



Performance Monitoring and Accountability 2020



JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

BILL & MELINDA GATES INSTITUTE *for*
POPULATION *and* REPRODUCTIVE HEALTH

Use Item-Level Timestamp Paradata for Multi-Country Comparison

Shulin Jiang, MSPH

Research Data Manager, PMA2020

Bill & Gates Institute for Population and Reproductive Health

CSDI Workshop March 27, 2018

Why is Timestamp Important in Survey Operation?

- Short, especially unusually short timestamps
 - Potential interviewer performance issues or possible falsification
 - Indicate measurement error and flag for quality control
- Long timestamps
 - Respondents may have difficulty on complex questions; reluctant to answer questions and etc.
 - Inform interviewer training and improve survey design

Existing Practice

- Timestamp paradata has been used to monitor data quality
 - Usually within one survey at a given time and site
 - Timestamps at survey or section level without rich details

Objectives

- Compare survey-level and item-level timestamps in a multi-country survey
 - Identify similar patterns across countries
 - Explore factors behind any deviance

About PMA2020

- Deploys innovative survey methods using mobile technology to support low-cost, rapid-turnaround surveys to monitor key health and development indicators
- CAPI surveys on Android phones
- Data collectors: female resident enumerators (REs)
- Data collection tool: Open Data Kit (ODK)
- Multiple rounds of cross-sectional surveys
- Comparability: universal + country-specific components

10 CURRENT PROGRAM COUNTRIES

- Democratic Republic of the Congo*
- Côte d'Ivoire
- Niger
- Burkina Faso
- Ghana
- Nigeria*
- Ethiopia
- Kenya
- Uganda
- India*

*Regionally representative. DRC sites include Kinshasa and Kongo Central; India sites are within Rajasthan; Nigeria sites include 7 states

PMA Analytics: Item-Level Timestamp Dataset

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JHU Collect > R...

102. How old were you at your last birthday?

← →

1	2	3	-
4	5	6	_
7	8	9	×
,	0	.	↩

- When REs collect data in ODK, user interactions are time-stamped and recorded as a log

Example of a section of log file:

<i>Timestamp</i>	<i>Code</i>	<i>Prompt</i>	<i>Value</i>
1480163429503	EP	FQ_age[1]	
1480163451094	LP	FQ_age[1]	46
1480163452841	EP	school[1]	
1480163461885	LP	school[1]	never
1480163461940	EP	marital_status[1]	
1480163468539	LP	marital_status[1]	never_married

- ODK survey submissions and their associated logs are summarized to generate PMA Analytics dataset

Advantages of PMA's Item-level Timestamp Data

- PMA Analytics tracks the following for every survey screen:
 - Active screen time: cumulative time that the survey is open and active
 - Short break time: cumulative time that the survey is paused for < 30 minutes
 - Other features: error message occurrences, screen visits, answer changes and etc.
- Interview time can be proxied as active screen time + short break time
- Log is an ODK feature. Autogenerated with little additional cost

