Methods Report for Pew Charitable Trusts:

2019 Philadelphia Residents Survey

April 8, 2019

Prepared by:

Chintan Turakhia, Jonathan Best and Sarah Glancey
1 Braxton Way
Suite 125
Glen Mills, PA 19342

ssrs
research. refined.

@ssrs_research | 484.840.4300 | info@ssrs.com

OVERVIEW

SSRS is conducting the data collection for Pew Charitable Trusts' 2019 Philadelphia Residents Survey. The goal of this survey is to better understand what residents think about Philadelphia and how they feel about important public policy issues facing the city.

The scope of work for this study calls for a probability sample of 1,200 adults age 18 or older who currently live in Philadelphia. Six hundred (n=600) completes will come from an RDD Phone Design and n=600 will come from an ABS design. This methodology report focuses on the 600 completes obtained from the RDD Phone Design.

The 2019 Philadelphia Residents Survey obtained surveys via phone with a representative sample of 600 adults age 18 or older who currently live in Philadelphia. Data collection was conducted in English and Spanish from March 18 to 31, 2019. Statistical results are weighted to correct known demographic discrepancies. The total sample design effect for this survey is 1.92 and the margin of sampling error for the complete set of weighted data is ± 5.6 percentage points.

The full questionnaire can be seen here. Answers from many of the questions are still being analyzed, and some will be released at a later date.

Details on the sampling, questionnaire design, programming, data collection and processing, weighting and analysis of the survey are discussed below.

SAMPLING METHODS

The target population for this study was non-institutionalized adults age 18 or older living in Philadelphia County. Samples were provided according to SSRS specifications.

Our sampling approach ensured we obtained a representative sample of the target population by utilizing an overlapping dual frame RDD phone design with 57% of the surveys allocated to the RDD (Random Digit Dial) cellular frame and 33% of the surveys allocated to the RDD landline frame. In addition, 10% of the surveys were allocated to an out-of-area cellular sampling frame.

For the RDD landline sample, the standard GENESYS RDD methodology produced a strict single-stage, Equal Probability Selection Method (EPSEM) sample of landline residential telephone numbers. GENESYS RDD samples achieve their statistical efficiency through a structured database in combination with single-stage sampling procedures, which ensures geographic representativeness and increases homogeneity within the implicit strata created by the GENESYS sampling procedures. As per standard practice, business numbers and non-working numbers were purged from the landline RDD sample prior to dialing.

To generate the RDD cell sample, MSG started with a cellular RDD database that is constructed quarterly utilizing commercially available U.S. Telephony databases. These databases are continuously updated to provide current information for every active 1000-series block in the North American Numbering Plan. These data sources provide the requisite information needed to identify every 1000-series block that is dedicated to providing wireless service in the U.S. The resulting 1000-series blocks comprised the basis for the RDD cellular sample frame. RDD cellular samples were drawn using equal probability sample methods and contained both working and non-working telephone numbers. The sampling interval was determined by dividing the total

number of possible numbers in the geographic sample frame (Philadelphia County) by the number of requested RDD sample records. Each sample interval was of equal size. One number was selected at random from each sampling interval. All possible telephone numbers were given an equal probability of selection.

An additional consideration that was considered when targeting geographies with RDD cellular sample is that cell phone numbers are highly portable so when someone moves residences, they often keep their cellular number, which remains associated with its original geography. This means that Philadelphia residents who moved into Philadelphia from a different area but kept their old cell phone number would not be covered in a standard RDD cell sample of Philadelphia County. According to the analysis we conducted in the five county Philly area (Philadelphia, Bucks, Delaware, Montgomery, and Chester counties), approximately 18% of the residents have an out-of-area cell phone number. This number is likely a bit higher for Philadelphia County. SSRS covered this population by drawing an out of area (OOA) sample from a database of cellular numbers. The OOA sample was drawn from SSI's Smart Cell sample frame. With more than 268 million telephone numbers, the Smart Cell sample frame combines coverage and projectability of RDD cell sample with the geographic and demographic targeting found in traditional directory-listed databases. In addition, Smart Cell covers 65-75% of active numbers in the RDD cell universe (compared to 50% or lower for the list-based approach used in prior waves of this study). All records in this database include the billing ZIP code associated with the cell phone customer, so we could target and sample people who have a cell phone that is associated with a geography outside of Philadelphia but have a billing ZIP code in Philadelphia.

Prior to dialing SSRS identified and purged all inactive cell numbers (CellWINS).

The sample size for this poll was n=600 interviews. Overall, approximately 33% of respondents were reached via landline and approximately 67% of respondents were reached via cellular telephone. A breakdown is shown in Table 1 below.

Table 1. Interviews by Sample Type

Sample type	n	%
Landline RDD	198	33%
Cell phone RDD	283	47%
Out of area Cell (OOA)	119	20%
Total	600	100%

QUESTIONNAIRE DESIGN
Questionnaire Development
The questionnaire was developed by Pew Charitable Trusts. 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 a hard copy questionnaire such as complex skip patterns. SSRS also translated the instrument into Spanish.

