Methodological Challenges in Estimating the Size of the Jewish Population in Greater Philadelphia

David A. Marker[1], Shelley Brock[1], Darby Steiger[1], Jill DeMatteis[1]
[1]Westat, 1600 Research Blvd, Rockville, MD 20850

Abstract
The Jewish Federation of Greater Philadelphia (JFGP) wanted to measure the size of the Jewish population in the five-county Greater Philadelphia area. The goal was to describe a wide range of characteristics of Jewish residents, overall, for each county, and for a set of eight local communities. This paper reports on the 2019 study that is the first study of local Jewish community to use address-based sampling (ABS) methodology to increase coverage and reduce bias in the survey results.

Key Words: Address-Based Sampling, coverage error, sponsorship

1. Introduction

The Jewish Federation of Greater Philadelphia (JFGP) wanted to measure the size of the Jewish population in the five-county Greater Philadelphia area (Philadelphia and its four suburban Pennsylvania counties: Bucks, Chester, Delaware, and Montgomery). The goal was to describe a wide range of characteristics of Jewish residents, overall, for each county, and for a set of eight local communities (referred to as *Kehillot*). Figure 1 shows the boundaries of the target area. The gray areas in the western suburbs were assumed to have few if any Jews and thus were excluded from the survey.

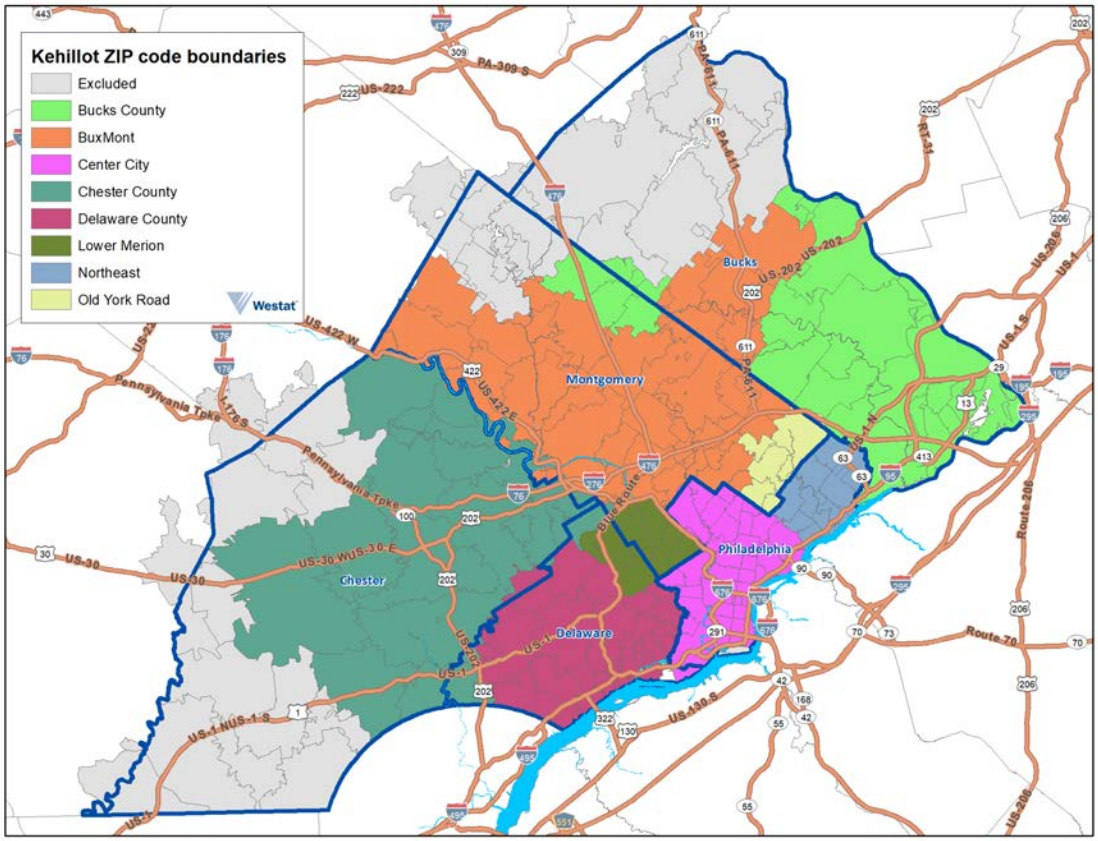

Figure 1: Boundaries of five counties (blue lines) and eight communities (*Kehillot*, each in a separate color)

Beyond the usual difficulties of conducting a population study, surveying the Jewish community brings additional complications. The U.S. Census Bureau, which is the source of demographic data often used in designing survey samples, does not collect information about religion in any of its surveys. Many Jews do not identify as religiously Jewish, but rather as culturally or ethnically Jewish, so may not answer "Jewish" to a question of "What religion are you?" Further, many Jews do not connect to any local Jewish organizations, so they are not likely to be found on lists of likely Jews from synagogues, Jewish community centers, or other organizations.

