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COVID-19 and Sexual and Reproductive Health Care: Findings From Primary Care Providers Who Serve Adolescents

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A B S T R A C T

Purpose: Among U.S. primary care physicians who delivered sexual and reproductive health (SRH) services to adolescents before the COVID-19 pandemic, we examine (1) changes in availability of in-person SRH services; (2) changes in accessibility and utilization of SRH services; and (3) use of strategies to support provision of SRH services during the pandemic.
Methods: Data were from the DocStyles provider survey administered September–October 2020. Descriptive analyses were restricted to family practitioners, internists, and pediatricians whose main work setting was outpatient and whose practice provided family planning or sexually transmitted infection services to ≥ one patient aged 15–19 years per week just before the COVID-19 pandemic (n = 791).
Results: Among physicians whose practices provided intrauterine device/implant placement/removal or clinic-based sexually transmitted infection testing before the COVID-19 pandemic, 51% and 36% indicated disruption of these services during the pandemic, respectively. Some physicians also reported reductions in walk-in hours (38%), evening/weekend hours (31%), and adolescents seeking care (43%) in the past month. At any point during the pandemic, 61% provided contraception initiation/continuation and 44% provided sexually transmitted infection services via telehealth. Among these physicians, about one-quarter reported confidentiality concerns with telehealth in the past month. There were small increases or no changes in other strategies to support contraceptive care.
Conclusions: Findings suggest disruption of certain SRH services and issues with access because of the pandemic among primary care providers who serve adolescents. There are opportunities to enhance implementation of confidential telehealth services and other service delivery strategies that could help promote adolescent SRH in the United States.

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IMPLICATIONS AND CONTRIBUTION

Findings highlight disruptions to sexual and reproductive health services during the COVID-19 pandemic among primary care providers who serve adolescents. There are opportunities to enhance implementation of confidential telehealth services and other strategies that promote continuity of care.

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Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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The COVID-19 pandemic has transformed the healthcare landscape in the United States, with potential adverse consequences for adolescent sexual and reproductive health (SRH). Contraception and sexually transmitted infection (STI) services remain critical for adolescents given high rates of unintended pregnancies and STIs [1,2]. However, concerns have been raised about limited availability of in-person SRH care owing to clinic closures, cancellation of services deemed nonessential, and diversion of staff and other resources [3–5]. Even when services are available, reductions in walk-in and evening or weekend hours, which are considered youth-friendly practices [6], may limit adolescent access, or adolescents may forgo in-person care they deem nonessential to minimize coronavirus exposure [7,8]. Although the rapid expansion of telehealth has partially compensated for disruptions to in-person services [9], confidentiality concerns associated with this approach may be a particular barrier for adolescent patients [4,9–11]. In the context of stay-at-home orders and increased parental telework, many adolescents may be unable to have telehealth visits with providers privately [4]. In addition, certain SRH services, such as provision of the most effective reversible contraception methods (i.e., intrauterine devices [IUDs] and implants) and some STI testing and management, require in-person visits [12–14].

Despite these concerns, few studies have examined SRH care during the COVID-19 pandemic [15,16]. One report from the United Kingdom found that declines in attendance at select SRH clinics since the pandemic began were more pronounced for individuals younger than 18 years of age [16], underscoring the importance of considering SRH care for adolescent populations. We do so in the U.S. context, using data from primary care physicians who provided family planning and STI services to adolescents before the COVID-19 pandemic. Specifically, we examine changes in (1) availability of in-person SRH services; (2) accessibility and utilization of SRH services; and (3) use of strategies to support provision of SRH services during the pandemic.

Methods

Data source

Data were from the DocStyles provider survey administered by Porter Novelli (http://styles.porternovelli.com) September 14–October 26, 2020. This nonprobability-based online panel survey recruits U.S. healthcare providers from Sermo's global medical panel (http://www.sermo.com), which includes about 350,000 providers who have opted in and had their employment verified via telephone confirmation at their place of work. DocStyles uses set quotas of 1,000 general primary care physicians (family practitioners and internists) and 250 for various provider types and physician specialties. To be eligible, providers must actively see patients in the United States and have been practicing for at least three years. Respondents received an honorarium from $54 to $72 depending on the number of questions they were asked.