Pretest
Prior to live data collection, SSRS conducted a pretest of the questionnaire from Wednesday, March 13 through Thursday, March 14, 2019. SSRS completed a total of 20 pretest interviews (10 LL; 10 cell) for the 2019 Philadelphia Residents Survey. For the pretest interviews, SSRS Omnibus prescreened sample previously

identified as living in Philadelphia county was used. Recordings of interviews conducted during the pretest were uploaded to Dropbox for Pew Charitable Trusts to review. SSRS also provided a pretest memo of the findings.

PROGRAMMING
Prior to the field period, SSRS programmed the study into CfMC 8.8 Survox software for administration in both English and Spanish. Extensive checking of the program was conducted to ensure that skip patterns followed the design of the questionnaire. Also, a number of cases of random data were run through the program to provide another check of the accuracy of the CATI program.

DATA COLLECTION, PROCESSING, AND INTEGRATION
Contact Procedures
Interviews were conducted from March 18 to March 31, 2019. As many as 7 attempts were made to contact every sampled telephone number. Sample was released for interviewing in replicates, which are representative subsamples of the larger sample. Using replicates to control the release of sample ensures that complete call procedures are followed for the entire sample. Calls were staggered over times of day and days of the week to maximize the chance of making contact with potential respondents. When necessary, each telephone number was called at least one time during the day in an attempt to complete an interview.

For the landline sample, interviewers asked to speak with the youngest male or youngest female currently at home based on a random rotation. If no male/female was available, interviewers asked to speak with the youngest adult of the other gender. This systematic respondent selection technique has been shown to produce samples that closely mirror the population in terms of age and gender when combined with cell interviewing.

For the cellular sample, interviews were conducted with the person who answered the phone. Interviewers verified that the person was an adult and in a safe place before administering the survey. Cellular respondents completing the survey were offered a $5 post-paid reimbursement for their participation.

Interviewing was conducted in English and Spanish. Any sample identified as a Spanish-language barrier were exclusively dialed by bilingual interviewers.

Survey Administration
All interviews were completed in English or Spanish using the CATI system. The CATI system ensured that questions followed logical skip patterns and that complete dispositions of all call attempts were recorded.

CATI 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 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 order to maximize survey response, SSRS enacted the following procedures during the field period:

- As many as seven (7) attempts were made to contact every sampled telephone number.
- Calls were staggered over times of day and days of the week to maximize the chance of making contact with potential respondents. At least one daytime call was conducted if necessary.
- Interviewers explained the purpose of the study and its importance.
- Respondents were offered the option of scheduling a call-back at their convenience.
- Specially trained interviewers contacted numbers where the initial call resulted in respondents hanging up the phone.

Data Processing and Integration

Data were 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. Back-coding was done for Question 5 to code open-end responses into prelisted categories where appropriate. No additional coding was done for open-end responses.

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

WEIGHTING AND ANALYSIS

Weighting is generally used in survey analysis to compensate for sample designs and patterns of non-response that might bias results. The weighting ensures that the demographic profile of the sample matches the profile of the target population. The data was weighted to match Philadelphia County adult resident parameters.

In the weighting, sample demographics were matched to population parameters.

Total Probability of Selection Weighting

The study was weighted to provide representative and projectable estimates of the adult population 18 years of age and older. The weighting process takes into account the disproportionate probabilities of household and respondent selection due to the number of separate telephone landlines and cellphones answered by respondents and their households, as well as the probability associated with the random selection of an individual household member.

(1) Probability of Selection (P_{phone}): A phone number's probability of selection depends on the number of phone-numbers selected out of the total sample frame. So for each respondent whose household has a landline phone number this is calculated as total landline numbers dialed divided by total numbers in the landline frame and conversely for respondents answering at least one cell phone number, this is calculated as total cell phone numbers divided by total numbers in the cell phone frame.

(2) Probability of Respondent selection (P_{select}): In households reached by landline, a single respondent is selected. Thus, the probability of selection within a household is inversely related to the number of adults in the household.

Total Probability of Selection: This is calculated as the phone number's probability of selection (by frame), and for landlines, divided by the number of adults in the household. Thus, for each respondent a probability can be calculated for being reached via landline (LL_{prob}) and for being reached via cell phone ($Cell_{prob}$). These calculations are:

$$LL_{prob}=P_{phone}{}^* /Pselect$$
$$Cell_{prob}=P_{phone}$$

The sample weights derived at this stage are calculated as the inverse of the combined probability of selection, or:

$$1/(LL_{prob}+Cell_{prob}-LL_{prob}{}^*Cell_{Prob})$$

Post Stratification Weighting

The second stage of the weighting balances the demographic profile of the sample to target population parameters. The data was raked twice, once for the phone and once for the ABS frame.

To handle missing data among some of the demographic variables we employ a technique called hot decking. Hot deck imputation replaces the missing values of a respondent randomly with another similar respondent without missing data. These are further determined by variables predictive of non-response that are present in the entire file. 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).

