Addressing Unit Missingness in Social Policy Survey Research: Resources for Further Reading

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On October 18–19, 2023, the Administration for Children and Families' (ACF) Office of Planning, Research, and Evaluation (OPRE) hosted the 2023 Methods Meeting, titled *Addressing Unit Missingness in Social Policy Survey Research.*[1] At the convening, experts discussed the reasons for declining survey response rates, the potential for increased nonresponse bias, and the implications of missing data for human services research, programmatic decisions, and policy decision-making. Meeting presenters addressed research design strategies to reduce nonresponse and mitigate the impact of missing data on resulting estimates. They also explored the use of external data sources to supplement and minimize the impact of missing data on surveys.

This document provides a list of resources for readers who wish to learn more about these topics, organized as a series of frequently asked questions. Resources were compiled from speakers' presentations.

WHAT PROBLEMS DOES UNIT MISSINGNESS CREATE FOR SOCIAL POLICY SURVEY RESEARCH?

Unit missingness, or *unit nonresponse*, the focus of the 2023 Methods Meeting, is the failure to obtain any survey information from a respondent. This can occur for a variety of reasons, including the inability to reach an intended respondent, their refusal to participate, or barriers to participation such as illness at the time of the survey.

If unit missingness is higher for some sample member groups than others—for example, individuals with limited internet access compared with individuals with accessible internet access—one group may be underrepresented in the data while another group may be overrepresented. This can exacerbate structural inequalities in research. Survey nonresponse can also introduce *bias* in data if the attitudes, characteristics, and experiences of respondents differ systematically from those of nonrespondents. As a result, survey findings may not

[1] See OPRE's Methods Meetings website at https://opremethodsmeeting.org/ for additional information, including agendas and meeting products.

represent the target population's needs, perspectives, and experiences, therefore limiting the survey's utility for informing important programmatic and policy decisions.

The following resources offer foundational information on the impact of unit missingness on survey data.

1. Groves, R. M., Fowler Jr., F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). *Survey methodology* (2nd ed.). Wiley. https://www.wiley.com/en-br/Survey+Methodology%2C+2nd+Edition-p-9780470465462

2. Groves, R. M., & Peytcheva, E. (2008). The impact of nonresponse rates on nonresponse bias: A meta-analysis. *Public Opinion Quarterly, 72*(2), 167–189. https://doi.org/10.1093/poq/nfn011

3. Groves, R. M., Singer, E., Lepkowski, J. M., Heeringa, S. G., & Alwin, D. F. (2004). Survey methodology. In J. S. House, F. T. Juster, R. L. Kahn, H. Schuman, & E. Singer (Eds.), *A telescope on society: Survey research and social science at the University of Michigan and beyond* (pp. 21–64). The University of Michigan Press. https://psycnet.apa.org/record/2004-15980-002

4. Peytchev, A. (2013). Consequences of survey nonresponse. *The ANNALS of the American Academy of Political and Social Science, 645*(1), 88–111. https://doi.org/10.1177/0002716212461748

The following resources provide additional background information on survey response, nonresponse bias, and response rates.

1. American Association for Public Opinion Research. (2023). Website. https://aapor.org/ [2]

2. De Heer, W., & De Leeuw, E. (2002). Trends in household survey nonresponse: A longitudinal and international comparison. *Survey Nonresponse,* 41, 41–54. https://www.researchgate.net/publication/284051397_Trends_in_Household_Survey_Nonresponse_A_Longitudinal_and_International_Comparison

3. Groves, R. M., & Couper, M. P. (1998). *Nonresponse in household interview surveys*. https://doi.org/10.1002/9781118490082

4. Hedlin, D. (2020). Is there a 'safe area' where the nonresponse rate has only a modest effect on bias despite non-ignorable nonresponse? *International Statistical Review*, 88(3), 642–657. https://doi.org/10.1111/insr.12359

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[2] Standards, guidelines, and a calculator for standardizing response rate computation are available on the American Association for Public Opinion Research website.

