

Attachment 1a

National Health Interview Survey (NHIS) Follow-up Health Study

Response to exams after surveys

The National Health and Nutrition Examination Survey (NHANES) is conducted annually and includes a household interview and a physical exam and additional interviews completed in the NHANES Mobile Examination Center (MEC). NHANES has conducted methodological studies to investigate the feasibility of in-home health examinations in the past. In 2012, NHANES (OMB 0902-0237) conducted a small methodological project called the Health Measures at Home Study. This study repeated NHANES participants' height, weight, and blood pressure measurements that had already been completed in the MEC, one to three weeks later in their homes. That study provided evidence that those measurements could be taken accurately in the home using portable equipment.^{1,2} Specifically, correlations between the MEC and in-home height and weight measurements were higher than 99%.¹ Furthermore, the percent agreement for high blood pressure across settings was also relatively high (91%).² However, that study did not attempt to collect urine or venous blood in the home. Instead, it collected dried blood spots (DBS). The correlation of HbA1c measured via venous blood draw in the MEC and DBS in the home was high (90%) though lower for HDL cholesterol (64%) and total cholesterol (65%) (Miller et al, 2015).³ These results agreed with previous studies that had found that the quality of cholesterol measurement from venous blood is higher than the quality of that from DBS.^{4,5} Compared to dry blood spot and capillary blood collection, venous blood collection also provides the larger quantity of blood needed to support the variety of assays necessary to describe the nation's health status. HMHS concluded that more research was needed to understand participant recruitment and response rates for home exams that are added to surveys.

Some insight into such response rates is available from other studies, but the results from those studies may not generalize to the full U.S. adult population. Previous research from the University of Michigan Health and Retirement Survey (HRS)⁶; the National Longitudinal Study of Adolescent to Adult Health

¹ Gindi, R. M., Zipf, G., Galinsky, A. M., Miller, I. M., Nwankwo, T., & Terry, A. L. (2014). Comparison of in-home collection of physical measurements and biospecimens with collection in a standardized setting: The Health Measures at Home Study.

² Nwankwo, T., Gindi, R., Chen, T.-C., Galinsky, A., Miller, I., & Terry, A. (2016). Comparison of blood pressure measurements obtained in the home setting: analysis of the Health Measures at Home Study. *Blood pressure monitoring*, 21(6), 327-334.

³ Miller, I. M., Lacher, D. A., Chen, T.-C., Zipf, G. W., Gindi, R. M., Galinsky, A. M., . . . Terry, A. L. (2015). Collection and laboratory methods for dried blood spots for hemoglobin A1c and total and high-density lipoprotein cholesterol in population-based surveys. *Clinica Chimica Acta*, 445, 143-154.
doi:<http://dx.doi.org/10.1016/j.cca.2015.03.028>

⁴ Lacher DA, Berman LE, Chen T-C, Porter KS. Comparison of dried blood spot to venous methods for hemoglobin A1c, glucose, total cholesterol, high-density lipoprotein cholesterol, and C-reactive protein. *Clin Chim Acta* 2013;422:54-8.

⁵ Affan ET, Praveen D, Chow CK, Neal BC. Comparability of HgA1c and lipids measured with dried blood spot versus venous samples: a systematic review and metaanalysis. *BMC Clin Pathol* 2014;14(21):1-9.

⁶ Crimmins, E., Faul, J., Thyagarajan, B., Weir, D. Venous blood collection and assay protocol in the 2016 Health and Retirement Study:2016 Venous Blood Study (VBS). Survey Research Center. University of Michigan, Ann Arbor, MI.

(Add Health)⁷; the Population Assessment of Tobacco and Health (PATH) study⁸; and The National Social Life, Health, and Aging Project (NSHAP)⁹ show overall health exam cooperation rates after a survey interview ranging from 40% to 90% for in-home examinations with national samples. However, these studies are longitudinal in nature, with varying methodologies and study populations (in particular, the HRS and NSHAP only include older adults). It is not clear, therefore, what relationship these response rates would have to the health exam response rates among NHIS participants, who represent a cross-sectional sample of the civilian noninstitutionalized adult population of the United States.

In 2018, NHANES conducted a feasibility study to determine if previous NHANES participants were willing to participate in a follow-up in-home health examination including capillary blood and urine collections. This study was also different from the current study because it returned to NHANES participants years after their participation, rather than immediately afterward. Also, the NHANES participants have already completed a multi-hour exam in the MEC, which might affect their likelihood of agreeing to a follow-up exam. It also differed in the components of the home protocol. That protocol included a longer questionnaire than the one used in this project but did not include a venous blood draw or urine collection. NHANES-LS measured weight, waist circumference, and blood pressure. It also included a monofilament assessment for neuropathy and a capillary blood collection. The incentive provided with this protocol was \$80. A separate \$20 incentive was provided following the urine collection, which occurred after the health representative left the home.

⁷ Harris, K.M. (2013). The Add Health Study: Design and Accomplishments. Carolina Population Center. University of North Carolina at Chapel Hill. <https://doi.org/10.17615/C6TW87>. Accessed from https://addhealth.cpc.unc.edu/wp-content/uploads/docs/user_guides/DesignPaperWave_I-IV.pdf on November 16, 2020.

⁸ Hyland, A. et al. Design and methods of the Population Assessment of Tobacco and Health (PATH) Study. *Tobacco Control*, 26(4), 371-378, doi: <http://doi.org/10.3886/ICPSR36231>

⁹ O'Doherty, K., Jaszczak, A., Hoffmann, J.N., You, H.M., Kern, D.W., Pagel, K., McPhillips, J., Schumm, L.P., Dale, W., Huang, E., & McClintock, M.K. (2014). Survey field methods for expanded biospecimen and biomeasure collection in NSHAP wave 2. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 69(8), S27–S37, doi:10.1093/geronb/gbu045