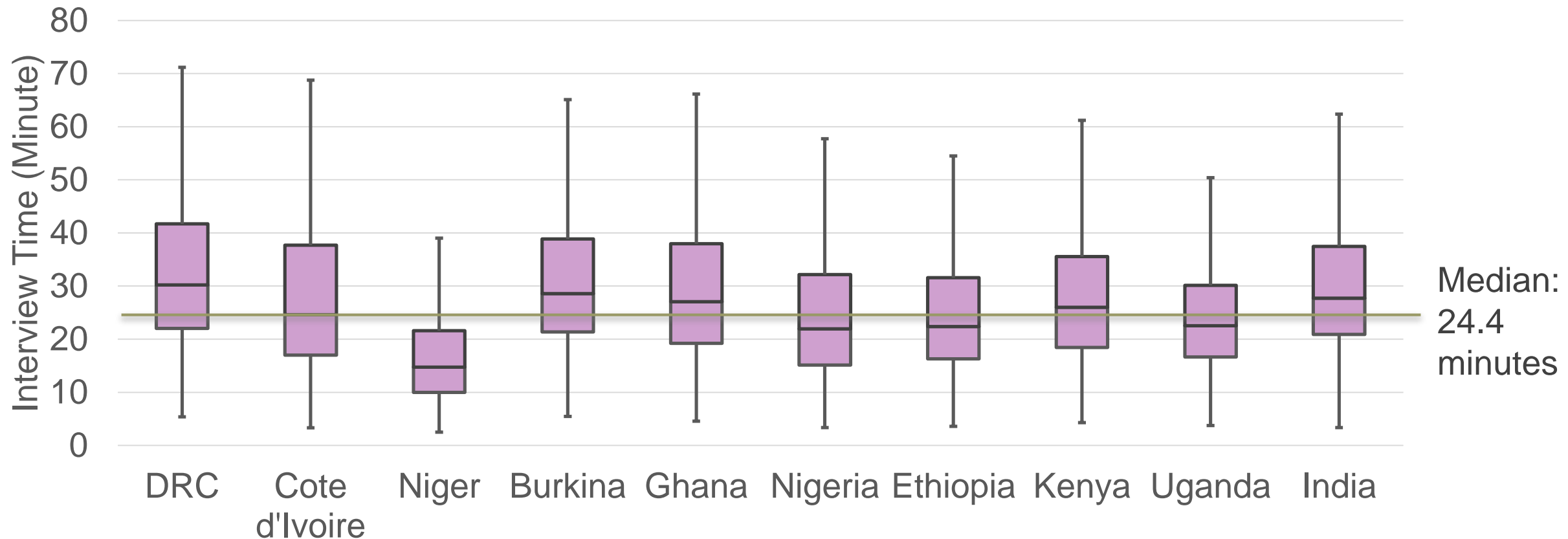
Data

- PMA2020 Female Survey data and the associated analytics data from the 10 countries
- Data collected from November, 2016 to November, 2017
- 52,698 survey submissions. respondents are representative sample of women aged 15 to 49
- Only completed surveys are included

Methods

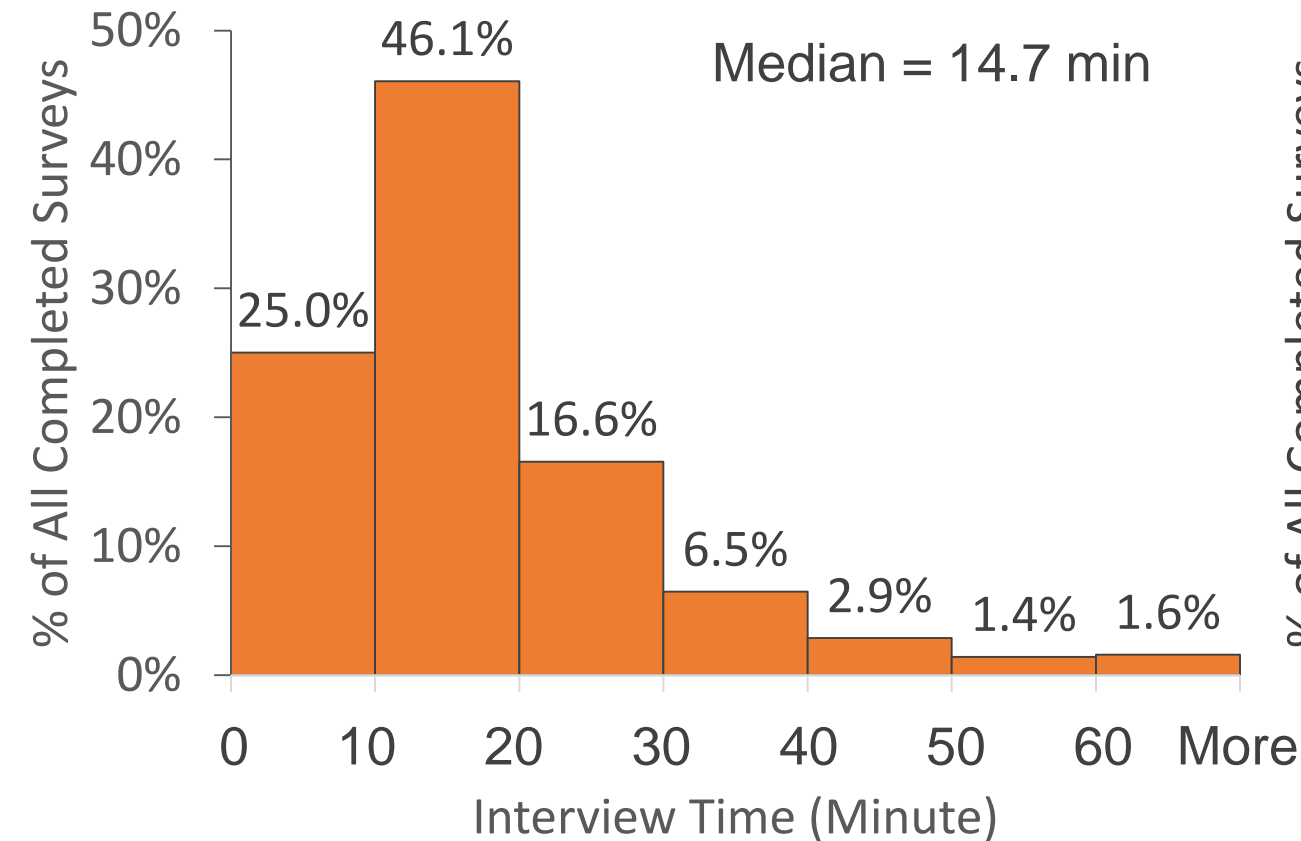
- Descriptive analysis for comparison
- Exploratory analysis to investigate deviance

