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Foundation of Our Future:
Portrait of Jewish Baltimore

BALTIMORE'S JEWISH COMMUNITY STUDY 2020

TECHNICAL APPENDICES: METHODOLOGY ONLY

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100 1920 2020 **The Associated** *Jewish Federation of Baltimore*

The Cohen Center for Modern Jewish Studies (CMJS), founded in 1980, is dedicated to providing independent, high-quality research on issues related to contemporary Jewish life.

The Cohen Center is also the home of the Steinhardt Social Research Institute (SSRI). Established in 2005, SSRI uses innovative research methods to collect and analyze sociodemographic data on the Jewish community.

Appendix A: Methodology

Overview

CMJS/SSRI has developed innovative methods to estimate the size and characteristics of the Baltimore Jewish community. As survey techniques have become more refined, the barriers to reaching respondents have become increasingly difficult to overcome. Researchers typically experience limitations in reaching respondents due to the proliferation of survey research, the prevalence of cell phones, and caller ID/blocking. Low-incidence populations are particularly hard to reach using the traditional method of random digit dialing (RDD) because the likelihood of reaching someone in the target population depends upon the size of that group relative to the population as a whole. To address these barriers, CMJS has utilized a research design that incorporates two innovations:

- Data from an extended sample of email-only respondents
- Use of organizational data to correct for sampling bias

The research design for the Baltimore Jewish Community Study utilizes random sampling from an identified frame, or list, of the known population. Local Jewish organizations provided their own lists. These lists were combined with a purchased list of likely Jewish households within the geographic area and were then deduplicated. The combined list constituted the sampling frame from which a primary random sample of households was drawn. Because this primary sample was a random selection from the overall frame, it is assumed to be representative of the entire frame. For that reason, data collected from the random sample were used to estimate overall population characteristics.

To supplement the primary random sample, a second sample was drawn from a frame consisting of the remaining households with email addresses. Information from these households increased the amount of data available from populations of interest and allowed for more detailed analysis of the characteristics of the community.

1. Sampling Frame

The 2019 Baltimore Jewish Community Study implemented a dual-mode Internet and telephone survey to reach year-round and seasonal residents of the Baltimore area. In the absence of an area probability or RDD frame, we built a sampling frame from the combined mailing lists of Jewish organizations in Baltimore and Howard County. The numbers and types of organizations included in the lists are shown in Table A1.

Table A1. Composition of strata

Number	Type	Organization
1	Families with children	9 organization lists
2	Young adults	6 organization lists
3	Synagogues	19 organization lists
4.1	Other lists, higher Jewish probability	20 organization lists
4.2	Other lists, lower Jewish probability	16 organization lists
5	Ethnic names	MelissaData (data purchase)

In order to find any Jewish-connected households not already known to the organized Jewish community, a list of possible Jewish households was purchased from a commercial data broker, MelissaData, and was added to the sample. This list identifies households based on their geography, and then further restricts households to those with common Jewish last names and first names. This list, referred to as the "ethnic names list," consisted of 26,521 households that were identified as likely to include someone who was Hebrew-speaking or Jewish by ethnicity, ethnic group, or religion, and did not appear on an organization's list; these households represented the "unaffiliated" Jewish community. The ethnic names list included an indicator whether a household was likely to have children or not. Households that appeared solely on the ethnic names list, and not on any organization's list, were assigned to separate groupings, called "strata," based on this indicator.

Households appearing in the "Other" organization stratum were further sub-stratified based on probability that households on the organizations' lists were Jewish. Lists from organizations that were judged based on experience with other community studies to be likely to have high rates of non-Jewish households were designated as having lower probability Jewish households (i.e., it was likely a lower proportion of households on the list were Jewish). By contrast, organizations that were similar to organizations in other communities whose lists proved to have very few non-Jewish households were assigned to a higher Jewish probability substratum.

The organizational and purchased lists were combined, cleaned, and deduplicated to ensure that no unique household appeared on the list more than once. Households without any mailing address were removed from the sampling frame because they could not be fully identified. The combined list-based sampling frame consisted of 96,550 households.

2. Sampling Frame Assignment for Simultaneous but Separate Studies

The 2020 Baltimore Jewish Community Study was conducted for The Associated in parallel with a study of the Howard County Jewish community. Because these contiguous communities have overlap in organizational participation, the initial sampling frame was developed by collecting contact lists from Jewish organizations in both federation catchment areas. The section of originating lists was used to develop the sample and weights (see sections 3 and 8 of this appendix). Households that reported living in The Associated's catchment area were directed to a survey designed for the community and are counted as respondents in this study.

3. Sample Design

The sample design for this study accounted for a unique characteristic of the community: This study was conducted in conjunction with a simultaneous but separate study for the Jewish Federation of Howard County. Both communities' members participate in organizations outside of their defined catchment area and therefore may appear on lists of organizations in either areas.

To accommodate these characteristics, the households in the sampling frame were divided into two regions based on household ZIP code: Baltimore, including Baltimore City, Baltimore County, Carrol County, and Harford County, as well as Anne Arundel County; and Howard County. The regional division ensured that the sample would be drawn from both federation catchment areas.

