Trends in Usage of Family Planning Services Following the COVID-19 Pandemic in Rhode Island

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Introduction

The societal response to the COVID-19 pandemic impacted healthcare access in various ways. In the early months of the pandemic, many healthcare services deemed "non-essential" were curtailed in an effort to reduce potential disease transmission and divert resources toward caring for patients with acute COVID-19 symptoms. Several studies documented a decline in hospital admissions and emergency department visits.[1,2,3] Similarly, ambulatory visits decreased or shifted from in-person to telehealth in many settings.[4] Many patients reported delaying or avoiding health care because of their concerns about COVID-19.[5]

These impacts were reflected in reproductive health care access as well. Reports written at the very start of the pandemic conjectured that access to contraception and abortion services could become limited globally, possibly resulting in an increase in unintended pregnancies and an increase in maternal mortality.[6,7] Other projections were informed by studies of previous large-scale crises, such as Hurricane Katrina in 2005 and the Great Recession of 2008.[8] Issues with access to medications and services, difficulties in affording care due to unemployment, and other factors led to shifts in women's fertility preferences and decreases in fertility after many such events.[9]

[1] Rennert-May et al. 2021
[2] Czeisler et al. 2020
[3] Pujolar et al. 2022
[4] Demeke et al. 2020
[5] Czeisler et al. 2020
[6] Kumar 2020
[7] Riley et al. 2020
[8] Lindberg et al. 2020; Diamond-Smith et al. 2021
[9] Leyser-Whalen et al. 2020; Lindberg et al. 2020; Diamond-Smith et al. 2021

In studies of the COVID-19 pandemic, many patients reported needing to cancel or delay reproductive health visits due to the pandemic, and feeling increased worry about their ability to receive care or afford contraceptives.[10] Providers also reported increased worry in one study that delays in preventive reproductive health care would cause negative health consequences for their patients; they also reported that it was difficult to address such preventive care with their patients during the pandemic.[11]

Quantitative reports of changes paint a mixed picture globally. In England, for example, during the first three months of the pandemic, prescriptions of estrogen-containing contraceptive methods declined and progesterone-only methods increased, with the exception of IUDs and implants, which declined by 25%.[12] However, only a slight decrease in usage of reproductive healthcare services was noted in Spain during the lockdown period of the pandemic; a similar trend was noted in Georgia, USA.[13,14] A study of visits to abortion clinics in the US did not find a decrease from the expected number of visits over the first four months of the pandemic.[15] A shift to telehealth for contraceptive care and medication abortion, extended use of contraceptives, and changes in medication abortion protocols have been cited as contributors to some of these neutral trends.[16,17]

However, when these impacts are broken down, it is evident that family planning services have not been equally accessible by patients facing economic strain; furthermore, economic strain does not affect all socioeconomic groups equally. In a

[10] Lindberg et al. 2020
[11] Weigel et al. 2020
[12] Walker 2022
[13] Leon-Larios et al. 2022
[14] McCool-Myers et al. 2022
[15] Andersen et al. 2020
[16] Polis et al. 2022
[17] Stifani et al. 2020

study from New York State, financial barriers were found to be present among patients who reported experiencing delays in accessing contraception during the pandemic.[18] Another survey found that income loss, food insecurity, and inability to afford transportation or housing during the pandemic affected Black and Hispanic/Latinx respondents two to four times more than non-Hispanic/Latinx white respondents, and that these factors were associated with a decreased desire to be pregnant.[19] Data from this survey also revealed that respondents experiencing income loss or hunger were more likely to report that COVID-19 impacted the type of contraception they were using. [20]

With the myriad factors potentially impacting how family planning services have been accessed throughout the pandemic, it is important to investigate this to better inform preparedness for future crises. This study aimed to identify the impacts of COVID-19 on usage of family planning services within Rhode Island, looking specifically at whether there is a change from the expected trend following the start of the COVID-19 pandemic in March of 2020. We hypothesized that there would be a decrease in usage of these services after this time.

A note on language: This study uses a database which differentiates patients based on biological sex, i.e., male and female. Our study population includes patients marked "female" only, and we will use that language as a result. Patients marked "female" in an electronic health record may identify as women, trans, nonbinary, gender expansive, or other identities, and may seek the family planning services we include in our study regardless of gender identity.

[18] Manze et al. 2022
[19] Lin et al. 2021
[20] Diamond-Smith et al. 2021

Methods

Study design

The Rhode Island Quality Institute (RIQI) is the state-designated Regional Health Information Organization (RHIO) and operates Rhode Island's Health Information Exchange (HIE) ("CurrentCare"). CurrentCare contains electronic health data, including electronic health record data from all acute care hospitals in Rhode Island, as well as data from many ambulatory and laboratory facilities across the state. As of 2019, over 500,000 individuals have opted to share their data with CurrentCare. De-identified data (assessed by a de-identification expert) from CurrentCare were provided by RIQI for the study period (January 2016 to July 2021).

