



Photo: PMA2020/Burkina Faso

## PMA2020 METHODOLOGICAL REPORT NO. 1:

# RESPONSE PATTERNS ON BEHAVIORAL OUTCOMES IN RELATION TO USE OF RESIDENT ENUMERATORS OVER MULTIPLE SURVEY ROUNDS

## **PMA2020 Methodological Report**

**Title:** Response Patterns on Behavioral Outcomes in Relation to Use of Resident Enumerators over Multiple Survey Rounds

**Authors:** Meagan Hawes, Sally Safi, Abigail Greenleaf, Amy Tsui, and the PMA2020 Study Group

The PMA2020 Study Group:

Georges Guiella, Institut Supérieur des Sciences de la Population (ISSP), Ouagadougou, Burkina Faso

Solomon Shiferaw and Assefa Seme, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia

Easmon Otupiri, School of Public Health, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

Peter Gichangi, International Center for Reproductive Health, Nairobi, Kenya

Frederick Makumbi, Makerere University School of Public Health, Kampala, Uganda

**Suggested citation:** Hawes, Meagan; Safi, Sally; Greenleaf, Abigail; Tsui, Amy; Guiella, Georges; Shiferaw, Solomon; Seme, Assefa; Otupiri, Easmon; Gichangi, Peter; and Makumbi, Fred. 2017. Response patterns on behavioral outcomes in relation to use of resident enumerators over multiple survey rounds. Performance Monitoring and Accountability 2020 (PMA2020) Methodological Reports No. 1. Baltimore, Maryland, USA: Bill & Melinda Gates Institute for Population and Reproductive Health, Johns Hopkins University.

## Table of Contents

<b>LIST OF TABLES &amp; APPENDICES .....</b>	<b>4</b>
<b>PREFACE .....</b>	<b>5</b>
<b>ABSTRACT .....</b>	<b>6</b>
<b>EXECUTIVE SUMMARY.....</b>	<b>7</b>
INTRODUCTION AND PURPOSE .....	9
COUNTRY SELECTION.....	10
RESIDENT ENUMERATORS (RES) IN PMA2020 .....	10
<i>Recruitment</i> .....	10
<i>RE Database</i> .....	13
<i>Retention</i> .....	13
CHARACTERISTICS OF RES.....	15
CONTACT BETWEEN RES AND RESPONDENTS: CROSS-SECTIONAL SAMPLES .....	17
ASSOCIATION BETWEEN RE-RESPONDENT CONTACT AND SELECT OUTCOMES.....	18
LIMITATIONS .....	30
REFERENCES.....	32
APPENDIX.....	33

## List of Tables & Appendices

### Tables:

Table 1. Number of unique REs, by country and round

Table 2a. Cumulative percent of REs retained, by country and round

Table 2b. Percent distribution of REs by number of rounds worked for PMA2020, by country

Table 3. Percent distribution of REs by demographic characteristics at Round 1 & Round 4, by country

Table 4. Percent of respondents who previously participated in a PMA2020 survey & percent of respondents well or very well acquainted with RE, by country and round

Table 5a. Percent distribution of respondent report of select outcomes according to previous participation in a PMA2020 survey, by country and round

Table 5b. Percent distribution of respondent report of select outcomes according to RE-respondent acquaintance, by country and round

### Appendices:

Appendix 1. Unweighted sample sizes of respondents, by country and round.

Appendix 2. Percent distribution of respondents according to level of RE-respondent acquaintance and RE residence in relation to EA, by country and round

Appendix 3: Percent distribution of respondents according to level of RE-respondent acquaintance and previous participation in a PMA2020 survey, by country during Round 4 of data collection.

Appendix 4. Percent agreement of household and female respondent reports of previous participation in a PMA2020 survey across Rounds 2-4, by country

## Preface

Performance Monitoring & Accountability 2020 (PMA2020) uses innovative mobile technology to gather population data on family planning and water, sanitation, and hygiene. Data are collected at both the household and health facility levels via smartphones through a network of local female Resident Enumerators (REs) stationed throughout the country.

A key goal of PMA2020 is to provide high quality, rapid-turnaround data, on a routine basis. To achieve this, PMA2020 continues to assess, revise, and publicize the methodology with which the data are gathered. This report is the first in a series of *Methodological Reports* that aims to explain and contextualize PMA2020 methodologies. It focuses on the unique socio-demographic profile of PMA2020 REs and examines potential differential reporting trends introduced by acquaintance between the REs and the survey respondents.

It is hoped that this *Methodological Report* will be useful to researchers, policy makers, and survey specialists to enhance the understanding and analysis of PMA2020 survey data.

This report could not have been assembled without the tireless contributions of PMA2020 Principal Investigators and Data Managers from Burkina Faso, Ethiopia, Ghana, Kenya and Uganda, each of who helped to assemble information on PMA2020's REs. The PMA2020 project is funded by the Bill & Melinda Gates Foundation, whose support is gratefully acknowledged.

**Scott Radloff, PhD**  
**Director, PMA2020**

## Abstract

Despite a long-held belief that interviewers with no prior social relationship with the respondent—social outsiders—are better able to elicit reliable and valid responses to survey questions than social insiders, there is scant empiric evidence to support this claim. The existing literature is equivocal as to whether or not social insiders or outsiders are more successful at eliciting a true response to survey questions. The Performance Monitoring & Accountability 2020 (PMA2020) project, which uses innovative mobile technology to collect rapid-turnaround household data, trains and employs as data collectors women who are often residents in sampled clusters. These data collectors may be socially acquainted with any of the randomly sampled survey respondents. Bringing pre-existing social acquaintances or relationships to the interviews, the data collectors serve as social insiders, which may advantage or disadvantage the interview process. This report details the socio-demographic profile of PMA2020 primary data collectors, known as Resident Enumerators (REs), across multiple rounds of surveys conducted in five countries (Burkina Faso, Ethiopia, Ghana, Kenya and Uganda) and examines the associations between women’s reporting of select reproductive health and socio-economic outcomes by interviewer-respondent acquaintance and by respondent’s participation in a previous survey round. No significant associations are found consistently within or across countries in this descriptive analysis with women’s reporting of modern contraceptive use or among contraceptors, of the type of method. However, differential reporting by the two PMA2020 design-related measures are found in Kenya in all rounds for presumed non-sensitive behaviors, i.e., number of births and level of schooling, and occasionally in one or two rounds in other countries. Advanced multivariate analyses and qualitative studies are planned.

## Executive Summary

There is a long-held belief among demographers and social scientists that interviewers with no prior personal relationship with a selected respondent are best positioned to elicit a reliable and valid response to survey questions. Based on this assumption, the majority of population surveys implemented in low- and middle-income countries, such as the Demographic and Health Surveys (DHS), are conducted by interviewers who are social outsiders to the communities surveyed. The PMA2020 project trains and employs women who are often residents in sampled clusters as data collectors. These data collectors may be socially acquainted with any of the randomly sampled survey respondents. Bringing pre-existing social acquaintances or relationships to the interviews, the data collectors serve as social insiders, which may advantage or disadvantage the interview process. The purpose of this report is to present the socio-demographic profile of PMA2020 primary data collectors, known as Resident Enumerators (REs), across multiple rounds of surveys conducted in five countries (Burkina Faso, Ethiopia, Ghana, Kenya and Uganda) and to examine the reporting of select reproductive health and socio-economic outcomes by interviewer-respondent acquaintance and by respondent's previous participation in a PMA2020 survey. Data from four rounds of surveys from each country are examined.

PMA2020 uses innovative mobile technology to routinely gather rapid-turnaround, cost-effective population data on family planning, fertility and health outcomes. Data are collected at both the household and health facility levels via mobile phones by a network of REs located throughout the country. REs are women of reproductive age, who have completed at least a secondary school education, and who typically reside in or near the survey enumeration areas (EAs) in which they work. The majority of EAs are surveyed exclusively by one RE.

Across the five program countries examined in this report, most REs are between the ages of 20 and 35 years old. Additional socio-demographic characteristics including education level, marital status, job status, and RE residence in relation to the EA are specific to the country context. Of particular relevance is RE residence in relation to the EA, defined as living within, nearby (within 10 kilometers), or far from (more than 10 kilometers) the EA. The proportion of REs who reside within the EA ranges from about 5% in Ethiopia to about 25% in Uganda. The proportion of REs living near the EA ranges from about 25% in Ethiopia to 71% in Ghana. Most REs (nearly 70%) in Ethiopia live far from the EA in which they work, while Ghana has the smallest proportion (about 15%) of REs living at a distance.

RE-respondent acquaintance varies across countries and rounds. In Ethiopia Round 1, 2% of interviews were between REs and respondents who knew each other well, while 61% of REs and respondents in Uganda Round 1 were well acquainted. In terms of re-interview of respondents, by Round 4 about 18% of respondents in Burkina Faso had previously participated in a PMA2020 survey, while 29% of respondents in Uganda had done so.

