

**Title:** Interviewer effects on abortion reporting: a multilevel analysis of household survey responses in Côte d'Ivoire, Nigeria and Rajasthan, India

## Introduction

Almost half of the 56 million abortions that occur each year are unsafe.<sup>1</sup> Unsafe abortion disproportionately affects low- and middle-income countries (LMICs), with 86% of all abortions<sup>2</sup> and 97% of unsafe abortions<sup>3</sup> taking place in these settings. Despite its importance as a public health and human rights concern, there is limited evidence about abortion in most LMICs.<sup>4</sup> Abortion data is needed to inform advocacy strategies, and policies and programmes that aim to reduce unsafe abortion. Understanding abortion incidence is also important for estimating contraceptive failure rates and fertility dynamics.<sup>5,6</sup>

Health records and vital registration systems can be limited in many LMICs, particularly for abortion data due to illegality, stigma, and their exclusion of informal and self-managed abortions.<sup>7</sup> Household surveys such as the World Fertility Surveys, Demographic and Health Surveys (DHS), and, more recently, the Performance Monitoring for Action (PMA) surveys therefore tend to be the dominant source of demographic, reproductive and public health data.<sup>7-9</sup> Household surveys in LMICs are commonly interviewer-administered but the presence of an interviewer in-person is thought to cause social desirability bias and under-reporting of abortion. As a result survey data about abortion are rarely used and poorly trusted<sup>4,10</sup>, or questions are excluded altogether from surveys. Despite a large body of research on the effect of interviewers on survey responses in high income countries, there is little analysis of this topic in LMIC surveys, and only one study of interviewer effects on abortion reporting in LMICs using DHS data, which lack meta-data about interviewer characteristics.<sup>11</sup> This study therefore aimed to assess interviewer effects on responses to abortion survey questions using PMA data from three countries in Africa and Asia.

## Methods

Nationally representative household survey data collected in Côte D'Ivoire, Nigeria and Rajasthan state, India, by PMA in 2018 were analysed. Household, female and service delivery point data were used, as were self-administered staff surveys completed by interviewers (except in Nigeria where the staff survey was not conducted). In this analysis, the participant's self-reported experience of ever 'removing a pregnancy' when they were pregnant or worried that they were pregnant was considered the main measure of a previous abortion experience. The interviewer effects for this question were compared to abortion questions designed to be less stigmatising: their closest confidante's experience of pregnancy removal and the respondent's own experience of a 'period regulation'. The interviewer effects for abortion questions were also compared to topics considered to be less stigmatised: first, whether the respondent or their partner were 'currently doing something or using any method to delay or avoid getting pregnant' (their current contraceptive use); second, whether the respondent reported they had ever given birth, and third whether the respondent reported they were currently pregnant. Potential explanatory variables included respondent, community, interview and interviewer characteristics.

Multi-level models with a random interviewer intercept were used to assess the variance in outcomes within- and between-interviewers, adjusting for respondent, community, interviewer and interview fixed effects. Analyses were conducted for each country individually. Bivariate logistic regression analysis was conducted to assess associations between potential explanatory variables and the odds of reporting removing a pregnancy, period regulation and a confidante's pregnancy removal. A multi-level logistic regression model with an interviewer random intercept was then used to assess interviewer effects on the odds of reporting removing a pregnancy, first fitting a null model with only interviewer random effects, then adding respondent and community variables (Model 1) and finally adding the interview and interviewer characteristics to the model (Model 2). The same process was followed for each outcome (respondent's pregnancy removal, respondent's period regulation, confidante's pregnancy removal, current contraceptive use, ever given birth, current pregnancy), and the variance and intra-cluster correlations from Models 1 and 2 were compared for the six outcomes.

## Results

Self-reports of having ever removed a pregnancy were highest in Côte D'Ivoire (19%) and Nigeria (15%) compared to Rajasthan (7%). Confidante-reporting of pregnancy removal was higher than self-report in Nigeria (20%) and Rajasthan (15%), but confidante-reporting (18%) of pregnancy removal was similar to self-reporting in Côte D'Ivoire. Reports of ever having regulated a period were significantly lower than reports of ever having removed a pregnancy in each setting, both for self-reporting (2-7%) and for confidante-reporting (6-9%).

Interviewer effects for pregnancy removal were considerable in each of the three countries: in Model 1, the interviewer effect accounted for 7% of the variance in the odds of reporting removing a pregnancy in Côte D'Ivoire, 18% in Rajasthan and 24% in Nigeria. The interviewer effect for the question about period regulation was higher than for pregnancy removal in Côte D'Ivoire (32%) and Nigeria (32%), but not in Rajasthan (17%). The question about the closest confidante's pregnancy removal had similar interviewer effects to the question about the respondent's own pregnancy removal in each country (4% Côte D'Ivoire, 23% Rajasthan, 23% Nigeria). Interviewer effects were generally lower for the questions about previous births (ranging from 3-7%) and current pregnancy (0-5%), compared to the question about pregnancy removal (7-24%). However, interviewer effects for the question about current contraceptive use were similar in size (8-22%) to the questions about abortion.

In each country, respondent characteristics were significantly associated with the odds of reporting a pregnancy removal. Broadly, respondents who were older, with more formal education and in a higher wealth quintile were more likely to report a pregnancy removal. However, there were some differences between countries. Unmarried women had lower odds (OR 0.14 [95% CI 0.04;0.51]) of reporting a pregnancy removal in Rajasthan while the reverse pattern was seen in the other countries (Côte D'Ivoire OR: 3.66; Nigeria OR: 1.30). Wealth was not significantly associated with reporting in Rajasthan, but was significant in

the West African countries, and rural status was only significantly associated with lower odds of reporting a pregnancy removal in Rajasthan (OR 0.57 [95% CI 0.36;0.91]).

