Measuring Dynamic Contraceptive Use: The Quality and Consistency of DHS Calendar Data

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Background

Contraceptive use dynamics—including method switching and discontinuation—are important determinants of contraceptive prevalence rates (CPR) and demographic outcomes like unintended pregnancy. To sustain progress in family planning programs, decisionmakers need access to consistent and high-quality data on contraceptive use dynamics. Yet these data often remain limited and underutilized given the costs and complexity of their collection and analysis. The primary source of these data in low- and middle-income countries are retrospective surveys, most notably through the Demographic and Health Survey (DHS) Program which includes a calendar that collects month-by-month histories of reproductive events dating back six years. Such retrospective calendars provide rich information on women's contraceptive histories which can generate insight into trends in discontinuation and switching. This instrument, however, is also subject to recall bias which negatively impacts the quality of the data.

Studies of the quality and consistency of data collected through retrospective calendars are limited. Early studies found the DHS calendar produced consistent estimates of CPR, reduced heaping, and demonstrated moderate to high reliability of calendar data. These studies also suggested though evidence of reduced data reliability specifically among younger women and women with more complex reproductive histories (including high parity, higher episodes of use, and greater use of short-acting and traditional methods).[i] However, questions persist about the quality of reporting among different subpopulations, across contexts of varying family planning program maturity, and by shorter and longer periods of recall. More recent studies have found evidence to suggest moderate to substantial underreporting of contraceptive use as well as other quality issues, both in the DHS and other retrospective calendars. Three studies, for example, found evidence of moderate to strong heaping at six and 12 months.[ii] The resulting significant gaps—4.1 percentage points on average—between calendar and current use reports existed in 74 percent of survey pairs, with particularly significant underreporting of traditional and short-acting methods.[iii]

Data and Methods

We undertook a comprehensive review of the quality and consistency of calendar data for all DHS survey pairs that utilized a calendar. Building on the methodology applies in Bradley, Winfrey, and Croft (2015), we compare retrospective reports of CPR – collected through the calendar – with the independent estimate of current CPR reported in the prior DHS in the same country for the same point in time, for women of the same ages. We compare CPR estimate overlaps (total and by method) and evaluate how often overlap occurs between calendar data and current status estimates as well as the extent to which women's recall varies by contraceptive method. We consider additional indicators of quality, including heaping of reported discontinuation at 11-, 12-, and 13-month intervals. We also examine split-calendar estimates of discontinuation rates, particularly seeking to determine if data based on shorter periods of recall (e.g., 2-3 years) are of higher quality and sufficient sample size.

We further examine displacement of births outside of the calendar and displacement of women out of the interview based on their age. Birth history and age data are both subject to reporting errors. Based on expected regularities within the data, we examine potential for incomplete or incompatible birth dates to assess calendar data quality wherein a birth date may have been transferred incorrectly outside of the calendar's timeframe. Moreover, women who were ages 15-49 at the time of interview would have been between ages 8-43 six years earlier, depending on exactly when their birthday falls in relation to the date of interview. We assess whether women were incorrectly excluded from the interview based on reported age and whether their age aligns with expected regularities in reporting.

Finally, we consider the quality of data collected using paper versus electronic survey tools. Electronic survey tools are more secure and accurate than paper survey tools – leaving less room for enumerator error. However, electronic survey tools do not allow for visual cues that are typical of paper-based tools. We explore the quality of calendar data between survey pairs that used differing mediums of data collection to assess effects on calendar quality.

Data cleaning and analysis are currently on-going.

Preliminary Results

Contraceptive use is often underreported in the retrospective calendar when compared to current use estimates from the same time period. Preliminary analysis suggests that consistent recall of contraceptive use earlier in the six-year calendar period is better. Analyzing a shorter period of calendar data (e.g., 2-3 years rather than six years) might mitigate some quality concerns. Short-acting methods, particularly coitally dependent methods, are more prone to underreporting in the calendar.

We anticipate that consistency may vary by education, parity, and age – increasing as women ascend education and age categories. Evidence is mixed related to consistency of reported discontinuation rates and this will be a key focus of our analysis. Notably, a forthcoming study on the consistency of (non-DHS) calendar data found evidence of overreporting rates of discontinuation and method switching in the retrospective calendar, contrasting the findings of Bradley, Winfrey, and Croft (2015).

Implications

As policymakers seek to maximize the use of data and evidence in family planning policy and program decision making, in many countries, data from the DHS reproductive calendar remain one of the only sources of information on contraceptive use dynamics. These data can provide crucial insight into trends and obstacles to contraceptive continuation, particularly for women who wish to delay or avoid pregnancy. Yet by the same measure, inaccurate estimates could lead decisionmakers towards ineffective or inefficient policy and program priorities. To help decisionmakers successfully utilize these data, there is a need to expand understanding of the quality, consistency, and limitations of the data collected through the DHS calendar instrument, and to identify strategies to maximize their quality, usefulness, and interpretability. Specific parameters around the number of years that such data is of highest quality enables decisionmakers to be confident that their recommendations are built on sound evidence.

References

[i] Sian L. Curtis and Ann K. Blanc, *Demographic and Health Surveys Analytical Reports No. 6: Determinants of Contraceptive Failure, Switching, and Discontinuation: An Analysis of DHS Contraceptive Histories* (Calverton, Md: Macro International, 1997); and JA Strickler, et al., "The reliability of reporting of contraceptive behavior in DHS calendar data: evidence from Morocco," *Studies in Family Planning*. 28, no.1 (1997):44-53.

[ii] Sarah E.K. Bradley, et al., "Global Contraceptive Failure Rates: Who Is Most at Risk?" *Studies in Family Planning* 50, no. 1 (2019): 3-24. https://doi.org/10.1111/sifp.12085

[iii] Sarah E.K. Bradley, William Winfrey, and Trevor N. Croft, *Contraceptive Use and Perinatal Mortality in the DHS: An Assessment of the Quality and Consistency of Calendars and Histories* (Rockville, Md: ICF International, 2015).