Total Interview Time Across 10 Countries

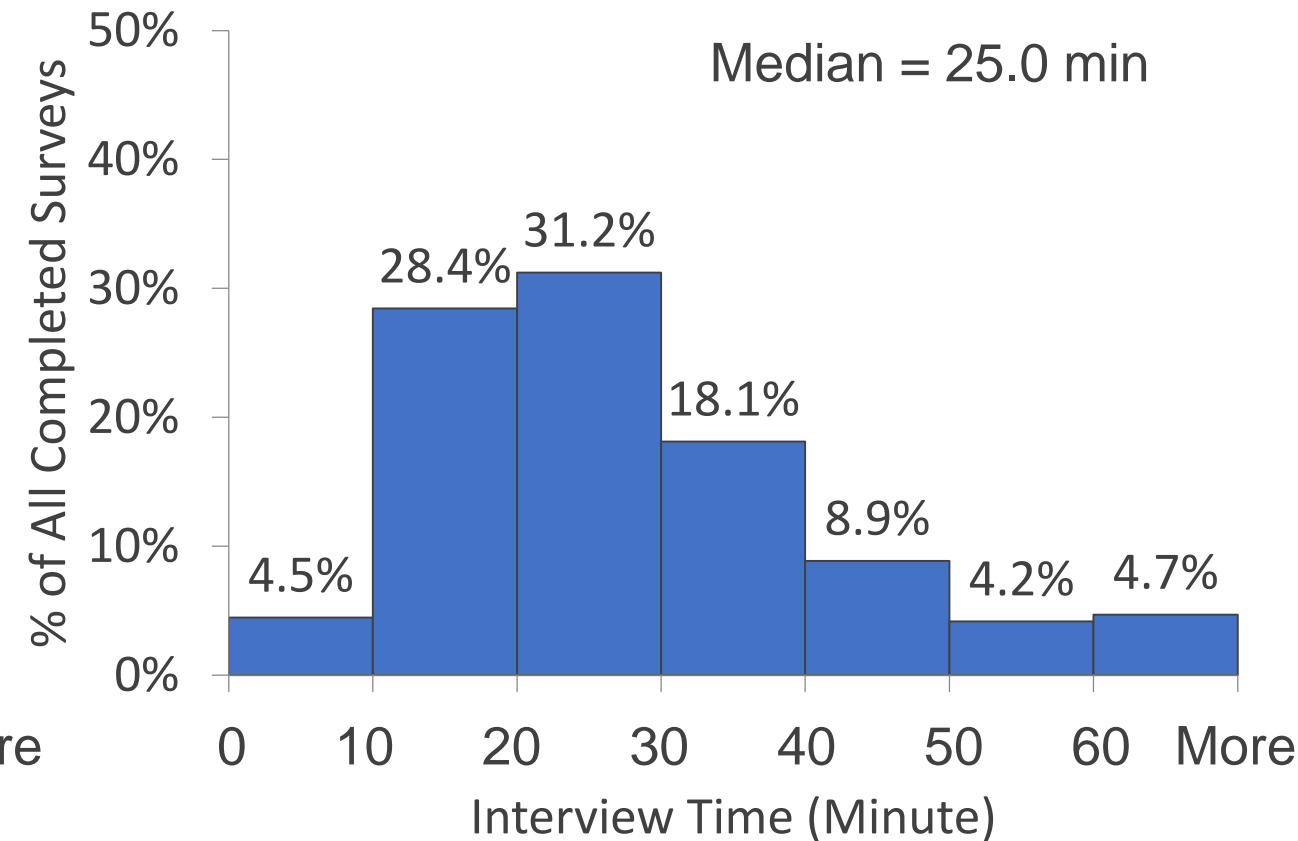


Total Interview Time Distribution (Niger vs Others)