5. Merkle, D. M., & Edelman, M. (2009). An experiment on improving response rates and its unintended impact on survey error. *Survey Practice, 2*(3). https://doi.org/10.29115/SP-2009-0013

6. Tourangeau, R. (2017). Presidential address: Paradoxes of nonresponse. *Public Opinion Quarterly, 81*(3), 803–814. https://doi.org/10.1093/poq/nfx031

7. Yan, T., & Curtin, R. (2010). The relation between unit nonresponse and item nonresponse: A response continuum perspective. *International Journal of Public Opinion Research, 22*(4), 535–551. https://doi.org/10.1093/ijpor/edq037

WHAT ARE PROBABILITY AND NONPROBABILTY SAMPLES? HOW IS SAMPLING RELATED TO REPRESENTATION IN SURVEYS?

In social policy survey research, *probability sampling* involves randomly selecting a group of people (a sample) from a larger population so that estimates obtained from the sample can be generalized to the specific population. In *nonprobability sampling*, individuals are not selected at random—for example, they may be selected according to convenience or purpose, or they may self-select into a survey. An example of nonprobability sampling is using an online commercial survey panel to conduct a survey.

Online nonprobability sampling can be a useful, cost-efficient way to conduct exploratory research or obtain rough estimates. However, because it is not known whether the sample represents the population of interest, it is typically not well suited for estimating rare outcomes, assessing subgroup effects, or generating estimates when accuracy is crucial. In addition, because not all members of the population have a nonzero probability of selection, response rates and coverage rates are not well defined, and, therefore, the causes of missingness cannot be determined. Commercial survey panels can introduce additional errors because of bots and other fraudulent responders, which can lead to overestimates of outcomes.

While probability sampling remains the most reliable approach to achieve representative and accurate estimates for a population, unit nonresponse can threaten representation and result in bias. Understanding the reasons for nonresponse (for example, if it is random, driven by design features, or related to demographic characteristics of sample members) and potential relationships between the variable of interest and the response mechanisms is key to identifying potentially sizable biases.

The following resources offer foundational information on probability sampling, nonprobability sampling, and nonresponse.

1. Kennedy, C., Mercer, A., & Lau, A. (in press). Exploring the assumption that online nonprobability survey respondents are answering in good faith. *Survey Methodology*.

2. Kennedy, C., Hatley, N., Lau, A., Mercer, A., Keeter, S., Ferno, J., & Asare-Marfo, D. (2021). Strategies for detecting insincere respondents in online polling. *Public Opinion Quarterly, 85*(4), 1050−1075. https://doi.org/10.1093/poq/nfab057

3. MacInnis, B., Krosnick, J. A., Ho, A. S., & Cho, M. J. (2018). The accuracy of measurements with probability and nonprobability survey samples: Replication and extension. *Public Opinion Quarterly, 82*(4), 707–744. https://doi.org/10.1093/poq/nfy038

4. Särndal, C. E., & Lundström, S. (2005). *Estimation in surveys with nonresponse*. John Wiley & Sons. https://doi.org/10.1002/0470011351

5. McPhee, C., Barlas, F., Brigham, N., Darling, J., Dutwin, D., Jackson, C., Jackson, M., Kirzinger, A., Little, R., Lorenz, E., Marlar, J., Mercer, A., Scanlon, P. J., Weiss, S., & Wronski, L. (2022). *Data quality metrics for online samples: Considerations for study design and analysis*. American Association for Public Opinion Research. https://aapor.org/wp-content/uploads/2023/02/Task-Force-Report-FINAL.pdf

The following resources provide more information on probability and nonprobability samples, examples of their use, and how online nonprobability samples are created.