Each region was further divided into six strata based on expected characteristics of the household inferred from the household's appearance on organizational lists. The composition of the six strata is shown in Table A2. Households that appeared on multiple lists were placed in the lowest-number strata for which they were eligible; for example, a household appearing on a "families with children" list (stratum 1), a synagogue list (stratum 3), and the Ethnic Names list (stratum 5) would be assigned to stratum 1.

Once the region and strata assignments were made, a primary sample of 18,976 total potential respondents was randomly selected from across each region/strata cell (Table A2). The sampling rate of each stratum was designed to oversample likely Jewish households and likely households with children in order to maximize the representation of those groups within the final sample.

Concurrent to the primary sample, a backup sample of 5,110 total primary-eligible households was drawn from the remainder of the sampling frame, to be used as needed to ensure the targeted number of completed primary-sample surveys were completed. In the event that households in the backup sample were not needed for the primary sample to reach the targeted number of completed surveys, they would be treated as part of the supplementary sample.

Following selection of the primary and backup samples, an email-only supplement was identified. This sample frame of 84,150 households for the email supplement included all households in the email sub-strata that were not selected into the primary or backup samples. In all, 30,138 of those households were selected into the email-only supplement.

Two synagogues in Howard County were unable to provide lists until after the original sample was drawn; households on these lists not otherwise in the frame were added as a "Replicate 2" and distributed across the primary and supplementary samples, in the Howard County and Baltimore regions. These lists are included in Tables A1 and A2.

The combination of the primary sample and the email-only supplement is referred to as the "full sample." The frame described in Table A2 represents the full combined frame and sample for the Baltimore and Howard County studies.

Table A2. List-based sample size by strata

	Stratum 1	Stratum 2	Stratum 3	Stratum 4.1	Stratum 4.2	Stratum 5	Total
Baltimore Region							
Frame	6,437	1,098	14,330	9,178	20,031	22,720	73,794
Primary	1,400	800	1,400	800	2,400	5,600	12,400
Backup	420	240	420	240	720	1,680	3,720
Supplement	4,087	49	6,619	4,847	9,648	3,914	29,164
Howard County							
Frame	470	227	708	1,321	2,769	3,795	9,290
Primary	400	200	276	1,000	1,400	3,300	6,576
Backup	28	27	120	300	420	495	1,390
Supplement	32	0	280	4	658	0	974
Total (including supplement-only eligible)							
Frame	10,166	2,157	15,038	13,360	29,288	26,521	96,530
Primary	1,800	1,000	1,676	1,800	3,800	8,900	18,976
Backup	448	267	540	540	1,140	2,175	5,110
Supplement	4,119	49	6,899	4,851	10,306	3,914	30,138

4. Survey Instrument and Data Collection

The survey instrument was designed in collaboration with The Associated. The questions were crafted to minimize potential bias and any burden on respondents. Where possible, questions, language, and definitions were adopted from previously published Jewish community survey questionnaires, allowing for greater confidence in their reliability.

The questionnaire was divided into two parts, a screener and the survey itself. The screener section was asked of all respondents to determine eligibility. Any household in the sample was considered eligible if it contained at least one adult aged 18 or older who lived in Baltimore City, Baltimore County, Carrol County, Harford County, or Anne Arundel County for at least part of the year and considered him- or herself to be Jewish. A total of 1,919 households in the primary sample completed the screener and of those, 1,570 were screened into the survey (separate from 50 in Anne Arundel County).

Those who live in Howard County were screened into the separate survey for that community.

Qualifying households proceeded to the main survey, which included sections on basic sociodemographic information, engagement in Jewish life, and perceptions of various aspects of Jewish communal life in Baltimore. In order to minimize the burden on respondents, a series of complex skip patterns ("branching") were created to ensure that respondents were only asked questions that pertained to their specific life situation or experience. The online survey took between 20-30 minutes to complete. Respondents completing the survey over the telephone usually

completed it in 25-40 minutes. However, the amount of time required to complete the survey varied depending on household composition and the degree of detail respondents were willing to offer for open-ended questions.

The survey and CATI interface were programmed by the University of New Hampshire Survey Center. Two modes of data collection were utilized: online and telephone. The online and telephone instruments were identical – when a survey was completed over the phone, the telephone interviewer would fill out the online version.

The survey instrument is presented in the form of a codebook in Appendix D.

5. Field Procedures

Prenotification letters were mailed to the combined primary sample of 18,976 households on April 8, 2019. These letters explained the purpose of the survey and provided each household with a unique link to complete the survey independently online. Households for which one or more e-mail addresses were available also received these letters electronically on April 8, 2019. "Replicate 2" households were invited to the survey on April 23. A sample of the prenotification letter is shown in Appendix E. A survey invitation was sent to one email address for each household. If email messages "bounced" or were undeliverable, another email address from the same household was substituted if available.

After one week, households that had not completed the survey were contacted by telephone. The primary goal of telephone contact was to administer the survey over the phone if the respondent was unable or unwilling to complete the survey online, or if the respondent simply preferred to complete the survey over the phone. If the respondent was unwilling to complete the survey over the phone at the time of the call, he or she was asked for a better time to be called again or for an email address to re-send the link to the survey online. Systematic respondent selection did not take place. The first adult reached in the household was interviewed. Calling began on April 15, 2019, starting with the households for which phone numbers were available but email addresses were not. Calling concluded on July 5, 2019. Ten email reminders were sent for all non-completed surveys during the field period.

