POST-ELECTION VOTING SURVEYS

QUANT LEO

TECHNICAL REPORT

2018

FVAP.gov
FEDERAL VOTING ASSISTANCE PROGRAM

Methodology

This report describes sampling, editing, weighting and imputation methodologies for the 2018 Quantitative Post-Election Voting Survey of Local Election Officials (Quant PEVS-LEO). The report is divided into four parts: a section describing the background and administration of the 2018 Quant PEVS-LEO, including its relationship to the U.S. Election Assistance Commission (EAC)'s Election Administration and Voting Survey (EAVS); a section describing the design of the Quant PEVS-LEO; a section describing the weighting methodology; and finally, a section explaining the data editing and imputation processes, variance calculation, and estimation. Appendix A displays the imputed national estimates for each of the 2018 Quant PEVS-LEO questions.

1.1 // EAVS and Quant PEVS-LEO Legislative Responsibility

In 2018, the Federal Voting Assistance Program (FVAP) continued its collaboration with the EAC to collect Congressionally-mandated quantitative data from state and local election officials through the 2018 EAVS. EAVS satisfies the EAC's requirements under the *Help America Vote Act* (*HAVA*)[1] to serve as a clearinghouse of election data nationwide. EAVS sections related to voter registration and the *Uniformed and Overseas Citizens Absentee Voting Act* (*UOCAVA*) voting allow states to satisfy their data reporting requirements established by the National Voter Registration Act (NVRA)[2], and *UOCAVA*[3]. Section 703(a) of *HAVA* amended section 102 of *UOCAVA* to add the requirement that each state must report certain election data to the EAC no more than 90 days after each Federal election. The data is to include the number of absentee ballots transmitted to absent Uniformed Services voters and overseas voters for the election and the number of those ballots that

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[1] https://www.eac.gov/about/help-america-vote-act/
[2] https://www.justice.gov/crt/about-national-voter-registration-act
[3] https://www.fvap.gov/info/laws/UOCAVA

were returned. In 2013, the EAC and FVAP entered into a Memorandum of Understanding (MOU) to establish a joint survey effort for 2014 that enables both agencies to meet their core requirements while reducing the overall burden on election officials. As a result of this successful interagency initiative, FVAP and the EAC now issue a single survey which includes FVAP's *UOCAVA* related survey questions from the original 2012 Quant PEVS-LEO as part of Section B in the EAC's EAVS. EAC engaged Fors Marsh Group (FMG) to help administer and analyze the 2018 EAVS and FVAP asked FMG to conduct the imputations necessary to create Section B state and national estimates.

1.2 // Survey Design

The EAC has conducted EAVS since 2004, with 2018 as the eighth administration of the survey. EAVS asks all 50 states, the District of Columbia and four U.S. territories—American Samoa, Guam, Puerto Rico, and the Virgin Islands—to provide data about the methods in which U.S. citizens participated in each Federal election. EAVS collects information on "ballots cast, voter registration, overseas and military voting, Election Day activities, voting technology, and other important issues," (EAC, 2018).

Specifically, the EAVS is divided into six sections:

    A.   Voter Registration

    B.   UOCAVA

    C.   Domestic Civilian Absentee Ballots

    D.   Election Administration

    E.   Provisional Ballots

    F.   Election Day Activities

For FVAP's reporting needs, Section B is the only section necessary for FVAP's program needs and is considered in this technical report, for simplicity's sake, the "2018 Quant PEVS-LEO". FVAP continued in 2018 to work with EAC to consolidate these Section B questions in the EAVS. After combining EAVS and Quant PEVS-LEO in 2014, Section B contained questions that were redundant and, in places, the question language was not clear and concise; thus in 2016, in order to streamline and improve Section B, FVAP began working with The Council of State Governments' (CSG) Overseas Voting Initiative to create a working group consisting of state and local election officials. This group identified redundant questions in Section B and the wording issues associated with several questions. No changes were made to the survey instrument itself between 2014 and 2016, but additions and edits were made to the Supplemental Instruction Manual (SIM) to reflect the suggestions of the Section B Working Group. Nine questions were identified as being redundant, and four

questions contained subitems that asked for data not collected by most states. The SIM instructed states to skip these 13 questions and their 62 subitems, and the items were "grayed out" in the data templates. As updated, SIM language sought to 1) define *UOCAVA* status more clearly, 2) clarify what "transmit" means when discussing "transmitted ballots" and 3) clarify the meaning of the phrase "returned and submitted for counting" in specific questions and the SIM.