Nineteen behavioral outcomes were first identified for this analysis, of which 16 were considered to be potentially sensitive to a priori RE-respondent relationships and three not sensitive. Of primary

interest was whether two key indicators for PMA2020 tracking of family planning progress—modern contraceptive use and type of contraceptive method used among contraceptors—were associated with RE-respondent acquaintance. This report focuses on five outcomes, three related to reproductive health (modern contraceptive use, contraceptive method type and parity) and two measuring socioeconomic status (respondent education level and whether or not a married respondent's husband had multiple wives). The reporting of each outcome is analyzed in association with the respondent's self-reported previous participation in a PMA2020 survey and with the RE's report of degree of acquaintance with the respondent, prior to interview. Pearson chi-square design-based tests of difference were used to assess the statistical significance of differential reporting. The test statistics suggest there are no consistently significant differences in reporting by previous participation or RE acquaintance both across countries and across multiple survey rounds within a country. When statistically significant, respondents' previous participation in a PMA2020 survey is most consistently positively associated with report of having births, while RE-respondent acquaintance is associated with report of primary school education. Notably, reporting of modern contraceptive use is not significantly associated with RE-respondent acquaintance in any country.

This report provides much-needed empirical insight into potential effects from interviews conducted by social insiders in low- and middle-income countries. Advanced statistical analysis is needed, however, to estimate the influence of the RE-respondent relationship on respondent report of outcomes while accounting for confounding from RE and respondent background factors, such as age, marital status and education. PMA2020 is completing the multi-level quantitative modeling and undertaking qualitative studies of the RE-respondent relationship in two field settings to better understand the effect social insiders as interviewers may have on data quality.



## Introduction and purpose

There is a long-held belief among demographers that interviewers with no prior social relationship with the respondent best elicit a true response to survey questions (Weinreb, 2000). Based on this tradition, the majority of large-scale surveys, such as the DHS, are conducted by interviewers who are not acquainted with the survey respondent and are therefore social outsiders to the communities surveyed. However, the empirical evidence supporting social outsider interviewers as better able to elicit more reliable or valid responses is scant. The literature is equivocal as to whether or not social outsiders or social insiders, defined as those who do have a previous acquaintance or social relationship with the respondent, are more successful at eliciting a true response to survey questions (Davis, 2010; Sana, 2014; Weinreb, 2000). Research by Weinreb found that in Kenya, female social insider interviewers were better able to elicit valid responses to sensitive questions (Weinreb, 2006). The benefits to employing social insiders to conduct surveys include minimizing the cost of fielding the survey and increasing local employment opportunities within communities in which data are collected.

One of the innovations of the PMA2020 data collection model is to employ women from surveyed communities to serve as Resident Enumerators (REs). REs, PMA2020's primary data collectors, are women of reproductive age with a minimum of a secondary school education. They are responsible for collecting data for national and sub-national surveys from households, females age 15-49, and health service delivery points in a designated Enumeration Area (EA) in 10 countries in Africa and Asia. REs typically reside in or near the EAs in which they conduct the survey.

PMA2020 surveys are implemented by in-country partners with technical direction and support provided by the Bill & Melinda Gates Institute for Population & Reproductive Health at the Johns Hopkins Bloomberg School of Public Health. PMA2020 surveys use a multi-stage, stratified, cluster design. Samples of EAs are drawn from a master frame maintained by national statistical offices. REs map and list all households in sampled EAs, and a random sample of 35-42 households per EA is selected for participation in the PMA2020 Household and Female Survey. Any competent household member can respond to the Household Questionnaire, and all females of reproductive age who are usual members of or slept in the household the previous night are eligible to complete the Female Questionnaire. Survey rounds are conducted every six to 12 months. Further detail on PMA2020 sample design is available from [www.pma2020.org/sampling](http://www.pma2020.org/sampling).

The purpose of this report is to present a socio-demographic profile of REs across five program countries, and to examine potential differential reporting of select outcomes by RE-respondent acquaintance and by respondent's previous participation in a PMA2020 survey. REs report acquaintance with the respondent at the beginning of both the Household and Female Questionnaire, and may choose to report themselves as very well acquainted, well acquainted, not well acquainted, or not at all acquainted with the respondent. Previous participation in a PMA2020 survey is reported by respondents of the Household and Female Questionnaire at the beginning of both surveys. This report focuses on Female Questionnaire respondents; henceforth "respondent" refers to respondents of the Female Questionnaire, unless otherwise noted. Data are presented

from Burkina Faso, Ethiopia, Ghana, Kenya and Uganda surveys. These five sites had four rounds of national-level survey data collected at the time of this report. The selected outcomes include three reproductive health outcomes (modern contraceptive use, contraceptive method type among contraceptors, and parity) as well as two socioeconomic outcomes (level of education and whether or not a married respondent's husband had multiple wives).<sup>1</sup>

This report provides empirical insight into potential associations of social insider interviewer effects with response patterns. PMA2020 intends for this report to provide context to the data collected in its surveys in order to increase researchers' and policy-makers' understanding and use of PMA2020 data.

## Country Selection

This report includes data from five African countries: Burkina Faso, Ethiopia, Ghana, Kenya and Uganda. Countries were included for analysis if survey data collected were nationally representative and if at least four rounds of data collection had been implemented.

## Resident Enumerators (REs) in PMA2020

### Recruitment

PMA2020 provides guidance to in-country partners on the recruitment of REs, but defers to in-country teams to opt for specific recruitment strategies that work best in the local context. In every country, PMA2020 requires that REs are women of reproductive age with at least secondary school education. REs are trained prior to survey rounds on how to use Open Data Kit (ODK), the software used by PMA2020, and to administer surveys using provided mobile phones. REs are assessed throughout the trainings and in a final exam and must demonstrate the ability to conduct interviews and collect data appropriately. Additional country-specific qualifications and recruitment strategies are listed below.

### i. Burkina Faso

PMA2020/Burkina Faso (PMA2020/BF) recruited REs using different strategies according to the three geographic locations of the EA to be surveyed: Ouagadougou, regional and district capitals, and rural areas.

In Ouagadougou, a recruitment notice describing the responsibilities of the RE, necessary experience, and educational requirements was posted at the Institut Supérieur des Sciences de la Population (ISSP), located at the University of Ouagadougou. ISSP is the PMA2020 implementing partner in Burkina Faso. Staff screened applications using education and survey experience as selection criteria. The candidates who best fit the RE profile were interviewed at ISSP, and the most qualified were chosen as REs.

---

<sup>1</sup> Other outcomes have been examined including survival status of last birth, date of last menstrual period, current pregnancy status, date of first sex, date of last sex, marital status, visited a health facility in past 12 months, visited by a health worker in the past 12 months, and exposure to family planning messages on the radio, TV or print media. The patterns of response to RE characteristics do not vary appreciably from those presented here.

REs in regional and district capitals were recruited by posting notices in town halls. For the city of Bobo-Dioulasso an additional notice was posted at the Regional Office of Demography & Statistics. All the candidate files received were sent to ISSP for screening. PMA2020/BF supervisors held telephone interviews with selected candidates and retained the most qualified candidates as REs.

Finally, for the recruitment of REs from rural areas, PMA2020/BF supervisors went to each EA and in collaboration with local authorities (e.g., the village councilor, the village development council, or the head of the village) identified candidates who fit the RE profile. Supervisors conducted interviews with all village candidates to select the most skilled to become REs. In some villages, however, there was no one in the village with the minimum required skills to be an RE. In these cases, PMA2020/BF supervisors went to villages within a 10-kilometer radius of the EA to recruit REs following the same strategy.

Burkina Faso's sampling design called for 53 EAs in initial survey rounds, but this was increased to 83 EAs prior to the third survey round to allow for a smaller margin of error around the modern contraceptive prevalence rates estimate. Thus, before the third round of data collection, 30 new REs were recruited to bring the total number of REs in Burkina Faso to 83. The same strategies described above were used for the recruitment of these new REs. The expansion of sample areas and inclusion of new EAs should be kept in mind when comparing results across the rounds.

## ii. Ethiopia

In Ethiopia, REs were recruited by advertising the position on local notice boards in Addis Ababa, and by outreach through the 25 Central Statistics Agency branch offices in the country. Eligibility criteria for REs included being female; having at least a secondary school diploma; proficiency in written and spoken local and English languages; living in or near the EA; willingness to learn about or possessing experience in survey fieldwork; experience using a mobile phone; and willingness to participate in a two-week intensive training on data collection and to work for five years with the PMA2020/Ethiopia (PMA2020/ET) team. Preference was given to candidates with a background in IT, computer science, statistics, math, or geography, and to candidates who demonstrated trustworthiness to keep collected data confidential, good communication skills, and the ability to work in a team. While candidates who held full-time positions were eligible to become REs, salaried health workers were excluded from consideration in order to minimize bias when collecting data from health facilities.