Niger



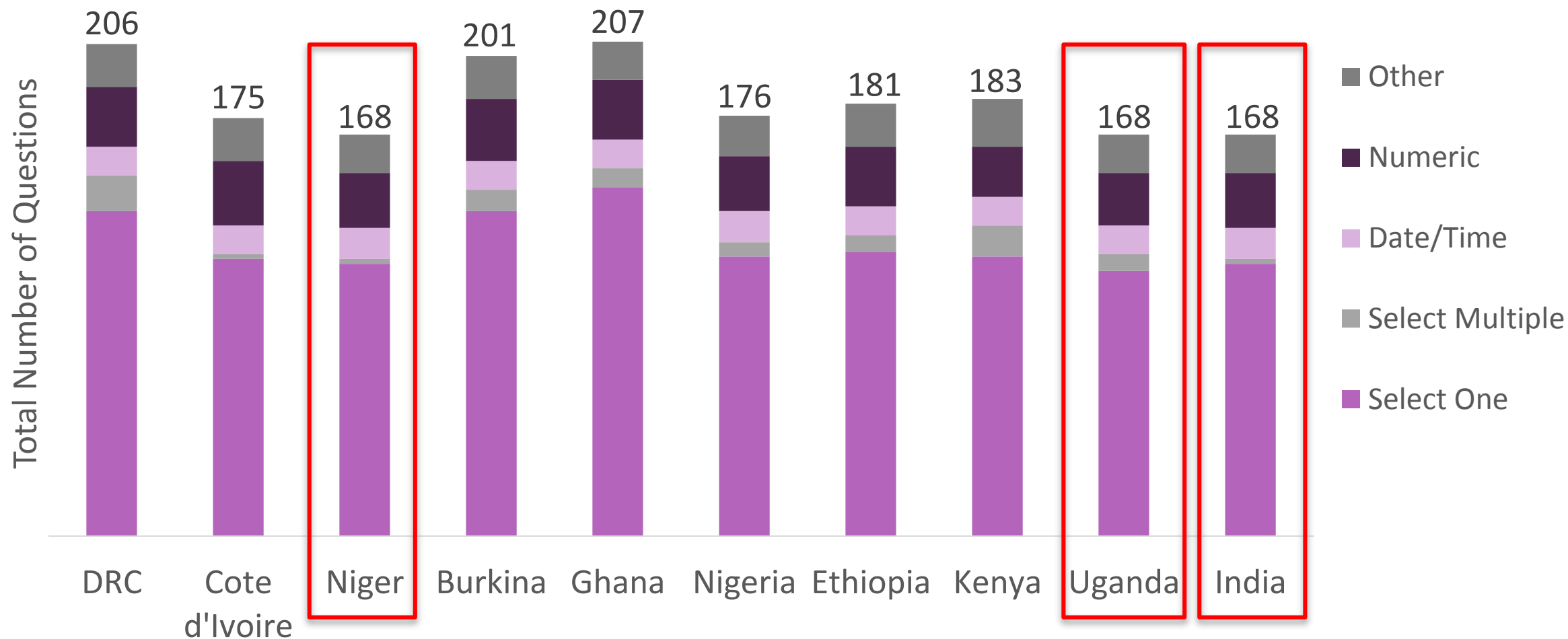
Others



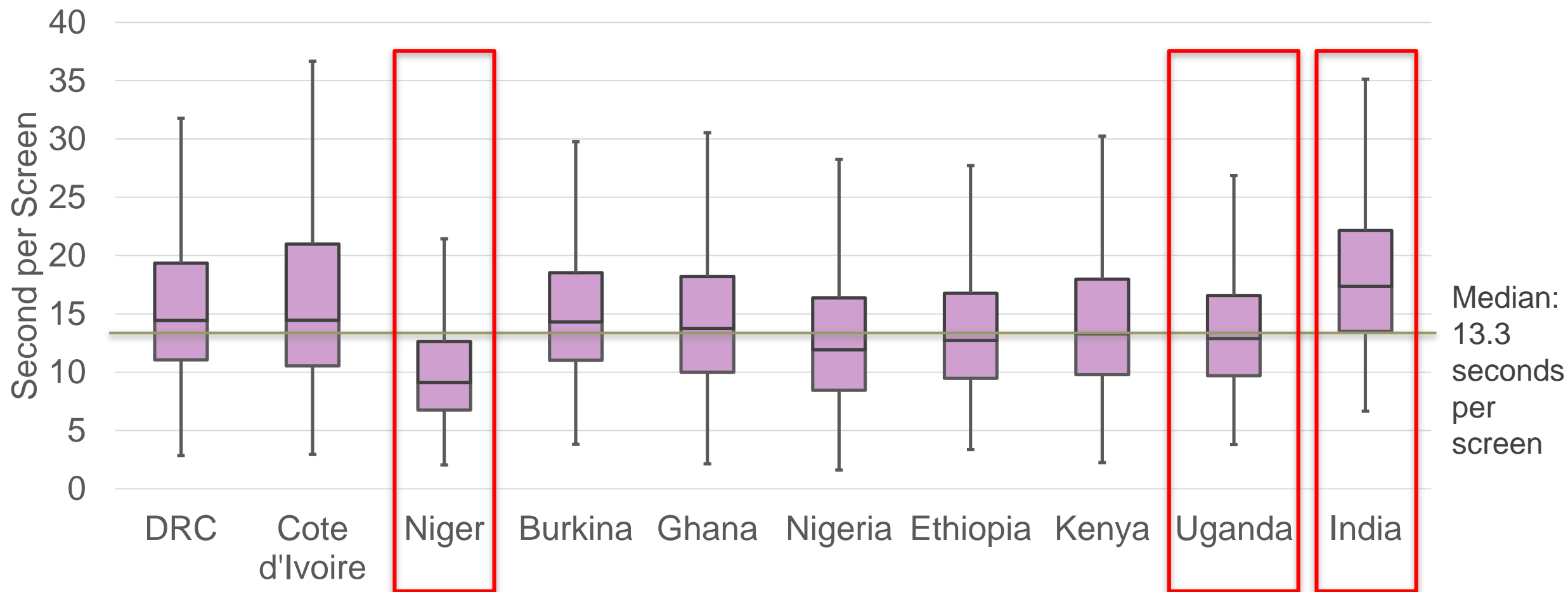
Interview Time is Associated with Multiple Factors (1)