Data collection was conducted and supervised by UNH, which was responsible for selecting and training callers, supervising and monitoring calling, tracking dispositions, and sending email reminders. Interviewers and supervisors were trained in survey procedures for this specific project, including the study's sponsor, target population, and eligibility criteria; the survey instrument; pronunciation of Hebrew and Yiddish words; and entering open-ended responses.

In addition to survey-specific training, interviewers also receive general training in telephone procedures and interviewing techniques. Only interviewers who had undergone this basic training worked on the project. Interviewers were provided with paper sheets with frequently asked questions and pronunciation guides, names of Jewish organizations and congregations, and background information on selected concepts.

Callers made up to five attempts to reach all households in the primary sample who did not complete the survey online in response to email requests or who did not have email addresses. The

maximum number of attempts for any one case (across all phone numbers) was nine. Callers offered to conduct survey interviews over the telephone or, if requested, to send the household members their unique link to complete the survey online at their convenience.

Households were contacted repeatedly at different days and times to determine whether available contact information was correct. Households whose available contact information was confirmed to be outdated, who had no contact information, and those for whom the status was uncertain were searched in online public records databases to find updated information. CMJS research assistants searched for additional contact information and added phone numbers to the calling list as they were identified.

The supplementary sample was conducted as an email-only survey that was not accompanied by prenotification letters or phone calls. The survey instrument for the email sample was identical to the one used for the primary sample. Email invitations were sent to the 35,248 households in the backup and supplementary samples on April 8, 2019 with ten reminders on for non-completed surveys during the field period.

To ensure the targeted number of completes was reached, on May 15, the Baltimore-list backup sample was released into the primary sample, and on June 3, 30% of the Baltimore-list supplementary sample was released into the primary sample. This yielded a realized combined primary sample of 31,396 and a realized combined supplement of 22,746.

Data collection ended on July 8, 2019. A cleaned dataset was prepared by UNH.

6. Data Outcomes

In the combined primary sample, 3,537 households completed the screener, with 2,347 screening in and 1,190 screening out (Table A3). The overall response rate was 35.4% for the primary sample (AAPOR RR4). For the combined list-based sample (primary plus supplement), 5,382 households completed the screener, and of those, 3,890 were screened into the full survey (Table A4). The overall response rate was 23.2% (AAPOR RR4).

Table A3. Outcome rates by strata for overall primary sample, combined studies (AAPOR)

Strata	Sample Size	Screened In	Screened Out	Response Rate 4	Refusal Rate 2	Cooperate Rate 1	Contact Rate 2
Families with children	3,445	770	68	45.6%	17.5%	62.3%	71.8%
Young adults	1,255	213	85	26.4%	21.2%	46.4%	56.4%
Synagogues	4,034	447	75	43.9%	24.1%	57.6%	74.2%
Other lists, high Jewish density	3,494	373	100	45.5%	19.4%	63.5%	70.7%
Other lists, low Jewish density	7,414	347	375	44.4%	17.7%	64.8%	67.4%
Ethnic names	11,754	197	487	22.8%	21.9%	47.3%	47.8%
Total	31,936	2,347	1,190	35.4%	19.9%	57.1%	61.0%

Table A4. Overall outcome rates by sample type, combined studies

Strata	Sample Size	Screened In	Screened Out	Response Rate 4	Refusal Rate 2	Cooperate Rate 1	Contact Rate 2
Primary	31,396	2,347	1,190	35.4%	19.9%	57.1%	61.0%
Supplement	22,746	1,543	302	8.3%	9.7%	45.0%	18.0%
Total	54,142	3,890	1,492	23.2%	17.9%	52.3%	43.5%

In the primary sample, 1,993 households completed the screener and branched into the Baltimore survey; of those, 1,515 were screened into the full survey (of which 1,449 were Jewish households that provided enough data for analysis and 50 lived in Anne Arundel County).

Table A5. Baltimore by sample type

	Primary	Supplement	Total
Eligible households	1,449	1,148	2,597
Ineligible households			
Screen out	783	99	882
Incomplete	478	153	631
Reclassified screened out	16	12	28
Anne Arundel households	50	49	99
Total	2,776	1,461	4,237

A total of 3,355 respondents screened into the Baltimore survey. Twenty-eight respondents were initially screened into the survey but after inspection of responses were determined to include no Jewish adults or that the adults were Messianic Jews and therefore ineligible for the survey.[1] An additional 631 respondents screened into the survey but did not complete the household roster, and so were not included in analyses. In addition, 99 households from Baltimore organization lists were found living in Anne Arundel County. The final sample consisted of 2,597 households (Table A5).

7. SSRI Data Synthesis for Population Estimates

Since 2005, the American Jewish Population Project (AJPP) at the Steinhardt Social Research Institute (SSRI) has identified and collected hundreds of nationally representative surveys of the US population to produce estimates of the Jewish population in the continental United States, its states, metropolitan areas, and counties (or groups of counties). These estimates provide an independent, external reference for the basic demographic profile of the Jewish population. This population profile serves as a point of reference for the community as a whole and for those who conduct targeted surveys of the population and have no frame of reference for evaluating the representativeness of their survey sample. Details of the methods are reported elsewhere.[2]

The data synthesis method demonstrates how an auxiliary data source can be constructed to provide independent, census-like estimates of the size and characteristics of the adult Jewish by religion (JBR) population in the United States at the county level.[3] These estimates of the adult JBR population may then be used to generate new post-stratification weights. These new post-stratification weights are then applied to the targeted study of the Jewish population.

