

Did COVID-19 Impact Contraceptive Uptake? Evidence from Senegal

Kamil Fuseini,  Leah Jarvis,  Augustine Ankomah,  Fatou Bintou Mbow, and Michelle J. Hindin 

This study assessed the impact of the COVID-19 pandemic on the number of new contraceptive acceptors in Senegal overall and by method. Monthly service data from March 2019 to December 2020 were extracted for the number of new contraceptive users of IUDs, implants, injectables, and oral contraceptive pills (OCPs). Data were analyzed using descriptive statistics and interrupted time series analysis for trend analyses overall and by the contraceptive method. Following the announcement of the first COVID-19 case in Senegal in March 2020, there was an immediate significant decrease in the number of new acceptors overall, and for new users of implants and injectables. From March–December 2020, the trend in monthly new family planning acceptors increased overall, mainly driven by significant increases in new IUD and implant acceptors. Compared to the period before the onset of COVID-19, there was a statistically significant shift from shorter-acting methods (OCPs, injectables) to long-acting reversible methods (IUDs, implants). Despite the immediate adverse impact of COVID-19-related restrictions, the number of new acceptors rebounded, trends in the number of new monthly acceptors significantly increased, and there was a significant shift to longer-acting methods.

INTRODUCTION

Health systems can be subject to major disruptions in service provision caused by external factors- changes in political leadership, armed conflict, extreme weather events, or disease outbreaks such as Ebola, Zika, and the current COVID-19 pandemic. How well a health system can provide continuous services despite such a disruption will depend on the nature of the crisis and contextual and system-level factors (Hanefeld et al. 2018). Contraceptive ser-

Kamil Fuseini, Augustine Ankomah, Population Council, Ghana, PO Box CT 4906 Cantonments, Accra, Ghana. Leah Jarvis, Population Council, New York, One Dag Hammarskjold Plaza, New York, NY, 10017, USA. E-mail: jarvis.leah@gmail.com. Fatou Bintou Mbow, Population Council, Senegal, Sacré Coeur 3 Pyrotechnie 85 Appart. 5ème étage à gauche, BP 21027 Dakar Ponty, Dakar, Sénégal. Michelle J. Hindin, Evidence 4 Global Impact, 104 Barringer Court, West Orange, NJ, 07052, USA.

© 2022 The Authors. *Studies in Family Planning* published by Wiley Periodicals LLC on behalf of Population Council.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

vices have been shown to be vulnerable to these types of external threats in the past, to varying degrees.

The Ebola outbreak in West Africa provides some important evidence on the potential for a highly transmissible disease to adversely impact access to sexual and reproductive health (SRH) services. Several studies have documented the trends in contraceptive delivery during the Ebola crisis, largely showing significant declines during the crisis with varying levels of recovery in the immediate and longer-term recovery periods. In Sierra Leone, researchers showed that compared to the period two years before the Ebola outbreak, the use of family planning (FP) fell 6 percent during the outbreak (Sochas, Channon, and Nam 2017). In Guinea, researchers found a 51 percent decline in facility-based contraceptive visits during the Ebola outbreak, but a rebounding of services following the peak of the crisis (Camara et al. 2017). A similar analysis in Sierra Leone showed an increasing trend of contraceptive distribution before Ebola, a marked drop in levels during the peak, and a rise following the peak to steady levels of contraceptive distribution. However, these levels remained significantly lower than pre-Ebola levels (Quaglio et al. 2019). A study that took a longer view found that in Liberia and Sierra Leone there were marked declines during the Ebola outbreak (65 percent in Liberia and 23 percent in Sierra Leone), but that contraceptive use rebounded to higher than pre-Ebola levels two years afterward (Bietsch, Williamson, and Reeves 2020).

At the outset of the COVID-19 pandemic, several studies modeled the potential impact of COVID-19 on SRH services, including contraception. Supply chain disruptions, closure of health facilities and pharmacies, restrictions on movement, financial hardship, and fear of exposure through health facilities were considered likely to impact contraceptive access and use (MSI Reproductive Choices n.d.; UNFPA 2020), and many feared that impacts on SRH services would be dramatic and long lasting. Estimates suggested that with a three-month lockdown, and low levels of service disruption, 13 million women would not be able to access contraception (UNFPA 2020), and a 10 percent decline in short- and long-term contraceptive use could lead to 15.4 million unintended pregnancies in low- and middle-income countries in a 12-month period (Riley et al. 2020). Another set of models suggests that in sub-Saharan Africa there could be a 6.8 percent decline in the demand satisfied for modern contraception in 2020 alone based on impeded access to these methods (Dasgupta, Kantorova, and Ueffing 2020).

Some early evidence in 2020 indicated drops in access to and use of contraceptive services. Disruption of health services, including family planning and contraception, has been documented around the globe, with both supply-side and demand-side causes for disruptions, including health workforce difficulties, lack of supplies, unavailability of services (supply), and patients not coming to facilities, lockdowns on movement and transportation hindering access, and patients experiencing financial hardship (demand) (Kamran et al. 2020; World Health Organization 2020a, 2021). The International Planned Parenthood Federation announced in April 2020 that 5,633 static and mobile clinics and community-based care outlets had temporarily closed—14 percent of total service delivery outlets (International Planned Parenthood Federation 2020). And a longitudinal survey in Burkina Faso and Kenya found that while the majority of women did not change their contraceptive status during the early months of the COVID-19 pandemic, there was a proportion of nonusers in Burkina Faso

(3.8 percent) and Kenya (14.4 percent) that reported pandemic-related reasons for nonuse (Karp et al. 2021).