- Survey instrument – Is the Female Survey of Niger distinctively different?
 - Survey length. Longer survey is associated with longer interview time
 - Question type. Date/Time > Select Multiple > Numeric > Select One
- Respondents
- Interviewers

Total Number of Questions (by Question Type)



Average Interview Speed Across 10 Countries



Interview Time is Associated with Multiple Factors (2)

- Survey instrument
- Respondents – Were respondents in Niger distinctively different than other countries?
 - Older respondents and those lack of education take longer time
 - Women receive questions subsequent to skip logic in PMA surveys
 - Currently or recently use family planning (FP)
 - Ever gave birth
- Interviewers

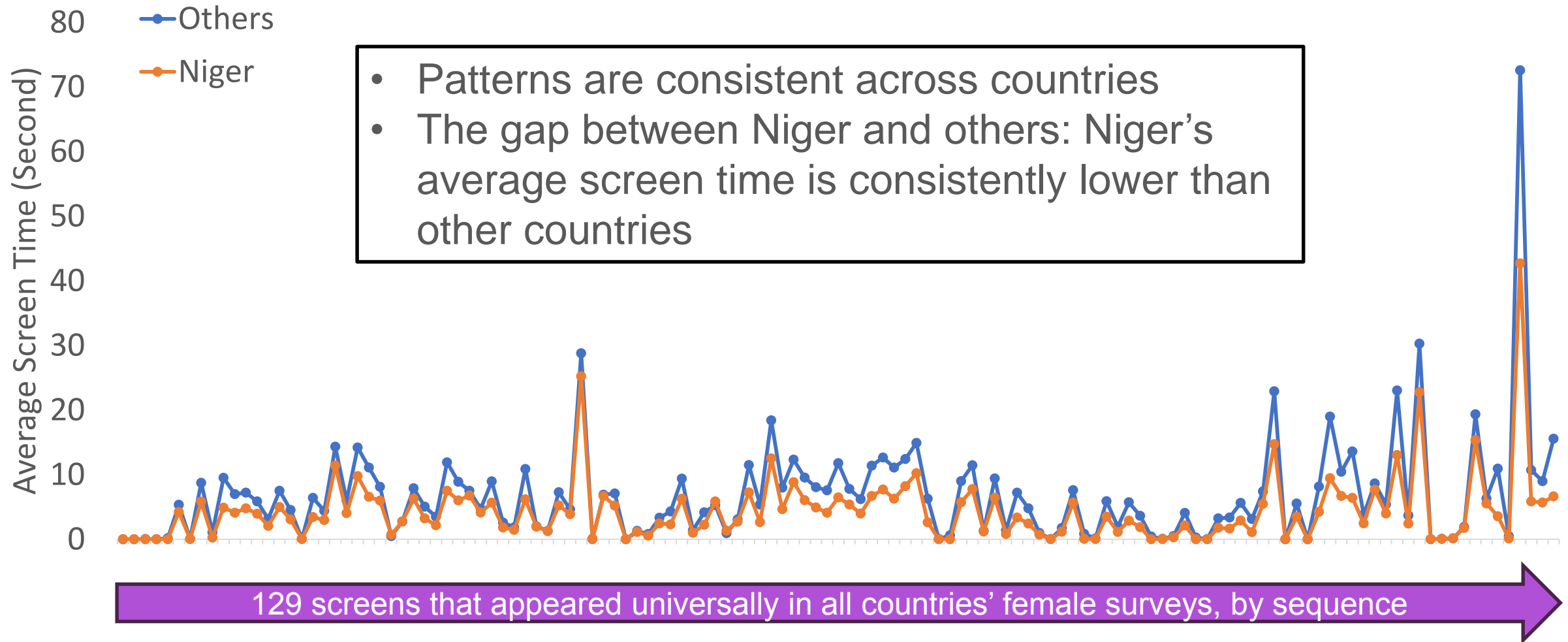
Respondent Basic Characteristics – Niger is NOT Distinctively Different