Abortion service availability and volumes were only significant in Nigeria, where the availability of a clinic providing abortion was associated with significantly higher odds (1.36 [1.04;1.78]) of reporting a pregnancy removal, though surprisingly the association with the facility-reported monthly number of abortions was negative (0.97 [0.94;0.99]).

In both Rajasthan (0.75 [0.58;0.97]) and Nigeria (0.68 [0.49;0.96]), respondents who were not well acquainted with the interviewer had significantly lower odds of reporting a pregnancy removal compared to respondents who were well or very well acquainted. However, respondents who were not at all acquainted did not have significantly different odds from those who were well or very well acquainted. There was no significant association with respondent-interviewer familiarity in Côte D'Ivoire, where almost all respondents were not at all familiar with the interviewer.

Survey language was significantly associated with the odds of reporting a pregnancy removal in the West African countries, but not in Rajasthan where almost all interviews were conducted in Hindi. In Rajasthan, none of the interviewer characteristics were significant. In Côte D'Ivoire the interviewer's parity, education level and comfort asking questions about abortion were significant at the 0.1 level.

## **Conclusion**

Interviewer-administered household surveys are a critical source of health information in LMICs. With the shift towards self-managed medication abortions purchased informally through pharmacies or online, surveys will become even more important for understanding trends in safety and sources of abortion. Although direct reports of abortions in surveys suffer from under-reporting, surveys offer one of the only opportunities to gather evidence about the sources and safety of abortions, the sub-groups most affected by unsafe abortion and their abortion-seeking pathways. These data are critical to inform strategies, policies and programmes that aim to increase access to safe abortion care. Understanding the extent to which interviewer effects impact abortion reporting can help inform decisions about whether to include abortion questions in demographic and public health surveys, which questions to use, and how abortion survey data quality can be improved through methodological adjustments.

This analysis highlights that interviewer effects for abortion reporting were high in the PMA surveys in Côte D'Ivoire, Nigeria and Rajasthan from 2018. However, interviewer effects for abortion questions were no higher than for the question about contraceptive use, suggesting that the exclusion of abortion questions from reproductive health surveys on methodological grounds should be reconsidered. Further work is needed to identify the effect of different question wordings on abortion reporting through comparative studies and cognitive interviewing. Use of a question about period regulation had higher interviewer effects than a question about pregnancy removal in the West African contexts, suggesting

this question may suffer from comprehension issues. Confidante-reporting had similar interviewer effects to self-reporting of pregnancy removal, though reporting was higher, particularly for recent abortions.

Observable interviewer characteristics were not significantly associated with abortion reporting in Côte D'Ivoire or Rajasthan, though the interviewer's comfort asking questions about abortion and education level were associated with reporting in Côte D'Ivoire. Abortion values clarification for interviewers and other measures to reduce stigma in the survey environment may improve survey data quality. Differences in interviewers' unmeasured skills and behaviours may be responsible for the remaining unexplained variance at the interviewer level, which could be further explored through the addition of relevant variables to the interviewer survey. Respondent-interviewer familiarity and language of interview were also significantly associated with abortion reporting. The effect of respondent-interviewer familiarity seems to depend on the level of familiarity, which raises challenges for survey logistics when using 'insider' interviewers. The association between language and abortion reporting raises challenges for countries with high linguistic diversity and cross-national surveys. Consideration of variations in language should inform testing of different question wordings and designs in future work. Issues relating to respondent-interviewer familiarity and linguistic diversity are also relevant for other LMIC household surveys and should be considered in future research on interviewer effects in LMICs.

## Bibliography

1. Ganatra B, Gerdtz C, Rossier C, et al. Global, regional, and subregional classification of abortions by safety, 2010–14: estimates from a Bayesian hierarchical model. *Lancet*. 2017;390(10110):2372-2381.
2. Chae S, Desai S, Crowell M, Sedgh G, Singh S. Characteristics of women obtaining induced abortions in selected low- and middle-income countries. *PLoS One*. 2017;12(3):1-19.
3. Singh S, Remez L, Sedgh G, Kwok L, Tsuyoshi O. *Abortion Worldwide 2017: Uneven Progress and Unequal Access*. New York; 2018.
4. Sedgh G, Keogh SC. Novel approaches to estimating abortion incidence. *Reprod Health*. 2019;16(1):1-10.
5. Jagannathan R. Relying on surveys to understand abortion. *Am J Public Health*. 2001;91(11):1825-1831.
6. Lindberg L, Scott RH. Effect of ACASI on Reporting of Abortion and Other Pregnancy Outcomes in the US National Survey of Family Growth. *Stud Fam Plann*. 2018;49(3):259-278.
7. Randall S, Coast E, Compaore N, Antoine P. The power of the interviewer. *Demogr Res*. 2013;28:763-792.
8. Bell SO, Bishai D. The impact of respondent–interviewer familiarity and repeated survey participation on abortion reporting: Evidence from rajasthan, india. *Int Perspect Sex Reprod Health*. 2019;44(4):147-156.
9. Safi S, Greenleaf A, Hawes M, et al. Resident Interviewers and Repeat Surveys: Effects on Measures of Reproductive Health. In: *Population Associations of America Conference*. Chicago; 2017.
10. MacQuarrie KLD, Winfrey W, Meijer-Irons J, Morse AR. Consistency of reporting of terminated pregnancies in DHS calendars . *DHS Methodol Reports No 25* . 2018;(September). <http://dhsprogram.com/pubs/pdf/MR25/MR25.pdf>.
11. Leone T, Sochas L, Coast E. Depends who's asking: interviewer effects in Demographic and Health Surveys abortion data. *Demography*. 2020;In press.