1.1 Previous Study

The last study of the Greater Philadelphia area Jewish community was conducted in 2009. A random digit dialing (RDD) sample of landline telephone numbers was selected and interviewed using computer assisted telephone interviewing (CATI). (Earlier studies in 1984 and 1997 had also used RDD with CATI.) This was supplemented by lists obtained from some local Jewish organizations. Due to changing telephone usage patterns, the use of a landline-only RDD survey in 2009 excluded the 41 percent of households that either did not have a landline telephone number or had a landline number but received all or almost all calls on cell phone numbers (e.g., only used their landline for a fax machine) (Blumberg and Luke, 2009). The excluded percentage was even larger for select subpopulations, for example, younger adults. Also excluded were households who had moved to the Greater Philadelphia area but retained the telephone numbers they used where they lived previously.

1.2 New 2019 Study

Collecting data by telephone has become more difficult and more costly as the population has transitioned from landline telephone service toward primarily or exclusively cell phone service. In addition, new technologies to identify and/or block incoming calls, and respondents having less "free time" to answer surveys has fueled the need to change the approach to collecting population-level data (Olson et al., 2019). The literature also indicates that there has been a significant reduction in respondent availability via landlines. Landline usage is dropping,[1] and among those with landlines, fewer respondents answer calls. The trend in household surveys is to reduce the role of telephones and increase the use of address-based samples (ABS) (Battaglia et al., 2016) while encouraging respondents to answer via a web instrument when possible. Moreover, in addition to these methodological challenges, there are substantive developments that make it harder to locate eligible respondents. Americans in general, and Jews in particular, have become less attached to religious organizations, with increasing numbers identifying as having no religion or multiple religions (Pew 2013).

2. Sample Design

Our 2019 study replaced RDD with ABS combined with 50 lists from local Jewish organizations. The ABS frame for this study, which is based on the U.S. Postal Service's Computerized Delivery Sequence file and is maintained by Marketing Systems Group (MSG), consisted of the set of all residential addresses in a list of ZIP codes that JFGP identified as likely having at least some Jewish population. Based on this knowledge from JFGP, using this frame provided almost complete coverage of every Jewish person living in households in the five-county area.

The 50 lists were deduplicated and matched to the ABS frame to partition it into separate strata for low eligibility list addresses, high eligibility list addresses, and non-list addresses. The low eligibility lists were either of college students (more likely to have moved) or a purchased list of "likely Jewish households" from a market research firm, where the proportion of households eligible to participate was expected to be low. Additionally, the sample was stratified by the eight *Kehillot* to facilitate geographic estimation. Out of 1.6 million residential addresses in the eligible ZIP codes, 3 percent were placed in the high eligibility stratum (where the proportion of households eligible to participate was expected to be high) and another 5 percent in the low eligibility stratum. A key to unbiased estimation is that respondents in each stratum were only weighted up to represent others in that stratum, so for example, Jews who are well connected to the community and thus appear on at least one high eligibility stratum list are only weighted up to represent others also found on such lists.

One caveat of the ABS approach is that the sample represents the household population but does not include Jewish adults who are living in nursing homes, military barracks, and other institutional housing. Those living in noninstitutional residential settings, however,

[1] Fully 56.7 percent of adults live in U.S. households that are cell-phone only, with no landlines in the household, compared with less than 30 percent in 2010. Furthermore, an additional 17.1 percent live in "wireless mostly" households, meaning that while they have a landline, they rely on cell phones for all or almost all of their calls. This means that nearly three-quarters (73.8%) of adults in U.S. households are currently unable or highly unlikely to be reached on a landline (Blumberg & Luke, 2019).

including most assisted-living facilities and nonbarracks housing on military bases, were eligible for inclusion.