Summary of Data

The full sample of surveys in the AJPP database spans the years 2000 to 2019, with an additional sample of surveys from 1988 to 1992, for more than 900 independent samples and a total combined sample size of more than 1.4 million respondents, of whom over 34,000 identify as Jewish by religion. Samples include those conducted as part of a series, such as the American National Election Studies,[4] the survey of Religion and Public Life conducted annually by the Pew Forum on Religion and Public Life, and the Cooperative Congressional Election Study (CCES).[5] In addition, the sample includes surveys conducted regularly by major news organizations (CBS, New York Times). Where a single survey may have included multiple sampling methods or frames (e.g., landline versus cellphone), each is treated as a separate independent sample, with unique identifiers to indicate series membership.[6] For surveys that included oversamples, only the representative portion of the samples were included in the analyses unless the oversamples were of groups estimated directly in the population models – for example, age or race – in which case the oversample contributed only to estimation of that particular group.

All of the surveys in the sample provide data on those who identify as Jewish by religion (JBR), which is the largest proportion of the Jewish population and therefore serves as the baseline group for generating population estimates. A smaller number of surveys include assessment of religious upbringing or parents' religious/ethnic identification, or non-religious Jewish identification (for instance, "Do you consider yourself Jewish?") in addition to current religious affiliation.[7] Often the religious identification question is asked as "What is your religion? Is it Protestant, Roman Catholic, Jewish, something else, or no religion?" Nearly all include Jewish as one of the discrete options. An increasing number of surveys provide no discrete options, asking simply, "What is your religion, if any?", and record all self-generated responses to the question. Question wording is recorded to examine whether there are differences in Jewish population estimates across the surveys. Most of the surveys specifically included a "no religion" option (none, non-religious, atheist, or agnostic). Recent research has suggested that the inclusion of none as a specific option increases the proportion of those who identify as "no religion."[8] Given that a substantial proportion (up to 25%) of the national

Jewish population might identify as no religion when asked about religion, this aspect of question wording was recorded. This is to see if (1) such question wording is associated with lower estimates of Jewish identification by religion, and (2) if higher proportions identifying as "no religion" are associated with lower estimated proportions of Jewish identification overall.

The present report is based on a target analysis of the Greater Baltimore area which included the following counties in Maryland: Baltimore city, Baltimore County, Anne Arundel County, Howard County, Harford County, and Carroll County. The analysis included data from a subset of 137 national samples that were conducted between the years 2012 and 2019. The subset sample included 1,975 respondents from the Greater Baltimore area of whom 92 identify as Jewish by religion.

Modeling

The full model specification included random effects for demographics and county. Demographic variables include age (18-24; 25-34; 35-44; 45-54; 55-64; 65+), race/ethnicity (Non-Hispanic White; Non-Hispanic Black; Hispanic; Other), sex (Male/Female), and educational attainment (Non-College / College). These variables mirror the categories used in the national data synthesis model.

Greater Baltimore Jewish Population Estimates

Results from the model provide overall population estimates as well as estimates of the distribution of Jews by demographic groupings (age, race, county, etc.) for the combined counties in the greater Baltimore area.

The overall estimate of the adult population who identify as Jewish by religion in the Greater Baltimore area is 72,000 (95% CI: 58,400 to 86,700) corresponding to 3.4 % (95% CI: 2.8% to 4.2%) of the adult population in the same area. Distributions within the Jewish population varied by age, education and race. Seventy-one percent of the Jewish by religion adults in the Greater Baltimore area live in the combined area of Baltimore county and Baltimore city. The estimate of the adult population who identify as Jewish by religion in this area is 51,200 (95% CI: 40,700 to 63,200) corresponding to 4.7% (95% CI: 3.7% to 5.8%) of the adult population in the same area.

Table A6. 2019 Greater Baltimore Population Estimates for Jewish Adults by Age, Education, and Race

	All Adults [a]		Jewish Adults [b]				
	Pop.	Pct. Within	Percentage of all Adults (CI)		Pop.	CI: Low	CI: Hi
Greater Baltimore [c]	2,084,191		3.4	(2.8,4.1)	72,000	58,400	86,700
Age							
18-24 years	212,240	0.10	2.5	(1.5,3.7)	5,300	3,200	7,900
25-34 years	394,052	0.19	3.5	(2.5,4.7)	13,700	9,800	18,500
35-44 years	344,527	0.17	2.6	(1.7,3.8)	8,800	5,600	12,900
45-54 years	357,063	0.17	3.3	(2.3,4.4)	12,100	8,700	16,200
55-64 years	366,854	0.18	4.2	(3.1,5.4)	15,400	11,400	19,600
65+ years	409,455	0.20	4.1	(3.2,5.3)	16,600	12,700	21,400
Education							
Non-College	1,326,892	0.64	1.7	(1.2,2.3)	22,800	15,800	30,900
College Grad	757,298	0.36	6.6	(5.3,8.2)	49,200	39,200	61,200
Race							
White, non-Hispanic	1,268,593	0.61	5.3	(4.3,6.4)	68,300	55,500	82,100
Black, non-Hispanic	574,345	0.28	0.3	(0.1,0.7) !	1,700	500	3,900
Hispanic	91,733	0.04	0.7	(0.2,1.6) !	600	200	1,400
Other non-Hispanic	149,519	0.07	0.9	(0.4,1.6)	1,300	500	2,400
Area							
Baltimore Area [d]	1,086,963	0.52	4.7	(3.7,5.8)	51,200	40700	63,200
Baltimore outlying [e]	997,158	0.48	2.1	(1.3,3.0)	20,800	13200	29,800