The study population included female patients enrolled in CurrentCare who accessed reproductive health care services during the study period. Usage of services was defined as frequency of entries of corresponding ICD-10-CM and CPT codes in the HIE (See Table 1 for a detailed list).

We included the following sociodemographic characteristics: birth year group (defined as patients born within 5-year groupings), self-identified race (defined as Asian, Black or African American, Other Race, unknown, or White), and self-identified ethnicity (defined as Hispanic or Latinx, not Hispanic/Latinx, or unknown). Sociodemographic characteristics are included for all patients who accessed family planning services over the entire 5-year study period (January 2016 to July 2021).

In accordance with the RI HIE dissemination guidelines, results informed by less than or equal to 10 individuals are indicated as "<=10". Any data deemed "sensitive" (i.e., pertaining to sensitive procedures) have also been excluded.

Statistical analysis

We used a Poisson regression model to analyze the time series data of monthly counts of various family planning services. We dichotomized the dates into “pre-COVID” and “post-COVID”, where “pre-COVID” represents dates from September 2018 through March 2020, and “post-COVID” represents dates from April 2020 through July 2021. The Poisson regression model was fitted using the formula "n ~ time", indicating that we were modeling the counts as a function of this dichotomous time variable. All analyses were conducted using R version 4.0.2.

This study was deemed exempt by the Brown University Human Research Protection Program.

Table 1. Billing codes by procedure type accessed in CurrentCare.

Category	Code System	Code	Description
Gynecologic exam	ICD-10-CM	Z01.41	Encounter for routine gynecological examination
		Z01.411	Encounter for gynecological examination (general) (routine) with abnormal findings
		Z01.419	Encounter for gynecological examination (general) (routine) without abnormal findings
	CPT	99397	Pelvic exam, preventive visit
Contraceptive management	ICD-10-CM	Z30.8	Encounter for other contraceptive management
		Z30.9	Encounter for contraceptive management, unspecified
		Z30.433	Encounter for insertion of intrauterine contraceptive device, immediately following removal
	CPT	58301	Removal of intrauterine device
Contraceptive initiation	ICD-10-CM	Z30.0%	Encounter for general counseling and advice on contraception
		Z30.430	Encounter for insertion of intrauterine contraceptive device
		0UHC	Insertion of contraceptive device in cervix

	ICD-10-PCS	0JH8	Insertion of contraceptive device in subcutaneous abdomen
		0JH6	Insertion of contraceptive device in subcutaneous chest
		0JHH	Insertion of contraceptive device in subcutaneous left lower arm
		0JHG	Insertion of contraceptive device in subcutaneous right lower arm
		0JHP	Insertion of contraceptive device in subcutaneous left lower leg
		0JHN	Insertion of contraceptive device in subcutaneous right lower leg
		0JHF	Insertion of contraceptive device in subcutaneous left upper arm
		0JHD	Insertion of contraceptive device in subcutaneous right upper arm
		0JHM	Insertion of contraceptive device in subcutaneous left upper leg
		0JHL	Insertion of contraceptive device in subcutaneous right upper leg
		0UH9	Insertion of contraceptive device in uterus
	CPT	58300	Intrauterine device insertion
	HCPCS	J7300	Paragard
		J7298	Mirena
		J7296	Kyleena
		J1050	Depo Provera
		J1055	Depo Provera
		J7297	Liletta
		J7301	Skyla
		S4993	Contraceptive pills for birth control
		J7304	Hormonal patch
		J7303	Vaginal ring
		J7307	Etonogestrel (contraceptive) implant system, including implant and supplies
Sterilization	ICD-10-CM	Z30.2	Encounter for sterilization
	CPT	58565	Hysteroscopy, surgical; with bilateral fallopian tube cannulation to induce occlusion by placement of permanent implants