For 2018, the recommendations from the Section B Working Group supported by FVAP, CSG, and the Overseas Voter Initiative (OVI) were fully implemented. Several questions were fully removed from the survey in 2018, including questions on the number of ballots transmitted, returned, and counted before and after the 45-day deadline. Instead, jurisdictions were asked to report items by *UOCAVA* voter type and by mode, which created some new subitems within questions. The questions were also reordered to better follow the process of transmitting and receiving *UOCAVA* ballots at the jurisdictional level. All Federal Write-In Absentee Ballot (FWAB) questions were moved to the end of Section B, and the instructions were clarified that FWABs should not be reported with other *UOCAVA* ballots. The instructions on what should be considered a "returned ballot" were clarified. The number of questions that allowed "other" as a response was reduced, resulting in renumbering for many Section B questions in the 2018 survey.[4]

1.3 // Sample Design and Selection

a. Target Population

The 2018 Quant PEVS-LEO is a census (via EAVS) designed to represent all voting jurisdictions in all 50 states, the District of Columbia and four U.S. territories. The population contained 6,460 voting jurisdictions identified by the EAC.

b. Sampling Frame

The sampling unit was the voting jurisdiction. Voting jurisdictions are typically counties, but were defined differently from state to state. For example, the states of Alaska and Maine are each considered to be one voting jurisdiction when reporting *UOCAVA* data, whereas Michigan, Wisconsin, and some states in New England define voting jurisdiction by individual townships. When accounting for states that only report as one jurisdiction (i.e., Alaska, Maine), it was determined that there are 6,460 unique reporting *UOCAVA* voting jurisdictions.

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[4] The 2018 EAVS survey instrument is available on the EAC website and can be found at:
https://www.eac.gov/assets/1/6/2018_EAC_Election_Administration_and_Voting_Survey_Instrument.pdf

c. Sample Design

All voting jurisdictions were selected (i.e., probability of selection equals 1). However, due to historically known issues of jurisdiction nonresponse and non-negligible missing data rates, it was determined that the survey would require imputation and weighting methodologies to account for missingness. Researchers identified a critical value (response to B5a, the total number of *UOCAVA* ballots transmitted for the 2018 election) that could act as a stratifying variable to split the population into homogenous groups of respondents. The 2018 Quant PEVS-LEO population was split into eight groups based on responses to B5a. Not all jurisdictions responded to the survey, however, and the critical question had missing data. For the purpose of assigning jurisdictions to one of the groups, researchers imputed for the missing B5a value with previous iterations of the EAVS using the 2014 data (the most recent federal midterm election). Jurisdictions without data for both 2014 and 2018 were dropped from the target population. Four jurisdictions (approximately 0.1 percent) were excluded from the population for this reason.[5] An additional 21 jurisdictions had missing data for the critical item and were all resolved with prior data (approximately .3 percent).

Strata definitions were taken from the 2014 Quant PEVS-LEO. The strata definitions (and their distribution) are shown in Table 1. Stratum 1 indicates that 1,877 jurisdictions responded as not transmitting a single *UOCAVA* ballot; as such, much of their subsequent responses (regarding the specifics of the *UOCAVA* ballots they transmitted) would typically be "0." It is also important to point out that 4,323 of the 6,456 jurisdictions (67.0 percent) transmitted 10 ballots or fewer in total.

Table 1: Stratification Based on UOCAVA Transmitted Ballots

Stratum Number	*UOCAVA* Transmitted Ballots	Total	Percent
1	0	1,877	29.07
2	1 to 10	2,446	37.89
3	11 to 30	947	14.67
4	31 to 100	604	9.36
5	101 to 500	372	5.76
6	501 to 1,000	85	1.32
7	1,001 to 5,000	104	1.61
8	5,001 or more	21	0.33
	Total	6,456	100

d. Survey Administration

The 2018 EAVS—including the Section B questions that comprise the 2018 Quant PEVS-LEO—began administration preceding the 2018 General Election. States and territories were asked to complete and submit the

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[5] Previous EAVS survey data are available from the EAC website at www.eac.gov.

