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Office of Research & Policy Analysis

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DATE: May 5, 2022

RE: Verification of Prisoner Reallocation Data for Montana Districting & Apportionment Commission

Purpose

This memorandum documents methods used to examine U.S. Census Bureau 2020 Public Law 94-171 population data ("Census Data") returned by Blockwell Consulting, LLC ("the Vendor") that were adjusted to show the reallocation of inmates to last known residences for the purpose of state legislative reapportionment. My review focused on reasonableness and veracity of the adjusted Census Data.

Findings

The adjusted population counts provided by Blockwell Consulting, LLC based are reasonably accurate and appropriate for use in redistricting. There are small discrepancies in the adjusted Census Data from expected values and for certain census blocks which lost population because of prisoner reallocation. These discrepancies are slight and inconsequential to the overall results of the analysis.

Background

The vendor was hired to modify 2020 Census Data by reallocating prisoners residing in Montana's secure, institutional living facilities (prisons) to their last known residential address for the sole purpose of redrawing state legislative districts by the Montana Districting and Apportionment Commission ("Commission").

Four electronic lists of prisoners were provided to the vendor. One list was provided by the Montana Department of Correction ("MT DOC") based on an extract from their Offender Management Information System ("OMIS"). Three additional lists of prisoners in the Montana prison system reportedly housed at facilities on National Census Day 2020 (April 1) but not controlled by MT DOC – the Dawson County Correctional Facility (DCCF), Cascade County Regional Prison (CCRP), and Crossroads Correctional Center (CCC) – were also provided to the vendor. When these lists were combined, the vendor received 2,840 prisoners to reallocate.

Assumptions

The following assumptions were made in checking the reasonableness of the adjusted Census Data:

- If all prisoners were successfully reallocated to residential addresses in Montana, the 2020 statewide population total as tabulated by Census Bureau should not change; population loss in census blocks with prisons would be equally balanced by population gained in other census blocks.
- Population totals in 7 census blocks (and corresponding legislative house districts) that contain prison facilities should decrease noticeably.
- Population in census blocks (and corresponding legislative house districts) which do not have prisons should increase or experience no change.

- Population totals of prisoners that were not successfully reallocated to other census blocks should be removed from the statewide total population when determining the new ideal population for legislative districts.

The vendor was unable to reallocate about half (48.7%) of prisoners because of unusable address data. Of the 2,840 prisoners sent to the vendor for reallocation, 1,505 were presumptively ineligible because of missing or unusable home address data. Of the remaining 1,335 prisoners with usable address information, 1,286 were successfully matched to another census block via standard geocoding services while 49 were not. (See *Blockwell Consulting’s final project report for details regarding the geocoding process and results.*)

Subtracting the number of unsuccessfully reallocated prisoners (1505 + 49) from the total population of Montana as tabulated in the 2020 Census gives an expected adjusted population total of 1,082,671.

Methodology

The adjusted data was received from the vendor in Caliper Compact Geographic Database file format for use with *Maptitude for Redistricting* software. Data was analyzed using this program and Microsoft Excel and Microsoft Access. The adjusted Census Data were compared to unadjusted Census Data for expected changes in specific census blocks and corresponding house districts. The adjusted data was also checked to see if it produced the expected adjusted statewide population total of 1,082,671.

Verification

#1 – Population Decreases in House Districts with Prisons after Reallocation

Figure 1 shows 7 house districts that contain prisons and the population before and after reallocation. Each district shows population loss, the expected result. Population loss in each district appears commensurate with the number of prisoners reportedly housed at each location when group-quarters data were reported to the Census Bureau in April 2020.

Below is a summary of house districts with prison facilities and inmate populations as of March 1, 2020¹ based on [MT DOC’s public data portal](#):

- House District #78 contains the Montana State Prison (Deer Lodge); population of inmates was reportedly 1640.
- House District #18 contains Crossroads Correctional Facility (Shelby); population of inmates was reportedly 598.
- House District #49 in Billings houses the Montana Womens Prison. Inmate population was reportedly 231.
- House District #19 in Great Falls houses the Cascade County Regional Prison (CCRP). Population reportedly contained 150 prisoners in the facility on Census Day 2020².
- House District #36 contains the Dawson County Correctional Facility (Glendive); inmate population was reportedly 141 on Census Day 2020.

Figure 1 – Population Comparison

House District	2020 Census	Post Reallocation	Change
78	9793	8191	-1602
18	9375	8781	-594
49	9543	9390	-153
19	10668	10525	-143
36	9877	9747	-130
38	9928	9872	-56
75	10581	10565	-16

¹ The MT DOC public data portal lists daily population counts in secure facilities. March 1, 2020 is the earliest date available on the data portal and the only date in the data set prior to Census Day on April 1, 2020.

² Counts of adult prisoners housed at regional correctional facilities on April 1, 2020 were provided to the Montana Districting and Apportionment Commission at the [August 17, 2021 meeting](#).

- House District #38 in Miles City contains the Pine Hills Correctional Facility; inmate population at was not available for March 1, 2020.
- House District #75 in Boulder holds the Riverside Special Needs Unit. The inmate population was reportedly 22.

The total population of these house districts was reduced by 2,694 by inmate reallocation, relatively close to the total number of prisoners (2,829) sent to the vendor.