1. Barlas, F. M. (2021). *Representative research: Assessing diversity in online samples?* [Webinar]. University of Michigan. https://surveydatascience.isr.umich.edu/sites/default/files/Feances%20Barlas%20SLIDES%2011.10.2021.pdf

2. Chang, L., & Krosnick, J. A. (2009). National surveys via RDD telephone interviewing versus the internet: Comparing sample representativeness and response quality. *Public Opinion Quarterly, 73*(4), 641–678. https://doi.org/10.1093/poq/nfp075

3. Dutwin, D., & Buskirk, T. D. (2017). Apples to oranges or gala versus golden delicious? Comparing data quality of nonprobability internet samples to low response rate probability samples. *Public Opinion Quarterly*, *81*(S1), 213–239. https://doi.org/10.1093/poq/nfw061

4. Enns, P. (2022). Do you know where your survey data come from? Outsourcing data collection poses huge risks for public opinion. *The Medium*. https://medium.com/3streams/surveys-3ec95995dde2

5. Erens, B., Phelps, A., Clifton, S., Mercer, C. H., Tanton, C., Hussey, D., Sonnenburg, P., Macdowall, W., Field, N., Datta, J., Mitchell, K., Copas, A. J., Wellings, K., & Johnson, A. M. (2014). Methodology of the third British National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Sexually Transmitted Infections*, *90*(2), 84–89. https://sti.bmj.com/content/sextrans/90/2/84.full.pdf

6. Geraci, J. (2022). *POLL-ARIZED: Why Americans don't trust the polls and how to fix them before it's too late*. Houndstooth Press. https://houndstoothpublishing.com/books/poll-arized/

7. Litman, L., Rosenzweig, C., & Moss, A. (2020). New solutions dramatically improve research data quality on MTurk. *CloudResearch*. https://www.cloudresearch.com/resources/blog/new-tools-improve-research-data-quality-mturk/

8. Lopez, J., & Hillygus, D. S. (2018). *Why so serious? Survey trolls and misinformation*. https://doi.org/10.2139/ssrn.3131087

9. Malhotra, N., & Krosnick, J. A. (2007). The effect of survey mode and sampling on inferences about political attitudes and behavior: Comparing the 2000 and 2004 ANES to internet surveys with nonprobability samples. *Political Analysis*, *15*(3), 286−323. https://doi.org/10.1093/pan/mpm003

10. Mercer, A., & Lau, A. (2023). *Comparing two types of online survey samples*. Pew Research Center. https://www.pewresearch.org/methods/2023/09/07/comparing-two-types-of-online-survey-samples/

11. NORC. (2022). *AP VoteCast: 2022 midterm general election methods statement*. University of Chicago. https://www.norc.org/content/dam/norc-org/pdfs/VoteCastMethodologyStatement%202022%20GE_10252022.pdf

12. Pennay, D., Neiger, D., Lavrakas, P. J., & Borg, K. (2018). *The online panels benchmarking study: A total survey error comparison of findings from probability-based surveys and nonprobability online panel surveys in Australia*. The Australian National University. https://csrm.cass.anu.edu.au/sites/default/files/docs/2018/12/CSRM_MP2_2018_ONLINE_PANELS.pdf

13. Qualtrics. (n.d.). *Fraud detection*. https://www.qualtrics.com/support/survey-platform/survey-module/survey-checker/fraud-detection/

14. Silver, N. (2018). *Which pollsters to trust in 2018*. FiveThirtyEight. https://fivethirtyeight.com/features/which-pollsters-to-trust-in-2018/

15. Vavreck, L., & Rivers, D. (2008). The 2006 cooperative congressional election study. *Journal of Elections, Public Opinion and Parties*, *18*(4), 355–366. https://doi.org/10.1080/17457280802305177

16. Yeager, D. S., Krosnick, J. A., Chang, L., Javitz, H. S., Levendusky, M. S., Simpser, A., & Wang, R. (2011). Comparing the accuracy of RDD telephone surveys and internet surveys conducted with probability and non-probability samples. *Public Opinion Quarterly*, *75*(4), 709–747. https://doi.org/10.1093/poq/nfr020

WHY DO INDIVIDUALS FAIL TO RESPOND TO SURVEYS, AND HOW CAN RESEARCHERS IMPROVE OUTREACH AND RECRUITMENT TO REDUCE NONRESPONSE?

Survey nonresponse may occur because a researcher has failed to reach a sampled person (e.g., because contact information was inaccurate or calls were not answered) or because the sampled person did not agree to participate. Nonresponse may also be due to language, ability, or technological barriers to completing the survey or an unwillingness or inability to participate.