In addition to the major improvement in coverage of the target population, ABS provided additional improvements over the previous design. ABS allows for specific, accurate targeting of geographic areas of interest. Each ZIP code was connected to a specific *Kehillot* allowing us to assure a specific sample size was allocated to each. Each address is associated with a specific county. Not only does this assure a sufficient number of completed cases in each target geography, but it also facilitates statistical adjustments that may significantly reduce potential nonresponse bias. With RDD, the characteristics available for nonresponse adjustments are aggregate characteristics for large geographic areas (typically, the primary ZIP codes associated with the telephone exchange). With ABS, we know the county, *Kehillot*, and (through geocoding) the census tract in which every nonresponding address is located, and from the American Community Survey (ACS) we can obtain characteristics of their census tract (e.g., percent renters, average income). This allows for the use of area-level characteristics that are more strongly associated with characteristics of the household at the address, resulting in nonresponse adjustments that are likely to be more effective in reducing biases in survey estimates.

3. Data Collection

Data collection occurred from late January through July of 2019. Each sampled address was mailed an initial invitation to take the survey via the web, with a unique ID and PIN for each address. They could request a paper copy screener survey but were encouraged to use the web. Follow-up postcards encouraged web response, followed by a paper copy of the screener mailed to remaining nonrespondents. As a result, 60 percent of screener respondents chose to respond via the web, including older adults.

The survey was offered in both English and Russian. A number of Jewish families from Russia and the former Soviet Union have moved to the Greater Philadelphia area over the last 40 years and many still speak only Russian at home. This necessitated offering a Russian language survey alternative to encourage this group to participate. Both the paper copy and web instruments were offered in the two languages.

Data were collected through a two-phase design, where the screener was used to determine if any adult in the household was Jewish; if so, the household was eligible to complete the main questionnaire. Web respondents to the screener continued seamlessly into the main questionnaire, while eligible paper screener respondents were mailed a paper copy of the main questionnaire, but were still offered the option of answering on the web. If the paper screener indicated that the only residents were ages 65 or older, then a shorter version of the paper questionnaire was sent with a larger font size to improve readability, eliminating all questions related to children. Eighty percent of main survey respondents chose to respond via the web.

3.1 Sponsorship

Initially the survey sponsorship was not prominently identified, for two reasons. First, if the JFGP was prominently identified as the sponsor, there was a concern that Jews would be more likely to respond than non-Jews, yielding a biased upward estimate of the proportion Jewish. Second, the JFGP was concerned that the Greater Philadelphia Jewish community had mixed views of the organization, and thus branding it as a JFGP study might dissuade some households from participating in the study. While the initial mailings

did not identify the sponsor, if the respondent checked the frequently asked questions on the website, the JFGP was identified.

The use of materials that did not prominently identify sponsorship was designed to yield an unbiased estimate of the percent of Jewish households, but at the expense of response rate. When additional list sample release groups were invited to participate (after the initial sample release), the cover letters were modified to identify the JFGP as the sponsor. The response rate increased, as did the proportion of eligible households. As a result, estimates of the proportion of Jewish households are only based on the initial release groups so as to remain unbiased.

3.2 Who Is Jewish?

In the 2009 study, two questions were used to identify Jewish households:

- "Is there anyone in the household who considers himself or herself to be Jewish?"
- If no, then he or she was asked if their parents were Jewish and if so, if the respondent "identifies" as Jewish.

Recent research in Jewish demography (Pew, 2013; Charme et al., 2008; Horowitz, 1998) has revealed that there are multiple ways in which some people consider themselves Jewish, and that this determination may change over time. As a result, for 2019 we used a more detailed set of questions to determine if the household qualified as Jewish.

- "**What religion are you?**" (IF JEWISH, ELIGIBLE)
- (IF NO TO THE ABOVE) **"Are you Jewish by religion?" "Are you Jewish by ethnicity or heritage?" "Are you Jewish by culture?"** (IF YES TO ANY, ELIGIBLE)
- (IF PRIOR QUESTION IS NOT JEWISH OR PARTIALLY JEWISH) "**Were you raised Jewish or did you have a Jewish parent?**" (IF YES AND RESPONDENT DID NOT CLAIM ANOTHER RELIGION, ELIGIBLE)
- (IF NO TO ALL OF THE ABOVE) **"Does any other adult in the household consider himself/herself Jewish by religion/ethnicity or heritage/culture or had a Jewish parent?"** (IF YES, ELIGIBLE)

These questions do not necessarily reflect an expansion of the definition of Jewishness relative to 2009, but they do clarify the many ways in which a respondent might identify. We believe this provides a clearer path to identifying all those who are Jewish. Also, by providing a neutrally worded initial question we believe we encouraged all religions to participate in a way that the 2009 questions did not.

Screening for those who were raised Jewish or had a Jewish parent, but who do not currently identify as Jewish (or any other religion) does provide a more inclusive definition of Jewishness. By examining the responses of those who qualified due to this last question, we found that they resemble many others who identified as Jewish via the first three questions. For example, they light Chanukah candles (21%), attend Passover Seder (13%), and attend High Holiday services (7%). While this group only represented 1 to 2 percent of Jews, they behave similarly to some other Jews and we found they were worthwhile to include in estimates of the Greater Philadelphia Jewish population.