2018 EAVS by February 1, 2019. Completed surveys were received by EAC and distributed to FMG via an online survey template and Microsoft Excel files throughout the submission period. FMG analyzed the survey returns for data quality and had a working relationship with EAC to address data issues by asking specific states to edit or clarify their submitted data. States then had two weeks to review and correct their submissions and certify their state's 2018 EAVS data submission. The final EAVS data certification deadline was March 1, 2019 though some states did not complete certification until early April 2019.

1.4 // Weighting

a. Case Dispositions

Final case dispositions for weighting were determined using information from the returned EAVS. A jurisdiction was considered to be a complete eligible respondent if it provided enough information about the number of absentee ballots transmitted to *UOCAVA* voters. Specifically, a jurisdiction needed to provide data that met at least one of the following three criteria:

- B5a (*UOCAVA* ballots transmitted)

- Both subparts of B5a (B5b: Uniformed Service transmitted ballots; B5c: non-military transmitted ballots)

- All questions related to ballot transmission mode (B6a: transmitted by postal mail; B7a: transmitted by email; and B8a: transmitted by other)

Table 2 shows the voting jurisdictions classified by whether they were considered a complete or incomplete response.[6]

Table 2: Case Dispositions for Weighting

Case Disposition	Information Source	Conditions	Sample Size
4. Eligible, complete response	EAVS	Jurisdiction provided a response to any criteria identified above	6,435
5. Eligible, Incomplete Response	EAVS	Jurisdiction did not provide a response to any criteria identified above.	21
Total			6,456

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[6] Note: The 2018 PEVS-LEO did not ask any eligibility questions. American Association for Public Opinion Research. 2015. *Standard definitions: Final dispositions of case codes and outcome rates for surveys* (8th edition). AAPOR.

b. Complete Adjustments and Final Weights

The final weights by stratum are displayed in Table 3. All jurisdictions had an initial base weight of 1 (due to the survey being a census). Base weights were adjusted for incomplete surveys only. The eligibility-adjusted weights for eligible respondents (disposition = 4) were adjusted to account for eligible jurisdictions that had not met the criteria to be a complete respondent (disposition = 5). Weighting adjustment factors were computed as the inverse of the completion probabilities within strata.[7] Only three of the eight strata had weighting adjustments.

Table 3: Final Weights by Stratification

Stratum Number	*UOCAVA* Transmitted Ballots	Population Total	Complete Respondents	Final Weight
1	0	1,877	1,862	1.008
2	1 to 10	2,446	2,444	1.001
3	11 to 30	947	943	1.004
4	31 to 100	604	604	1
5	101 to 500	372	372	1
6	501 to 1,000	85	85	1
7	1,001 to 5,000	104	104	1
8	5,001 or more	21	21	1
	Total	6,456	6,435	

1.5 // Edit and Imputation Process

To calculate estimated totals from EAVS data, edit and imputation processes were developed for the items with missing data. Without an edit and imputation process, the estimated totals would underestimate the actual total (i.e., estimates would be biased low). For example, if a voting jurisdiction indicated it had *UOCAVA* voters but failed to report the number of Uniformed Service members covered by *UOCAVA*, the Uniformed Service members' number would be underestimated since it would be assumed to be 0 for this jurisdiction.

Work to overcome these issues proceeded in two stages. The edit process is the inspection of collected data before statistical analysis, with the goal of verifying that the data have properties intended for the original design. An imputation process then places an estimated answer into a data field for a record that previously had no data or had incorrect or implausible data.

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[7] For the creation of State totals, each stratum was given separate weights for each State based on nonresponse patterns in that State.

a. Edit Process

FMG conducted the edit process on behalf of FVAP after having received EAVS data from jurisdictions. Among the editing steps undertaken:

- Missing data was backfilled with -88 for "Not Applicable"; or with -99 when a jurisdiction indicated "Data Not Available."