Weighting is accomplished using SPSSINC RAKE, an SPSS extension module that simultaneously balances the distributions of all variables using the GENLOG procedure. The sample is balanced to match estimates for the population age 18 or older in Philadelphia City derived from the 2017 American Community Survey (ACS)[1]

The population parameters that we plan to use for post-stratification are: age (18-24; 25-29, 30-35, 36-49, 50-60, 61-64, 65 or older), gender, Education (less than high school, high school graduate, some college, four-year college or more); and race/ethnicity (white non-Hispanic; Black non-Hispanic; Hispanic; Other non-Hispanic), Density[2], and Phone Use (Cellphone Only, Dual Frame, Landline Only)[3].

Weights are expected to be trimmed at the 4th and 96th percentiles 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. The following table provides the population parameters, and we will add the unweighted and weighted sample distributions after weighting.

---

[1] Steven Ruggles, Katie¬¬ Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. Integrated Public Use Microdata Series: Version 7.0 [dataset]. Minneapolis: University of Minnesota, 2017. https://doi.org/10.18128/D010.V7.0.

[2] Melissa Data Zip Code list - 1/2019 | TIGER/Line Shapefile, 2015, 2010 nation, U.S., 2010 Census 5-Digit ZIP Code Tabulation Area (ZCTA5) National

[3] Based on the ABT/SRBI 2016 Philadelphia Trend Survey benchmark and projected according to the 2015/2016 *NHIS Modeled estimates (with standard errors) of the percent distribution of household telephone status for adults age 18 and over, by state*

The table below compares population parameters to unweighted and weighted sample demographics.

Table 2. Weighting Demographics Summary

	Parameter	Unweighted	Weighted
<u>Sex</u>			
Male	46.3%	46.8%	46.6%
Female	53.7%	53.2%	53.4%
<u>Age</u>			
18-24	11.5%	5.3%	11.0%
25-29	13.2%	5.8%	11.6%
30-35	13.5%	9.7%	13.7%
36-49	21.6%	17.7%	21.9%
50-60	17.2%	18.7%	18.0%
61-64	5.7%	8.8%	6.0%
65 or older	17.1%	34.0%	17.9%
<u>Education</u>			
Less than HS grad.	14.1%	6.5%	12.7%
HS grad.	35.6%	25.8%	35.6%
Some College	23.3%	23.3%	23.8%
College grad or more	27.0%	44.3%	28.0%
<u>Density</u>			
1	20.6%	18.5%	19.9%
2	19.4%	19.2%	19.6%
3	19.8%	18.9%	20.0%
4	20.2%	19.9%	19.7%
5	20.1%	23.5%	20.6%
<u>Phone Use</u>			
Landline Only	4.6%	47.5%	4.8%
Dual Frame	38.6%	34.7%	39.8%
Cellphone Only	56.8%	8.3%	55.4%
		9.5%	
<u>Recoded Race/ethnicity</u>			
White, not Latino	37.6%	37.6%	38.6%
Black, not Latino	39.7%	39.7%	38.9%
Latino	12.8%	12.8%	12.4%
Other, not Latino	9.8%	9.8%	10.0%

Effects of Sample Design on Statistical Inference

Specialized sampling designs and 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 total sample design effect for this survey is 1.92.

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

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

In a wide range of situations, the adjusted standard error of a statistic should be calculated by multiplying the usual formula by the square root of the design effect ($\sqrt{deff}$). Thus, the formula for computing the 95% confidence interval around a percentage is:

$$\hat{p} \pm 1.96 \sqrt{\frac{deff \times \hat{p}(1-\hat{p})}{n}}$$

where $\hat{p}$ is the sample estimate and *n* is the unweighted number cases in the group being considered.

The formula for computing the 95 percent confidence interval around the difference between two percentages, p_1 and p_2, of sizes n_1 and n_2, is:

$$(\hat{p}_1 - \hat{p}_2) \pm 1.96 \sqrt{\frac{deff_1 \times \hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{deff_2 \times \hat{p}_2(1-\hat{p}_2)}{n_2}}$$

where $\hat{p}_1$ is the estimate of p_1, $\hat{p}_2$ is the estimate of p_2, and *deff*$_1$ and *deff*$_2$ are the design effects for each group.

The survey's margin of error is the largest 95% confidence interval for any estimated proportion based on the total sample—one around 50%. For example, the margin of error for the total sample is ±5.6 percentage points. This means that in 95 out every 100 samples using the same methodology, estimated proportions based on the entire sample will be no more than 5.6 percentage points away from their true values in the population. It is important to remember that sampling fluctuations are only one possible source of error in a survey estimate. Other sources, such as measurement error, may contribute additional error of greater or lesser magnitude.

Table 3. Sample Sizes, Design Effects and Margins of Error

n=	Design Effect	Margin of Error
600	1.92	+/- 5.6 percentage points

DELIVERABLES

SSRS provided the following deliverables to Pew Charitable Trusts:

- Formatted, clean questionnaires
- A final, clean, fully labeled, weighted SPSS data file
- Two banners of cross-tabulations run on final weighted data
- Topline results
- Methodology report

ABOUT SSRS

SSRS is a full-service public opinion research firm managed by a core of industry-leading professionals. SSRS service offerings include the Omnibus Survey, Probability Panel and other Online Solutions 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. Please visit www.ssrs.com for further information.