3.3 Collecting Data in 2019

Collecting data on the Greater Philadelphia Jewish population in early 2019 posed several challenges. The Tree of Life synagogue attack in Pittsburgh, Pennsylvania took place October 27, 2018. While we were collecting data in Philadelphia, not Pittsburgh, there are close ties between the two communities. During the data collection period (April 27, 2019) the Poway synagogue attack in California occurred, further putting the American Jewish community on edge.

Throughout our data collection period there were almost daily news items about Russian interference with the 2016 election, the Trump administration's close ties with Russia, and possible impeachment. With the household screener offered in English or Russian and vague information about the identity of the survey sponsor, we encountered some suspicion and pushback from sampled households. For example, one sampled household suggested that we're "doing just what the Nazis did" Another household worried that "given the results of the 2016 election, maybe Russian was going to be the second official language of America." We spent considerable time addressing these concerns to gain support and response from households. These reactions also contributed to our decision to identify the survey sponsor for the second and subsequent releases of listed sample.

3.4 Successful Data Collection

A total of 79,486 addresses were sampled, from which 10,787 households completed the screener. There were 2,634 screeners identifying eligible households (at least one Jewish adult) of whom 2,119 completed the main survey. Table 1 provides detailed response rates overall and by stratum.

Table 1: Response rates by stratum and overall

Sampling stratum	*Sample size*	*Screener completes*	*Screener weighted RR*[*]	*Eligible for Survey*	*Survey completes*	*Survey weighted RR*[**]	*Overall RR*
Low eligibility list	5,056	664	13.2%	382	303	78.2%	10.3%
High eligibility list	6,379	1,639	25.6%	1,469	1,220	82.8%	21.2%
Non-list ABS	68,061	8,484	11.7%	783	596	77.6%	9.1%
Overall	79,496	10,787	12.2%	2,634	2,119	78.6%	9.6%

[*] American Association for Public Opinion Research (AAPOR) RR3
[**]AAPOR RR5

Overall (shown in red) 12.2 percent of households completed the screener, with 78.6 percent of those eligible completing the main survey questionnaire. These percentages were similar for both the non-list ABS and low eligibility list strata. The high eligibility list stratum, however, had noticeably higher participation rates, with 25.6 percent completing the screener and 82.8 percent the main instrument. While the non-list ABS and low eligibility list strata had similar response rates, that is not true for eligibility; while only an estimated 12 percent[2] of households in the non-list ABS stratum are Jewish households, 47 percent of those in the low-eligibility list stratum are Jewish households, and 87 percent of those in the high-eligibility list stratum are Jewish households.

[2] Final decisions on which responses to include as Jewish reduced these eligibility numbers from the values reported here, especially for the non-list ABS stratum.

4. Estimating the Size of the Jewish Population

The methodological improvements in the 2019 survey approach resulted in significantly larger estimates of Jewish population in Greater Philadelphia. Table 2 shows the estimates from the 2009 survey, our 2019 estimates using a comparable definition of Jewishness (i.e., without the last question about being raised Jewish or having Jewish parents); the percent change; our best estimate for 2019 (including the more expansive definition of Jewish households); and a 95 percent confidence interval on that estimate.

As mentioned previously, the addition of the last screening question did not have a large impact on the estimated size of the Jewish population. The number of Jewish households in 2019 is almost 60 percent larger, and the number of people in such households and the number of Jewish adults both are almost 70 percent larger than the 2009 estimates. During this same time period, the overall population of the five-county area increased by only 3.5 percent.[3] While it is possible that the Jewish population has been increasing faster than the general population, that alone is likely not the only explanation for the large difference since 2009; we attribute most of this change to the improved methodology.

Table 2: Jewish population estimates

	2009	*2019 Standard*	*Percent change*	*2019 Inclusive*	*Confidence interval*[*]
Jewish households	116,700	190,900	+59%	194,200	(151,500-237,000)
People in Jewish households	251,400	437,400	+69%	445,800	(347,300-544,200)
Jewish adults	177,800	306,500	+68%	308,700	(238,200-379,200)
Jewish children	36,900	41,000	+13%	42,500	(27,200-57,700)

[*] 95 percent confidence interval for the 2019 inclusive estimate

5. Summary

The 2019 survey of the Jewish community of Greater Philadelphia represented a major change from past surveys. It was the first study of a local Jewish community in the United States to use ABS. It also used improved language for identifying Jews. As a result, we did the following:

- Expanded coverage to include virtually all households in the Greater Philadelphia area;
- Improved response rates;
- Obtained better geographic targeting of communities of interest;
- Used neutral, unbiased language to identify Jewish households; and,
- Employed a more inclusive definition of Jewish households.