		58600	Ligation or transection of fallopian tube(s), abdominal or vaginal approach, unilateral or bilateral
		58605	Ligation or transection of fallopian tube(s), abdominal or vaginal approach, postpartum, unilateral or bilateral, during same hospitalization (separate procedure)
		58611	Ligation or transection of fallopian tube(s) when done at the time of cesarean delivery or intra-abdominal surgery (not a separate procedure) (List separately in addition to code for primary procedure)
		58615	Occlusion of fallopian tube(s) by device (e.g., band, clip, Falope ring) vaginal or suprapubic approach
		58670	Laparoscopy, surgical; with fulguration of oviducts (with or without transection)
		58671	Laparoscopy, surgical; with occlusion of oviducts by device (e.g., band, clip, or Falope ring)
Abortion	ICD-10-CM	Z33.2	Encounter for elective termination of pregnancy
	ICD-10-PCS	10A0%	Abortion of products of conception
	CPT	59840	Induced abortion, by dilation and curettage
		59841	Induced abortion, by dilation and evacuation
		59850	Induced abortion, by 1 or more intra-amniotic injections (amniocentesis-injections), including hospital admission and visits, delivery of fetus and secundines
		59851	Induced abortion, by one or more intra-amniotic injections (amnio-centesis injections), including hospital admission and visits, delivery of fetus and secundines; with dilation and curettage and/or evacuation
		59852	Induced abortion, by one or more intra-amniotic injections (amniocentesis-injections), including hospital admission and visits, delivery of fetus and secundines; with hysterotomy (failed intra-amniotic injection)
		59855	Induced abortion, by one or more vaginal suppositories (e.g., prostaglandin) with or without cervical dilation (e.g., laminaria), including hospital admission and visits, delivery of fetus and secundines
		59856	Induced abortion, by one or more vaginal suppositories (e.g., prostaglandin) with or without cervical dilation (e.g., laminaria), including hospital admission and visits, delivery of fetus and secundines; with dilation and curettage and/or evacuation
		59857	Induced abortion, by one or more vaginal suppositories (e.g., prostaglandin) with or without cervical dilation (e.g., laminaria), including hospital admission and visits, delivery of fetus and secundines; with hysterotomy (failed medical evacuation)

Results

A total of 156,435 female patients were included in the analysis, 70,301 (44.9%) of which were of reproductive age (15-49 years). Most patients self-identified race as White (71.4%) and ethnicity as "Not Hispanic or Latino" (63.8%), which corresponds to the demographic profile for the State of Rhode Island. Age (represented as "birth year group"), self-identified race, and self-identified ethnicity distributions varied depending on service type.

Table 2. Characteristics of CurrentCare-enrolled patients accessing family planning services, 1/2016-7/2021

		Count, by Service/Procedure Type				
		Sterilization	Contraception Management	Contraception Initiation	Gyn Exam	Abortion
Birth Year Group	1940-44	0	<=10	<=10	1979	0
	1945-49	0	<=10	<=10	2245	0
	1950-54	0	<=10	12	4356	0
	1955-59	<=10	<=10	<=10	5823	0
	1960-64	<=10	34	21	6415	0
	1965-69	<=10	92	50	6584	0
	1970-74	46	172	146	6358	0
	1975-79	143	303	245	6363	18
	1980-84	266	418	404	6919	49
	1985-89	269	629	545	7520	58
	1990-94	167	768	744	8208	65
	1995-99	26	981	1101	5898	53
	2000-04	0	61	1281	<=10	<=10
	2005-2010	0	<=10	121	<=10	0
Self-Identified Race	Asian	<=10	98	87	1300	<=10
	Black or African American	76	764	799	4453	43
	Other Race	105	925	1142	8179	45
	Unknown	117	564	662	7273	26
	White	614	2063	2000	47934	131
Self-Identified Ethnicity	Hispanic or Latino	117	1118	1444	9652	46
	Not Hispanic or Latino	515	2625	2526	50935	181
	Unknown	290	671	720	8552	25

On average, the expected counts of contraception initiation services, contraception management services, and gynecological exams were lower than pre-COVID counts; these relationships were all statistically significant at a level of 0.05 (see Table 3).

For contraception initiation services, which include insertion of IUDs and implants as well as initiation of oral contraceptive pills, Depo-Provera injection, vaginal ring, and hormonal patch, counts post-COVID were 0.23 times higher than pre-COVID, representing a 77% reduction ($p < 0.05$). Counts of contraception management services, including general management visits and IUD or implant removal or reinsertion at the same visit, decreased by 73% in the post-COVID period ($p<0.05$). Similarly, for gynecological exam services, including pelvic exams with or without abnormal findings, counts decreased by 85% ($p<0.05$).

Sterilization procedures, which include various types of tubal ligation, occlusion, or removal procedures, showed a different trend. Counts increased by 93% in the post-COVID period, though this relationship was not statistically significant ($P>0.05$).

Counts for abortion procedures by month were not included per the RI HIE guidelines, as these procedures are considered sensitive.