However, some recent evidence has indicated that the impact of the COVID-19 pandemic on contraception access and use has not been as drastic nor as long-lasting as initially feared. Contraception use has in fact increased among some women in need, such as among nulliparous women in rural Kenya and urban Burkina Faso (Wood et al. 2021). An analysis of data on utilization of contraceptive health services by women referred via community health promoters in two regions of Mozambique showed a moderate, short-term decrease in service provision and utilization in the early stages of the pandemic; however, this was followed by a rebound to prepandemic service levels within a few months (Leight et al. 2021).

Lesser than feared impacts of the pandemic on contraceptive use may have in part been due to service delivery approaches adapted to minimize the impact on service availability and accessibility. Telehealth—or the practice of using communications that do not require in-person contacts, such as phone or video calls, WhatsApp, and text messages to provide counseling and services—has gained popularity and widespread use globally, accelerated by the pandemic (Nanda et al. 2020; Oyediran, Makinde, and Adelakin 2020). The increased use of self-care methods, including Sayana Press, pills, and condoms, has also been proposed, as well as the practice of providing more commodities at each visit, reducing the number of visits needed (Weinberger et al. 2020).

Context of Contraceptive Use in Senegal

From 2010 to 2019, there has been a general upward trend in the prevalence of modern contraceptive use among all Senegalese women, aged 15–49 (The DHS Program n.d.). According to the 2019 DHS, among all women, the most commonly used modern method was implants (7.0 percent), followed by injectables (5.6 percent), and oral contraceptive pills (OCP) (2.8 percent). Compared with modern contraceptive users in 2015 DHS, method use has been relatively stable with the overall rise in the prevalence of modern contraceptive use in 2019 is explained by primarily by an increase in implant use (3.8 percent in 2015, 7.0 percent in 2019). Despite recent progress in the prevalence of modern contraceptive use, approximately one in five Senegalese women have an unmet need for contraception, and 28 percent report contraceptive discontinuation within the first year of use (The DHS Program n.d.).

For their current method, the large majority of the implant (96.0 percent), injectable (94.4 percent), IUD (89.9 percent), and OCP (82.2 percent) users obtained their method from the public sector. Among public sector sources of contraceptives, health posts were the most used source, followed by a government health center. Among women who reported condom use, the majority obtained them from the private sector (66.2 percent), specifically from pharmacies (The DHS Program n.d.). Among current users, 8 percent of Senegalese women obtained their most recent method from a pharmacy, while most women obtained their method from the public sector including a government health post (64 percent), health center or clinic (15 percent), or government hospital (6 percent) (Mallick et al. 2020).

COVID-19 in Senegal

Senegal was one of the first West African countries to officially report a case of COVID-19, on March 2, 2020. On March 23, the Government declared a state of emergency, which sought to

limit interurban movement of people and goods at certain times, temporarily closed schools, and imposed a curfew throughout the country. From May 29, 2020, a subsequent order somewhat loosened restrictions: although there was a continued ban on gatherings in some public places such as theaters, bars, beaches, and sports grounds, people could gather in other public places including restaurants, markets, and places of worship. The order required people gathering in such spaces to wear masks, practice social distancing and wash or disinfect hands. The State of Emergency was extended three times and lasted until June 30, 2020 (République du Sénégal: Ministère de l'Economie du Plan et de la Coopération 2020). As major lockdowns were lifted, the government of Senegal continued public information campaigns to limit the spread of COVID-19 while simultaneously bolstering efforts to provide safe family planning (FP) and reproductive, maternal, newborn, child, and adolescent health (RMNCAH) care to women in Senegal (Ndiaye and Thioye 2020).

In the context of COVID-19 in Senegal, this study seeks to understand whether and to what extent the COVID-19 pandemic and related lockdowns affected women's uptake of contraception for the first time. Using district-level health monitoring information systems data, we explored the temporal trends in new contraceptive users for 12 months before the first COVID-19 case in March 2020, and for 10 months afterward, through December 2020. We also examine the trends in the method mix for the 22-month period.

MATERIALS AND METHODS

Data Source

Data for this study were extracted from Senegal's District Health Information System 2 (DHIS2), a nationwide health information data capture system based on data aggregated from public health facilities (DHIS2 n.d.). Senegal's DHIS2 includes service data on modern contraceptive methods available at public health facilities including IUDs, implants, injectables, condoms, and OCPs. Service delivery data are recorded at the facility level and then entered into the DHIS2 system by public health facility staff. Data are recorded for indicators including new and continuing FP users, FP counseling, contraceptive discontinuation, and others, by FP method and by patients' ages.

For this analysis, we used data on the number of new FP acceptors, based on the number of women who are using FP for the very first time and received an IUD, implant, injectable, or OCPs. While data are available for "continuing users" these data are not collected each month. Instead, the number of continuing users is based on estimated continued use. For example, a woman who gets a five-year implant is counted as a continuing user for five years. However, there is no information on whether she had the implant removed. With the potential for overestimation of use, we opted to only include new users in our analysis. Additionally, while condoms are included in DHIS2, most women who report condom use obtain them from pharmacies (The DHS Program n.d.). Given the likely significant underestimation of condom users, we have excluded them from the current analysis. Monthly data on new users were extracted and aggregated from March 2019 through December 2020 providing trend information for 12 months prior to the announcement of the first case of COVID-19 in Senegal (March 2019 to February 2020) and for 10 months following the onset

of COVID-19 (March 2020 to December 2020). This study used anonymous secondary data aggregated to the population level; thus Institutional Review Board (IRB) approval was not required.