We strongly urge that future studies of the Jewish community also include these methodological improvements. There are many decisions that will have to be considered for the unique characteristics of each local community, some of which are mentioned here.

[3] Census data accessed October 23, 2019. Available at: https://data.census.gov/cedsci/.

- There is a tradeoff between using the lists of known Jews or likely Jews and the non-list ABS sample. While it is more cost effective to obtain completed responses from the list sample, they represent only a portion of the Jewish community, namely, those who are already involved or connected in some way. The non-list ABS sample is less-efficient (in terms of raw numbers of completed surveys), and therefore more expensive approach; but it tends to identify Jewish households that are less connected to Jewish institutions, thus improving the representation of the Jewish population and adding more new information than other surveys
- It may not be worthwhile to include low eligibility lists. Low eligibility lists (purchased "likely Jewish" names and lists of college students) are not as useful at targeting Jewish households. Only if there is limited coverage of the Jewish population on high eligibility lists, or if college students are of particular interest, are these lists likely to be worthwhile.
- Sponsorship should be carefully considered in communication materials to list and non-list ABS samples. Identifying a Jewish organization as the sponsor can bias participation, but not including a recognized sponsor can adversely impact response rates. Ideally, a neutral organization (or group of sponsors crossing religious boundaries) can be named as the sponsor.
- Screening questions need to be designed carefully to capture a broad reflection of Jewish households. It is important to recognize that Jewish identity encompasses not only religion, but also ethnicity, heritage, culture, and upbringing.
- Offering the survey in multiple language should be considered in the context of current events. The decision on which languages to offer for both the screener and main study is typically made based on the population being surveyed. However, it is important also to consider the current political environment and how the general population will react to this choice of languages. They may not understand the rationale and may infer other meanings that can affect response rates.
- Multiple modes of data collection are preferable to offering a single mode of response. We found that all age groups participated via the web, but some populations lack access to the internet, are not comfortable responding to surveys online, or lack the understanding of how to do so. However, Montaquila et al. (2013) have shown that mail is more effective than telephone for nonresponse follow up in ABS studies, but it may be advantageous to offer both options to those not comfortable with the web.

6. References

Battaglia, M .P., D. A. Dillman,, M. R. Frankel, R. Harter, T. D. Buskirk, C. B. McPhee, J. M. DeMatteis, and T. Yancey. 2016. Sampling, data collection, and weighting procedures for address-based sample surveys. *Journal of Survey Statistics and Methodology*, *4*(4), 476-500.

Blumberg, S. J., and J. V. Luke. 2019. Wireless substitution: early release of estimates from the National Health Interview Survey, July-December 2018. Available at: https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201906.pdf. Retrieved on: December 6, 2019.

Blumberg, S.J., and J. V. Luke. 2009. Wireless substitution: early release of estimates from the National Health Interview Survey, January-June 2009. Available at: https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200912.htm. Retrieved on: December 6, 2019.

Charmé, S., B. Horowitz, T. Hyman, and J. S. Kress. 2008. Jewish identities in action: An exploration of models, metaphors, and methods. *Journal of Jewish Education*, *74*(2), 115-143.

Horowitz, B. 1998. Connections and journeys: Shifting identities among American Jews. *Contemporary Jewry*, *19*(1), 63-94.

Montaquila, J. M., J. M. Brick, D. Williams, K. Kim, and D. Han. 2013. A study of two-phase mail survey data collection methods. *Journal of Survey Statistics and Methodology*, *1*(1), 66-87.

Olson, K., J. D. Smyth, R. Horwitz, S. Keeter, V. Lesser, S. Marken,, N. Mathiowetz, J. McCarthy, E. O'Brien, J. Opsomer, D. Steiger, J. Su,, Z. T. Suzer-Gurtekin C. Turakhia, and J. Wagner. 2019. AAPOR Report on Transitions from Telephone Surveys to Self-Administered and Mixed Mode Surveys (released 10/23/2019). Available at: https://www.aapor.org/Education-Resources/Reports/Transitions-from-Telephone-Surveys-to-Self-Adminis.aspx

Pew. 2013. A Portrait of Jewish Americans. Available at: https://www.pewforum.org/2013/10/01/jewish-american-beliefs-attitudes-culture-survey/