

Title: Family planning service disruptions amid COVID-19: Longitudinal evidence from facilities in seven low- and middle-income countries

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Abstract (200 words): Researchers projected that COVID-19 would limit access to contraception, as systems-level challenges shook global supply chains and preventive measures restricted movement, reducing the workforce and services. Early evidence from sub-Saharan Africa suggested that women's need for and use of family planning (FP) appeared more stable than initially hypothesized, signaling that reproductive health services remained operational amid pandemic-related uncertainty. We use data collected from 2,437 facilities offering FP across seven low- and middle-income countries (LMICs) between 2019 and 2021, with longitudinal data from four contexts, to 1) examine how facilities perceived COVID-19 disrupted their FP services during COVID-19 and characteristics associated with perceived disruptions, and 2) assess how reported service disruptions related to observed changes, comparing indicators of facility operations captured before and during the pandemic. Findings indicate significant variation in the impact that COVID-19 had on facility-based FP services across LMICs, with the largest disruptions to services occurring in Rajasthan. Public and higher-level facilities were generally less likely to report any COVID-19-related disruption to FP services. Low levels of disruptions to service availability overall indicate resilience of facilities to deliver SRH care during the pandemic. Future analysis will explore nuanced differences in service readiness over time.

Background

Disruptions to family planning services and commodity stock-outs due to COVID-19 are expected to increase women's unmet need for contraception, contributing to increased risk of unintended pregnancy and related maternal morbidity and mortality in low- and middle-income countries (LMICs; Jain & Winfrey, 2017; Riley et al. 2020). Early projections estimated that 60 million fewer women would rely on modern contraception to regulate their fertility, contributing to 15 million additional unintended pregnancies (Riley et al. 2020). Since the onset of the COVID-19 pandemic, several small-scale facility-based studies have reported disruptions to the continued provision of sexual and reproductive (SRH) services across a variety of LMICs (Belay et al., 2020; MOMENTUM, 2020). To date, research on service-related impacts on family planning has been limited in scope, providing little insights on the extent and nature of the disruptions and their implications for women's access to care.

An extensive analysis conducted by the Reproductive Health Supplies Coalition (RHSC) and JSI across six countries indicated that, despite “ripple effects” of COVID-19 across supply chain functions, many health systems were able to mitigate disruptions to reproductive health services (RHSC, 2021). Diminished demand for services, particularly due to fears of infection at health facilities during this time, may have also contributed to the ability of SRH services to remain operational, at least early in the pandemic (Karp et al., 2021). Coupled with the relative stability of reproductive health services, recent analyses using population-based data in several settings in Western, Central, and Eastern Africa found little change or increasing use of contraception, including long-acting methods in the early months following the outbreak (May through July 2020) and limited changes in the proportion of women with an unmet need for contraception at the population-level (Karp et al., 2021; Wood et al., 2021). These findings offer an opportunity to revisit trends in FP service delivery during COVID-19 and identify factors contributing to greater vulnerability or resilience of SRH health services in adapting to the global health crisis.

While assessments of health service data, such as DHIS2, are beginning to provide a picture of COVID-19's impact on reproductive health services, the extent to which disruptions to care varied by facility characteristics within and across geographies remains largely unknown. Additionally, capturing the ways facility staff perceive disruptions that occurred during COVID-19 provides a unique perspective for understanding how facility-based FP care may have been impacted, beyond records and registers. Using longitudinal and cross-sectional facility-based data from seven LMICs, we examined how family planning service readiness was affected during the COVID-19 pandemic and facility-based factors contributing to such disruptions. Specifically, we examined the extent to which facilities reported that COVID-19 affected delivery of FP services (*service availability, personnel, and commodities*) and assessed how facility perceptions of these disruptions relates to observed changes in service provision, comparing indicators (e.g., FP services, commodities, and facility caseloads) before and during COVID-19.

Methods

Study procedures and sample

This analysis uses data collected by Performance Monitoring for Action (PMA) in six countries across sub-Saharan Africa, including Kenya, Burkina Faso, Democratic Republic of the Congo

(DRC; Kinsahsa and Bas Congo), two states in Nigeria (Lagos and Kano), Côte d'Ivoire, and Uganda, and one region in south Asia, Rajasthan, to examine service disruptions and stockouts amid the early months of the COVID-19 pandemic. In Burkina Faso, DRC, Kenya, and Nigeria, baseline data were collected from December 2019 to January 2020—before COVID-19—with follow-up data collected approximately one year later, from November 2020 to January 2021. In Côte d'Ivoire, Rajasthan, and Uganda, baseline data were collected from August to October 2020, in the early months of COVID-19 (Table 1).