Statistical Analyses

Our analysis was conducted in several phases. First, we performed quality checks on the data extracted from DHIS2, aggregated the data on new users, and created summary statistics on new acceptors overall and by method. Next, we descriptively analyzed trends in the number of new acceptors, overall and by method, conducting chi-square to test for significant differences in method mix. We then conducted interrupted time series (ITS) analysis to estimate both the immediate and longer-term impact of COVID-19 on the number of new acceptors, overall, and by method. ITS segmented ordinary least square regression models were estimated to assess the impact of COVID-19 and related lockdowns on the number of new FP acceptors using the onset month of March 2020 as the “intervention”. The period of March 2019–February 2020 is the preintervention period as provides the “counterfactual” estimate. Due to model fit and evidence of autocorrelation (data not shown), we chose to use Prais–Winsten models to account for the autocorrelation observed in the data (Prais and Winsten 1954). To adjust for the potential effect of seasonality in contraceptive uptake, we used moving averages for smoothing. Postintervention linear trends were estimated for all ITS models. We also tested the robustness of our results by region (data not shown).

The ITS regression model (single group) takes the form:

$$Y_t = \beta_0 + \beta_1 T_t + \beta_2 X_t + \beta_3 X_t T_t + \epsilon_t$$

where Y is the count of new users each month, (T). β_0 represents the intercept or starting level of the outcome variable (estimated number of new FP acceptors in March 2019). β_1 estimates the average monthly change in the number of new FP acceptors until the onset of the intervention or the counterfactual slope (March 2019 to February 2020). T_t is the time (in months) since the start of the study, β_2 represents the change in the number of new FP users that occurred in March 2020 with the beginning of the COVID-19 pandemic, and β_3 represents the difference between the trend in new FP acceptors before the first announced case of COVID-19 compared to the trend in the number of new FP acceptors following the initial case. X_t is a dummy (indicator) variable representing the event (pre-event periods 0, otherwise 1), $X_t T_t$ is an interaction term between the event and time, and ϵ_t the random error term. Data were unweighted and analyzed using Stata version 16 (StataCorp 2019).

RESULTS

Trends in New Acceptors and Method Mix

Table 1 shows the frequency distribution and percentages of new FP acceptors nationally by month and method. The lowest levels occurred in May 2020, approximately two months into the pandemic, when there were only 18,838 new acceptors. Throughout the 22-month period, on average, 6.0 percent of new acceptors selected IUDs, 36.1 percent selected

TABLE 1 Distribution of new FP methods acceptors (IUDs, implants, injectables, and oral contraceptive pills) by month in Senegal, March 2019–December 2020

Date	IUD		Implants		Injectables		Oral contraceptive pills		Total	
	n	%	n	%	n	%	n	%	n	%
2019										
March 2019	1,160	5.2	6,889	30.9	11,114	49.9	3,129	14.0	22,292	100.0
April 2019	1,494	6.4	7,340	31.7	10,809	46.6	3,546	15.3	23,189	100.0
May 2019	900	4.2	6,617	31.1	10,453	49.2	3,294	15.5	21,264	100.0
June 2019	1,049	5.1	6,631	32.4	9,866	48.2	2,902	14.2	20,448	100.0
July 2019	1,174	5.0	7,812	33.1	11,376	48.1	3,269	13.8	23,631	100.0
August 2019	982	4.7	6,370	30.7	9,940	47.9	3,444	16.6	20,736	100.0
September 2019	1,297	6.1	7,757	36.5	8,809	41.4	3,400	16.0	21,263	100.0
October 2019	1,460	6.0	8,918	36.4	10,646	43.4	3,488	14.2	24,512	100.0
November 2019	1,830	6.7	11,252	41.1	11,060	40.4	3,254	11.9	27,396	100.0
December 2019	1,418	5.8	8,817	36.0	11,115	45.3	3,172	12.9	24,522	100.0
January 2020	1,418	5.5	9,411	36.3	11,575	44.7	3,498	13.5	25,902	100.0
February 2020	1,450	6.2	8,709	37.2	9,831	42.0	3,403	14.5	23,393	100.0
March 2020	15,632	5.6	96,523	34.7	126,594	45.4	39,799	14.3	278,548	100.0
2020										
March 2020	1,349	6.0	8,119	36.0	9,750	43.2	3,361	14.9	22,579	100.0
April 2020	1,117	5.3	7,646	36.3	9,062	43.0	3,245	15.4	21,070	100.0
May 2020	1,045	5.7	6,625	36.0	7,882	42.9	2,836	15.4	18,388	100.0
June 2020	1,687	6.9	9,359	38.4	10,078	41.3	3,260	13.4	24,384	100.0
July 2020	1,849	7.0	10,079	38.2	10,964	41.5	3,510	13.3	26,402	100.0
August 2020	1,387	6.4	8,181	37.5	9,208	42.3	3,011	13.8	21,787	100.0
September 2020	1,654	7.4	8,665	38.9	8,854	39.7	3,102	13.9	22,275	100.0
October 2020	1,518	6.8	8,945	40.2	8,960	40.3	2,834	12.7	22,257	100.0
November 20	1,882	7.4	10,188	40.0	10,106	39.7	3,278	12.9	25,454	100.0
December 2020	1,546	6.1	9,067	35.9	11,054	43.8	3,577	14.2	25,244	100.0
March 2020–December 2020	15,034	6.5	86,874	37.8	95,918	41.7	32,014	13.9	229,840	100.0
Total	30,666	6.0	183,397	36.1	222,512	43.8	71,813	14.1	508,388	100.0

SOURCE: DHS2, Senegal.