Multiple strategies can be applied to reduce nonresponse. One is using a mix of modes to diversify and tailor contact with the sample when possible. Different individuals may be more receptive to certain modes (or certain modes may not be possible for some—for example, those who do not have internet access cannot access web surveys). Specialized protocols for different groups based on historical analyses (known as a responsive design approach) can increase appeal and reach to heterogenous populations. If response rates are different across subgroups during the course of data collection, a responsive survey design that shifts effort and resources to sample members who are underrepresented may help reduce those differences. This approach may include developing stopping rules or limiting the effort to pursue sample members when it is no longer likely to be fruitful. Researchers may also use techniques such as respondent-driven sampling to identify and recruit hard-to-survey populations.

The following resources offer foundational information on theories of nonresponse.

1. Groves, R. M., Cialdini, R. B., & Couper, M. P. (1992). Understanding the decision to participate in a survey. *Public Opinion Quarterly, 56*(4), 475–495. https://doi.org/10.1086/269338

2. Peytchev, A., Riley, S., Rosen, J., Murphy, J., & Lindblad, M. (2010). Reduction of nonresponse bias through case prioritization. *Survey Research Methods, 4*(1), 21–29. https://doi.org/10.18148/srm/2010.v4i1.3037

3. Singer, E. (2011). Toward a benefit-cost theory of survey participation: Evidence, further tests, and implications. *Journal of Official Statistics, 27*(2), 379–392. https://www.researchgate.net/publication/289473256_Toward_a_Benefit-Cost_Theory_of_Survey_Participation_Evidence_Further_Tests_and_Implications

4. Tourangeau, R., Edwards, B., Johnson, T. P., Wolter, K. M., & Bates, N. (Eds.). (2014). *Hard-to-Survey Populations*. Cambridge University Press. https://doi.org/10.1017/CBO9781139381635

5. Tourangeau, R., Rips, L. J., & Rasinski, K. (2000). *The psychology of survey response*. Cambridge University Press. https://doi.org/10.1017/CBO9780511819322

The following resources offer information on recruitment methods, respondent-driven sampling, and the use of responsive and adaptive designs to recruit hard-to-survey populations.

1. Axinn, W. G., Wagner, J., Couper, M., & Crawford, S. (2021). Applying responsive survey design to small-scale surveys: Campus surveys of sexual misconduct. *Sociological Methods & Research*. https://doi.org/10.1177/00491241211031270

2. Boelter, J., Dennis, A. M., Vogel, L. K., & Croes, K. D. (2023). Recruiting hard-to-reach populations amid the COVID-19 pandemic. *Survey Practice, 16*(1). https://doi.org/10.29115/SP-2023-0011

3. Coffey, S., West, B. T., Wagner, J., & Elliott, M. R. (2020). What do you think? Using expert opinion to improve predictions of response propensity under a Bayesian framework. *Methoden, Daten, Analysen, 14*(2). https://doi.org/10.12758%2Fmda.2020.05

4. DeBell, M., Krosnick, J. A., Gera, K., Yeager, D. S., & McDonald, M. P. (2020). The turnout gap in surveys: Explanations and solutions. *Sociological Methods & Research, 49*(4), 1133–1162. https://doi.org/10.1177/0049124118769085

5. Goel, S., & Salganik, M. J. (2010). Assessing respondent-driven sampling. *Proceedings of the National Academy of Sciences, 107*(15), 6743–6747. https://doi.org/10.1073/pnas.1000261107

6. Groves, R. M., Singer, E., & Corning, A. (2000). Leverage-saliency theory of survey participation: Description and an illustration. *The Public Opinion Quarterly, 64*(3), 299–308. https://doi.org/10.1086/317990

7. Heckathorn, D. D. (1997). Respondent-driven sampling: A new approach to the study of hidden populations. *Social Problems, 44*(2), 174–199. https://doi.org/10.2307/3096941

8. Lynn, P. (2019). Applying prospect theory to participation in a CAPI/web panel survey. *Public Opinion Quarterly, 83*(3), 559–567. https://doi.org/10.1093/poq/nfz030