Facilities are selected into the PMA sample based on the multistage sampling strategy, using enumeration areas (EAs) used to identify eligible women aged 15-49 for the population-based survey. Specifically, all public and private facilities are identified during the EA listing process, and facilities with catchment areas that encompass sampled EAs are eligible for the survey. Altogether, the complete PMA sample included a total of 3,052 facilities across the seven geographies. We restricted our analysis to facilities that offered FP services, resulting in a final analytical sample of 2,437 public and private facilities in Burkina Faso (n=228), Côte d'Ivoire (n=192), DRC (n=273), Kenya (n=904), Nigeria (n=173), Rajasthan (n=507), and Uganda (n=333). Longitudinal analyses exploring changes in facility readiness to deliver family planning services were limited to

Measures

Our primary outcome was *perceived* disruptions to family planning services during COVID-19, explored through measures assessing challenges to service availability, providers, and method supplies and stockouts. As part of the broader facility questionnaire, the facility in-charge or family planning unit head responded to a series of questions about operational challenges experienced during COVID-19. We assessed general service availability as experience of facility closures during COVID-19 lockdown (yes/no), length of closure (weeks), reduced days/hours of operation (yes/no), suspension of FP services (yes/no), and length of FP service suspension (weeks). Provider-related challenges included the reassignment of FP providers to COVID-19-related duties (yes/no), increased absenteeism (yes/no), and inability to maintain client FP records (yes/no). Method supply-related challenges reflected how regular the respondent perceived the supply of family planning commodities to be during COVID-19 restrictions (no change/regular, more irregular, stopped completely). We generated a dichotomous measure of *any COVID-19-related disruption* (yes/no), distinguishing facilities that experienced at least one operational challenge from those reporting none. To explore how severity of disruptions varied across contexts and facility types, we created an additive measure, summing the number of service disruptions reported (i.e., closure for any period of time, reduced hours or days of operation, suspension of FP services, reassignment of providers from FP, absenteeism of providers, more irregular or complete stop of FP supplies). We also explored demand-related changes via reported reduction in the number of FP clients.

Our secondary outcomes will comprise two *observed* disruptions to family planning services, specifically decreased days of service operation and increased stockouts of contraceptive supplies, and one *observed* decline in family planning services, decreased demand for services—all assessed as the difference between the pre-COVID and during COVID-19 period. We

calculated the difference in each of the three measures at the facility-level using information collected before and during the pandemic and dichotomized each measure of *observed* changes (yes/no) to signal whether observed changes aligned with the anticipated negative effects of the pandemic on SRH services.

To understand how experiences of COVID-19 service disruptions varied according to facility characteristics, we also explored a number of facility factors, including managing authority (public, private), facility type (hospital, health center/clinic, pharmacy/drug shop/other; categorized due to the low number of health clinics), residence of the EA served by the facility, availability of electricity and water, number of days FP services are offered, availability of services to adolescents aged 10-19, and integration of community health volunteers (CHVs) within facilities.

Analytic Methods

Descriptive statistics were used to examine facility characteristics and the proportion of facilities reporting each type of COVID-19-related service disruption, by country. Chi-squared tests were used to examine differences in perceived disruptions by facility characteristics. Future analyses will explore how facility perceptions of COVID-19's impact on family planning services relates to observed changes comparing indicators (e.g., FP services, commodities, facility caseloads) before and during COVID-19. All analyses were run within each country (site-specific), given the wide variation in COVID-19's impact across geographies.

Preliminary results

As COVID-19's impact ranged widely across geographies, Table 1 provides a brief description of the pandemic context within each country at that time baseline and follow-up data were collected. Facility characteristics, by country, are presented in Table 2. Most facilities were public, ranging from 73% in Nigeria to 90% in Côte d'Ivoire, the exception of DRC and Rajasthan, in which a majority of facilities were private (68% and 56%, respectively). A large proportion of facilities were health centers/clinics for most countries (e.g., 85% in Burkina Faso and 67% in Uganda), with significant variation in facility type across geographies. Challenges to infrastructure were most common in DRC, where more than half of facilities reported outages of electricity (59.2%) and water (55%) for more than two hours in the past 24 hours. Nearly all facilities across countries offered FP services to adolescents aged 10-19 (88% in Rajasthan to >99% in Côte d'Ivoire), integration of community health volunteers (CHVs) was far less common, ranging from 14% in Côte d'Ivoire to 64% in Kenya.