- When the total value (e.g., B5a) for a question was reported as 0 or missing, but the jurisdiction reported data for any of the subitems in that question (e.g., B5b, B5c), the total value was backfilled with the sum of the subitems.

b. Imputation Process

The imputation process was designed to produce estimates for respondents who did not provide a value to any item or subitem that was required by FVAP. For the purpose of this analysis, "Not Applicable" entries were given a value of 0, whereas "Data Not Available" entries were treated as missing. Imputations were then created at the jurisdiction level and aggregated up to the state and national level. Jurisdiction-level imputations were created for responding jurisdictions with missing items and subitems.[8] Creating imputations involved a multiple weighted sequential hot deck imputation procedure. For weighted sequential hot deck imputation, the population was divided into the strata defined in Table 1. For jurisdictions with missing data, donor jurisdictions that were complete cases were selected at random from jurisdictions within the same subgroup that had answered the missing data. Imputation was carried out five times (m = 5) following standard imputation practices. Data sets were produced for each imputation and a master data set combined all five imputations. For estimation, standard procedures were used by averaging across the five data sets.

c. Variance Estimation

Estimates from the 2018 Quant PEVS-LEO have uncertainty due to unit and item nonresponse. Unit nonresponse was about 0.3 percent and item nonresponse ranged from zero to 40 percent (see Appendix A, Table A1) for most survey questions that estimated numeric totals. FMG used weighting to compensate for unit nonresponse and imputation to adjust for item nonresponse. To create national estimates, missing information from responding jurisdictions was imputed using a sequential hot deck procedure as described in the previous section and a weighting process was developed so that totals would represent all jurisdictions. Table A1 in the Appendix shows the final imputed national estimates and their associated precision (displayed as "margins of error").[9]

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[8] Use of these estimates as jurisdiction-level figures is not recommended because of their low reliability due to sampling variability.

[9] Margins of error were estimated using Stata's mi estimate command. See Appendix A.

References

American Association for Public Opinion Research. (2015). Standard definitions: Final dispositions of case codes and outcome rates for surveys (8th edition). AAPOR.

EAC. (2019). 2018 EAC Election Administration and Voting Comprehensive Report (Report to 117th Congress). Retrieved from https://www.eac.gov/research-and-data/election-administration-voting-survey/.

Federal Voting Assistance Program. (2019). *2018 FVAP Post-Election Survey Report to Congress*. Retrieved from https://www.fvap.gov/.

Appendix A:
2018 National Estimates

TABLE A1 – Question by Final Estimate, Margin of Error and Relative Precision

Question	Description	Final Estimate (Weighted)	Margin of Error	Relative Precision
A1a	Total Registered Voters	211,456,032	76,941	0%
B1a	*UOCAVA* Registered: Total	761,669	5,956	1%
B1b	Uniformed Service Registered: Total	316,588	4,520	1%
B1c	Non-military Registered: Total	437,488	2,596	1%
B2a	*UOCAVA* FPCAs: Total	323,379	7,289	2%
B2b	Uniformed Service FPCAs: Total	85,452	1,321	2%
B2c	Non-military FPCAs: Total	236,908	7,234	3%
B3a	*UOCAVA* FPCAs Rejected: Total	7,372	766	10%
B3b	Uniformed Service FPCAs Rejected: Total	2,418	54	2%
B3c	Non-military FPCAs Rejected: Total	4,881	698	14%
B4a	*UOCAVA* FPCAs Rejected: Total Late	2,115	68	3%
B5a	*UOCAVA* Transmitted Ballots: Total	655,889	23	0%
B5b	Uniformed Service Transmitted Ballots: Total	260,996	153	0%
B5c	Non-Military Transmitted Ballots: Total	395,342	2,786	1%
B6a	*UOCAVA* Transmitted Ballots: Mail	275,469	4,270	2%
B6b	Uniformed Service Transmitted Ballots: Mail	156,613	4,955	3%
B6c	Non-military Transmitted Ballots: Mail	117,310	1,460	1%
B7a	*UOCAVA* Transmitted Ballots: Email	370,935	5,853	2%
B7b	Uniformed Service Transmitted Ballots: Email	99,578	3,000	3%
B7c	Uniformed Service Transmitted Ballots: Email	256,882	4,824	2%
B8a	*UOCAVA* Transmitted Ballots: Other	35,948	4,843	13%
B8b	Uniformed Service Transmitted: Other	12,462	2,801	22%
B8c	Non-military Transmitted: Other	22,004	4,875	22%
B9a	*UOCAVA* Ballots Returned: Total	349,283	1,922	1%
B9b	Uniformed Service Ballots Returned: Total	123,224	2,252	2%
B9c	Non-military Ballots Returned: Total	228,404	4,039	2%
B10a	*UOCAVA* Ballots Returned: Mail	231,302	1,715	1%