Notes:
a) Source: Census Population Estimates Program, 2018. Adjustment for education made using ACS 2017 and adjustment for household population made using 2010 Census.
b) 'Jewish Adults' Includes adults who identify their religion as Jewish.
c) Baltimore City, Baltimore County, Carroll County, Harford County, Howard County, Anne Arundel
d) Baltimore City and Baltimore County
e) Anne Arundel County, Howard County, Harford County and Carroll County
!) Coefficient of Variation larger than 30, Interpret data with caution.

Estimating the number of JNRs (Jews of no religion)

The next step in estimating the size of the adult Jewish population was to estimate the number of adult JNRs. Estimates of the number of JNRs are not directly available from the data synthesis and must be approximated from other sources. We used a ratio of JNRs to JBRs derived from the Pew study of American Jews.

The resulting target estimates for JBR and JNR adults are show in Table A8. The resulting proportion of JNRs to JBR adults was 0.25.

Table A7. JBR and JNR targets for postestimation

	JBR Adults	JNR Adults	Total
Baltimore City and Baltimore County	57,129	14,282	71,411
Baltimore City, Baltimore County, Carrol County, Harford County	59,783	14,946	74,729

8. Weighting

Overview of weighting procedures used

The purpose of developing survey weights for the sample is to adjust the survey data so that they will represent the population from which they were drawn. This is done in two ways: base weights, which are based on sample design, and poststratification weights, which are adjustments to external benchmarks.

For base weights, the data are adjusted to match the sampling frame by calculating the strata-specific probabilities of selection into the sample and rates of response. By selectively adjusting weights upward (for respondents from strata in which households were less likely to be selected or to respond) and downward (for respondents from strata in which households were more likely to be selected or to respond), the resulting weights adjust the data to match the frame from which they were drawn.

Poststratification, the second phase of weighting, adjusts the data to match known population parameters. In this case, the known parameters that were utilized were the Enhanced RDD estimates of the JBR adult population and their age distribution, and the JNR estimate, as described in the previous section. The number of children currently enrolled in Jewish early childhood programs, day schools, and part-time schools, the number of donors to the Associated, and the number of synagogue members are provided by local organizations. After applying the base weights, the sample is adjusted again to match these parameters. This step yields the primary sample weights for households and respondents.

The weighted primary sample was used to estimate the size of the adult Jewish population for multiple categories of religious identity as well as for the distribution of Jewish denominational affiliation.

For the supplemental sample, base weights were calculated for the email portion of the frame based on differential probability of selection and response. After applying base weights, poststratification weights were calculated to adjust the full sample to the JBR and age estimates from the data synthesis, the number of children in day school, as well as the JNR estimate and denominational affiliation calculated from the primary sample.

At the end of the process, a datafile was created with one record per household. In this file, each record has four weights:

1) wtprimhh: the weight of the household for the primary sample
2) wtfullhh: the weight of the household for the full sample
3) wtprimresp: the respondent's individual weight for the primary sample
4) wtfullresp: the respondent's individual weight for the full sample

Design and base weights

Base weights were calculated separately for the primary sample and the full sample. Base weights were calculated as the product of the design weight (inverse of the probability of selection into the sample) and the nonresponse weight (inverse of the probability of responding after being selected into the sample).

For the primary sample, data were weighted separately within each sub-stratum by the probability of selection into the sample (design weights) and nonresponse. To calculate the design weight, the preliminary frame size was adjusted to account for the presumed ineligibility of a proportion of the households in the sample frame. Ineligible households identified during the data collection period of the survey were those households that were found to be duplicates, deceased, or infirm.

The adjusted frame size for each stratum was calculated as:

Adjusted frame size = Frame size × (Number eligible households ÷ Number selected households)

The design weight for each stratum was calculated as:

Design weight = Adjusted frame size ÷ Number eligible households

Respondents were those who partially or fully completed the survey. Partial surveys were those in which the screening data were completed (whether the respondent was screened in or out). The nonresponse weight for each stratum was calculated as:

Nonresponse weight = Number eligible households ÷ Number respondent households

The base weight was calculated by multiplying the design weight by the nonresponse weight:

Base weight = Design weight × Nonresponse weight

Poststratification

In order to adjust the sample to account for the known population of Jews in the Baltimore area, the process of poststratification was used.[9]

In order to adjust to the number of JBR adults, the survey data were reviewed based on responses to religion questions for each adult in the household. Each adult received a preliminary designation of Jewish by religion (JBR), Jewish not be religion (JNR), Jews of multiple religions (JMR), Jewish

background (JB), Jewish affinity (JA), or not Jewish. All households with no JBR, JNR, or JMR adults were classified as non-Jewish and reclassified as screened out of the sample.