Perceived disruptions to services amid COVID-19

Overall, COVID-19 appeared to have the largest impact on perceived facility readiness to provide family planning services in Rajasthan across nearly every indicator, followed by significant impacts in Nigeria and Uganda (Table 2). West African countries, including Côte d'Ivoire, Burkina Faso, and DRC, were relatively unaffected in terms of general facility and FP service availability, with <5% of facilities reporting closures, reduced hours, or suspended services. While most surveyed facilities in Kenya reported SRH services remained open, 15% experienced irregularities in hours of operation. Facility closures were rare, although 23% of facilities in

Rajasthan and approximately 5-7% of facilities in Nigeria and Uganda suspended services completely for three weeks or more.

Provider-related challenges, including provider reassignment and absenteeism were more commonly reported across contexts. Reassignment of FP providers to COVID-19-related duties ranged from 9% to 15% in sub-Saharan countries, but rose to 36% in Rajasthan, while high absenteeism was most commonly reported—by more than one-quarter of facilities—in Uganda and Nigeria (26% and 29%, respectively). A majority of facilities across sites reported no change in the regular supplies for family planning services, yet 15% of facilities in Rajasthan experienced a complete stop in supplies and one in five facilities in Kenya, Uganda, Nigeria, and Rajasthan reported supply chain irregularities. Finally, 10-40% of facilities across settings indicated they were unable to maintain clients' FP records during COVID-19.

Most facilities across geographies experienced at least one COVID-19-related service disruption, ranging from 68% of facilities in Côte d'Ivoire to 91% in Rajasthan. The average number of COVID-19-related service disruptions was highest in Rajasthan where facilities reported, on average, 1.9 (sd=1.8) challenges related to their general service availability, provider capacity, and FP method supplies, while the average reported challenges were much lower in Côte d'Ivoire (mean: 0.4, sd=0.7) and Burkina Faso (mean: 0.4, sd=0.8). Perceived demand-related changes induced by COVID-19 varied considerably across sites. While 69.9% of facilities in Burkina Faso reported experiencing no reduction in FP clients during COVID-19, a nearly equal proportion of facilities in Rajasthan (65.8%) reported experiencing moderate (42.3%) or large (23.5%) declines in the number of clients seeking FP services.

Differences in experience of COVID-19-related impact by facility characteristics

Facility characteristics were related to COVID-19-related service disruptions in four of the seven contexts. Overall, public facilities in Cote d'Ivoire, Kenya, Nigeria, and Uganda appeared to have greater preparedness to deliver FP services amid the pandemic with significantly more private facilities reporting they experienced any service disruption related to COVID-19, compared to public facilities in these countries ($p<0.05$), while these differences were not observed in Burkina Faso or Rajasthan. Similarly, in Nigeria, Rajasthan, and Uganda, significant differences in FP readiness were observed by facility type, with a greater proportion of lower facilities (i.e., health centers, clinics, and pharmacies/drug shops) reporting FP service disruptions during COVID-19, relative to hospitals ($p<0.05$).

Preliminary conclusions

Findings indicate significant variation in the impact that COVID-19 had on facility-based FP services in LMICs, with the largest disruption to services occurring in Rajasthan. Public and higher-level facilities were generally less likely to report any COVID-19-related disruption to FP services. Low levels of disruptions to service availability overall indicate greater facility readiness to deliver SRH care during the pandemic. Future analysis will explore nuanced differences in service readiness over time.

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Table 1. Facility survey administration schedule by site and COVID-19 context

Site	Survey	Dates of data collection	Cumulative number of confirmed COVID-19 cases*	Cumulative number of confirmed COVID-19 deaths*	COVID-19 Stringency Index* (range: 0-100; 100=strictest)	National policy measures to mitigate spread of Coronavirus			
						Stay-at-home requirement*	Face coverings required*	School closures*	Workplace closures*
Burkina Faso	Baseline	Dec 2019 - Jan 2020	--	--	--	--	--	--	--
	Follow-up	Dec 2020 - Jan 2021	2,931	68	13.9	No measures	Required in all public spaces	No measures	No measures
Cote d'Ivoire	Baseline	Sept - Oct 2020	18,103	126	38.0	Recommended	Required outside the home at all times	Required closures (some levels)	No measures
Democratic Republic of the Congo	Baseline	Dec 2019 - Jan 2020	--	--	--	--	--	--	--
	Follow-up	Dec 2020 - Jan 2021	12,859	335	22.2	No measures	Required in all public spaces	Recommended	Recommended
Kenya	Baseline	Nov - Dec 2019	--	--	--	--	--	--	--
	Follow-up	Nov - Dec 2020	55,877	1,013	68.5	Required (except for essentials)	Required in some public spaces	Required closures (some levels)	Recommended
Nigeria	Baseline	Dec 2019 - Jan 2020	--	--	--	--	--	--	--