TABLE 2 Interrupted time series analysis of new FP acceptors in Senegal from March 2019–December 2020

	Coefficient	Semi-robust standard. error
Number of new FP acceptors (March 2019)	21,946.9***	646.6
Monthly change in the number of new FP acceptors pre-COVID (March 2019–February 2020)	215.3	111.4
Change in the number of new FP acceptors in March 2020	−2,690.9*	977.1
Difference in trends in the monthly number of new FP acceptors between March 2019–February 2020 compared to March–December 2020	96.5	205.2
Monthly change in the number of new FP acceptors from March–December 2020	311.8*	140.1

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

implants, 43.8 percent selected injectables and 14.1 percent selected OCPs. When considering the prepandemic period (March 2019–February 2020), 5.6 percent of all new users selected IUDs, 34.7 percent adopted implants, 45.4 percent adopted injectables, and 14.3 percent adopted OCPs. Comparing the method mix prepandemic to the period during the pandemic (March–December 2020), we find a significant shift to long-acting reversible contraceptive (LARC) methods. There were significantly more new acceptors of IUDs (6.5 percent vs 5.6 percent, $p \leq 0.001$), and implants (37.8 percent vs. 34.7 percent, $p \leq 0.001$) and significantly fewer of injectables (41.7 percent vs. 45.4 percent, $p \leq 0.001$) and OCPs (13.9 percent vs. 14.3 percent, $p \leq 0.001$).

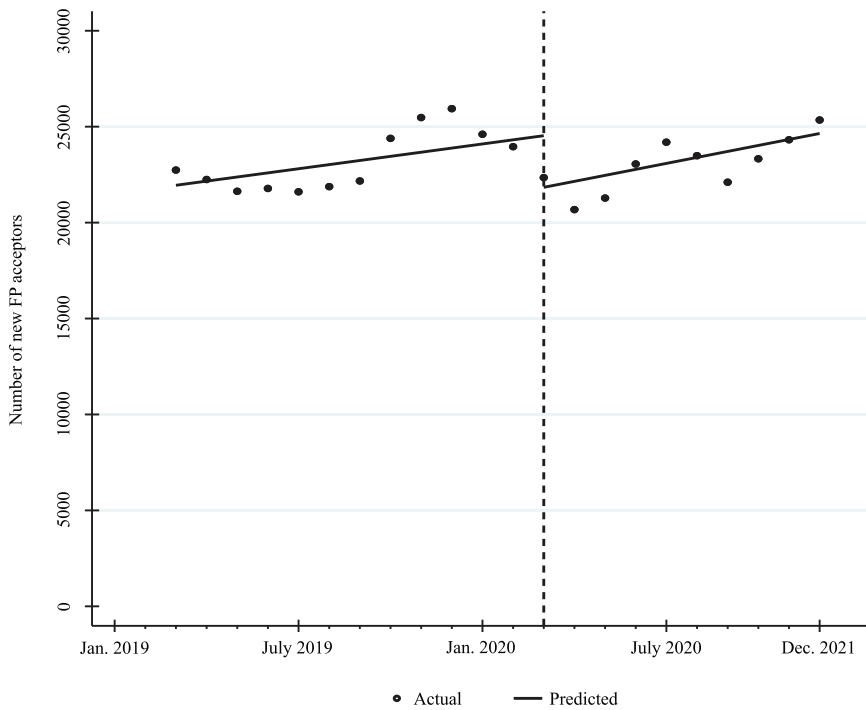
Table 2 shows the results of the ITS analysis for new FP acceptors (IUD, implants, injectables, and pills) over the 12 months preceding the first COVID-19 case in Senegal (March 2019 to February 2020), and the 10 months after the first case (March to December 2020). The number of new FP acceptors in March of 2019 (starting time for the analysis) was 21,946. The number of new acceptors increased by an average of 215 per month ($p = 0.07$, 95 percent confidence interval (CI): −18.7 to 449.3) between March 2019 and February 2020; however, this change was not statistically significant. When the first COVID-19 case was announced in March 2020, there was an immediate statistically significant decrease in new acceptors (−2690.9 new acceptors, $p = 0.01$, 95 percent CI: −4743.7 to −638.2). During the COVID-19 period (March 2020–December 2020), the average monthly number of new acceptors was increasing significantly, by over 300 per month (311.8, $p = 0.04$, 95 percent CI: 17.5–606.1). The difference between the trends in the prepandemic period and postpandemic onset period was not significant (96.5, $p = 0.64$, 95 percent CI: −334.7 to 527.7). These results are shown visually in Figure 1.

Table 3 shows the results of the national-level ITS analysis by the FP method. Before the first case of COVID was announced in Senegal, the trend in new FP acceptors was not significantly increasing or decreasing, with the exception of implants where there was an average increase of 205.6 new users per month ($p = 0.01$, 95 percent CI: 67.4 to 343.7). With the announcement of the first case in Senegal, there was an immediate, significant decrease in the number of new implant (−1160.6, $p = 0.02$, 95 percent CI: −2133.3 to −187.8) and injectable acceptors (−1132.0, $p = 0.01$, 95 percent CI: −2004.5 to −259.4). As was seen in the overall model, by method, there was no significant change in the trend in new acceptors following the COVID-19 restrictions compared to the trend before COVID-19 for any method. However, there was a significant increase in the average monthly number of new acceptors during

TABLE 3 Interrupted time series analysis of new FP acceptors in Senegal from March 2019–December 2020, by FP method

	New IUD acceptors		New Implant acceptors		New Injections acceptors		New oral contraceptive acceptors	
	Coefficient	Semi-robust standard error	Coefficient	Semi-robust standard error	Coefficient	Semi-robust standard error	Coefficient	Semi-robust standard error
Number of new FP acceptors in March 2019	1,191.5***	118.3	6,843.9***	290.4	10,666.7***	229.02	3,280.6	51.0
Monthly change in number of new FP acceptors from March 2019 to February 2020	21.9	15.3	205.6**	65.8	-26.0	41.5	6.9	6.5
Change in the number of new FP acceptors in March 2020	-151.2	76.2	-1,160.6*	463.0	-1,132.0*	415.3	-171.9	106.4
Difference in trends in monthly number of new FP acceptors between March 2019 to February 2020 compared to March–December 2020	25.9	23.2	-51.9	112.0	123.9	87.8	-1.6	22.2
Monthly change in number of new FP acceptors from March–December 2020	47.8***	12.1	153.7*	58.7	97.9	68.3	5.2	21.0

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

FIGURE 1 Actual and predicted number of new FP acceptors, by month

the COVID-19 period for two methods—IUDs (47.8, $p = 0.001$, 95 percent CI: 22.4 to 73.3) and implants (153.7, $p = 0.02$, 95 percent CI: 30.4 to 276.9). These results align with what was shown in Table 1, with a method mix shifting to longer-acting methods.