After realizing that a substantial number of REs recruited for the Round 1 survey were not from same EAs as the one in which they were working, PMA2020/ET supervisors and regional coordinators reached out to local networks to increase the chance of recruiting truly resident REs for subsequent rounds of data collection. In Round 3, for separate reasons, the survey was expanded to include 21 additional EAs in the Oromia Region. Staff from the Oromia Regional Health Bureau and from local district health offices assisted PMA2020/ET in recruiting new REs to survey these additional EAs. This inclusion of new REs should be kept in mind when comparing cross-round results.

### iii. Ghana

In Ghana, PMA2020/Ghana (PMA2020/GH) supervisors assembled RE selection criteria and went directly to each EA to recruit REs before Round 1 of survey data collection. Selection criteria for REs required candidates to be female, have attained at least a high school diploma, and have an ability to work with smart phones. In each EA, PMA2020/GH supervisors collaborated with local stakeholders such as the local health administration to identify three or four qualified candidates. All candidates were interviewed in the EA, after which one candidate was selected as an RE and one was selected as an alternate. Based on their region of origin, the candidate selected as an RE was invited to an intensive training in Accra, Kumasi, or Tamale. PMA2020/GH supervisors retained the contact information for the alternate candidate and she was invited to participate if the original RE became unable to continue with PMA2020. In subsequent rounds, when an RE was unable to continue with PMA2020/GH, she was asked to assist with the recruitment of her replacement.

### iv. Kenya

In Kenya, RE recruitment began with the distribution of a recruitment notice that detailed minimum requirements: candidates were expected to have obtained an O-level certificate with a minimum grade of D+, and were expected to reside within or near the survey EA. Preference was given to candidates with previous survey experience.

The recruitment notice was first posted on an online job portal. Next, the notice was advertised at the county offices of the Kenya National Board of Statistics (KNBS) throughout the country. PMA2020/Kenya (PMA2020/KE) supervisors reviewed all candidate applications, and qualified applicants were short-listed and invited to interview. Interviews were held at the county KNBS offices, and were conducted by both KNBS staff and PMA2020/KE central staff.

Since first recruitment of REs, PMA2020/KE no longer posts the recruitment notice online and exclusively recruits at the county level through KNBS offices.

### v. Uganda

Before the first round of data collection, PMA2020/Uganda (PMA2020/UG) supervisors recruited REs by visiting each of the chosen EAs to find qualified candidates. With the help of local leaders including district, sub-county, council and village leaders, PMA2020/UG staff identified candidates who met the following criteria: a minimum academic qualification of a higher secondary education degree; ability to use a smart phone; previous data collection experience; residence in the sampled EA or in the surrounding sub-counties; and having received a positive recommendation from the local council. For a small number of EAs, where PMA2020/UG supervisors were unable to identify qualified candidates, additional recruitment visits were made to the surrounding sub-counties.

Qualified candidates were interviewed in the EA, and selected individuals were invited to an RE training in Kampala, where they were trained and assessed in their ability to collect data and use ODK. During subsequent rounds of data collection, a small number of additional REs were recruited to replace REs who could no longer continue with PMA2020/UG. Similar recruitment strategies were used. Before each round, additional REs were trained intensively for an average of five days before joining a refresher training for all REs prior to data collection.

## RE Database

Prior to the start of each round of data collection in every country, PMA2020 administers an electronic staff survey to collect socio-demographic information about PMA2020 REs. The staff survey is prepared using ODK and is self-administered using the RE's mobile smart phone. The survey includes questions about the RE's name, age, marital status, number of children, region of residence within the country, residence location with respect to the EA (categorized as in the EA, near the EA meaning within 10 kilometers, or far from the EA defined as more than 10 kilometers away), job status, and level of education.

To prepare this report, staff survey responses were aggregated across all rounds of data collection for each country. If an RE had participated in multiple rounds of data collection, and had completed the staff survey more than once, her earliest responses were used and subsequent responses dropped so that each RE was represented only once. The name of each RE was matched to a random 4-digit RE identification code, and RE names were dropped from the staff survey response database for each country. PMA2020 Household and Female Questionnaire data include the random identification code that corresponds to the RE who conducted each survey. Based on RE identification code, the staff survey database was merged with Rounds 1-4 Household and Female Questionnaire data for each country to create a combined dataset for analysis.

## Retention

Table 1 presents the number of unique REs who worked during each round of data collection. The largest number of REs employed for four survey rounds is in Ethiopia, with 261, and the smallest in Burkina Faso with 105 REs employed.

As one RE typically surveys one EA, the number of REs per round generally corresponds to the number of EAs surveyed per round. Samples consisted of 100 EAs in Ghana, 120 EAs in Kenya, and 110 EAs in Uganda in Rounds 1 through 4. As noted earlier, additional survey EAs were added in Burkina Faso and Ethiopia prior to Round 3; therefore, samples consisted of 53 EAs in Burkina Faso in Rounds 1 and 2, 83 EAs in Burkina Faso Rounds 3 and 4, 200 EAs in Ethiopia Rounds 1 and 2, and 220 EAs in Ethiopia Rounds 3 and 4. This expansion required the recruitment of additional REs before these rounds. In some countries an RE works in multiple EAs each round. This practice is particularly common in Ethiopia. In this setting, REs often cover multiple EAs and/or work in pairs due to transportation costs, security concerns, and staff retention issues. As a result, the number of REs working in each round in Ethiopia is less than the number of EAs in the sample.

**Table 1. Number of unique REs, by country and round**

Number of Unique REs					
Round	Burkina Faso (53 EAs*)	Ethiopia (200 EAs**)	Ghana (100 EAs)	Kenya (120 EAs)	Uganda (110 EAs)
1	53	183	98	118	106
2	53	194	99	105	95
3	82	188**	100	119	105
4	81	202	100	116	101
All rounds	105	261	115	146	130

Data from PMA2020 Female Survey, 2013-2016 \*30 EAs added to the Burkina Faso survey prior to Round 3, requiring the recruitment of additional REs. \*\*21 EAs added to the Ethiopia survey prior to Round 3, The number of REs did not proportionally increase as REs were working in multiple EAs.

Retention of REs is a priority for PMA2020. *Table 2a* presents the cumulative percentage of Round 1 REs who remain as PMA2020 staff in subsequent rounds. Retention rates of these original REs range from 64.2% in Burkina Faso to 86.7% in Ghana. Across all countries, approximately one quarter of the original REs did not participate by the fourth survey round, and were replaced by newly recruited and trained REs.

**Table 2a.** Cumulative percent of REs retained, by country and round

<b>Percent of Round 1 REs Retained</b>					
Round	Burkina Faso	Ethiopia	Ghana	Kenya	Uganda
n	53	183	98	118	106
1	100.0	100.0	100.0	100.0	100.0
2	92.5	82.0	94.9	86.4	88.7
3	77.4*	80.9*	91.8	78.8	86.8
4	64.2*	71.0*	86.7	77.9	73.6

Data from PMA2020 Female Survey, 2013-2016

\* Despite the sample expansion and accompanying RE recruitment that took place prior to Burkina Faso Round 3 and Ethiopia Round 3, the denominator reported here remains the number of REs who worked in Round 1 in each country (53 in Burkina Faso and 183 in Ethiopia).

*Table 2b* examines the percentage of REs who have ever worked to administer a survey in a given country by the number of survey rounds that they have worked for PMA2020. Patterns of how many survey rounds an RE has worked differ by country. In Ethiopia the percentage is split quite evenly with approximately one quarter of REs having each worked during one survey round, two survey rounds, three survey rounds, or all four survey rounds. This is due to the fact that the sample expanded by 21 EAs prior to Round 3 as well as high levels of staff turnover in Ethiopia. In contrast, in Ghana, Kenya and Uganda the majority of REs have worked all four rounds. In Burkina Faso, about 40% of REs have worked in two rounds, and another 40% have worked in all four rounds. This is explained by the recruitment of additional REs for new EAs prior to Round 3.

**Table 2b.** Percent distribution of REs by number of rounds worked for PMA2020, by country

<b>Percent of All REs by Number of Rounds They Have Worked for PMA2020</b>					
No. of Rounds Worked	Burkina Faso*	Ethiopia**	Ghana	Kenya	Uganda
n	105	261	115	146	130
1	12.4	23.9	8.7	11.6	14.6
2	43.5	25.3	8.7	24.0	12.3
3	2.5	24.5	11.3	3.4	18.5
4	41.6	26.3	71.3	61.0	54.6

Data from PMA2020 Staff Survey, 2014-2016

\*30 EAs added to the Burkina Faso survey in Round 3, requiring the recruitment of additional REs.

\*\*21 EAs added to the Ethiopia survey in Round 3. The number of REs did not proportionally increase as REs were working in multiple EAs.