9. Rao, R. S., Glickman, M. E., & Glynn, R. J. (2008). Stopping rules for surveys with multiple waves of nonrespondent follow-up. *Statistics in Medicine, 27*(12), 2196–2213. https://doi.org/10.1002/sim.3063

10. Sosenko, F. L., & Bramley, G. (2022). Smartphone-based respondent driven sampling (RDS): A methodological advance in surveying small or 'hard-to-reach' populations. *PLOS ONE, 17*(7), Article e0270673. https://doi.org/10.1371/journal.pone.0270673

11. West, B. T., Wagner, J., Coffey, S., & Elliott, M. R. (2023). Deriving priors for Bayesian prediction of daily response propensity in responsive survey design: Historical data analysis versus literature review. *Journal of Survey Statistics and Methodology, 11*(2), 367–392. https://doi.org/10.1093/jssam/smab036

12. West, B. T., Wagner, J., Hubbard, F., & Gu, H. (2015). The utility of alternative commercial data sources for survey operations and estimation: Evidence from the National Survey of Family Growth. *Journal of Survey Statistics and Methodology, 3*(2), 240–264. https://doi.org/10.1093/jssam/smv004

13. West, B. T., Zhang, S., Wagner, J., Gatward, R., Saw, H. W., & Axinn, W. G. (2023). Methods for improving participation rates in national self-administered web/mail surveys: Evidence from the United States. *PLOS ONE, 18*(8), Article e0289695. ∂ https://doi.org/10.1371/journal.pone.0289695

14. Willis, G. B., Smith, T. W., Shariff-Marco, S., & English, N. (2014). Overview of the special issue on surveying the hard-to-reach. *Journal of Official Statistics, 30*(2), 171–176. ∂ https://doi.org/10.2478/jos-2014-0011

15. Yan, T., & Datta, R. A. (2015). Altering the survey-taking climate: The case of the 2010 US census. *Survey methods: Insights from the field*, 8. ∂ https://doi.org/10.13094/SMIF-2015-00014

16. Yan, T., & Williams, D. (2022). Response burden: Review and conceptual framework. *Journal of Official Statistics*, 38(4), 939–961. ∂ https://doi.org/10.2478/jos-2022-0041

HOW CAN RESEARCHERS MEASURE NONRESPONSE BIAS?

Measuring nonresponse bias in surveys is critical. While researchers often use response rates to evaluate the representativeness of a survey, they are a poor indicator of nonresponse bias. Measuring nonresponse bias directly can inform (1) the researcher's confidence in inferences made from the data, (2) changes in survey design to reduce nonresponse bias, and (3) postsurvey adjustments. Researchers are encouraged to employ several methods to measure nonresponse bias, such as comparing survey estimates with benchmark estimates; comparing respondents and nonrespondents on variables available for the full sample; and collecting relevant auxiliary information, such as administrative data or interviewer observations, to examine differences between respondents and nonrespondents on variables related to outcomes of interest.

The following resources provide information on methods to measure nonresponse bias and suggested tools and approaches:

1. Biemer, P., & Peytchev, A. (2011). *A standardized indicator of survey nonresponse bias based on effect size* [Paper presentation]. International Workshop on Household Survey Nonresponse, Bilbao, Spain.

2. Groves, R. M., & Brick, J. M. (2005). Practical tools for nonresponse bias studies: Short course materials. *Joint Program in Survey Methodology*. https://doi.org/10.1007/978-1-4614-6449-5

3. Groves, R. M., & Magilavy, L. (1984). *An experimental measurement of total survey error* [Paper presentation]. American Statistical Association. http://www.asasrms.org/Proceedings/papers/1984_132.pdf

4. Hedlin, D. (2020). Is there a 'safe area' where the nonresponse rate has only a modest effect on bias despite non-ignorable nonresponse? *International Statistical Review, 88*(3), 642–657. https://doi.org/10.1111/insr.12359