Countries		Age (Years)		% Ever Attended School		% Current or Recent FP User		% Ever Birth	
	N	Mean	95%CI	Mean	95%CI	Mean	95%CI	Mean	95%CI
DRC	4293	28.5	[28.2, 28.8]	94.3	[93.6, 95.0]	42.0	[40.6, 43.5]	63.9	[62.5, 65.3]
Cote d'Ivoire	2785	28.1	[27.8, 28.4]	52.8	[50.1, 54.6]	29.4	[27.7, 31.1]	74.0	[72.3, 75.6]
Niger	3030	28.0	[27.7, 28.3]	53.7	[51.9, 55.4]	24.4	[22.9, 25.9]	71.9	[70.3, 73.5]
Burkina	3237	28.3	[28.0, 28.7]	44.8	[43.1, 46.5]	32.0	[30.4, 33.6]	74.7	[73.2, 76.2]
Ghana	4297	29.2	[28.9, 29.5]	83.6	[82.5, 84.7]	33.0	[31.6, 34.4]	64.9	[63.4, 66.3]
Nigeria	11442	28.3	[28.1, 28.5]	77.3	[76.5, 78.1]	22.7	[21.9, 23.5]	67.9	[67.1, 68.8]
Ethiopia	7401	27.4	[27.2, 27.6]	68.2	[67.1, 69.2]	32.4	[31.3, 33.4]	61.1	[60.0, 62.2]
Kenya	5974	28.4	[28.2, 28.7]	93.9	[93.3, 94.5]	50.3	[49.1, 51.6]	71.6	[70.4, 72.7]
Uganda	4161	27.7	[27.5, 28.0]	89.2	[88.2, 90.1]	40.1	[38.6, 41.6]	74.3	[72.9, 75.6]
India	6078	28.7	[28.4, 28.9]	63.7	[62.5, 64.9]	47.6	[46.4, 48.9]	68.6	[67.4, 69.7]

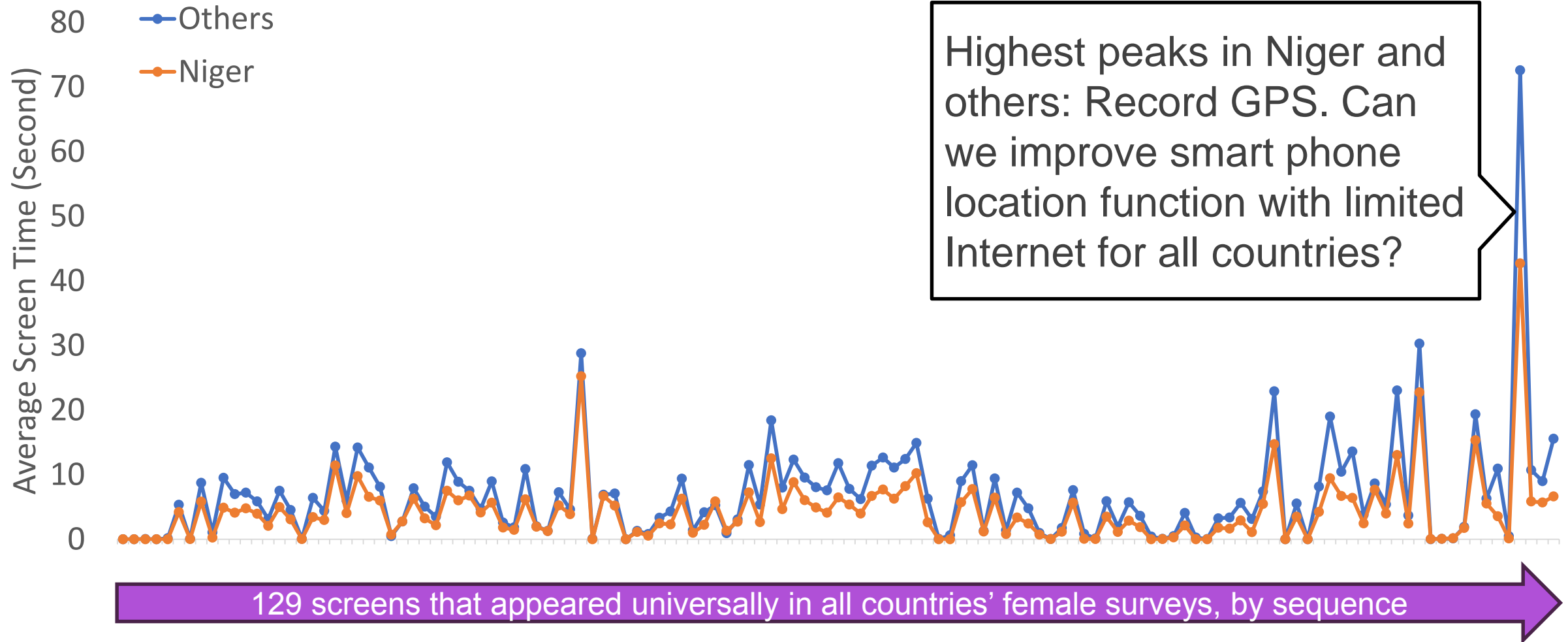
Interview Time is Associated with Multiple Factors (3)