## Characteristics of REs

Table 3 presents selected socio-demographic characteristics of PMA2020 REs for both the first and the fourth survey round. Data were self-reported by REs via PMA2020's electronic, self-administered staff survey. Six socio-demographic characteristics are reviewed: age, education level, current marital status, parity, employment status, and residence in relation to EA. Age is examined at five-year intervals. Marital status is defined as either currently married/ in union or as not currently married, including never married, divorced, and widowed women. Education level is defined as the highest level of schooling achieved by the RE, classified as secondary or technical education, or beyond. Parity is classified as having 0-1 births, 2-3 births, or more than 4 births. Job status is defined as employment that REs held in addition to their work with PMA2020 and classified as either employed full time, employed part-time, self-employed, or working as a student, or unemployed. Lastly, residence in relation to the surveyed EA is defined as within the EA, within 10 kilometers of the EA boundaries (near), or more than 10 kilometers from the EA bounds (far).

Across all five countries, the majority of REs are between the ages of 20 and 35 years old. In Ghana, REs are equally likely to hold a secondary or technical school diploma, or to have attained a higher level of education. This is true for REs in the first survey round in Burkina Faso; however over two-thirds of Burkina Faso Round 4 REs held a higher degree. In Ethiopia and Kenya, the majority of REs hold a secondary school diploma, while in Uganda over 90% of REs hold a tertiary degree.

Approximately one third of REs reported being married in all countries except Kenya, where marriage was reported for over 70% of REs. With the exception of Kenya, more than 75% of REs report 0-1 births, 10-20% report 2-3 births, and less than 10% report 4 or more births. In Kenya birth history is split more evenly with approximately 55% of REs reporting 0-1 births, 40% reporting 2-3 births, and less than 5% reporting 4 or more births.

With the exception of Ghana and Ethiopia, where roughly one-third of REs report full-time employment in addition to their work with PMA2020, about 90% of REs report PMA2020 work as their sole employment or report working part-time, being self-employed or being enrolled as a student.

In all countries, no more than 30% of REs lived within their assigned EA. However, in four of the five countries, a majority of REs reported living in or near to their EA. Across all rounds, Ghana had the highest proportion of REs living in or near their assigned EA, ranging from 87% in Round 1 to 85% in Round 4. Similarly, in Burkina Faso, Kenya, and Uganda upwards of two-thirds of REs lived in or near their EA across all rounds of data collection. Only in Ethiopia were a minority of REs true residents in or near the EA; in Round 4, 33% of REs in Ethiopia lived in or near the EA.

**Table 3. Percent distribution of REs by demographic characteristics at Round 1 & Round 4, by country**

		RE Characteristics									
		Burkina Faso		Ethiopia		Ghana		Kenya		Uganda	
Round		1	4	1	4	1	4	1	4	1	4
Number of REs (n)		53	81	183	202	98	100	118	116	106	101
<b>Age Group</b>											
15-19		0.0	1.2	0.0	0.5	0.0	1.0	0.0	0.0	2.9	2.3
20-24		22.2	30.9	40.5	40.1	44.9	45.0	10.2	10.3	25.5	23.3
25-29		50.0	46.9	49.4	49.5	40.8	41.0	44.9	45.7	43.1	47.7
30-34		16.7	14.8	8.9	8.9	12.2	11.1	34.8	34.5	14.7	12.8
35-39		5.6	3.7	1.2	1.0	2.0	2.0	8.5	6.0	9.8	8.1
40-44		5.6	2.5	0.0	0.0	0.0	0.0	1.7	3.5	1.0	2.3
45-49		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.3
<b>Education Level</b>											
Secondary/ Technical		50.0	33.3	67.1	68.1	46.4	46.5	98.2	91.3	6.7	5.7
Beyond Secondary		50.0	66.7	32.9	31.9	53.6	53.5	1.8	8.7	93.3	94.3
<b>Current Marital Status</b>											
Married/ In union		36.1	33.3	29.2	27.6	26.5	28.0	71.2	71.6	35.2	36.4
Not married*		63.9	66.7	70.8	72.4	73.5	72.0	28.8	28.5	64.8	64.6
<b>Parity</b>											
0-1		86.1	86.4	90.1	91.3	86.7	87.0	55.1	56.0	76.2	74.4
2-3		8.3	9.9	9.9	8.1	13.3	13.0	41.5	39.7	17.8	18.6
4+		5.6	3.7	0.0	0.7	0.0	0.0	3.4	4.3	5.9	7.0
<b>Job Status</b>											
Full-time employed		8.3	2.5	35.7	35.9	38.1	37.1	3.4	3.2	7.8	4.7
Part-time or student or self-employed		72.2	90.1	53.0	44.8	39.2	37.1	33.3	33.3	50.0	54.7
Unemployed		19.4	7.4	11.3	19.3	22.7	25.8	63.3	63.4	42.2	41.7
<b>Residence in relation to EA</b>											
In		16.7	11.1	5.4	5.7	15.3	14.0	15.3	26.7	25.0	27.4
Near		63.9	60.5	26.2	27.6	71.4	71.0	53.4	48.3	40.0	41.7
Far		19.4	22.2	68.5	66.7	13.3	15.0	31.4	25.0	35.0	31.0

Data from PMA2020 Staff Survey, 2014-2016

\*Not married includes never married, divorced, and widowed women



## Contact between REs and respondents: cross-sectional samples

Prior to every round of data collection, a new sample of households is randomly selected from the household listing in the EA. This can result in re-interviews of a small number of households and females that have been previously surveyed. *Table 4* presents the percent of Female Questionnaire respondents in Rounds 2 through 4 who report previous participation in a PMA2020 survey (note that previous participation in a PMA2020 survey in Round 1 is not possible). In Ghana Round 2 and 3 and Ethiopia Round 3, Female Questionnaire respondents were not asked whether they had previously participated in a PMA2020 survey. In these cases, however, the Household Questionnaire respondent was asked about previous participation. Therefore, the household respondent answer is substituted for the female respondent answer for these three rounds. This substitution is based on the high correlation of report of previous survey participation by household and female respondents (See Appendix 4). In Round 4, Ghana and Uganda report the highest proportion of previously interviewed respondents at nearly 30%, while Burkina Faso has the lowest rate of previous participation at about 18%.

*Table 4* also presents the percent of female respondents who are acquainted with their RE, as reported by the RE, by country and round. Before beginning each Female Questionnaire, REs report the degree to which they are acquainted with the respondent. An RE may report that she is not at all acquainted, not well acquainted, well acquainted, or very well acquainted with the respondent. Reporting of RE-respondent acquaintance is reviewed during PMA2020 trainings before survey administration, and the interpretation of acquaintance level is standardized: REs are instructed to select 'very well acquainted' if they know the respondent's first name and would greet the respondent at the market, church or mosque; to select 'well acquainted' if they know the respondent by sight and may also know a family member; to select 'not well acquainted' if they may have seen the respondent at a community or religious gathering but do not recognize the respondent on sight and do not know a family member; and to select 'not at all acquainted' if they have never met the respondent or the respondent's family members previously. Tabulated below is the combined proportion of female respondents who are either well or very well acquainted with their RE, as reported by the RE. Ghana and Uganda report the highest proportion of REs who are acquainted with their respondent, although this varies nonlinearly from about 40% to 60% by round. Acquaintance levels drop to around 20% or lower in Kenya and Burkina Faso. Ethiopia has the lowest reported acquaintance level, around 5% or less, in line with the high percentage of REs living far from the sample EA.

As PMA2020 conducts serial surveys within the same EAs, the presence of an RE in a community over time may cause acquaintance to increase with re-interview. The association between acquaintance and re-interview is explored in Appendix 3.

**Table 4.** Number of female respondents, percent of respondents who previously participated in a PMA2020 survey, and percent of respondents very well or well acquainted with RE, by country and round

	Number of Female Respondents	Percent of Respondents who Previously Participated	Percent of Respondents Acquainted with RE
<b>Burkina Faso</b>			
Round 1	2,064	n/a	7.7
Round 2	2,102	11.5	12.7
Round 3*	3,261	9.4	7.0
Round 4	3,196	17.8	9.1
<b>Ethiopia</b>			
Round 1	6,468	n/a	1.8
Round 2	6,648	17.3***	3.4
Round 3**	7,545	18.8	5.7
Round 4	7,481	23.0	4.8
<b>Ghana</b>			
Round 1	3,645	n/a	45.1
Round 2	3,892	50.2***	50.2
Round 3	4,556	29.9***	44.8
Round 4	5,185	26.9	39.3
<b>Kenya</b>			
Round 1	3,754	n/a	13.9
Round 2	4,329	9.3	15.5
Round 3	4,396	14.4	20.0
Round 4	4,921	19.5	22.1
<b>Uganda</b>			
Round 1	3,716	n/a	60.6
Round 2	3,631	20.4	38.7
Round 3	3,690	25.6	50.7
Round 4	3,793	29.0	53.9

Data from weighted PMA2020 Household & Female Survey, 2013-2016

\*30 EAs added to the Burkina Faso survey prior to Round 3.

\*\*21 EAs added to the Ethiopia survey prior to Round 3.

