

Survey Critique: Child Vaccinations

I chose to examine a survey conducted by Harvard T.H. Chan School of Public Health regarding public opinions of child vaccinations (Sweeney 2019). The poll found that Americans supported school requirements for parents to get their children vaccinated against preventable diseases, but also showed relatively lower levels of trust in regard to the safety of vaccinations. I will examine the sampling and coverage methods and suggest areas for improvement if the survey were to be repeated.

The survey was comprised of four questions, which were asked using a nationally representative random digit dial telephone sample of adults ages 18 and older in the United States. This poll was targeted more to parents with children under the age of 18 living with them. The first three questions were asked of 1,550 adults – 704 parents and 846 non-parents.

When reviewing this survey, I first considered several of the outcomes that could've occurred during sampling. For example, clustering could have resulted – if both parents of the household shared a phone number, it is possible that only one parent's responses were recorded (instead of both parents). On the other hand, multiplicity could have also occurred, in which someone had multiple phone numbers and was polled twice. The survey authors stated that 1,279 interviews were completed with respondents reached by cell phones and 437 with landlines. It is possible that someone was polled on both their cell phone and landline, which is something that the authors successfully accounted for. They acknowledged that respondents with both a landline and cell phone have a higher probability of being selected and thus used weighting to address this. Lastly, an empty record could have resulted – no name was recorded, and only a phone number was available.

In regard to other potential sampling errors, the survey authors acknowledged a non-response bias, which could be a major source of error, especially within subgroups. It is possible that a certain subgroup has relatively limited access (or limited usage) to telephones compared to other subgroups, which could have skewed results. For example, low-income families are less likely to have a landline than higher-income families (Kastrenakes 2017). This could influence the survey results because this subgroup also has reduced access to proper health care resources, such as vaccination (Ollove 2018). Thus, as a whole, lower-income families might exhibit lower levels of support for school vaccination requirements because their access to such health services is much more limited. As a result, the survey results might be overstated and skewed by showing an inflated percentage of public support for school vaccination requirements.

I believe the authors did a nice job in stating several techniques they utilized in their sampling to diminish the impact of potential biases. They used random-digit dialing, replication of subsamples, and systematic respondent selection within households. Weighting was used as well (reflecting seasonal phone patterns, cell phone versus landline probabilities, parents versus nonparents, actual population proportions, etc.). All of these techniques are very important in ensuring that the sample is representative and that the sample frame accurately reflects the target population. If the sample was not random or representative, the results would lose external validity because they would not be largely generalizable to the United States public (some subgroups may be over/under represented).

If this survey were to be repeated, I would suggest several strategies to diminish the impact of potential coverage errors. First, I would improve the survey format so that people are more likely to respond to the questions, thus addressing the possibility of non-response, which can result in coverage error. Vicente and Reis (2012) argue that the validity of inferences made

from the survey data can be negatively impacted if the non-response rate is high, because the data will be biased. For example, Dillman (2014) discussed how social exchange concepts can be used to encourage response – appealing to positive attitudes, using adult-to-adult styles of communication, focus on the respondent costs and benefits, making the survey interesting and fun, and using incentives, to name a few. In the case of the Harvard vaccination survey, the authors could appeal to the emotional significance of the survey by stressing (especially to parents) how much this information will impact the health of their children and of other children in the United States. The authors could also provide some sort of incentive (gift card, cash, etc.) to encourage responsiveness. Even promising confidentiality and establishing authenticity and legitimacy could help improve response rates.

In addition, utilizing other survey modes may improve coverage. Vincent G. Iannacchione (2011) discussed address-based sampling (ABS) as a superior method of sampling than telephone surveys due to the diminishing coverage associated with surveys administered by phone. As discussed earlier, many do not have cell phones or landlines, so a telephone survey is not likely to reach everyone in the target population. Vicente and Reis (2012) back this up by adding that the magnitude of coverage error depends on each member of the target population having access to the survey mode. Address-based sampling can help address this and has been found to be specifically effective in accomplishing coverage of the household population, which is the target of the Harvard study (Iannacchione 2011). On top of that, Dillman (2014) pointed out that respondents often feel more comfortable responding to some modes over others.

People's comfort with telephone responses has decreased over time (Dillman 2014). Especially because child vaccination is a fairly personal topic for most parents, nonresponse may occur via

telephone, leading to decreased coverage. Utilizing a different survey mode, such as mail or web, may improve coverage.

References

- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method*. Hoboken, NJ: Wiley.
- Iannacchione, V. G. (2011). The Changing Role of Address-Based Sampling in Survey Research. *Public Opinion Quarterly*, 75(3), 556–575. doi: 10.1093/poq/nfr017
- Kastrenakes, J. (2017, May 4). Most US households have given up landlines for cellphones. Retrieved from <https://www.theverge.com/2017/5/4/15544596/american-households-now-use-cellphones-more-than-landlines>.
- Ollove, M. (2018, October 5). How to Boost Vaccine Rates for Low-Income Families. Retrieved from <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2018/10/05/how-to-boost-vaccine-rates-for-low-income-families>.
- Sweeney, C. (2019, September 12). Poll finds public support for school-based vaccination, but limited trust in vaccine safety and public health agencies. Retrieved from <https://www.hsph.harvard.edu/news/press-releases/poll-finds-public-support-for-school-based-vaccination-but-limited-trust-in-vaccine-safety-and-public-health-agencies/>.
- Vicente, P., & Reis, E. (2012). Coverage Error in Internet Surveys: Can Fixed Phones Fix It? *International Journal of Market Research*, 54(3), 323–345. doi: 10.2501/ijmr-54-3-323-345