The first stage of the poststratification was conducted on an individual rather than a household level.[10] The file was converted to an individual-level file with one record created for each adult in the household. The weights of the individual records initially were set at the weights of the household record, resulting in a total weight that added up to the number of individuals rather than the number of households.

The individual records were poststratified to match the JBR and JNR counts. Individuals in the data file who were JNR or JMR were adjusted to the JNR estimates. The ages, genders, and educational attainment of the JBR adults were adjusted to match the JBR age estimates by geography. Characteristics of JNRs, and all of non-Jewish adults, were derived from the base weights.

The result of this step were *interim individual* poststratification weights for each individual adult. Because further poststratification weights were conducted at the household level, the *interim individual weights* were converted to preliminary household weights by taking the mean of all of the individual poststratified weights for all adults in the household for the respondent record.[11] All records for non-respondents were dropped.

Poststratifying to known parameters

The second stage of postestimation applied to households rather than individuals. At this stage, we further poststratified the sample using known parameters of the Jewish community: day school enrollment, part-time school enrollment, pre-school enrollment, synagogue membership, and donating to the local Jewish federation. To make use of these numbers, the education enrollment numbers needed to be converted to a number of households that they each represented.

Local schools and the state department of education provided estimates of 5,270 children enrolled in Jewish day schools, 1,600 in Jewish part-time schools, and 1,350 children in Jewish early childhood centers. To use this estimate for individual adult weights, we estimated the number of households that these figures represented and the number of adults in those households.

For each household, we categorized it as a day school household if any children were enrolled in day school and a part-time household if any children were enrolled in part-time school. We coded synagogue households if they were members of an Orthodox, Conservative, Reform, or other denominational "brick-and-mortar" synagogue. Households that said they donated to a local Jewish federation within the past year were coded as donors.

For households that had any children in school we estimated:

Mean (weighted) day school (DS) students per DS household
Mean (weighted) part-time school (PT) students per PT household
Mean (weighted) early childhood school (EC) students per EC household

To estimate households, we used the following formula:

DS household count = (DS students total ÷ mean DS students per household)
PT household count = (PT students total ÷ mean PT students per household)
EC household count = (EC students total ÷ mean EC students per household)

For synagogue households, membership estimates provided by the synagogues in the catchment area indicated that there were 6,900 households belonging to Orthodox synagogues, 4,100 to Conservative, 2,300 to Reform synagogues, and 200 to other synagogues.

The Associated provided a figure of 3,400 annual campaign donors.

The last stage of the poststratification of the primary sample was to adjust the number of households to match the early childhood households, day school households, part-time school households, denominational synagogue households, and federation donor households. The results of this step yielded the *primary household weight.*

Respondent weights

Weights for individual respondents, *primary respondent weights*, were created for analysis of individual-level characteristics. Respondents were poststratified to represent all adults in the population.

Using the *primary household weights*, estimates were generated for the total number of adults for the following parameters:
- Jewish type (JBR, JNR, JMR) or non-Jewish
- Age, gender, and education
- Jewish denomination (Orthodox, Conservative, Reform, Other, None)
- Adults in day school household
- Adults in part-time school household
- Adults in early childhood school household
- Adults in synagogue household (Orthodox, Conservative, Reform, No specific denomination)
- Adults in federation donor households
- Geography

The starting weight for the respondent poststratification was the *interim individual weight* for the respondent. This was poststratified using the parameters listed above to yield the *primary respondent weight.*

Weights for the full sample

For the full sample, base weights were calculated differently than for the primary sample, but the poststratification processes were similar. The full sample was a combination of the primary and supplementary (email-only) samples. All list-based households in the frame were eligible to be selected into the primary sample, but only households with email addresses could be selected into the supplement. Furthermore, households in the supplement received a lower level of effort than did those in the primary, resulting in different probabilities of response.

Base weights for the primary and supplementary samples

The design weight for each email stratum was calculated as:

Design weight = Email frame size ÷ (primary email sample + supplement email sample)

The probability of response depended on the level of effort and therefore was different for primary and supplement subsets.

Nonresponse weight, email primary = Primary email sample ÷ Primary email respondents

Nonresponse weight, email supplement = Supplement email sample ÷ Supplement email respondents

The base weight was calculated by multiplying the design weight by the nonresponse weight:

Base weight = Design weight × Nonresponse weight

Poststratification of full sample

Poststratification of the full sample was conducted in the same way as for the primary sample, as described above. However, all poststratification targets for the full sample were the estimates generated from the primary sample only.

How validation to known benchmarks works

In all sample surveys, a subset of the population is interviewed, and their answers are used to represent the entire population of interest. Researchers assume that if they had interviewed everyone, the results would be the same. Each survey respondent "represents" a group of people who did not answer the survey. This approach works if the people who respond to the survey are a representative sample of the whole population.

In reality, survey respondents are not perfectly representative of the whole population. Some people are easier to reach by phone or email; some people are more willing to participate in the survey because they have more time for the task or interest in the subject. In surveys of the Jewish community, people who are more involved in the community are generally more willing to participate in the survey. How can researchers correct for this problem, known as bias?