\*\*\*Previous participation in a PMA2020 survey asked only of the household respondent during this round. Thus, reported values are the percent of previous participation among household interview respondents.

## Association between RE-respondent contact and select outcomes

Table 5a presents five selected respondent outcomes (modern contraceptive use, contraceptive method, parity, education level, and whether or not a married respondent's husband had multiple wives) by previous participation in a PMA2020 survey across each country and round. Analysis is restricted to females with completed Female and Household Questionnaires who are de facto household members. When examining contraceptive method, analysis is further restricted to respondents who are contraceptive users, and when examining whether a respondent's husband

has co-wives, analysis is further restricted to currently married respondents. See Appendix 1 for information about sample size for each outcome.

Modern contraceptive use and whether or not a married respondent's husband had multiple wives are defined as dichotomous yes or no variables. For this analysis, parity is dichotomized as nulliparous or parous women. Contraceptive method is defined as the current contraceptive method used, classified as female or male sterilization, implant, IUD, injectable, pill, condom, other modern method, or traditional method. Education level is defined as having never attended school, or having completed primary school, secondary or technical school, or earned a tertiary degree.

Pearson chi-square design-based tests of difference were conducted for each outcome to examine potential differentials in reporting. The distributions for the five outcomes varied expectedly by country context. Parity showed differential reporting based on previous participation in a PMA2020 survey in each country for at least one round. Evidence of differential reporting by previous participation of modern contraceptive use, education level and whether or not a married respondent's husband had multiple wives was evident in some countries but not others. In differentiating between modern contraceptive prevalence rates reported by those who had previously participated, the Pearson chi-square test resulted in p values in the statistical significance range of <0.05 in Ethiopia Round 4 (29.9% if previous participation versus 25.5% if not), in Kenya Round 4 (47.2% if previously participated versus 40.2% if not), and in Uganda Round 4 (32.6% if previously participated versus 25.3% if not). These are the only three instances of significant associations observed. Notably, reporting of type of contraceptive method used by contraceptors was unassociated with previous survey participation across all five countries.

*Table 5b* presents the same five outcomes by RE-respondent acquaintance across each country and round. Chi-square tests of difference illustrate differential reporting of parity based on RE-respondent acquaintance in Burkina Faso, Kenya and Uganda. Reporting of education level is associated with RE-respondent acquaintance in one round in all countries except Ghana. Differential reporting of modern contraceptive use by RE acquaintance is found only in Ethiopia Round 4 (35.3% if acquainted and 26.1% if not acquainted) and Burkina Faso Round 4 (30.7% if acquainted and 21.1% if not acquainted), and for type of method used only in Kenya Round 1. The reporting of modern contraceptive use, a key FP2020 indicator, thus does not appear to be significantly influenced by RE-respondent acquaintance in any country.

**Table 5a.** Percent distribution of respondent report of select outcomes according to previous participation in a PMA2020 survey, by country and round

Respondents report of outcomes by previous PMA participation in Burkina Faso																		
Previous Participation	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**		
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes
<b>Round 2</b>																		
No	81.6	18.4	0.4	34.5	3.6	31.1	12.6	11.7	1.3	4.7	23.9	76.1	67.0	16.8	14.7	1.4	54.7	45.2
Yes	80.0	20.0	0.0	37.7	3.7	36.0	11.1	6.9	2.5	2.1	16.7	83.3	76.9	10.2	11.7	1.2	54.2	45.8
p		0.707									0.789	0.023				0.262		0.900
<b>Round 3</b>																		
No	78.4	21.6	0.1	40.7	1.6	30.4	10.5	10.7	0.9	5.1	28.5	71.5	61.9	18.4	18.2	1.5	58.6	41.2
Yes	79.4	20.6	0.0	35.6	2.5	36.6	11.4	4.1	1.3	8.5	15.1	84.5	68.4	15.2	15.3	1.1	56.5	43.5
p		0.736									0.917	<0.001				0.501		0.892
<b>Round 4</b>																		
No	78.3	21.7	0.1	38.7	1.6	31.4	11.0	11.2	0.9	5.1	24.5	78.3	63.9	16.5	17.3	2.3	56.4	43.4
Yes	76.6	23.4	0.0	34.6	2.7	36.5	11.4	4.4	1.3	8.5	13.5	86.5	66.8	14.8	16.8	1.7	48.9	51.1
p		0.436									0.841	<0.001				0.515		0.076

Data from weighted PMA2020 Female Survey, 2013-2016

P-values from Pearson chi-squared design-based tests of difference

\*Among contraceptors

\*\*Among married women

**Table 5a.** Percent distribution of respondent report of select outcomes according to previous participation in a PMA2020 survey, by country and round (continued)

Respondents report of outcomes by previous PMA participation in Ethiopia																			
Previous Participation	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**			
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes	
<b>Round 2</b>																			
No	82.0	18.0	0.0	37.1	0.3	55.6	1.7	2.6	1.0	1.7	33.6	66.4	53.2	32.6	12.0	0.8	88.4	11.0	
Yes	76.0	24.0	1.1	19.3	2.1	68.1	4.7	1.0	1.5	2.3	34.1	65.9	43.9	37.3	14.9	2.4	84.3	15.7	
p	0.445									0.593			0.835			0.790		0.247	
<b>Round 3</b>																			
No	75.0	25.0	1.1	19.7	2.6	64.9	5.6	1.3	1.9	2.7	34.6	65.4	44.6	36.9	14.6	2.7	88.6	10.9	
Yes	71.5	28.5	1.8	22.1	1.4	65.8	5.0	1.8	0.3	1.9	29.3	70.7	44.0	37.8	14.2	2.8	88.1	11.7	
p	0.066									0.204			0.036			0.984		0.587	
<b>Round 4</b>																			
No	74.5	25.5	0.6	22.2	2.0	60.3	7.2	1.5	1.8	4.6	35.7	64.3	40.6	38.3	16.5	3.0	86.9	12.8	
Yes	70.1	29.9	1.0	24.7	2.1	59.9	5.9	0.6	1.6	4.2	23.1	76.9	45.0	39.2	12.7	1.8	86.2	13.0	
p	0.015									0.734			<0.001			0.009		0.247	

Data from weighted PMA2020 Female Survey, 2013-2016  
P-values from Pearson chi-squared design-based tests of difference  
\*Among contraceptors  
\*\*Among married women

**Table 5a.** Percent distribution of respondent report of select outcomes according to previous participation in a PMA2020 survey, by country and round (continued)

Respondents report of outcomes by previous PMA participation in Ghana																			
Previous Participation	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**			
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes	
<b>Round 2</b>																			
No	85.0	15.0	1.0	13.5	1.6	33.0	23.0	5.9	10.7	11.3	36.0	64.0	14.3	17.0	39.4	18.2	73.7	22.8	
Yes	87.0	13.0	3.1	15.9	3.0	33.9	17.6	7.2	11.5	8.0	30.6	69.4	26.8	20.0	33.7	14.9	68.8	29.1	
p	0.375									0.237		0.011					0.002		0.360
<b>Round 3</b>																			
No	82.4	17.6	2.4	10.7	1.5	28.2	16.1	8.9	15.8	16.4	36.4	63.6	16.9	18.0	39.4	17.9	78.4	20.1	
Yes	80.7	19.3	2.5	15.3	1.4	28.9	13.2	7.0	15.3	16.5	32.5	67.5	24.8	15.8	36.4	16.7	70.7	26.9	
p	0.565									0.371		0.060					0.100		0.001
<b>Round 4</b>																			
No	76.1	23.9	1.7	14.5	2.0	30.0	13.5	8.6	13.6	16.1	39.2	60.8	16.3	17.8	38.3	18.2	79.4	16.6	
Yes	78.2	21.8	3.1	15.8	1.4	31.3	13.4	8.5	10.7	15.8	29.6	70.4	24.2	18.0	34.3	16.5	71.9	25.7	
p	0.259									0.835		<0.001					0.001		0.002

Data from weighted PMA2020 Female Survey, 2013-2016  
P-values from Pearson chi-squared design-based tests of difference  
\*Among contraceptors  
\*\*Among married women

**Table 5a.** Percent distribution of respondent report of select outcomes according to previous participation in a PMA2020 survey, by country and round (continued)

