2021 NASHVILLE/ DAVIDSON COUNTY SURVEY

Submitted to: CSDI at Vanderbilt University

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SUMMARY

Beginning in 2015, the Center for the Study of Democratic Institutions (CSDI) at Vanderbilt University has conducted public opinion polls of Nashville/Davidson County residents to help inform community stakeholders, government officials, academics, the general public, etc. about important issues facing the Nashville Metro area. The 2021 survey marks Vanderbilt University's sixth poll of the Nashville Metro area.

The 2021 Nashville/Davidson County Poll obtained surveys via web and telephone with a representative sample of 1,006 adults, age 18 or older, living in Nashville-Davidson County, Tennessee. Data collection was conducted in English from March 8, 2021 to March 30, 2021.

Implementing an ABS design, 1,006 respondents were reached via mail. Contacts were asked to complete the survey via web or call a toll-free number to complete the survey by phone. In total, 978 surveys were completed via web and 28 surveys were completed via phone.

Statistical results are weighted to correct known demographic discrepancies. The margin of sampling error for the complete set of weighted data is ± 4.6 percentage points.

Details on the design, execution and analysis of the survey are discussed below.

SAMPLE DESIGN

Target Population

The target population for this poll was non-institutionalized adults age 18 or older living in Davidson County, Tennessee. SSRS used an ABS sampling design for this mixed mode study. Our sampling approach ensured that we obtained a representative sample of the target population via a full probability design.

Address-Based Sampling (ABS) Design

The sampling frame under this design was the United States Postal Service (USPS) Computerized Delivery Sequence (CDS) File. The CDS File is a computerized file that contains information on all delivery addresses serviced by the USPS. Sample was provided by SSRS sister company Marketing Systems Group (MSG). For this poll, SSRS selected a random sample of addresses in Davidson County from the CDS File. We appended a Hispanic surname flag and low education (HS grad or less) flag for possible targeted mailing effort.[1]

African Americans (AA) and Hispanics are typically under-represented in ABS samples. To help combat this, Davidson County was divided into five substrata based on African American (AA) and Hispanic incidences at the CBG (Census Block Group) level. High AA/Hispanic density strata were oversampled relative to the

[1] No targeted mailing effort was conducted.

lower density strata. This stratification plan was expected to help bring AA and Hispanic proportion in the sample closer to population incidences.

Table 1: Sample Stratification

	CBGs		Total Pop		Sample Distribution
High AA (50%+ AA)	82	17.3%	112,832	16.6%	25.3%
Medium AA (30-50% AA)	76	16.1%	124,939	18.4%	29.2%
High Hispanic (20%+ Hisp.)	54	11.4%	81,355	12.0%	16.6%
Medium Hisp. (10-20% Hisp.)	38	8.0%	65,703	9.7%	8.2%
Residual	223	47.1%	293,493	43.3%	20.6%
Total	473	100.0%	678,322	100.0%	100.0%

For the selection of ABS records, the following addresses filters were imposed:

- Inclusions:
  - Address Types: Residential (single family dwelling or multi-family dwelling), Residential with some business.
  - Primary Address Filters: City style, Rural route (a non-city style address), Highway contract route (routes located on the highway that are contracted out for delivery), Only Way to Get Mail PO Boxes (OWGM).
  - Secondary Address Filters: Throwback (address is an actual street address, but delivery is made to a customer's PO Box), Drop points (central mail receptacle for multiple units, and limited, if any, information in the ABS frame at the unit level, such as apartment or unit numbers).
- Exclusions:
  - Address Types: Business, Business with some residential.
  - Primary Address Filters: Traditional PO Boxes (box holders who have a deliverable street address but choose to have their mail delivered to a PO Box and therefore could be sampled more than once).
  - Secondary Address Filters: Seasonal (addresses where mail is delivered only during a specific season such as a summer residence), Educational (non-dormitory housing units near the campus of an academic institution), Vacant (delivery points that have been unoccupied for 90 days or longer), No Stat (addresses not currently receiving mail delivery [for example, planned development] and are not in the CDS).

QUESTIONNAIRE AND LETTER DEVELOPMENT

Questionnaire Development

The questionnaire was developed by the Principal Investigators at the Center for the Study of Democratic Institutions (CSDI) at Vanderbilt University in consultation with the SSRS project team. SSRS reviewed the questionnaire primarily to identify potential problems in the instrument that might increase respondent burden, cause respondents to refuse or terminate the interview, create problems with respondent comprehension, or pose practical challenges for mode-specific administration such as complex skip patterns.

Letter and Postcard Design

The text for the study invitation letter, reminder postcard, and reminder letter were developed by SSRS in consultation with Vanderbilt University investigators. SSRS sent Vanderbilt University the final mailing materials for approval before printing and mailing the materials to contacts.