B10b	Uniformed Service Ballots Returned: Mail	92,470	1,602	2%
B10c	Non-military Ballots Returned: Mail	130,275	1,960	2%
B11a	*UOCAVA* Ballots Returned: Email	87,151	3,844	4%
B11b	Uniformed Service Ballots Returned: Email	15,846	829	5%
B11c	Non-military Ballots Returned: Email	63,399	3,289	5%
B12a	*UOCAVA* Ballots Returned: Other	31,616	2,989	9%
B12b	Uniformed Service Ballots Returned: Other	9,470	1,238	13%
B12c	Non-military Ballots Returned: Other	20,045	3,497	17%
B13a	*UOCAVA* Returned Undeliverable: Total	29,121	1,483	5%
B13b	*UOCAVA* Returned Undeliverable: Mail	26,016	688	3%
B13c	*UOCAVA* Returned Undeliverable: Email	4,162	1,284	31%
B13d	*UOCAVA* Returned Undeliverable: Other	327	47	14%
B14a	*UOCAVA* Ballots Counted: Total	342,830	1,604	0%
B14b	Uniformed Service Ballots Counted: Total	117,786	2,328	2%
B14c	Non-military Ballots Counted: Total	225,887	4,702	2%
B15a	*UOCAVA* Ballots Counted: Mail	215,847	1,566	1%
B15b	Uniformed Service Ballots Counted: Mail	87,054	973	1%
B15c	Non-military Ballots Counted: Mail	125,723	1,681	1%
B16a	*UOCAVA* Ballots Counted: Email	98,362	3,978	4%
B16b	Uniformed Service Ballots Counted: Email	16,975	1,106	7%
B16c	Non-military Ballots Counted: Email	70,402	2,986	4%
B17a	*UOCAVA* Ballots Counted: Other	34,520	4,400	13%
B17b	Uniformed Service Ballots Counted: Other	9,598	1,243	13%
B17c	Non-military Ballots Counted: Other	23,522	4,054	17%
B18a	*UOCAVA* Ballots Rejected: Total	19,596	73	0%
B18b	Uniformed Service Ballots Rejected: Total	6,748	70	1%
B18c	Non-military Ballots Rejected: Total	12,616	110	1%
B19a	*UOCAVA* Ballots Rejected: Deadline	9,280	131	1%
B19b	Uniformed Service Ballots Rejected: Deadline	2,790	42	2%
B19c	Non-military Ballots Rejected: Deadline	6,315	346	5%
B20a	*UOCAVA* Ballots Rejected: Signature	2,475	82	3%
B20b	Uniformed Service Ballots Rejected: Signature	1,238	165	13%
B20c	Non-military Ballots Rejected: Signature	1,214	78	6%
B21a	*UOCAVA* Ballots Rejected: Postmark	644	0	0%
B21b	Uniformed Service Ballots Rejected: Postmark	46	0	0%
B21c	Non-military Ballots Rejected: Postmark	28	0	0%
B22a	*UOCAVA* Ballots Rejected: Other Text	4,094	482	12%
B22b	Uniformed Service Ballots Rejected: Other	1,582	518	33%
B22c	Non-military Ballots Rejected: Other	1,417	221	16%