Respondents report of outcomes by previous PMA participation in Kenya																		
Previous Participation	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**		
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes
<b>Round 2</b>																		
No	60.4	39.6	5.1	17.6	4.4	52.2	11.4	4.6	3.4	1.3	26.0	74.0	3.8	49.2	1.5	32.1	4.4	82.9
Yes	53.1	46.9	8.4	20.6	3.2	47.0	11.3	4.4	2.9	2.3	15.0	85.0	2.8	60.2	1.7	26.9	3.4	85.0
p		0.204								0.620		<0.001				0.006		0.860
<b>Round 3</b>																		
No	54.0	46.0	3.7	21.1	5.7	45.6	11.4	5.7	3.7	3.2	25.7	74.3	4.3	47.6	2.1	30.5	4.6	85.1
Yes	50.5	49.5	4.7	21.0	2.6	47.6	14.3	5.9	1.5	2.5	19.3	80.7	4.0	55.5	3.4	27.9	2.9	82.7
p		0.177								0.225		0.337				0.003		0.195
<b>Round 4</b>																		
No	55.1	44.9	4.3	24.6	6.1	41.0	9.9	6.0	4.4	3.7	31.5	68.5	3.7	46.8	2.3	32.9	3.2	87.1
Yes	50.1	49.9	5.2	22.0	3.7	50.2	9.7	3.9	2.2	3.2	20.9	79.1	4.8	56.3	1.8	24.2	1.3	85.6
p		0.031								0.05		<0.001				0.001		0.060

Data from weighted PMA2020 Female Survey, 2013-2016  
P-values from Pearson chi-squared design-based tests of difference  
\*Among contraceptors  
\*\*Among married women

**Table 5a.** Percent distribution of respondent report of select outcomes according to previous participation in a PMA2020 survey, by country and round (continued)

Respondents report of outcomes by previous PMA participation in Uganda																		
Previous Participation	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**		
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes
<b>Round 2</b>																		
No	73.6	26.4	6.0	12.2	3.0	44.8	6.4	14.1	4.8	8.8	28.2	71.8	9.3	58.3	26.5	3.4	64.0	29.4
Yes	74.9	25.1	9.1	13.2	3.6	44.3	3.7	15.5	3.2	7.5	19.9	80.1	11.1	61.7	21.1	3.5	60.5	31.5
p		0.578								0.725		0.005				0.331		0.698
<b>Round 3</b>																		
No	74.3	25.7	4.7	13.9	1.4	46.8	6.9	12.4	3.9	9.9	28.1	71.9	8.7	59.7	26.6	2.7	65.6	28.4
Yes	73.3	26.7	8.0	15.5	0.5	43.4	8.8	12.9	1.1	9.8	17.6	82.4	12.7	60.0	22.8	3.2	65.7	28.3
p		0.656								0.285		<0.001				0.028		0.989
<b>Round 4</b>																		
No	74.7	25.3	5.9	13.3	1.9	47.5	6.8	11.1	3.2	10.3	26.0	74.0	8.6	61.6	24.9	2.6	61.8	31.3
Yes	67.4	32.6	8.2	12.9	1.7	46.8	6.6	8.7	2.7	12.4	12.7	87.3	9.7	62.5	21.7	4.1	67.6	28.3
p		<0.001								0.809		<0.001				0.297		0.018

Data from weighted PMA2020 Female Survey, 2013-2016  
P-values from Pearson chi-squared design-based tests of difference  
\*Among contraceptors  
\*\*Among married women



**Table 5b.** Percent distribution of respondent reports of select outcomes according to RE-respondent acquaintance, by country and round

Respondents report of outcomes by RE acquaintance in Burkina Faso																			
RE acquaintance	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**			
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes	
<b>Round 1</b>																			
Not very well/ Not at all	84.2	15.8	0.4	42.8	2.1	37.0	12.6	3.8	1.0	0.4	21.7	78.3	71.0	14.8	12.5	1.7	50.2	49.8	
Very well/ Well	84.4	15.6	0.0	51.7	0.0	25.6	22.7	0.0	0.0	0.0	13.6	86.4	69.3	21.4	9.1	0.2	55.5	44.5	
p	0.962									0.689			0.042			0.046		0.573	
<b>Round 2</b>																			
Not very well/ Not at all	82.1	17.9	0.4	34.2	4.0	29.1	13.4	12.5	1.3	5.2	23.7	76.3	67.5	15.9	14.9	1.6	53.4	46.6	
Very well/ Well	76.9	23.1	0.0	39.3	1.7	46.7	6.8	3.3	2.1	0.0	19.1	80.9	72.2	17.1	10.7	0.0	62.5	37.5	
p	0.319									0.210			0.256			0.422		0.124	
<b>Round 3</b>																			
Not very well/ Not at all	79.0	21.0	0.1	39.1	1.5	32.0	10.8	9.8	1.0	5.8	27.6	72.4	65.0	15.3	17.3	2.3	58.1	41.9	
Very well/ Well	72.0	28.0	0.0	51.8	4.4	20.8	8.4	12.8	0.0	1.7	22.4	76.9	58.4	24.3	16.6	0.7	63.9	36.1	
p	0.130									0.253			0.001			0.360		0.320	
<b>Round 4</b>																			
Not very well/ Not at all	78.9	21.1	0.1	37.1	1.5	31.1	10.8	10.1	1.0	5.8	23.1	76.9	63.0	17.7	17.8	1.5	55.3	44.7	
Very well/ Well	69.3	30.7	0.0	49.6	3.9	21.7	8.3	12.7	0.0	1.7	16.4	83.6	56.5	23.2	19.4	0.9	53.3	46.7	
p	0.001									0.253			0.048			0.035		0.749	

Data from weighted PMA2020 Female Survey, 2013-2016  
P-values from Pearson chi-squared design-based tests of difference  
\*Among contraceptive users  
\*\*Among married women

**Table 5b.** Percent distribution of respondent reports of select outcomes according to RE-respondent acquaintance, by country and round (continued)

Respondents report of outcomes by RE acquaintance in Ethiopia																		
RE acquaintance	Modern Contraceptive Use		Current Method*							Parity		Education Level			Multiple Wives**			
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes
<b>Round 1</b>																		
Not very well/ Not at all	77.5	22.5	0.8	15.6	2.2	72.0	6.2	1.6	0.6	1.1	33.5	66.5	45.5	36.8	12.2	2.7	84.8	15.2
Very well/ Well	77.4	22.6	0.0	16.4	1.8	66.4	8.7	1.2	0.6	5.0	37.6	62.4	30.7	43.0	17.3	6.3	84.3	15.7
p	0.992									0.584		0.401					0.153	0.951
<b>Round 2</b>																		
Not very well/ Not at all	76.0	24.0	1.0	20.7	2.1	67.0	4.4	1.0	1.6	2.3	33.3	66.7	44.6	37.1	14.6	2.2	88.3	11.7
Very well/ Well	82.4	17.6	0.0	10.2	1.1	74.0	7.9	0.8	0.0	5.9	43.2	56.8	34.7	40.8	20.7	3.0	93.2	6.8
p	0.117									0.637		0.126					0.258	0.192
<b>Round 3</b>																		
Not very well/ Not at all	74.3	25.7	1.1	20.3	2.3	65.4	5.5	1.3	1.7	2.5	33.7	66.3	44.7	37.1	14.3	2.6	89.1	10.9
Very well/ Well	74.9	25.1	4.6	19.3	3.4	60.9	6.0	3.4	0.4	2.0	32.0	68.0	41.5	36.0	16.9	4.1	84.2	15.8
p	0.862									0.123		0.864					0.645	0.283
<b>Round 4</b>																		
Not very well/ Not at all	73.9	26.1	0.7	22.4	1.9	60.1	7.1	1.3	1.7	4.7	33.2	66.8	41.3	38.8	15.7	2.7	87.3	12.7
Very well/ Well	64.7	35.3	1.4	29.8	3.3	59.5	2.3	1.0	2.4	0.4	25.6	74.4	49.3	33.5	13.8	1.8	83.2	16.8
p	0.001									0.136		0.121					0.277	0.418

Data from weighted PMA2020 Female Survey, 2013-2016

P-values from Pearson chi-squared design-based tests of difference

\*Among contraceptors

\*\*Among married women

**Table 5b.** Percent distribution of respondent reports of select outcomes according to RE-respondent acquaintance, by country and round (continued)

Respondents report of outcomes by RE acquaintance in Ghana																				
RE acquaintance	Modern Contraceptive Use		Current Method*							Parity		Education Level			Multiple Wives**					
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes		
<b>Round 1</b>																				
Not very well/ Not at all	85.0	15.0	2.5	12.0	2.7	31.3	24.3	6.9	11.7	8.7	31.6	68.4	20.2	18.1	37.3	17.4	71.6	28.4		
Very well/ Well	86.7	13.3	1.0	15.0	2.9	36.0	27.6	7.7	4.0	5.7	31.5	68.5	23.1	18.5	35.7	15.8	71.4	28.6		
p	0.415									0.469		0.084					0.865		0.964	
<b>Round 2</b>																				
Not very well/ Not at all	85.5	14.5	1.0	18.0	2.7	33.7	19.6	7.1	9.1	8.9	33.9	66.1	21.5	20.2	34.7	16.3	72.9	27.1		
Very well/ Well	85.2	14.8	2.4	10.4	1.8	33.1	23.8	7.8	11.4	9.3	33.3	66.7	20.8	18.1	37.3	16.6	73.3	26.7		
p	0.867									0.620		0.569					0.897		0.408	
<b>Round 3</b>																				
Not very well/ Not at all	82.7	17.3	2.5	11.8	1.6	26.5	14.9	9.6	17.0	16.2	35.6	64.4	19.7	17.0	38.5	18.4	80.2	19.8		
Very well/ Well	81.0	19.0	2.2	13.6	1.3	30.0	17.8	6.7	13.2	15.2	33.6	66.4	19.3	17.8	39.5	15.9	75.7	24.3		
p	0.432									0.796		0.314					0.772		0.158	
<b>Round 4</b>																				
Not very well/ Not at all	75.9	24.1	2.2	14.2	2.0	29.0	13.0	10.0	14.3	15.3	37.4	62.6	16.9	18.2	38.4	17.5	82.6	17.4		
Very well/ Well	77.6	22.4	1.8	16.0	1.5	32.3	14.5	6.6	10.2	17.1	35.4	64.6	20.7	17.5	35.3	17.9	76.6	23.4		
p	0.450									0.514		0.424					0.592		0.140	