CONTACT PROCEDURES

Two-Release Approach

To ensure all survey programs and data collection systems were operating as expected and to assess progress for a second release, SSRS implemented a two-release approach for the contact protocol. Release #1 began with a sample of 2,500 households. After some surveys had been completed and the system thoroughly tested in the live environment, an additional 7,500 pieces of were released in the second wave. Release #2 followed the same general contact protocol established for Wave 1.

Description of Mailings

All sampled households were first mailed an initial invitation letter. This invitation letter was one-page, single-sided, and printed in English. This letter was printed on Vanderbilt University's stationery (produced by SSRS). The text of the letter was developed in collaboration with Vanderbilt University investigators and include a short web link for the survey and a unique password to access the secure web survey. The letter also included a $1 bill as a pre-incentive and an offer of $10 payment upon completion of the survey. Inclusion of a pre-incentive generally improves the overall study participation rate by acting as a token of appreciation and encouraging participation in the survey. The $10 payment via an electronic gift code was disbursed via email immediately after completion of the web survey and via check on a weekly basis to respondents completing the survey via phone. To maximize response by offering invitees more than one way of completing the survey, this letter included a toll-free number that potential respondents could call to complete the survey via phone if they did not have internet access or preferred to complete the survey via phone.

Approximately two business days after mailing of the invitation letter, a reminder postcard was sent to all target households. The purpose of this mailing was simply to remind an eligible adult in the target household to look for the initial mailing and complete the survey. The postcard was an open-faced (not sealed) card and did not contain the survey web link or the respondent's unique password to preserve respondent confidentiality.

Approximately two weeks after the study invitation letters were mailed, a reminder letter was mailed to all non-responders. This letter stressed the urgency of this final contact and included a toll-free number that potential respondents could call to complete the survey via phone.

All mailings were sent via USPS first-class mail.

Table 2: Contact Schedule

Date	Mailing	Count
March 8, 2021	Release #1 invitation letters mailed	2,500
March 10, 2021	Release #1 postcards mailed	2,500
March 11, 2021	Release #2 invitation letters mailed	7,500
March 15, 2021	Release #2 postcards mailed	7,500
March 25, 2021	Release #1 reminder letters mailed	2,337
March 25, 2021	Release #2 reminder letters mailed[2]	7,208

PROGRAMMING

Prior to the field period, SSRS programmed the study into its Confirmit platform for web and CATI administration in English. The web program was optimized for administration via smartphone or other mobile handheld devices. Extensive checking of the program was conducted to ensure that skip patterns followed the design of the questionnaire. The web program was checked on multiple devices, including desktop computers and handheld mobile devices, and different web browsers in order to ensure consistent and optimized visualization across devices and web browsers. SSRS generated unique survey passwords that were assigned at the sample level and provided via mail to potential respondents. The web survey was accessed directly by respondents, using their unique passwords. This also gave them the ability to return to their survey later if they chose to suspend their interview.

[2] Reminder letters for both releases were combined and mailed on the same day instead of staggering. There were USPS delivery delays for the Release #1 invitation letters that resulted in letters arriving several days after their anticipated landing date. To reduce the size of the reminder mailing by removing completed surveys and undeliverables while still maintaining the original field period, Release #1 reminders were sent March 25, instead of March 22.

DATA COLLECTION, PROCESSING, AND INTEGRATION

Web Data Collection

All contacted households were invited to take the survey online, accessing the survey using a unique password to avoid duplication of interviews by the same person.

Telephone Data Collection

Invitation letters included a toll-free number for non-internet or internet-reluctant eligible contacts to participate in the study via telephone. If an interviewer was available at the time of the call, the inbound call was routed to the interviewer for an immediate response. If an interviewer was not available at the time of the call, interested contacts were able to leave a voicemail message to request a callback for a phone interview.

Interviewers received written materials about the survey instrument and received formal training for this particular project. The written materials were provided prior to commencement of data collection and included an annotated questionnaire that contained information about the goals of the study, detailed explanations about why questions were being asked, the meaning and pronunciation of key terms, potential obstacles to be overcome in getting good answers to questions, and respondent problems that could be anticipated ahead of time, as well as strategies for addressing the potential problems.

Interviewer training was conducted before the study was launched. Interviewers were given instructions to help them maximize response rates and ensure accurate data collection.

In total, 28 phone interviews were completed from inbound requests. There was no outbound dialing conducted.

Data Processing and Integration

Prior to running cross-tabulations, data were cleaned and checked using standard procedures. This program establishes editing parameters in order to locate any errors. Minimal back-coding was done for Race other-specify text responses. No other coding was done for open-end responses.

