the Interagency Council on Statistical Policy.

Chair, Committee on Professional Ethics of the American Statistical Association (2013-2016). Awarded special recognition by the ASA Board for his leadership in the first revision in two decades of the Ethical Guidelines for the Practice of Statistics

Fellow of the American Statistical Association (2001): Citation "For outstanding contributions to census methodology, especially to the understanding of coverage and accuracy measurement critical to the Decennial Census; for statistical communication."

Chair, Survey Research Methods Section, American Statistical Association (2010).

Member, Committee on Populations Statistics, Population Association of America (2006 - 2009)

Country Representative, International Association of Survey Statisticians (2006 – now)

Chair of the Organizing Committee, International Conference on Establishment Surveys (2005 - 2007)

Program Chair, Survey Research Methods Section, American Statistical Association (2003)

Secretary, Julius Shiskin Award Committee (1993 - 2002)

Chairman of Nominating Committee, International Association of Survey Statisticians, (1994)

Representative at Large, Washington Statistical Society, (1993 - 1996)

LANGUAGES

French: He has consulted on technical statistical matters in French.

Swedish: He can read articles and engage in conversation.

Portuguese: He can engage in polite conversation.

Swahili: He is able to ask directions, order food and other basic tasks.

SELECTED PAPERS AND PUBLICATIONS

2019 "Babies no Longer: Projecting the 100+ Population", in Developments in Demography in the 21st Century, J. Singelmann, D. L. Poston, Jr (eds.), The Springer Series on Demographic Methods and Population, Analysis 48, https://doi.org/10.1007/978-3-030-26492-5_7 (with Sandra Leigh Johnson)

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2015 "Projecting Diversity: The Methods, Results, Assumptions and Limitations of the U.S. Census Bureau's Population Projections," *West Virginia Law Review*, Vol 117, (with J. Ortman and S.L. Colby) (`https://wvlawreview.wvu.edu/files/d/cf719326-445a-40d7-b1d1-ce7cdd32ca13/hogan-print.pdf`)

2014 "Assessing Accuracy in Postcensal Estimates: Statistical Properties of Different Measures," Emerging Techniques in Applied Demography, pp 119-136, (M. Hoque and L.B. Porter, Eds), (with Mary Mulry)

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2013 "Quality and the 2010 Census", Population Research Policy Review, DOI 10.1007/s11113-013-9278-5 (with Patrick J. Cantwell, Jason Devine, Vincent T. Mule Jr and Victoria Velkoff)

2011 "Do Current Race and Ethnicity Concepts Reflect a Changing America?" *Journal of Race and Social Problems*, forthcoming, (With Karen Humes).

2009 "Measurement of Race and Ethnicity in a Changing, Multicultural America," *Journal of Race and Social Problems*, DOI 10.1007/S12552-009-9011-5 (With Karen Humes).

2008 "Measuring Population Change Using the American Community Survey," *Applied Demography in the 21st Century*," S. Murdock and D. Swanson (eds), The Netherlands: Springer Publications, 13-30.

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APPENDIX 2

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