5. Kreuter, F., Olson, K. M., Wagner, J., Yan, T., Ezzati-Rice, T. M., Casas-Cordero, C., Lemay, M., Peytchev, A., Groves, R. M., & Raghunathan, T. E. (2010). Using proxy measures and other correlates of survey outcomes to adjust for nonresponse: Examples from multiple surveys. *Journal of the Royal Statistical Society: Series A (Statistics in Society), 173*(2). https://doi.org/10.1111/j.1467-985X.2009.00621.x

6. Lin, I.-F., & Schaeffer, N. C. (1995). Using survey participants to estimate the impact of nonparticipation. *Public Opinion Quarterly, 59*, 236–258. https://doi.org/10.1086/269471

7. Little, R. J. A., West, B. T., Boonstra, P. S., & Hu, J. (2019). Measures of the degree of departure from ignorable sample selection. *Journal of Survey Statistics and Methodology, 8*(5), 932–964. https://doi.org/10.1093/jssam/smz023

8. Lynn, P. (2017, April). From standardised to targeted survey procedures for tackling non-response and attrition. *Survey Research Methods, 11*(1), 93–103. https://doi.org/10.18148/srm/2017.v11i1.6734

9. Schouten, B., Cobben, F., & Bethlehem, J. (2009). Indicators for the representativeness of survey response. *Survey Methodology, 35*(1), 101–114. https://www150.statcan.gc.ca/n1/en/pub/12-001-x/2009001/article/10887-eng.pdf

10. Schouten, B., Cobben, F., Lundquist, P., & Wagner, J. (2016). Does more balanced survey response imply less non-response bias? *Journal of the Royal Statistical Society Series A: Statistics in Society, 179*(3), 727–748. https://doi.org/10.1111/rssa.12152

11. Wagner, J. (2010). The fraction of missing information as a tool for monitoring the quality of survey data. *Public Opinion Quarterly, 74*(2), 223–243. https://doi.org/10.1093/poq/nfq007

WHAT SURVEY DESIGN AND ADMINISTRATION TECHNIQUES CAN REDUCE UNIT MISSINGNESS?

Survey design features that can reduce nonresponse include using multiple modes to contact and collect data from sample persons, lessening burden by shortening surveys and improving questionnaire design, and providing incentives. *Responsive design* (using data from the field to implement planned changes in data collection) and *adaptive survey design* (implementing different data collection designs across subgroups) provide cost-effective opportunities to control nonresponse bias by enabling researchers to deploy features of these design approaches, targeting resources to select groups.

The following resources explore strategies for designing surveys to reduce nonresponse, including using mixed modes to collect data, offering incentives, optimizing questionnaire design, and using adaptive and responsive design techniques during data collection.

Mixed Mode Data Collection

1. Ansolabehere, S., & Schaffner, B. F. (2014). Does survey mode still matter? Findings from a 2010 multi-mode comparison. *Political Analysis*, 22(3), 285–303. https://doi.org/10.1093/pan/mpt025

2. Bosnjak, M., Neubarth, W., Couper, M. P., Bandilla, W., & Kaczmirek, L. (2008). Prenotification in web-based access panel surveys: The influence of mobile text messaging versus e-mail on response rates and sample composition. *Social Science Computer Review, 26*(2), 213–223. https://doi.org/10.1177/0894439307305895

3. Coffey, S. M., & Elliott, M. R. (2023). Optimizing data collection interventions to balance cost and quality in a sequential multimode survey. *Journal of Survey Statistics and Methodology*, smad007. https://doi.org/10.1093/jssam/smad007

4. DeLeeuw, E. D. (2018). Mixed-mode: Past, present, and future. *Survey Research Methods, 12*(2), 75–89. ∂ https://doi.org/10.18148/srm/2018.v12i2.7402

5. Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons. https://www.wiley.com/en-us/Internet%2C+Phone%2C+Mail%2C+and+Mixed+Mode+Surveys%3A+The+Tailored+Design+Method%2C+4th+Edition-p-9781118921302