Prior to running cross-tabulations, data from web and telephone modes were combined and thoroughly cleaned with a computer validation program written by one of SSRS's data processing programmers. This program established editing parameters in order to locate any errors, including data that did not follow skip patterns, out of range values, and errors in data field locations.

SSRS also reviewed item non-response to evaluate the data quality for each interview. One survey with about 20% non-response was rejected and removed from the data provided to Vanderbilt University.

After quality control procedures were carried out, SSRS provided a clean, processed, fully-labeled and weighted final SPSS dataset to Vanderbilt University.

WEIGHTING AND ANALYSIS

The survey data were weighted to be representative of the adult population of Davidson County, Tennessee. A disproportionately-stratified address-based sample was drawn from the U.S. Postal Service's Computerized Delivery Sequence File. The weighting was done in two stages. The first stage was the application of a base weight that corrects for different selection probabilities across sample strata and within households. The second stage of weighting balanced sample demographic distributions to known population benchmarks.

Base weight

The base weight, $\boldsymbol{BW}$, is the product of a sampling weight (SAMPWT) and a household size adjustment (HHSA). The sampling weight corrects for the disproportionate sample design by adjusting the distribution of completed interviews across the five ABS strata to match the distribution of the ABS frame across strata. The sampling weight for the ABS recruits can be expressed as $\mathbf{ABS_SAMPWT} = \boldsymbol{P_i}/\boldsymbol{p_i}$where $\boldsymbol{P_i}$ is the proportion of the sample frame from in stratum $\boldsymbol{i}$ and $\boldsymbol{p_i}$ is the proportion of completed interviews in stratum $\boldsymbol{i}$.

Since we interview one adult in every household regardless of how many adults live in the household, each respondent's probability of being sampled is a function of the number of adults in the household. Specifically, in a household with $\boldsymbol{A}$ adults, a respondent is chosen with probability $\mathbf{1}/\boldsymbol{A}$. The household size adjustment is the reciprocal of the selection probability, or $\boldsymbol{HHSA} = \boldsymbol{A}$.[3]

The final base weight is the product of the sampling weight and the household size adjustment.

$$BW = SAMPWT \times \mathrm{HHSA}$$

Post-stratification

In the second stage of weighting, sample demographics distributions were adjusted to match known population distributions. The sample was balanced to match Davidson County, Tennessee adult population benchmarks for sex, age, education, race/ethnicity, internet use, and sample stratum. The sex, age, education, race/ethnicity, and internet use parameters were derived from the U.S. Census Bureau's 2015-2019 5-year American Community Survey (ACS) data. The sample strata distribution came from the Census Planning Database based on ACS 2013-2017 5-Year estimates.

[3] We cap A at 3 to reduce the variance of the weights.

The following table lists the dimensions used in the raking.

Table 3: Raking Dimensions

Dimension	Value Label	
Gender by Age	Male, 18-24	Female, 18-24
	Male, 25-34	Female, 25-34
	Male, 35-44	Female, 35-44
	Male, 45-54	Female, 45-54
	Male, 55-64	Female, 55-64
	Male, 65+	Female, 65+
	missing on age	
Sex by Education	Male, High School Grad or less	
	Male, Some College / Associate Degree	
	Male, College Grad or higher	
	Female, High School Grad or less	
	Female, Some College / Associate Degree	
	Female, College Grad or higher	
Race/Ethnicity	White, not Hispanic	
	Black or African American, not Hispanic	
	Hispanic	
	Other, not Hispanic	
Internet Use	Yes	
	No	
Sample Strata	High African American	
	Medium African American	
	High Hispanic	
	Medium Hispanic	
	Residual	

Raking was accomplished using SPSSINC RAKE, an SPSS extension module that simultaneously balances the distributions of all variables using the GENLOG procedure. Missing values on the weighting variables were imputed using a Hot Deck procedure. Hot deck imputation replaces the missing values of a respondent randomly with another similar respondent without missing data. We use an SPSS macro detailed in 'Goodbye, Listwise Deletion: Presenting Hot Deck Imputation as an Easy and Effective Tool for Handing Missing Data' (Myers, 2011).

Weights were trimmed to prevent individual interviews from having too much influence on the final results. The use of these weights in statistical analysis ensures that the demographic characteristics of the sample closely approximate the demographic characteristics of the target population. Table 4 compares weighted and unweighted distributions to population parameters.

