Evaluation of Dried Blood Spots Collected by Non-medically Trained Interviewers: Number, Size and Quality of Spots.

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Extended Abstract:

The use of minimally invasive techniques for biomarker collection in population-based research has recently become both feasible and desirable. Collection of blood spot specimens on filter paper offers many advantages over blood collection via venipuncture, including: significant reduction in participant burden and discomfort, utilization of non-medical data collectors rather than phlebotomists, and efficiency of storage and transportation. However, the feasibility of blood spot collection in large-scale population-based research using non-medical data collectors has not been evaluated. Blood spot quantity and quality has important implications for the number and type of biological assays that can be conducted. The National Social Life, Health and Aging Project provides an ideal opportunity to examine the quantity and quality of samples that can be expected from non-medically trained interviewers in a home-based interview. This paper presents an analysis of blood spot number, size and quality collected by non-medical field

interviewers from a nationally-representative sample of community-dwelling participants in the National Social Life, Health and Aging Project.

Methods

Training was conducted by the National Opinion Research Center in cooperation with University of Chicago researchers. Interviewers were brought to a central location for 8 days of training on both the questionnaire and biomarker collection. Initial training was conducted in a small-group setting with a lecture and demonstration and interviewers were given supplies and instructed to practice on themselves and each other. Near the end of training, interviewers, in groups of 4, were brought in for practice with two trainers for individual observation, advice and further practice. At the end of training, interviewers were required to pass a skills test in both interviewing and biomarker collection.

The National Social Life, Health and Aging Project is currently conducting face to face interviews and biomarker collection in the homes of 3000 individuals, age 58-85, across the United States. Of the total sample of 3000 individuals, 2500 will be asked to volunteer for a single finger stick and collection of blood spots. Sterile, single use lancets (Surgilance 2.3 mm blade – cat# SLB2501000) were used to deliver a controlled puncture and stimulate blood flow. Drops of blood were then collected on Schleicher & Schuell (#909) blood collection cards. Filter paper cards were left to dry until the completion of the interview (approximately 30 minutes). Filter paper was then packed in plastic bags, with desiccant packs, for transport to the interviewer's home. Filter paper was then removed from the bag and placed in a box with desiccant in the refrigerator. One week's worth of filter papers were shipped via Federal Express to Northwestern University, Laboratory for Human Biology Research for analysis.

Each card contains five circles of standard size (1/2 inch diameter) for suggested collection. Interviewers in this study were instructed to blot the first drop on the filter paper in the right-most circle. This spot will not be used for analysis and is not described in the current paper. Remaining spots are counted, measured (in relation to the size of punches possible) and any obviously blotted or double dropped spots are noted. Both individual spots and entire cards will be described. Spots are considered to be too small if they were not large enough to allow for a single small (1/8 inch hole-punch). Spots are considered good if they will allow for a singe large (1/4 inch) hole-punch. Spots are considered excellent if they fill the entire circle. For the purposes of the NSHAP study, one large and three small punches are required for analysis of proposed biomarkers. Cards are considered to be inadequate if they cannot support the necessary punches, adequate if they will only support the required punches, and excellent if they will support more than the required amount of punches.

Results/Expected Results

At the time of submission, 1370 filter paper cards are available for analysis. Cards contained between 0 and 9 usable spots of varying size. Almost all (93%) of the cards contain at least four usable blood spots. Although cards have not yet been measured, initial observations suggest that over 90% of all cards will be adequate for the

purposes of the NSHAP study (yielding at least 3 small and one large punch). Very few of the cards contained obviously blotted or double spotted drops that would be unusable in laboratory analysis. By the time of presentation, an estimated 2000 blood spot cards will be available for analysis. Number and quality of spots and cards are not expected to be significantly different in the remaining sample.

Conclusion

The quality of cards obtained during the National Social Life, Health and Aging project suggests that collection of dried blood spots for biomarker analysis by non-medically trained interviewers is feasible and a useful alternative to venipuncture in population-based research.

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