This problem is not unique to surveys of the Jewish community. For surveys of the general public, such as election polls, data from the United States Census and other sources are used to "correct" for bias and adjust the results to match the population of interest. In the case of Jewish community

studies, census data are not available, so researchers can use available administrative data as "benchmarks" to correct for bias. Here is an example:

Assume there are 200 people in the Jewish population and researchers interview 10 of them. The researchers assume that these 10 people's responses would be proportionally similar to what they would find if they had interviewed all 200 people. If two out of 10 survey respondents (i.e., 20%) answered "yes" to a question, the researchers will assume that 40 out of 200 people in the population (i.e., 20%) would answer "yes" to that same question.

In this example, because there are only 10 interviews, each one "counts" for 20 people in the population. Accordingly, each interview has a "weight" of 20.

Table A8. Illustration of survey weights

	Respondent	Weight	Population total=200
1	👤	20	
2	👤	20	
3	👤	20	
4	👤	20	
5	👤	20	
6	👤	20	
7	👤	20	
8	👤	20	
9	👤	20	
10	👤	20	

Now suppose that the researchers asked each interviewee two questions:

-   Are you a member of a synagogue (yes/no)?
-   Do you ever light Shabbat candles (yes/no)?

In Table A9, respondents who light Shabbat candles are designated with a *. Respondents who are synagogue members are shown in blue; nonmembers are shown in red.

Table A9. Survey weights with responses

	Respondent	weight	Population total=200
1	👤	20	👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤
2	👤	20	👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤
3	👤	20	👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤
4	✳	20	✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳
5	✳	20	✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳
6	✳	20	✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳
7	👤	20	👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤
8	👤	20	👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤
9	👤	20	👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤 👤👤👤👤👤
10	✳	20	✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳ ✳✳✳✳✳
Those who light Shabbat candles are designated with a ✳; those who do not are designated with a 👤. Synagogue members are shown in blue; nonmembers are shown in red.			

Based on analysis of this example, 60% of the population are synagogue members, and 40% light Shabbat candles. The researchers would conclude that 120 of the 200 people in the population are synagogue members and 80 out of 200 light Shabbat candles.

Now suppose the researchers approached each of the synagogues to ask how many members they had, and the synagogues report that there are only 60 members and 140 nonmembers. The researchers can use this benchmark information to correct their survey results by adjusting the survey weights.

Step 1: The original survey weight for each respondent was 20, yielding an estimate of 120 synagogue members in the population (6 respondents x 20 people each). However, based on the benchmark information, the researchers know the actual number is 60. If they adjust the survey weight for each synagogue member respondent to 10, the number of members in the population will be correct. In total, using the adjusted weight, the synagogue member respondents will represent only 60 people in the population (6 respondents x 10 people each).

Step 2: The original survey weight of 20 remains in place for nonmembers, yielding an estimate of 80 nonmembers (4 respondents x 20 people each). The actual number should be 140. If the researchers adjust the survey weight for each of the nonmember respondents to 35, the number of nonmembers in the population will be correct (4 respondents x 35 people each).

Table A10. Adjusted survey weights

	Respondent	Weight	Population total=200
1	🧍	10	🧍🧍🧍🧍🧍 🧍🧍🧍🧍🧍
2	🧍	10	🧍🧍🧍🧍🧍 🧍🧍🧍🧍🧍
3	🧍	10	🧍🧍🧍🧍🧍 🧍🧍🧍🧍🧍
4	✳	10	✳✳✳✳✳ ✳✳✳✳✳
5	✳	10	✳✳✳✳✳ ✳✳✳✳✳
6	✳	10	✳✳✳✳✳ ✳✳✳✳✳
7	🧍	35	(35 person icons)
8	🧍	35	(35 person icons)
9	🧍	35	(35 person icons)
10	✳	35	(35 star icons)

Analysis of the resulting population shows that 30% of the population (i.e., 60 people) are synagogue members, matching the benchmark information provided by the synagogues. However, the adjusted weights can also be used to produce a more accurate estimate of Shabbat candle lighting, even though that was not one of the benchmarks. Before the weights were adjusted, the researchers estimated that 80 people in this population of 200 light Shabbat candles. With the adjusted weights, they now estimate that 65 people in the population light Shabbat candles, which is 32.5% of the population. (To avoid reporting overly precise estimates, CMJS/SSRI typically rounds to the nearest whole number and so would report an estimate of 33%).

This process adjusted survey weights to match known benchmarks derived from administrative data. Through this adjustment, the researchers were able to produce reliable estimates of benchmark data as well as other measures related to those benchmarks. This is a standard technique to minimize survey bias.

Table A11. Summary of findings before and after adjustment

Measure	Before adjustment	After adjustment
Population size	200	200
Number of synagogue members	120	60
% synagogue members	60%	30%
Number of Shabbat candle lighters	80	60
% light Shabbat candles	40%	33%

9. Final Population Estimates

Precise population estimates with confidence intervals

Population numbers presented in the report were rounded so as to avoid overprecision – that is, the misleading implication that our estimates are correct down to the single digit.

The precise population estimates with 95% confidence intervals are shown in Table A10. For example, the best estimate of the total Jewish population is 95,408 people. Given the size of the sample and possible sampling and non-response error, we can be 95% confident that the true value lies somewhere between 83,630 people and 107,187 people.