Data from weighted PMA2020 Female Survey, 2013-2016

P-values from Pearson chi-squared design-based tests of difference

\*Among contraceptive users

\*\*Among married women

**Table 5b.** Percent distribution of respondent reports of select outcomes according to RE-respondent acquaintance, by country and round (continued)

**Respondents report of outcomes by RE acquaintance in Kenya**

RE acquaintance	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**			
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes	
<b>Round 1</b>																			
Not very well/ Not at all	58.8	41.2	3.2	17.9	4.6	54.9	10.6	4.9	3.4	0.5	22.2	77.8	4.0	46.9	2.5	31.5	86.7	13.3	
Very well/ Well	56.0	44.0	4.4	17.1	6.4	63.2	5.0	2.5	1.6	0.0	16.4	83.6	2.6	66.0	1.3	22.2	85.6	14.4	
p		0.478								0.073		0.003					<0.001		0.605
<b>Round 2</b>																			
Not very well/ Not at all	59.5	40.5	5.7	18.3	4.2	50.5	11.9	4.6	3.5	1.4	25.8	74.2	4.0	49.2	1.6	32.1	86.8	13.2	
Very well/ Well	60.8	39.2	4.3	16.3	5.0	57.5	8.2	4.3	2.8	1.5	20.6	79.4	2.2	56.0	0.7	29.0	88.0	12.0	
p		0.747								0.552		<0.001					0.255		0.656
<b>Round 3</b>																			
Not very well/ Not at all	54.3	45.7	4.1	20.6	5.4	44.0	12.4	6.4	3.7	3.5	26.6	73.4	4.3	46.7	2.6	30.9	88.9	11.1	
Very well/ Well	50.3	49.7	3.2	23.0	4.3	53.1	9.7	3.0	2.1	1.6	17.6	82.4	3.9	56.8	1.1	27.3	87.8	12.2	
p		0.115								0.042		<0.001					0.079		0.649
<b>Round 4</b>																			
Not very well/ Not at all	55.6	44.4	4.2	23.3	6.5	41.6	9.8	5.9	4.5	4.2	31.2	68.8	4.4	45.8	2.5	32.4	89.3	10.7	
Very well/ Well	48.4	51.6	5.2	26.0	2.7	47.8	10.1	4.3	2.2	1.7	22.9	77.1	2.1	58.3	1.4	27.5	89.4	10.6	
p		0.390								0.051		0.001					0.005		0.973

Data from weighted PMA2020 Female Survey, 2013-2016  
P-values from Pearson chi-squared design-based tests of difference  
\*Among contraceptive users  
\*\*Among married women

**Table 5b. Percent distribution of respondent reports of select outcomes according to RE-respondent acquaintance, by country and round (continued)**

Respondents report by RE-respondent acquaintance in Uganda																				
RE acquaintance	Modern Contraceptive Use		Current Method*							Parity			Education Level			Multiple Wives**				
	No	Yes	Sterilization	Implant	IUD	Injectable	Pill	Condom	Other Modern	Traditional	Never	1 or more times	Never attended	Primary	Secondary	Tertiary	No	Yes		
<b>Round 1</b>																				
Not very well/ Not at all	78.1	21.9	8.8	12.0	1.1	52.8	10.0	7.1	2.9	5.3	23.2	76.8	13.0	55.9	23.8	3.5	67.8	32.2		
Very well/ Well	79.6	20.4	4.8	11.8	4.1	54.9	7.6	9.1	2.3	5.4	25.7	74.3	13.9	59.3	22.3	2.6	66.6	33.4		
p	0.515									0.358		0.407					0.353		0.701	
<b>Round 2</b>																				
Not very well/ Not at all	73.4	26.6	6.3	11.1	3.2	43.6	6.2	15.6	4.6	9.4	28.7	71.3	10.9	56.3	25.7	4.2	67.0	33.0		
Very well/ Well	74.5	25.5	7.0	14.7	3.0	46.5	5.3	12.4	4.2	6.9	23.1	76.9	7.7	63.2	24.9	2.4	69.3	30.7		
p	0.623									0.819		0.014					0.101		0.416	
<b>Round 3</b>																				
Not very well/ Not at all	74.6	25.4	4.1	13.7	0.7	49.1	6.7	11.7	2.8	11.1	26.1	73.9	9.1	59.3	26.9	2.6	71.6	28.4		
Very well/ Well	73.7	26.3	7.0	14.9	1.7	42.8	8.2	13.3	3.6	8.7	24.6	75.4	10.2	60.5	24.2	3.1	68.2	28.4		
p	0.733									0.436		0.795					0.836		0.315	
<b>Round 4</b>																				
Not very well/ Not at all	72.5	27.5	5.5	11.1	1.2	45.7	8.3	12.2	3.5	12.5	24.0	76.0	9.0	59.6	25.1	4.0	70.8	29.2		
Very well/ Well	72.5	27.5	7.7	14.8	2.4	48.4	5.3	8.7	2.9	9.7	20.5	79.5	8.9	63.8	23.0	2.2	65.3	34.7		
p	0.979									0.235		0.146					0.414		0.051	

Data from weighted PMA2020 Female Survey, 2013-2016  
P-values from Pearson chi-squared design-based tests of difference  
\*Among contraceptors  
\*\*Among married women

## Limitations

Two limitations on the foregoing analysis should be mentioned. The first pertains to missing data on some REs. In four of the five countries studied, not all REs completed the staff survey. Extensive efforts were made by PMA2020 country teams to contact REs whose responses were missing, but in some cases the individual was no longer working in the country or no longer had a working contact number and therefore could not be reached. Responses from 17 REs were missing in Burkina Faso (16% of REs who had ever worked for PMA2020/BF), 3 REs in Ghana (3% of REs who had ever worked for PMA2020/GH), 23 REs in Ethiopia (9% of REs who had ever worked for PMA2020/ET), and 12 REs in Uganda (9% of REs who had ever worked for PMA2020/UG). No RE responses were missing in Kenya.

A second limitation is the possibility of an RE borrowing another RE's smartphone device to collect data. This would introduce error in the RE attributes associated with reported acquaintance between the RE and the respondent. The chances for this are small given the deployment of REs to individual EAs. PMA2020 does not observe evidence of this bias, but it is important to acknowledge the potential error.

### 1. Discussion and further research

Using chi-square tests of differences to examine differences in outcome reporting, we find that respondents who have previously participated in at least one PMA2020 survey were not significantly more likely to report modern contraceptive use than first-time respondents across all survey rounds in Burkina Faso and Ghana and in all but one round in Ethiopia (Round 4,  $p=0.015$ ), Kenya (Round 4,  $p=0.031$ ) and Uganda (Round 4,  $p<.001$ ). The reporting of the type of contraceptive method used by contracepting women was not significantly associated with previous participation in any round across all five countries. In contrast, the reporting of parity was significantly associated with previous participation in every country, where those subsequently re-sampled for an interview were more likely to report any birth. Lastly, there was significant differential reporting of education level by whether the respondent participated in a previous PMA survey in Ghana only but in no specific direction.

In examining the impact of RE-respondent acquaintance, we find that respondents are not significantly more likely to report modern contraceptive use to REs with whom they are acquainted than to REs with whom they are not acquainted. There is one exception in Ethiopia for Round 4 and one in Burkina Faso for Round 4; however, only 5 percent of the sample falls into the well-acquainted category in Ethiopia, and only 10% of the sample falls into the well-acquainted category in Burkina Faso. Reporting of the type of contraceptive method currently used by contraceptors was similarly unassociated with RE acquaintance in all five countries, although there was one instance of a statistically significant relationship (Kenya, Round 1,  $p=0.015$ , where injectables were more likely to be reported to an acquaintance and pill less so). The association between RE acquaintance and respondent's reporting of her schooling level was statistically insignificant across nearly all

rounds in four of the five countries. In Kenya there was significantly more reporting of primary level schooling when the RE reported being acquainted than not acquainted with the respondent in all four rounds. Similarly, in Kenya there was significantly more reporting of having children when the RE reported being acquainted with the respondent.