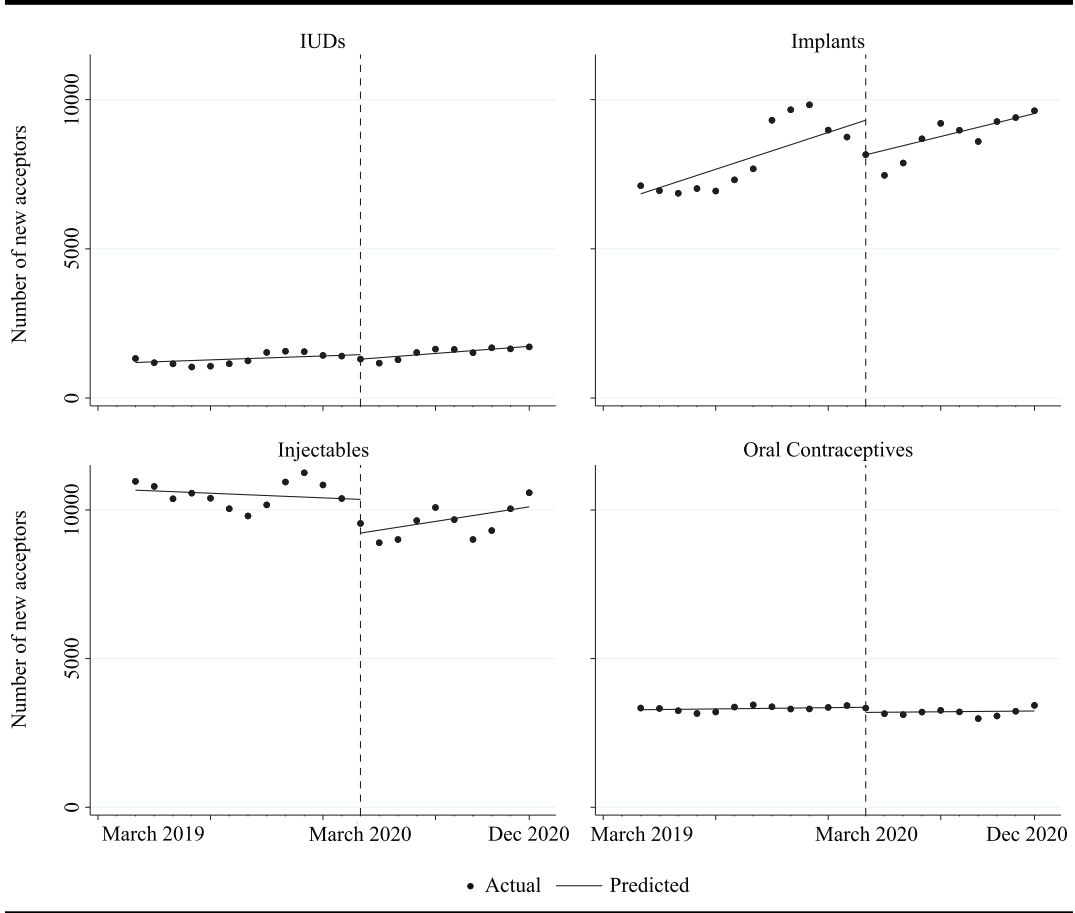
Figure 2 provides a visual display of the results in Table 3.

DISCUSSION

Our examination of trends in new FP acceptors from March 2019 to December 2020 shows a significant but short-lived disruption in new users occurring with the immediate onset and lockdown period of COVID-19 in Senegal in March 2020. In the longer pandemic period, through the rest of 2020, overall trends in new FP acceptors do not appear to have been significantly negatively impacted by COVID-19 when compared to the pre-pandemic period. On the contrary, the overall number of new FP acceptors significantly increased from March to December. This indicates that with the first COVID-19 case being announced, the onset of a period of strict lockdown on movement, and widespread fear—FP services were impacted. Women may have been unable or unwilling to access health facilities, or facilities and providers may have diverted resources away from FP toward services deemed more essential.

In addition to our findings about new FP acceptors overall, we find that there was a significant shift in method mix following the start of the pandemic, with proportionally more new users opting for LARCs over short-acting methods compared with the prepandemic period. There was a shift toward more LARCs in the overall method mix, and a significant increase in

FIGURE 2 Actual and predicted number of new FP acceptors, by FP method



new IUD and implant acceptors in March–December 2020, while for the two shorter-acting methods, injectables and OCPs, there was a shift away from these methods, compared to before the pandemic. This may reflect a shift in fertility preferences, a preference for obtaining methods from other sources, or a desire to minimize the number of facility visits by obtaining a method that does not require frequent resupply. A previous study from Burkina Faso and Kenya showed that while most women did not shift their contraceptive use in the early months of the pandemic, women who did switch methods were more likely to adopt a more effective method (Karp et al., 2021).