Table A12. Population Estimates with Confidence Intervals Shown

	Estimate	Lower bound	Upper bound
Total Jews	95,408	83,630	107,187
Adults	92,961	83,087	102,836
Jewish	74,928	67,344	82,511
Non-Jewish	18,034	13,567	22,500
Children	22,513	16,780	28,246
Jewish	20,481	14,883	26,079
Non-Jewish	2,032	681	3,383
Total people	115,474	101,880	129,068
Total households	46,743	42,307	51,179

10. Analysis

All analyses were completed using statistical software Stata, version 16. Unless otherwise noted, all analyses were restricted to Jewish households (in which at least one adult was Jewish) as well as individual Jewish adults and Jewish children who were specifically identified by respondents as being Jewish. Analysis of characteristics of the entire population were based only on the primary sample with appropriate weights applied. All analyses of subgroups or subsets of the population were conducted using the full sample with appropriate weights applied.

11. Margin of Error

Many studies report a margin of error instead of reporting confidence intervals. The margin of error is the 95% confidence interval that would be expected if ALL survey respondents had answered a question; if there were only two response choices; if about half gave each response; and if the survey design had used a simple random sample. Given these conditions, the margin of error is dependent solely on the sample size and population size. Furthermore, the margin of error is only applicable to percentages, not to totals or means.

In our sample, with 1,449 respondents in the primary sample, the margin of error would have been ±2.6% if we had used a simple random sample. Using our stratified random sample design increases the margin of error to about ±5%.

12. Bias and Limitations

Although the study aimed to create a definitive population estimate of the Baltimore Jewish community, some groups were likely undercounted and/or underrepresented. In particular, residents of institutional settings such as hospitals, nursing homes, and dormitories on college campuses, as well as adults who have never associated in any way with a Jewish organization in Baltimore, were less likely to have been identified and contacted to complete the survey. Although we could not produce an accurate count of these individuals, these undercounts were unlikely to introduce significant bias into the reported estimates due to the efforts to reduce bias described above. Where appropriate, we noted the limitations of the methodology

Every effort to create a representative sample was made in order to prevent bias or, where bias was unavoidable, to identify and reduce it. Nevertheless, some groups are particularly likely to be underrepresented in the sample. Most significant among these are unaffiliated Jews (including new residents and intermarried families) and young adult Jews. Young adult Jews are also likely undercounted for other reasons. Young adults in general are notoriously difficult to reach for telephone surveys, in part due to the increasing rate of cell phone-only households and in part because they tend to move more frequently than older adults; both conditions render young adults harder to track.

Newcomers who are not known to the community are very likely undercounted, though they may have appeared on the ethnic names list. Interfaith families and Jews of color may also be underrepresented to the extent that they are unaffiliated and reside in households with directory listings that do not fit the selected ethnic name parameters.

13. Qualitative Coding

The survey included open-ended questions about aspects of Jewish life in which respondents or members of their households were unable to participate due to health issues or financial difficulties, the strengths and gaps within the Jewish community, and ideas for which Jewish experiences respondents find most meaningful. Responses were coded by CMJS/SSRI staff and student research assistants, with at least two researchers coding each question.

Coders were trained to ensure intercoder reliability, stability, and accuracy. Their worked was reviewed on an ongoing basis for quality control. Difficult cases were marked for review by supervisors.

Coding was conducted both deductively and inductively. For each question, coders were given a set of categories to look for in the responses; these categories were based on those used for similar questions from previous studies. However, coders were also instructed to watch for emerging patterns. When a coder believed that a new pattern of responses existed within the data, they reviewed their findings with a supervisor who decided whether the new pattern warranted a new code. When a new code was created, the coders reviewed previously coded entries to check whether the new code would apply to them.

14. Reanalysis of 2010 Study

CMJS/SSRI has spent the past decade developing new tools for more accurate estimation in Jewish community studies. These tools include the use of the AJPP and benchmark data (specifically day school and Hebrew school enrollment, synagogue membership, and donors to Federation) for poststratification weighting. To ensure that comparisons between the 2010 and 2020 studies were as accurate as possible, the 2010 dataset was reweighted using these techniques.

Using the AJPP method for estimating Jewish population size, CMJS/SSRI drew on national studies conducted in the time around the 2010 study to generate a new estimate of the population size. Because AJPP does not derive population estimates from local studies of Jews, it corrects for bias that can result from the use of RDD techniques in local studies. The AJPP model produced an estimate of 71,100 Jewish adults,[12] relatively close to the 2010 study estimate of 71,500 Jewish adults.

Using the new population estimates and benchmarks (specifically Jewish pre-school and day school enrollment, donors to The Associated, and dues-paying synagogue-member households[13]), CMJS/SSRI developed new survey weights for the 2010 dataset. (See section 8 of this appendix for an explanation of how benchmarks are used in survey weighting.) Then, using the revised weights, new estimates of population characteristics were developed for comparison to the present study. This method for reanalyzing the data based on external benchmarks is similar to methods used in other surveys, such as election polls, that adjust findings to match known population data from the census. Any discrepancies between 2010 estimates presented in this study and those presented in the 2010 study report are a result of this reweighting process.