- Survey instrument
- Respondents
- Interviewers – Interviewer effect and data quality?
 - <10 minutes interviews are more prevalent among Niger REs
 - However, Niger REs don't seem to stand out on other data quality measures (GPS, non-response, roster deletion, success rates, ineligible rates and etc.)
 - Interviewer characteristics and field knowledge are needed for further investigation

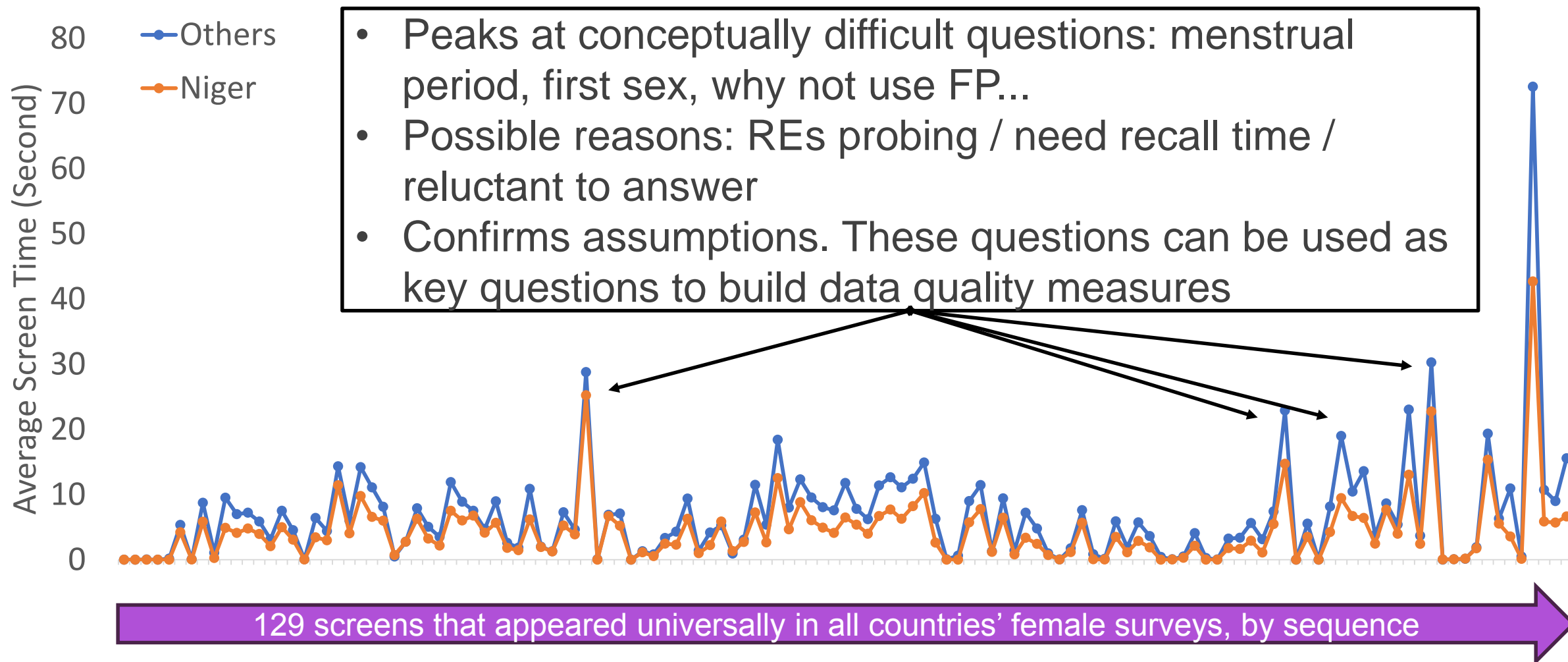
Average Screen Time at Item-Level (Niger vs Others)



Average Screen Time at Item-Level (Niger vs Others)



Average Screen Time at Item-Level (Niger vs Others)



Take-Home Messages

- Analyze paradata as rigorously as analyzing data
 - Quality control
 - Responsive survey design
- Develop tools to generate item-level paradata that is easy to analyze
- Apply on comparative multi-country surveys and address any deviance