The results for this descriptive analysis suggest that the association of previous survey participation and RE-respondent acquaintance on reporting of sensitive and non-sensitive behaviors will vary by country context and over time. Some secular change in behavioral outcomes over the two years of survey rounds is to be expected. We observe a few more significant associations between previous participation in a PMA2020 survey than RE-respondent acquaintance across the five countries studied. However, neither measure of the survey design using the same RE repeatedly appears to consistently be associated with the reporting of the five outcomes of interest. The patterns in Kenya related to respondent reporting of parity and schooling if the RE is acquainted are an interesting contrast to the absence of patterns with respect to modern contraceptive use and method type.

Further analysis is being conducted to estimate the magnitude and direction of influences from contextual and interviewer-related factors introduced by employing social insiders as survey enumerators. PMA2020 staff is undertaking both quantitative multi-level modeling and qualitative studies in Burkina Faso and Kaduna state, Nigeria. The multivariate analysis nests respondents within interviewers to examine differences in reporting of reproductive health outcomes by RE-respondent acquaintance and re-interview status, adjusting for RE and respondent attributes. This analysis will be reported separately. The complementary qualitative studies in Burkina Faso and Kaduna state will employ focus group discussions and in-depth interviews with REs to investigate more fully the social context in which PMA2020 interviews and questions are conveyed and understood. The studies will also explore REs' perceptions of their social standing in their survey communities. Since most REs recruited to PMA2020 surveys live near, rather than uniformly in, the sample EA, the analytic perspective taken in this investigation is to interpret social insider status as being from within the local area that can cover a cluster of EAs.

PMA2020 survey rounds shift to an annual cycle after the first four rounds are completed. This will mitigate influences from RE factors unless they are employed for other survey modules. To minimize any carryover of RE influences, the fifth round is conducted in a sample cluster randomly selected from those contiguous to the original one.

## References

Angelwicz P, Adams J, Obare F et al. (2009). The Malawi Diffusion and Ideational Change Project 2004-06: Data collection, data quality, and analysis of attrition. *Demographic Research*, 20(21): 503.

Davis RE, Couper MP, Janz NK et al. (2010). Interviewer effects in public health surveys. *Health Education Research*, 25(1): 14-26.

Elliot MR and West BT. (2015). "Clustering by Interviewer": A Source of Variance That is Unaccounted for in Single-Stage Health Surveys. *American Journal of Epidemiology*, 182(2): 118-126.

Rodriguez LA, Sana M and Sisk B. (2015). Self-administered Questions and Interviewer-Respondent Familiarity. *Field Methods*, 27(2): 163-181.

Sana A, Stecklov G & Weinreb A. (2016). A test of the stranger-interviewer norm in the Dominican Republic. *Population Studies*, 70(1): 73-92.

Stecklov G, Weinreb A and Sana M. (2015). Family Planning for Strangers: An Experiment on the Validity of Reported Contraceptive Use. *PLOS One*, 10(8): e0136972.

Weinreb A. (2006). The Limitations of Stranger-Interviewers in Rural Kenya. *American Sociological Review*, 71(6): 1014-1039.



## Appendix

*Appendix 1. Unweighted sample sizes of respondents, by country and round*

	<b>Burkina Faso</b>	<b>Ethiopia</b>	<b>Ghana</b>	<b>Kenya</b>	<b>Uganda</b>
<b>Round 1</b>					
Eligible female respondents	2,064	6,468	3,645	3,754	3,716
Eligible married female respondents	1,502	3,670	2,283	2,498	2,404
Contracepting females	354	1,602	543	1,585	817
<b>Round 2</b>					
Eligible female respondents	2,102	6,648	3,892	4,329	3,631
Eligible married female respondents	1,440	3,769	2,429	2,650	2,252
Contracepting females	509	1,677	574	1,806	1,035
<b>Round 3</b>					
Eligible female respondents	3,261	7,545	4,556	4,396	3,690
Eligible married female respondents	2,239	4,363	2,694	2,744	2,369
Contracepting females	844	2,072	947	2,086	1,048
<b>Round 4</b>					
Eligible female respondents	3,196	7,481	5,185	4,921	3,793
Eligible married female respondents	2,221	4,346	3,041	2,826	2,511
Contracepting females	843	2,096	1,330	2,316	1,172

Note: Analyses for Tables 5a and 5b use the samples shown in this Appendix. Specifically, analyses involving the outcomes modern contraceptive use, parity, and education level are based on eligible female respondents. Analyses involving whether a respondent's husband has multiple wives are based on eligible married female respondents. Analyses involving current method are based on contracepting females.

**Appendix 2.** Percent distribution of respondents according to level of RE-respondent acquaintance and RE residence in relation to the EA, by country and round

	<b>Burkina Faso*</b>		<b>Ethiopia**</b>		<b>Ghana</b>		<b>Kenya</b>		<b>Uganda</b>	
	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted
<b>Round 1</b>										
In	87.7	12.3	98.8	1.2	59.2	40.8	70.3	29.7	25.9	74.1
Near	94.5	5.5	98.3	1.7	55.2	44.8	93.3	6.7	49.2	50.8
Far	98.0	2.0	98.6	1.4	44.3	55.7	87.7	12.3	42.3	57.7
<b>Round 2</b>										
In	74.1	25.9	93.7	6.3	53.4	46.6	92.2	7.8	42.6	57.4
Near	92.5	7.5	94.5	5.5	49.1	50.9	92.5	7.5	66.3	33.7
Far	93.9	6.1	97.3	2.7	44.6	55.4	88.4	11.6	66.0	34.0
<b>Round 3</b>										
In	92.6	7.4	92.1	7.9	71.4	28.6	88.5	11.5	76.3	23.7
Near	92.4	7.6	91.4	8.6	52.4	47.6	88.0	12.0	75.1	24.9
Far	97.1	2.9	95.7	4.3	53.4	46.6	82.0	18.0	71.8	28.2
<b>Round 4</b>										
In	79.1	20.9	95.2	4.8	72.5	27.5	85.9	14.1	76.7	23.3
Near	89.8	10.2	95.7	4.3	72.8	27.2	84.0	16.0	68.6	31.4
Far	99.2	0.8	95.6	4.4	75.3	24.7	77.6	22.4	68.6	31.4

\*30 EAs added to the Burkina Faso survey in Round 3, requiring the recruitment of additional REs.

\*\*21 EAs added to the Ethiopia survey in Round 3. The number of REs did not proportionally increase as REs were working in multiple EAs.

**Appendix 3:** .Percent distribution of respondents according to level of RE-respondent acquaintance and previous participation in a PMA2020 survey, by country during Round 4 of data collection.

	<b>Burkina Faso</b>		<b>Ethiopia</b>		<b>Ghana</b>		<b>Kenya</b>		<b>Uganda</b>	
	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted	Not acquainted/ Not very well acquainted	Very well acquainted / Well acquainted
No previous participation	95.2	4.8	96.8	3.3	69.3	30.7	80.7	19.3	51.7	48.3
Previously participated in a PMA2020 survey	88.0	12.0	94.7	5.3	36.9	63.1	58.4	41.6	32.6	67.4

**Appendix 4.** Percent of female respondents reporting previous participation according to household respondent report of previous participation

	<b>Burkina Faso R2-4</b>		<b>Ethiopia R3-4*</b>		<b>Ghana R4*</b>		<b>Kenya R2-4</b>		<b>Uganda R2-4</b>	
Sample Size	8,521		14,382		5,084		13,601		11,031	
	<b>Female Respondent's Report of Previous Participation</b>									
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
<b>Household Respondent's Report of Previous Participation</b>										
No	97.3	2.7	96.8	3.2	92.9	7.1	96.5	3.5	93.0	7.0
Yes	31.7	68.3	23.4	76.6	32.5	67.5	32.1	67.9	32.3	67.7

\* Ethiopia Round 2 and Ghana Rounds 2 and 3 are excluded from this table since female respondents were not asked about previous participation in these rounds

Note: Across rounds where both Household Questionnaire and Female Questionnaire respondents were asked about previous participation in a PMA survey, responses are highly correlated. Specifically, across Rounds 3 and 4 in Ethiopia, 97% of household respondents reported no previous participation in a PMA2020 survey when female respondents in those households also reported no previous participation; 77% of household respondents reported they had previously participated in a PMA2020 survey when female respondents in those households also did so. In Ghana Round 4, 93% of household respondents reported no previous participation in a PMA2020 survey when female respondents in those households reported no previous participation, and 68% of household respondents reported previous participation when female respondents in those households also reported previous participation. The level of correlation between household and female report of previous participation in other countries is similar. Some discordance between report of previous participation of household respondents and female respondents is expected. For example, a female might complete the Female Questionnaire for the first time in a household that has previously participated in a PMA2020 survey if she turned 15 years of age since the last PMA2020 survey or if she was away at school during the last PMA2020 survey.