While women who use OCPs primarily obtain them from health facilities, they are also widely available in pharmacies. However, Senegalese law highly regulates activities in which pharmacists can engage and stipulates that they cannot engage in medical procedures such as injections, nor can they provide OCPs without a prescription (Mbow et al. 2018; Peterson et al. 2019). A 2019 survey of pharmacies and clients in urban districts of Senegal showed that while most surveyed private facilities stocked OCPs and injectables, few current users surveyed obtained their method from a pharmacy (Peterson et al. 2019). We are not able to show whether women who would have wanted to start using OCPs or injectables obtained them

outside the public health facilities, such as in a private pharmacy, opted for another method, or did not start using a method at all. A mixed methods study in Senegal of short-term method users showed that 30 percent of women experienced delays in getting resupply of OCPs and injectables, and the reasons for these delays included health system barriers (cost of FP and availability of methods) as well as individual characteristics (covert use and illiteracy) (Cavallaro et al. 2018). Such factors may have contributed to the shift to LARCs among new users who may have not wanted to consider repeated visits to the facilities, especially during the pandemic.

There are several important limitations to this work. First, the DHIS2 data represent only public facilities and do not include data from pharmacies or private facilities. Without these data, it is not possible to get a complete picture of all new acceptors. We also do not have any data on quality of care, method availability, and whether women who came in for a specific method got their method of choice. Additionally, new acceptors do not include women who are switching methods or seeking refills of methods, and it is likely that most women who comprise modern contraceptive users are not new users. However, new users are an important focus, as they often face more hurdles to obtaining a method than continuing users. For some months, we have evidence of high data quality for the DHIS2; however, we were unable to assess data quality for all months of data, and data entry at the height of restricted movement could have been adversely impacted.

Despite these limitations, we find that the COVID-19 pandemic significantly affected the initiation of contraceptive use from public health facilities at the beginning of the outbreak in Senegal, but that initiation of contraceptive use recovered in the ensuing months to prepandemic levels as has been found in other studies. Legal restrictions in Senegal on FP method provision in pharmacies, including injectables, provide some unique challenges to increasing access to contraceptive methods outside of public health facilities, making contraceptive users vulnerable. Approaches such as task shifting, where community health workers and pharmacists offer more methods, should be explored in Senegal, despite legal and policy barriers, as evidence from others, settings have shown feasibility (Prata et al. 2011; Hoke et al. 2012; Mané, Diop, and RamaRao 2015; Cover et al. 2017; Burke et al. 2018; Hernandez et al. 2018). Self-care options such as self-injection of Sayana Press have also been shown to be acceptable in other settings (Cover et al. 2017; Burke et al. 2018; Nai et al. 2020). These approaches may also provide more equitable access for women who cannot easily access a public health facility. Providing a legal framework in which additional professionals such as pharmacists can provide some FP methods can help ensure uninterrupted access to methods when crises disrupt regular sources.

Though our study was not able to examine the impact of socioeconomic or geographic factors on access to FP, COVID-19 has highlighted inequities in health systems and access to care globally, and barriers to accessing care, including FP, are likely to have disproportionately affected poor and marginalized women (Gilson et al. 2020). There is a critical need for women to be able to continue to access FP, including during health crises (FP2020 2020; World Health Organization 2020b), and additional research is needed to better understand which women were unable to access contraception and why, and to document the full impact of the pandemic on reproductive health outcomes.

CONCLUSION

Health crises such as the COVID-19 pandemic can have a significant effect on the provision of essential preventative health care, including FP. Despite contraception is an essential medical service, we repeatedly find that provision of contraception can be easily disrupted. While there are reasons for optimism in terms of longer-term indications of health system recovery, women who were not able to access contraception during the initial COVID-19 lockdowns may have experienced unwanted or mistimed pregnancies and births. Shifts in the method mix toward a greater reliance on LARCs after the pandemic onset may indicate that women want to be able to use the longer term, more reliable methods, in particular in times of crisis. Policy change is needed in Senegal to expand options to contraception that include a larger number of venues where women can obtain methods, as well as a broadening of personnel who can provide a range of methods in the private sector. Such efforts could provide Senegalese women with more options, particularly when health systems are challenged, as they have been by the COVID-19 pandemic.

DATA AVAILABILITY STATEMENT

The service statistics from DHIS2 were provided by the Ministry of Health of Senegal and are not publicly available.

REFERENCES

- Bietsch, Kristin, Jessica Williamson, and Margaret Reeves. 2020. "Family Planning during and after the West African Ebola Crisis." *Studies in Family Planning* 51(1): 71–86. <https://doi.org/10.1111/sifp.12110>.
- Burke, Holly M., Catherine Packer, Mercy Buluzi, Elise Healy, and Bagrey Ngwira. 2018. "Client and Provider Experiences with Self-Administration of Subcutaneous Depot Medroxyprogesterone Acetate (DMPA-SC) in Malawi." *Contraception* 98(5): 405–410. <https://doi.org/10.1016/j.contraception.2018.02.011>.
- Camara, Bienvenu S., Alexandre Delamou, Ermias Diro, Abdoul H. Béavogui, Alison M. El Ayadi, Sidikiba Sidibé, Fassou M. Grovogui, et al. 2017. "Effect of the 2014/2015 Ebola Outbreak on Reproductive Health Services in a Rural District of Guinea: An Ecological Study." *Transactions of the Royal Society of Tropical Medicine and Hygiene* 111(1): 22–29. <https://doi.org/10.1093/trstmh/trx009>.
- Cavallaro, Francesca L., Diane Duclos, Jenny A. Cresswell, Sylvain Faye, David Macleod, Adama Faye, and Caroline A. Lynch. 2018. "Understanding 'Missed Appointments' for Pills and Injectables: A Mixed Methods Study in Senegal." *BMJ Global Health* 3(6): e000975. <https://doi.org/10.1136/bmjgh-2018-000975>.
- Cover, Jane, Jeanette Lim, Allen Namagembe, Justine Tumusiime, Jennifer Kidwell Drake, and Carie Muntifering Cox. 2017. "Acceptability of Contraceptive Self-Injection with DMPA-SC among Adolescents in Gulu District, Uganda." *International Perspectives on Sexual and Reproductive Health* 43(4): 153–162. <https://doi.org/10.1363/43e5117>.
- Dasgupta, Aisha, Vladimira Kantorova, and Philipp Ueffing. 2020. "The Impact of the COVID-19 Crisis on Meeting Needs for Family Planning: A Global Scenario by Contraceptive Methods Used." *Gates Open Research*, 4: 102. November. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7720714/>.
- DHIS2. n.d. "About DHIS2." Accessed May 12, 2021. <https://dhis2.org/about/>.
- FP2020. 2020. "Access to Contraception Is Critical in COVID-19 Response: FP2020 Statement." Washington, D.C. <http://familyplanning2020.org/sites/default/files/COVID/COVID-19%20%26%20FP%20statement%202020-04-01.pdf>.
- Gilson, Lucy, Bruno Marchal, Irene Ayepong, Edwine Barasa, Jean Paul Dossou, Asha George, Ryan Guinanan, et al. 2020. "What Role Can Health Policy and Systems Research Play in Supporting Responses to COVID-19 That Strengthen Socially Just Health Systems?" *Health Policy and Planning* 35(9): 1231–1236. <https://doi.org/10.1093/heapol/czaa112>.