B23a	*UOCAVA* FWABs Returned: Total	8,082	327	4%
B23b	Uniformed Service FWABs Returned: Total	2,772	398	14%
B23c	Non-military FWABs Returned: Total	4,651	699	15%
B24a	*UOCAVA* FWABs Counted: Total	5,735	354	6%
B24b	Uniformed Service FWABs Counted: Total	1,737	343	20%
B24c	Non-military FWABs Counted: Total	3,521	700	20%
B25a	*UOCAVA* FWABs Rejected: Deadline	744	35	5%
B25b	Uniformed Service FWABs Rejected: Deadline	317	68	21%
B25c	Non-military FWABs Rejected: Deadline	427	56	13%
B26a	*UOCAVA* FWABs Rejected: Absentee	641	70	11%
B26b	Uniformed Service FWABs Rejected: Absentee	136	45	33%
B26c	Non-military FWABs Rejected: Absentee	198	40	20%

Note: B5a was imputed using 2014 EAC data. More information regarding B5a is covered in the Sample Design section. Relative precision refers to the percentage of the margins of error in relation to the final estimate: ([Margin of Error/Final Estimate] * 100).

TABLE A2 – Question by Edited and Imputed Totals

Question	Edited Total (Unweighted)	Number Imputed	Imputed Total
A1a	211,348,000	6	211,348,000
B1a	735,231	324	761,541
B1b	304,575	419	316,521
B1c	420,677	426	437,434
B2a	312,405	260	323,324
B2b	79,341	511	85,430
B2c	218,392	512	236,875
B3a	6,344	2,476	7,371
B3b	2,137	2,515	2,418
B3c	4,077	2,518	4,880
B4a	1,989	2,581	2,115
B5a	655,808	0	655,808
B5b	260,750	16	260,959
B5c	393,041	18	395,298
B6a	268,543	236	275,447
B6b	147,820	684	156,599
B6c	110,859	694	117,303
B7a	354,496	238	370,881
B7b	90,825	613	99,559
B7c	237,763	508	256,849
B8a	31,303	325	35,943

B8b	10,741	774	12,460
B8c	17,345	771	22,002
B9a	344,497	64	349,224
B9b	119,167	178	123,199
B9c	219,665	181	228,370
B10a	220,809	507	231,263
B10b	85,921	725	92,452
B10c	121,588	729	130,255
B11a	76,918	566	87,132
B11b	13,429	788	15,842
B11c	56,042	791	63,387
B12a	28,993	1,513	31,614
B12b	8,232	1,734	9,469
B12c	16,559	1,736	20,044
B13a	27,860	604	29,120
B13b	24,835	727	26,015
B13c	2,708	811	4,162
B13d	294	2,285	327
B14a	338,275	30	342,775
B14b	114,719	159	117,764
B14c	218,275	167	225,855
B15a	205,112	568	215,811
B15b	82,023	601	87,037
B15c	118,521	612	125,705
B16a	78,785	819	98,343
B16b	13,799	823	16,971
B16c	58,100	828	70,390
B17a	31,736	1,684	34,518
B17b	8,421	1,692	9,597
B17c	20,089	1,693	23,521
B18a	19,328	156	19,594
B18b	6,566	382	6,747
B18c	12,212	395	12,615
B19a	8,948	308	9,278
B19b	2,602	547	2,789
B19c	5,739	554	6,314
B20a	2,353	612	2,474
B20b	990	909	1,237
B20c	1,038	911	1,214

B21a	620	1,389	644
B21b	19	1,554	46
B21c	19	1,554	28
B22a	3,586	866	4,093
B22b	1,125	1,177	1,582
B22c	1,044	1,178	1,417
B23a	7,286	798	8,080
B23b	2,305	957	2,772
B23c	3,661	959	4,650
B24a	5,018	806	5,734
B24b	1,328	961	1,737
B24c	2,644	964	3,521
B25a	692	1,006	744
B25b	245	1,126	317
B25c	385	1,127	427
B26a	587	1,025	641
B26b	112	1,084	136
B26c	163	1,084	198

Note: The first column provides the question number. The second column provides the total for the question for all responding jurisdictions. The third column provides the number of jurisdictions with imputed data. The fourth column provides the total for all values (imputed and nonimputed).