6. Olson, K., Smyth, J.D., Horwitz, R., Keeter, S., Lesser, V., Marken, S., Mathiowetz, N. A., McCarthy, J. S., O'Brien, E., Opsomer, J. D., Steiger, D., Sterrett, D., Su, J., Suzer-Gurtekin, Z. T., Turakhia, C., & Wagner, J. (2021). Transitions from telephone surveys to self-administered and mixed-mode surveys: AAPOR Task Force report. *Journal of*

Survey Statistics and Methodology, 9(3): 381–411.
https://doi.org/10.1093/jssam/smz062

7. Szolnoki, G., & Hoffmann, D. (2013). Online, face-to-face and telephone surveys: Comparing different sampling methods in wine consumer research. *Wine Economics and Policy, 2*(2), 57–66. 🔓 https://doi.org/10.1016/j.wep.2013.10.001

8. Virtanen, V., Sirkiä, T., & Jokiranta, V. (2007). Reducing nonresponse by SMS reminders in mail surveys. *Social Science Computer Review, 25*(3), 384–395. https://doi.org/10.1177/0894439307299588

Incentives

1. Albanese, S. M., Edwards, A., Weiss, A., Gonzalez, K., & Kirby, G. (2023). *Supporting survey response through tokens of appreciation: White paper from the Assessing the Implementation and Cost of High-Quality Early Care and Education project* (OPRE Research Report 2023-236). U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation. 🔓 https://www.acf.hhs.gov/opre/report/supporting-survey-response-through-tokens-appreciation

2. Barry, J., Williams, R., & Irvin, E. (2021). Push-to-web testing for the GP Patient Survey. In *Survey Research Methods Centre update* (pp. 43–47). 🔓 https://www.ipsos.com/sites/default/files/ct/publication/documents/2022-01/Ipsos%20Research%20methods%20newsletter_V6_fix%20%283%29.pdf

3. Biemer, P. P., Murphy, J., Zimmer, S., Berry, C., Deng, G., & Lewis, K. (2018). Using bonus monetary incentives to encourage web response in mixed-mode household surveys. *Journal of Survey Statistics and Methodology, 6*(2), 240–261. https://doi.org/10.1093/jssam/smx015

4. Dykema, J., Stevenson, J., Assad, N., Kniss, C., & Taylor, C. A. (2021). Effects of sequential prepaid incentives on response rates, data quality, sample representativeness, and costs in a mail survey of physicians. *Evaluation & the Health Professions, 44*(3), 235−244. 🔓 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9331818/

5. McGonagle, K. A., Sastry, N., & Freedman, V. A. (2022). The effects of a targeted "early bird" incentive strategy on response rates, fieldwork effort, and costs in a national panel study. *Journal of Survey Statistics and Methodology.* 🔓 https://doi.org/10.1093/jssam/smab042

6. Mercer, A., Caporaso, A., Cantor, D., & Townsend, R. (2015). How much gets you how much? Monetary incentives and response rates in household surveys. *Public Opinion Quarterly*, *79*(1), 105−129. https://doi.org/10.1093/poq/nfu059

7. Sherr, S., & Wells, B. (2021). What you see is what you get: Evaluating the use of visible incentives in the California Health Interview Survey. *California Health Interview*

Survey: Making an Impact.
🔓 https://healthpolicy.ucla.edu/publications/Documents/PDF/2021/CHIS-2021-Making-an-Impact.pdf

8. Singer, E., & Ye, C. (2013). The use and effects of incentives in surveys. *The ANNALS of the American Academy of Political and Social Science*, *645*(1), 112–141. https://doi.org/10.1177/0002716212458082

9. Singer, E. (n.d.). *The use of incentives to reduce nonresponse in household surveys*. The University of Michigan, Institute for Social Research, Survey Research Center. 🔓 https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=99a37f7b5f2b4aa5857efe531fc75ce3fe340ab7

10. Zhang, S., West, B. T., Wagner, J., Couper, M. P, Gatward, R., & Axinn, W. G. (2023). Visible cash, a second incentive, and priority mail? An experimental evaluation of mailing strategies for a screening questionnaire in a national push-to-web/mail survey. *Journal of Survey Statistics and Methodology*. https://doi.org/10.1093/jssam/smac041

Questionnaire Design

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WHAT APPROACHES CAN RESEARCHERS USE TO ADDRESS UNIT MISSINGNESS AFTER DATA COLLECTION?