- Hanefeld, Johanna, Susannah Mayhew, Helena Legido-Quigley, Frederick Martineau, Marina Karanikolos, Karl Blanchet, Marco Liverani, Esther Yei Mokuwa, Gillian McKay, and Dina Balabanova. 2018. "Towards an Understanding of Resilience: Responding to Health Systems Shocks." *Health Policy and Planning* 33(10): 1144. <https://doi.org/10.1093/heapol/czy087>.
- Hernandez, Julie H., Pierre Akilimali, Annie Glover, Rebecca Emel, Albert Mwembo, and Jane Bertrand. 2018. "Task-Shifting the Provision of DMPA-SC in the DR Congo: Perspectives from Two Different Groups of Providers." *Contraception* 98(5): 449–453. <https://doi.org/10.1016/j.contraception.2018.07.002>.
- Hoke, Theresa H., Stephanie B. Wheeler, Kelsey Lynd, MacKenzie S. Green, Bakolisoa Harimalala Razafindravony, Eugénie Rasamihajamanana, and Paul D. Blumenthal. 2012. "Community-Based Provision of Injectable Contraceptives in Madagascar: 'Task Shifting' to Expand Access to Injectable Contraceptives." *Health Policy and Planning* 27(1): 52–59. <https://doi.org/10.1093/heapol/czr003>.
- International Planned Parenthood Federation. 2020. "COVID-19 Pandemic Cuts Access to Sexual and Reproductive Healthcare for Women around the World." <https://www.ippf.org/news/covid-19-pandemic-cuts-access-sexual-and-reproductive-healthcare-women-around-world>
- Kamran, Iram, Tahira Parveen, Rehan Niazi, and Irfan Masood. 2020. "Reproductive Health Care in the Time of COVID-19: Perspectives of Poor Women and Service Providers from Rahim Yar Khan, Punjab." Islamabad: Population Council. <https://doi.org/10.31899/rh14.1051>.
- Karp, Celia, Shannon N Wood, Georges Guiella, Peter Gichangi, Suzanne O Bell, Philip Anglewicz, Elizabeth Larson, Linnea Zimmerman, and Caroline Moreau. 2021. "Contraceptive Dynamics during COVID-19 in Sub-Saharan Africa: Longitudinal Evidence from Burkina Faso and Kenya." *BMJ Sexual & Reproductive Health* 47(4): 252–260. <https://doi.org/10.1136/bmj.srh-2020-200944>.
- Leight, Jessica, Catherine Hensly, Marcos Chissano, and Liza Ali. 2021. "Short-Term Effects of the COVID-19 State of Emergency on Contraceptive Access and Utilization in Mozambique." *PLoS ONE* 16(3): e0249195. <https://doi.org/10.1371/JOURNAL.PONE.0249195>.
- Mallick, Lindsay, Shireen Assaf, Michelle W Weinberger, and Gbaiké Ajayi. 2020. "Contraceptive Use, Method Mix, and Method Availability: A Multilevel Analysis." *DHS Analytical Studies*. Rockville, MD: DHS. <https://dhsprogram.com/pubs/pdf/AS74/AS74.pdf>.
- Mané, Babacar, Nafissatou Diop, and Saumya RamaRao. 2015. "Task Sharing in the Delivery of Family Planning Programs: Experiences from Senegal." Dakar: Population Council. https://knowledgecommons.popcouncil.org/cgi/viewcontent.cgi?article=1819%26context=departments_sbsr-rh.
- MSI Reproductive Choices n.d. "Stories from the Frontline: In the Shadow of the COVID-19 Pandemic." Accessed September 15, 2021. <https://www.msichoice.org/covid-19/stories-from-the-frontline/>
- Mbow, Fatou Bintou, Ndeye Dome Fall, Nafissatou Diop, and Sara Chace Dwyer. 2018. "Exploration Du Rôle Potentiel Des Pharmacies Privées Dans l'offre de Services de Planification Familiale Au Sénégal: Revue Documentaire Sur Les Aspects Juridiques." Dakar, Senegal.
- Nai, Dela, Patrick Aboagye, Kamil Fuseini, Elizabeth Tobey, Aparna Jain, Nora Maresh, and Rebecca Fertziger. 2020. "Introduction of DMPA-SC Self-Injection in Ghana: A Feasibility and Acceptability Study Using Sayana® Press." Washington, DC: Population Council. https://knowledgecommons.popcouncil.org/cgi/viewcontent.cgi?article=2089&context=departments_sbsr-rh.
- Nanda, Kavita, Elena Lebetkin, Markus J. Steiner, Irina Yacobson, and Laneta J. Dorflinger. 2020. "Contraception in the Era of COVID-19." *Global Health Science and Practice* 8(2): 166–168. <https://doi.org/10.9745/GHSP-D-20-00119>.
- Ndiaye, Marème Mady Dia, and Aïssatou Thiouye. 2020. "Senegal: A Leader in Access to FP/RH Care During COVID-19." Knowledge SUCCESS. <https://knowledgesuccess.org/2020/09/29/senegal-a-leader-in-access-to-fp-rh-care-during-covid19/>
- Oyediran, Kolawole A., Olusesan A. Makinde, and Olugbemiga Adelakin. 2020. "The Role of Telemedicine in Addressing Access to Sexual and Reproductive Health Services in Sub-Saharan Africa during the COVID-19 Pandemic." *African Journal of Reproductive Health* 24(2): 49–55. <https://doi.org/10.29063/ajrh2020/v24i2s.8>.
- Peterson, Jill, Aurelie Brunie, Ibrahima Diop, Seynabou Diop, John Stanback, and Dawn Chin-Quee. 2019. "Over the Counter: The Potential for Easing Pharmacy Provision of Family Planning in Urban Senegal." *Gates Open Research*, 2: 29. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6600082/>