#2 – House Districts without Prisons Show Population Increase or No Change after Reallocation

Only three (3) house districts showed no change after prisoner reallocation (Figure 2). The remaining 90 house districts had small population gains by prisoner reallocation, with the minimum being 1 and the maximum being 60. The average increase in population among the 90 districts was about 13. The median increase was slightly lower, between 8 and 9.

Reallocation of prisoners did not significantly alter total population counts for any house district from those tabulated by Census Bureau. The average increase for the 90 districts with population gain in the adjusted data was 0.125%. The maximum increase in population for any house district was less than 1% of the total without prisoner reallocation (Figure 3).

Figure 2 – House Districts without Population Change

House District	2020 Census	Post Reallocation	Change
34	10456	10456	0
62	13624	13624	0
64	14503	14503	0

Figure 3 – Description Statistics

90 House Districts with Population Increase because of Prisoner Reallocation	
Minimum Absolute Increase	1
Maximum Absolute Increase	60
Median Absolute Increase	8.5
Average Absolute Increase	13.2
Mode Absolute Increase	6.0
Average Percent Increase	0.125%
Minimum Percent Increase	0.0091%
Maximum Percent Increase	0.5790%

#3 – Total Statewide Population based on Adjusted Data = 1,082,671

Summing the adjusted 2020 Census Data results in a new statewide population total of 1,082,717. This summation was tested at the census block and house district levels. The total absolute change in population based on prisoner reallocation is a net decrease of 1,508 persons or -0.1391% in population for the State of Montana.

The total of 1,082,717 in the adjusted Census Data deviates from the expected target of 1,082,671 by 46 persons. That is, there are 46 more people in the adjusted Census Data than is expected based on the assumption that 2840 total prisoners were removed and 1286 were then readded via different census blocks. This discrepancy is discussed in the next section.

Discussion

The vendor acknowledged discrepancies in population counts and demographic tabulations in two of the seven prisons in the final report. The vendor attributes the discrepancies to different counts of prisoners captured on Census Day 2020 and those captured about one year later in the prisoner extract data. That is, count of inmates reported in April 2021 are higher than those reported to the Census Bureau in April 2020. These higher 2021 counts result in negative population numbers for census blocks with prisons when subtracted from 2020 counts. Negative population counts are obviously erroneous (there is no such thing as negative population) and the result of discrepancy between the two datasets. Negative population counts are more evident when comparing counts by race/ethnicities than total population in the adjusted Census Data.

The vendor's solution to resolve negative population counts was to generate two sets of adjusted data, one set (designated with a "R") showing negative population counts, and one set of data where any negative population count was recoded to zero (these fields in the dataset begin with "S"). The two sets of adjusted counts produce different statewide totals given one set includes negative numbers and one does not.

Conclusions

I verified population counts from 7 census blocks and house districts with prisons decreased commensurate relative to the number of prisoners reportedly housed at those facilities on or around Census Day 2020. After inmate reallocation, most house districts (90%) showed small population gains in the adjusted data. The overall impact of prisoner reallocation on existing house district is negligible, with no district experiencing an increase of more than 0.6% from the unadjusted Census Data.

Recommendations**#1 – Adjusted State Population Total**

Should the Commission decide to use the adjusted 2020 Census Data, I recommend using the adjusted population total of 1,082,717. The number used for Total Population of the State represents the dividend when determining ideal equal population size for legislative districts. While there is a small discrepancy from the expected number, the difference is slight and equates to a 10-people-per-district deviation from what was expected.

#2 – Releasing an Adjusted P.L.94-171 Population Dataset

If the Commission uses the adjusted 2020 Census Data, a new set of population data files should be released with a unified set of "R" and "S" data variables for use by third parties and public redistricting applications. Variables with negative values from the "R" dataset are nonsensical and should be avoided. A limited set of variables from the "S" dataset could be helpful for compliance with the Voting Rights Act.

As suggested by the vendor, the Commission should use the "R" data for the purposes of drawing districts with equal population and the "S" variables when examining demographics. Combining population counts derived with different methods into a single file is less than ideal. Users should be aware that summing demographic categories (fields with "S" variables) in the file will not equal the total population figures derived from the "R" dataset.

Below is schema of data fields for inclusion in geographic data files if adjusted 2020 Census Data is authorized for release by the Commission.

Figure 4 – Population & Demographic Variables for Adjusted Census Data

#	Field_Name	Adjusted_Dataset	Adjusted_Dataset Field	Field_Description
1	Adj_Population	R	RP0010001	Total Persons
2	Adj_NH_Wht	S	SP0020005	Non-Hispanic White Alone
3	Adj_AP_Black	S	SP0010004	Black alone or in-part
4	Adj_AP_Ind	S	SP0010005	American Indian and Alaska Native alone or in part
5	Adj_AP_Asn	S	SP0010006	Asian alone or in part
6	Adj_Hisp	S	SP0020002	Hispanic
7	Adj_18+_Pop	S	SP0030001	Total persons 18+
8	Adj_NH18+_Wht	S	SP0030003	White 18+
9	Adj_18+_AP_Black	S	SP0030004	Black alone or in-part 18+
10	Adj_18+_AP_Ind	S	SP0030005	American Indian and Alaska Native alone or in part 18+
11	Adj_18+_AP_Asn	S	SP0030006	Asian alone or in part 18+
12	Adj_Hisp18+_Pop	S	SP0040002	Hispanic 18+