Researchers can adjust for nonresponse bias using postsurvey weighting and imputation techniques. *Survey weighting* addresses unit nonresponse, while *data imputation* addresses item nonresponse. Weighting can compensate for unequal selection probabilities, adjust for unknown eligibility, and adjust for nonsampling errors. If unit missingness is not random, researchers can use *auxiliary data* (ideally variables correlated with survey outcomes alone or correlated with both survey outcomes and nonresponse) to estimate response propensities and create nonresponse adjustment weights. Methods to impute missing data resulting from interviewer errors and respondents' inability or refusal to respond to specific items include

complete case analysis, mean value imputation, hot deck imputation, regression imputation, and sequential regression imputation.

The following resources provide foundational information on nonresponse reduction and adjustment techniques:

1. Little, R. J., & Rubin, D. B. (2019). *Statistical analysis with missing data*. John Wiley & Sons. https://doi.org/10.1002/9781119482260

2. Valliant, R., Dever, J. A., & Kreuter, F. (2018). *Practical tools for designing and weighting survey samples*. Springer. https://doi.org/10.1007/978-1-4614-6449-5

The following resources provide additional information on nonresponse reduction and adjustment techniques:

1. Andridge, R. R., & Little, R. J. (2010). A review of hot deck imputation for survey non-response. *International Statistical Review, 78*(1), 40–64. https://doi.org/10.1111%2Fj.1751-5823.2010.00103.x

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21. Valliant, R., & Dever, J. A. (2018). *Survey weights: A step-by-step guide to calculation*. Stata Press. https://www.stata-press.com/books/survey-weights/

22. Van Buuren, S. (2018). *Flexible imputation of missing data* (2nd ed). CRC Press. https://doi.org/10.1201/9780429492259

23. Van Buuren, S., & Groothuis-Oudshoorn, K. (2011). Multivariate imputation by chained equations. *R Journal of Statistical Software, 45*, 1–67. 🔓 https://doi.org/10.18637/jss.v045.i03

HOW CAN ADMINISTRATIVE DATA BE USED TO ADDRESS UNIT MISSINGNESS?

Missing data can impede survey objectives, reduce sample sizes, and increase standard errors and bias. *Administrative data* are typically data generated as by-products of a nonresearch activity. Administrative data come from numerous sources and vary widely in how documented and curated the data are, the validity and reliability of the data, and the accessibility of the data. Researchers can use administrative data to better understand survey unit missingness and how it might affect estimates. For example, administrative data can be used to identify and correct for undercoverage in a sample frame, to inform nonresponse patterns, to implement tailored data collection methods, and to adjust for survey nonresponse. The more we can know about the missingness, the better we can support future mitigation.

The following resources provide examples of how administrative data can be used to address unit missingness in social policy survey research:

1. Appendices of: Farrell, M., Juras, R., Judkins, D., & Dastrup, S. (2020). *The San Diego workforce partnership's bridge to employment in the healthcare industry program: Three-year impact report* (OPRE Report 2020-105). U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation. https://www.acf.hhs.gov/sites/default/files/documents/opre/sdwp_appendices_3_year_report_08_2020.pdf

2. Subappendix 3 of: Judkins, D. R., Prenovitz, S., Durham, G., Kolenikov, S., Roessel, E., Klerman, J. A., & Koralek, R. (2023). *Health Profession Opportunity Grants (HPOG 2.0) intermediate-term impact report appendix* (OPRE Report 2023-202). U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation. 🔓 https://www.acf.hhs.gov/sites/default/files/documents/opre/OPRE_hpog_appendix_aug2023.pdf

3. Judkins, D., Roessel, E., & Durham, G. (2022). *Career pathways long-term outcomes study: Appendices for PACE six-year impact reports* (OPRE Report 2022-69). U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation. https://www.acf.hhs.gov/sites/default/files/documents/opre/pace%20six-year%20impact%20report%20technical%20appendix%2003-2022.pdf

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