Limitations

- Cannot separate respondent and interviewer behaviors using timestamps
- Screen time is a proxy of question time but not always equivalent
- Cannot draw a definitive conclusion based solely on Analytics data
 - However, Analytics data sheds lights on areas that need attention
 - More data and analysis is needed, such as interviewer characteristics

Going Forward

- Work with country partners to better understand the context of timestamps
 - Balance between local best practice and standardization across countries
 - Multiple rounds of paradata needed to validate a global standard
- Follow up with country partners to confirm and address the issues in training
- Expand capacity for country partners to monitor data collection using timestamp paradata

Acknowledgement

- Developer of PMA Analytics – James Pringle
- Feedback from country team – Narendra Shekhawat
- Reviewers – Linnea Zimmerman, Yoonjung Choi

Reference

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Johns Hopkins Bloomberg School of Public Health
615 N. Wolfe Street, Baltimore, MD 21205

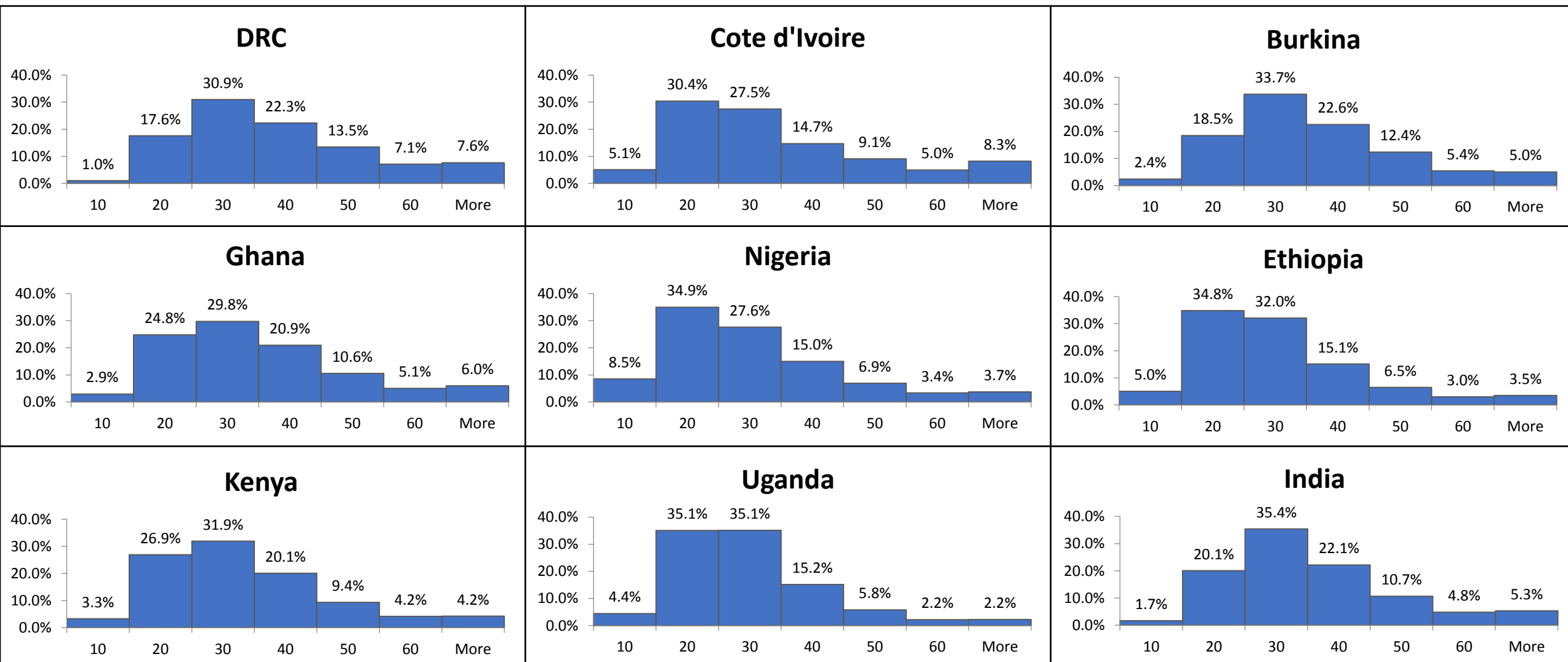
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Supplemental 1. PMA2020 Survey Schedule

	2016			2017										
	O	N	D	J	F	M	A	M	J	J	A	S	O	N
DRC											6			
Cote d'Ivoire												1		
Niger										4				
Burkina Faso		4												
Ghana											6			
Nigeria							4							
Ethiopia								5						
Kenya		5												
Uganda							5							
India/Rajasthan											3			

Supplemental 2. Total Interview Time Distribution (Nine Countries)



Supplemental 3. Average Screen Time at Item-Level (All Countries)