Table 4: Population Parameters and Weighted and Unweighted Sample Distributions

Characteristic	Value Label	Parameter	Unweighted	Weighted
Gender by Age	Male, 18-24	5.1%	2.8%	5.2%
	Male, 25-34	12.5%	8.5%	12.1%
	Male, 35-44	8.8%	6.6%	9.3%
	Male, 45-54	7.6%	5.1%	6.4%
	Male, 55-64	6.9%	7.7%	6.1%
	Male, 65+	6.4%	9.6%	6.0%
	Female, 18-24	5.4%	4.1%	5.7%
	Female, 25-34	13.5%	13.7%	14.2%
	Female, 35-44	8.9%	11.8%	9.6%
	Female, 45-54	7.9%	8.4%	8.1%
	Female, 55-64	8.1%	10.4%	8.3%
	Female, 65+	8.9%	11.2%	9.0%
Gender by Education	Male, HS Grad or less	17.1%	6.6%	14.3%
	Male, Some College	12.1%	9.7%	11.4%
	Male, College+	18.1%	24.0%	19.5%
	Female, HS Grad or less	16.2%	10.0%	15.7%
	Female, Some College	14.5%	15.0%	15.4%
	Female, College+	22.0%	34.7%	23.6%
Race/Ethnicity	White, non-Hispanic	60.6%	63.0%	62.8%
	Black, non-Hispanic	25.4%	23.2%	22.8%
	Hispanic	8.0%	6.9%	8.3%
	Other, non-Hispanic	5.9%	7.0%	6.1%
Internet Use	Yes	90.6%	98.7%	93.5%
	No	9.4%	1.3%	6.5%
Sample Strata	High AA	15.6%	21.8%	14.2%
	Medium AA	17.9%	28.8%	19.1%
	High Hispanic	11.0%	15.0%	11.1%
	Medium Hispanic	9.7%	8.7%	10.4%
	Residual	45.7%	25.6%	45.2%

Effects of Sample Design on Statistical Analysis

Post-data collection statistical adjustments require analysis procedures that reflect departures from simple random sampling. SSRS calculates the effects of these design features so that an appropriate adjustment can be incorporated into tests of statistical significance when using these data. The so-called "design effect" or *deff* represents the loss in statistical efficiency that results from a disproportionate sample design and systematic non-response. The design effect for the total sample is 2.20.

SSRS calculates the composite design effect for a sample of size n, with each case having a weight, *w*, as:

$$deff = \frac{n\sum w^2}{(\sum w)^2}$$ [4]

The survey's margin of error is the largest 95% confidence interval for any estimated proportion based on the total sample — the one around 50%. For example, the margin of error for the total sample is ±4.6 percentage points. This means that in 95 out of every 100 samples drawn using the same methodology, estimated proportions based on the sample will be no more than 4.6 percentage points away from their true values in the population. Margins of error for subgroups will be larger. It is important to remember that sampling fluctuations are only one possible source of error in a survey estimate. Other sources, such as respondent selection bias, questionnaire wording, and reporting inaccuracy, may contribute additional error of greater or lesser magnitude.

[4] Kish, L. (1992). Weighting for Unequal Pi. Journal of Official Statistics, Vol. 8, No.2, 1992, pp. 183-200.

RESPONSE RATES

Table 5 reports the disposition of all sampled ABS records that were contacted. The response rate estimates the fraction of all eligible sample that was ultimately interviewed. Response rates are computed according to American Association for Public Opinion Research standards. The response rate for the ABS sample was 13.7%.

Table 5: ABS Sample Disposition

Disposition	N
Complete (I)	**1,006**
Web	978
Phone	28
Eligible, non-interview (R)	**2**
Refusal & Break-off	2
Unknown eligibility, non-interview (UH)	**8,625**
Nothing ever returned	8,362
Refused, unknown if eligible	96
Over-quota	167
Not eligible, returned (IN)	**367**
Does not live in Davidson County, TN	7
Not age 18 or older	5
Business/Commercial	1
Undeliverable	354
Total records contacted	**10,000**
e=(I+R)/(I+R+IN)	73.3%
RR3=I/[I+R+(e*UH)]	**13.7%**

DELIVERABLES

SSRS delivered to Vanderbilt University:

- Final questionnaire instrument;
- Weighted dataset in SPSS;
- Weighted banners in PDF;
- Topline; and
- A detailed methodology report.

ABOUT SSRS

SSRS is a full-service survey and market research firm managed by a core of dedicated professionals with advanced degrees in the social sciences. Service offerings include the Omnibus Survey, SSRS Opinion Panel and other Online Solutions, and SSRS Text Message Panel, as well as custom research programs – all driven by a central commitment to methodological rigor. The SSRS team is renowned for its multimodal approach, as well as its sophisticated and proprietary sample designs. Typical projects for the company include complex strategic, tactical, and public opinion initiatives in the U.S. and in more than 40 countries worldwide. SSRS is research, refined. Visit www.ssrs.com for more information.