IUSSP 2021 Extended Abstract — Theme: Family Planning and Contraception

	Follow-up	Dec 2020 - Jan 2021	67,838	1,176	50.9	Required (except for essentials)	Required in all public spaces	Recommended	Recommended
India^	Baseline	Aug - Sep 2020	1,800,000	37,367	79.6	Required (except for essentials)	Required outside the home at all times	Required closures (all levels)	Required for some
Uganda	Baseline	Sep - Oct 2020	3,037	32	76.9	Required (except for essentials)	Required outside the home at all times	Required closures (all levels)	Required for some

Note: *by first day of survey administration month. Data from [www.https://ourworldindata.org/coronavirus](https://ourworldindata.org/coronavirus); accessed April 30, 2021. ^Information about COVID-19 in India (cumulative cases, deaths, and policy responses) were only available at national level; though data from this study were collected in Rajasthan state.

Table 2. Characteristics of facilities offering family planning services, by site, %(n)

	Burkina Faso (n=228)	Cote d'Ivoire (n=192)	Democratic Republic of Congo (n=273)	Kenya (n=904)	Nigeria (n=173)	Rajasthan (N=507)	Uganda (n=333)
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Managing authority							
Public	186 (86.5)	172 (89.6)	87 (31.9)	766 (86.8)	117 (73.1)	225 (44.4)	257 (77.2)
Private	29 (13.5)	20 (10.4)	186 (68.1)	116 (13.2)	43 (26.9)	282 (55.6)	76 (22.8)
Facility type							
Hospital	13 (6.0)	67 (34.9)	46 (16.8)	96 (10.9)	42 (26.3)	41 (8.1)	52 (15.6)
Health center/clinic	183 (85.1)	99 (51.6)	131 (48.0)	236 (26.8)	72 (45.0)	196 (38.7)	224 (67.3)
Pharmacy/Drug shop/Other	19 (8.8)	26 (13.5)	96 (35.2)	550 (62.4)	46 (28.8)	270 (53.3)	57 (17.1)
Residence of EA served							
Urban	136 (63.3)	-- --	-- --	318 (36.1)	132 (82.5)	-- --	-- --
Rural	79 (36.7)	-- --	-- --	564 (63.9)	28 (17.5)	-- --	-- --
Infrastructure in place							
Electricity outages*	16 (7.5)	19 (9.9)	161 (59.2)	215 (24.4)	76 (47.5)	101 (19.9)	99 (30.0)
Water outages*	42 (19.5)	74 (38.7)	151 (55.3)	242 (27.4)	71 (44.4)	214 (42.2)	122 (36.7)
Average number of days FP services offered, mean(sd)	6.8 (0.7)	5.9 (1.2)	5.2 (8.3)	5.3 (0.9)	5.3 (1.4)	6.8 (0.9)	5.5 (1.4)
Offers adolescent family planning^	225 (98.7)	191 (99.5)	243 (89.3)	884 (97.8)	155 (89.6)	445 (88.1)	322 (96.7)
Community health volunteers (CHVs)							
Facility integration of CHWs	44 (20.5)	26 (13.5)	84 (30.8)	568 (64.4)	49 (30.6)	183 (36.1)	196 (58.9)
Average number of CHWs per facility, mean(sd)	6.8 (0.7)	5.9 (1.2)	5.2 (8.3)	5.3 (0.9)	5.3 (1.4)	6.8 (0.9)	5.5 (1.4)

Notes: *Facility experienced an outage of electricity/water for more than two hours in past 24 hours. EA = Enumeration Area served by the facility. p-val=p-value from chi-squared test. ^Adolescent family planning: facility offers family planning services to adolescents aged 10-19. -- indicates awaiting residence of EA served in final dataset preparation.