- Prais, Sigbert J., and Christopher B. Winsten. 1954. *Trend Estimators and Serial Correlation*. Chicago: Cowles Commission discussion paper. Vol 383: 1–26.
- Prata, Ndola, Amanuel Gessesew, Alice Cartwright, and Ashley Fraser. 2011. “Provision of Injectable Contraceptives in Ethiopia through Community-Based Reproductive Health Agents.” *Bulletin of the World Health Organization* 89(8): 556–564. <https://doi.org/10.2471/blt.11.086710>.
- Quaglio, Gianluca, Francesca Tognon, Livio Finos, David Bome, Santigie Sesay, Atiba Kebbie, Francesco di Gennaro, et al. 2019. “Impact of Ebola Outbreak on Reproductive Health Services in a Rural District of Sierra Leone: A Prospective Observational Study.” *BMJ Open* 9(9): e029093. <https://doi.org/10.1136/bmjopen-2019-029093>
- République du Sénégal: Ministère de l’Economie du Plan et de la Coopération. 2020. “Recueil Des Principaux Textes Émis Depuis Le Début de La Crise Sanitaire Liée à La COVID-19 – Exposé Des Textes.” *Dakar*. <https://www.economie.gouv.sn/fr/notes-et-points-de-conjoncture/recueil-des-principaux-textes-emis-depuis-le-debut-de-la-crise>
- Riley, Taylor, Elizabeth Sully, Zara Ahmed, and Ann Biddlecom. 2020. “Estimates of the Potential Impact of the COVID-19 Pandemic on Sexual and Reproductive Health in Low-and Middle-Income Countries.” *International Perspectives on Sexual and Reproductive Health* 46: 73–76. <https://doi.org/10.1363/46e9020>.
- Sochas, Laura, Andrew Amos Channon, and Sara Nam. 2017. “Counting Indirect Crisis-Related Deaths in the Context of a Low-Resilience Health System: The Case of Maternal and Neonatal Health during the Ebola Epidemic in Sierra Leone.” *Health Policy and Planning* 32: iii32–iii39. <https://doi.org/10.1093/heapol/czx108>.
- StataCorp. 2019. “*Stata Statistical Software: Release 16*.” College Station, TX.: StataCorp LLC.
- The DHS Program. n.d. “STATcompiler.” Accessed September 15, 2021. <https://www.statcompiler.com/en/>
- UNFPA. 2020. “Impact of the COVID-19 Pandemic on Family Planning and Ending Gender-Based Violence, Female Genital Mutilation and Child Marriage.” *Interim Technical Note*. New York, USA: UN FPA. <https://www.unfpa.org/pcm/node/24179>.
- Weinberger, Michelle, Brendan Hayes, Julia White, and John Skibiak. 2020. “Doing Things Differently: What It Would Take to Ensure Continued Access to Contraception during COVID-19.” *Global Health Science and Practice* 8(2): 169–175. <https://doi.org/10.9745/GHSP-D-20-00171>.
- Wood, Shannon N, Celia Karp, Funmilola OlaOlorun, Akilimali Z Pierre, Georges Guiella, Peter Gichangi, Linnea A Zimmerman, Philip Anglewicz, Elizabeth Larson, and Caroline Moreau. 2021. “Need for and Use of Contraception by Women before and during COVID-19 in Four Sub-Saharan African Geographies: Results from Population-Based National or Regional Cohort Surveys.” *The Lancet Global Health* 9(6): e793–e801. [https://doi.org/10.1016/S2214-109X\(21\)00105-4](https://doi.org/10.1016/S2214-109X(21)00105-4).
- World Health Organization. 2020a. “Pulse Survey on Continuity of Essential Health Services during the COVID-19 Pandemic.” In: *Pulse Survey on Continuity of Essential Health Services during the COVID-19 Pandemic*. Geneva, Switzerland.
- World Health Organization. 2020b. “Maintaining Essential Health Services: Operational Guidance for the COVID-19 Context.” *World Health Organization*. Geneva, Switzerland.
- World Health Organization. 2021. “Second Round of the National Pulse Survey on Continuity of Essential Health Services during the COVID-19 Pandemic: January–March 2021.” *World Health Organization*. Geneva, Switzerland.

ACKNOWLEDGMENTS

The authors would like to acknowledge Dr. Anta Diaw, Health and Social Information System Division of the Ministry of Health and Social Action, Dakar, Senegal, for helping to obtain the data that were used for this research. This work was supported by the William and Flora Hewlett Foundation under Grant 2019–9151.