Table 3. Poisson regressions for family planning services, 9/1/2018-7/1/2021

		Coefficient	Standard Error	P-value
Contraception Initiation	Intercept	4.45653	0.02693	<2E-16
	Time Pre-COVID	0.22561	0.03482	9.23E-11
Contraception Management	Intercept	4.29388	0.02921	<2E-16
	Time Pre-COVID	0.26552	0.03747	1.38E-12
Gyn Exams	Intercept	7.116901	0.007121	<2E-16
	Time Pre-COVID	0.15022	0.009351	<2E-16
Sterilization	Intercept	3.10395	0.05661	<2E-16
	Time Pre-COVID	-0.06739	0.07663	0.379

Discussion

In our sample, frequency of procedures related to many family planning services deviated from the expected trend following the start of the COVID-19 pandemic in March of 2020. The expected post-COVID counts of contraception initiation services, contraception management services, and gynecological exams were lower than pre-COVID counts ($p<0.05$), while expected post-COVID counts of sterilization services did not show a statistically significant deviation. The latter finding contradicts the study hypothesis that there would be a decrease in all family planning-related services after March of 2020.

Our finding that counts of services related to contraception initiation or management and gynecological exams decreased after the start of the pandemic in Rhode Island is consistent with studies that showed decreases in overall ambulatory visits. [21] This also

[21] Demeke et al. 2020

aligns with the Guttmacher report published in April of 2020, which reported that 33% of female patients delayed or cancelled reproductive health care visits or had trouble getting birth control.[22] One possible explanation for this trend is patient avoidance or delay of care due to concern about COVID-19, as reported in a CDC Morbidity and Mortality Weekly Report in September of 2020.[23] Though some types of contraception could be discussed and prescribed over telehealth, our results suggest that a shift to telehealth did not completely address typical need for contraceptive care during this time period.

Previous studies have shown a similar trend in the first few months of the pandemic, when clinics were closed for in-person visits and there was more overall confusion about how to access health care. Our study further indicates that this trend persists over the 15 months following March 2020. This implies the presence of other contributing factors besides early pandemic confusion and precaution, such as economic insecurity. A study in New York found financial barriers to be present among patients who reported experiencing delays in accessing contraception during the pandemic.[24] An online survey conducted in January of 2021 indicated that respondents experiencing income loss or hunger were more likely to report that COVID-19 impacted the type of contraception they were using.[25] Further research is needed to determine whether economic insecurity contributed to the trends found in this study of the Rhode Island population, or whether there are still other factors yet unexplored.

[22] Lindberg et al. 2020
[23] Czeisler et al. 2020
[24] Manze et al. 2022
[25] Diamond-Smith et al. 2021

Expected post-COVID counts of sterilization services did not show a statistically significant change; however, the data did show a non-significant increase in these services. Initially such elective procedures were postponed by all hospital systems in Rhode Island. A release from May 2020 documents the first time elective procedures were resumed by the Lifespan system, Rhode Island's largest health systems, though there were other pauses when COVID-19 cases increased.[26] This would be expected to drive counts of such procedures down, contradictory to what we found.

To further contextualize the findings of this study, other studies have reported that the pandemic impacted fertility preferences, which may have swayed patients to choose more permanent options for contraception (e.g., sterilization). The Guttmacher report showed that 34% of women chose to get pregnant later or have fewer children due to the pandemic; notably this percentage was higher at 37% for women living at <200% of the federal poverty level.[27] Other unknown factors likely play a role in explaining why usage of sterilization services did not follow the same trend as the other service categories, indicating that further study is needed.

A major limitation of this study is that it did not capture whether disparities exist in who this decrease in usage of family planning services affected most. Another survey found that income loss, food insecurity, and inability to afford transportation or housing during the pandemic affected Black and Hispanic/Latinx respondents two to four times more than white respondents.[28] It is well established that health and economic effects of the COVID-19 pandemic have disproportionately affected black, indigenous, and other

[26] https://www.lifespan.org/lifespan-living/resuming-elective-surgery-and-procedures
[27] Lindberg et al. 2020
[28] Lin et al. 2021

populations of color in the United States, and further study is needed to determine how these communities may have been affected in Rhode Island.

The study design also had some notable limitations. First, the ICD-10-CM and CPT codes used for sterilization services may not exclusively refer to procedures performed for the primary purpose of sterilization; some of the same codes are used for these procedures performed in other contexts. Further, monthly counts for abortion services could not be obtained through CurrentCare, leaving a major part of family planning unexplored. We were also unable to obtain demographic data by month for each service group to explore the aforementioned disparities.

Conclusion

It is important to be aware of any change in access to family planning services, as well as any disparities in access, to be able to prepare for future disruptions in care. This study has found that usage of family planning services in Rhode Island was altered by the COVID-19 pandemic, and that this impact was felt over 15 months after its start. Given the essential nature of such services, we should continue working to understand how and why they were affected, and therefore strengthen and protect Rhode Islanders' access to reproductive healthcare moving forward.

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