Table 3. Among facilities offering family planning (FP), the proportion reporting disruptions to FP services during COVID-19, by site

Type of service disruption	Democratic Republic of						
	Burkina Faso (n=228)	Cote d'Ivoire (n=192)	Congo (n=273)	Kenya (n=904)	Nigeria (n=173)	Rajasthan (n=507)	Uganda (n=333)
	%	%	%	%	%	%	%
Service availability challenges							
Closed for any period of time							
No	98.1	99.0	98.5	96.8	89.4	72.5	94.3
Yes	1.9	1.0	1.5	3.2	10.6	27.5	5.7
Length of closure							
None/<1 week	98.6	99.0	98.9	97.5	90.0	75.1	94.9
1-2 weeks	0.9	0.5	0.4	1.2	3.1	3.8	0.6
3 weeks or more	0.5	0.5	0.7	1.2	6.9	21.1	4.5
Reduced hours or days of operation							
No	95.3	94.3	76.8	84.9	64.4	56.0	73.9
Yes	4.7	5.7	23.2	15.1	35.6	44.0	26.1
Suspended FP services							
No	96.3	98.4	98.9	96.8	94.4	74.7	94.6
Yes	3.7	1.6	1.1	3.2	5.6	25.3	5.4
Length of FP service suspension							
None/<1 week	96.7	98.4	98.9	97.2	94.4	75.1	94.9
1-2 weeks	1.4	1.6	1.1	1.0	1.3	2.0	0.6
3 weeks or more	1.9	1.6	1.1	1.8	4.4	22.9	4.5
Provider-related challenges							
COVID-19 reassignment of FP providers							
No	87.0	91.1	89.3	87.9	83.1	63.6	85.0
Yes	13.0	8.9	10.7	12.1	16.9	36.4	15.0
High absenteeism of FP providers							
No	95.8	97.4	92.3	89.2	70.0	81.8	73.3
Yes	4.2	2.6	7.7	10.8	30.0	18.2	26.7
Unable to maintain FP client records							
No	90.2	90.1	72.3	88.3	80.0	59.7	74.8
Yes	9.8	9.9	27.7	11.7	20.0	40.3	25.2
Method supply-related challenges							
No change/regular	88.8	82.1	78.1	77.6	75.9	62.8	76.1
More irregular	10.3	16.3	18.5	21.3	21.5	22.0	20.3
Stopped completely	0.9	1.6	3.4	1.1	2.5	15.2	3.6
Any COVID-19-related disruption*							
No	12.6	33.3	31.7	23.8	21.3	11.5	17.1
Yes	87.4	66.7	68.3	76.2	78.8	88.5	82.9
Average number of COVID-19-related service disruptions, mean(sd)	0.4 (0.8)	0.4 (0.7)	0.7 (0.9)	0.7 (0.9)	1.2 (1.3)	1.9 (1.5)	1.0 (1.2)
Demand-related changes							
No reduction in FP clients	68.7	45.3	31.7	35.9	26.3	21.5	33.7
Small reduction in FP clients	20.6	31.8	36.9	31.0	33.8	12.6	25.6
Moderate reduction in FP clients	8.9	11.5	13.1	24.6	16.3	42.3	24.4
Large reduction in FP clients	1.9	11.5	18.3	8.5	23.8	23.5	16.3

Notes: FP=family planning. *Any COVID-19-related disruption to family planning services includes facilities reporting at least one of the following: closure for any period of time, reduced hours or days of operation, suspension of FP services, reassignment of providers from FP, absenteeism of providers, more irregular or complete stop of FP supplies; does not include demand-related changes.

Table 4. Among facilities offering family planning (FP), the proportion of facilities that experienced any type of COVID-19-related disruptions to FP services, by facility characteristics and site

	Burkina Faso (n=228)		Cote d'Ivoire (n=192)		Democratic Republic of the Congo (n=273)		Kenya (n=904)		Nigeria (n=173)		Rajasthan (n=507)		Uganda (n=333)	
	Yes	p-val	Yes	p-val	Yes	p-val	Yes	p-val	Yes	p-val	Yes	p-val	Yes	p-val
Overall (%)														
Managing authority														
Public	87.1	0.699	64.0	0.019	77.0	0.031	74.7	0.007	72.6	0.002	91.1	0.107	77.8	<0.001
Private	89.7		90.0		64.0		86.2		95.3		86.5			
Facility type														
Hospital	84.6	0.920	55.2	0.043	73.9	0.038	71.9	0.565	73.8	0.015	78.0	0.002	69.2	<0.001
Health center/clinic	87.4		71.7		73.3		76.3		72.2		94.4		81.7	
Pharmacy/Drug shop/Other	89.5		76.9		58.3		76.9		93.5		85.9			
Residence of EA served														
Urban	84.6	0.094	--	--	--	--	75.2	0.589	76.5	0.134	--	--	--	--
Rural	92.4						76.8		89.3					

Notes: -- indicates awaiting residence of EA served in final dataset preparation. EA = Enumeration Area served by the facility. p-val=p-value from chi-squared test. *Adolescent family planning: facility offers family planning services to adolescents aged 10-19.