Questions were developed related to COVID-19 and SRH services for inclusion on the Fall 2020 survey (Supplemental File). These items were implemented with general primary care physicians, pediatricians, and obstetricians/gynecologists. However, this analysis is limited to the general primary care and pediatrician samples given these physicians are typical primary care providers for adolescents [17], and primary care is an important setting for preventive care generally and providing adolescent SRH services specifically [18,19]. Moreover, missed opportunities for providing adolescent SRH services in the primary care context are well-documented [20,21], and demands related to COVID-19 testing and treatment [22] (which may be less pronounced for obstetricians/gynecologists focused on SRH services) may exacerbate these gaps in care.

Response rates for the general primary care physicians and pediatricians were 69% (n = 1,000) and 76% (n = 252), respectively. Most general primary care physicians were male (69.9%), white (61.3%), and non-Hispanic (94.8%) (compared with 54.9%, 79.6%, and 88.7%, respectively, of active members of the American Academy of Family Physicians) [23,24]. Among pediatricians, 56.8% were male and 61.9% were non-Hispanic white (compared with 66% and 71%, respectively, of all pediatricians participating in the 2018–2019 American Academy of Pediatrics Periodic Survey) [25].

Measures

Table 1 summarizes survey questions and response options in relation to the study objectives. The survey asked physicians whether their practice provided selected services to patients (not specifically adolescents) just before and at any point during the COVID-19 pandemic, without defining specific time frames. For each time period, respondents could select all from the following services: IUD or implant placement; IUD or implant removal; clinic-based STI testing; telehealth for contraception initiation; telehealth for contraception continuation; and telehealth for STI services. We created single indicators for IUD or implant placement or removal and telehealth for contraception initiation or continuation. Separate questions addressed issues providing family planning or STI services because of the pandemic at any point during the pandemic and in the past month. Response options included IUD or implant placement services limited; IUD or implant removal services limited; and STI testing services limited. Again, we combined responses regarding IUD or implant placement and removal to create single indicators for limited IUD or implant services for each time period.

These questions about issues providing family planning or STI services at any point during the pandemic and in the past month also included response options addressing access and utilization issues particularly salient to adolescent patients: walk-in hours reduced [6]; weekend/evening hours reduced; [6] fewer adolescents seeking care; and confidentiality concerns with telehealth [9–11]. The same questions also provided a response option "clinic closed for in-person appointments." Another question asked providers to select characteristics that applied to their practice just before the pandemic; "walk-in hours were available" and "weekend/evening hours were available" were two of several response options included.

Finally, separate questions assessed use of strategies to support contraceptive services just before and at any point during the COVID-19 pandemic. Physicians could select from a list including: renewed contraception prescriptions without requiring an office visit; provided or prescribed a year's worth of oral contraceptives; provided or prescribed emergency contraceptive pills in advance of need; and sent patient reminders about depot-medroxyprogesterone acetate injections or IUD/implant removal/replacement.

Analyses

Family practitioners, internists, and pediatricians whose main work setting was outpatient and whose practice provided family planning or STI services to ≥ one adolescent patient (defined as

Table 1
Survey items used to measure availability, accessibility, and use of strategies to support SRH services

Survey question	Response options used to examine availability of in-person SRH services	Response options used to examine accessibility and utilization of SRH services	Response options used to examine use of strategies to support provision of SRH services
Just before the COVID-19 pandemic, what services did your practice provide? *Select all that apply.*	- IUD or implant placement - IUD or implant removal - Clinic-based STI testing		- Telehealth for contraception initiation - Telehealth for contraception continuation - Telehealth for STI services
At any point during the COVID-19 pandemic, what services has your practice provided? *Select all that apply.*	- IUD or implant placement - IUD or implant removal - Clinic-based STI testing		- Telehealth for contraception initiation - Telehealth for contraception continuation - Telehealth for STI services
Just before the COVID-19 pandemic, did your practice use the following strategies? *Select all that apply.*			- Renewed contraception prescriptions without requiring an office visit - Provided or prescribed emergency contraceptive pills in advance of need - Provided or prescribed a year's worth of oral contraceptives - Sent patient reminders about DMPA injections or IUD/implant removal/replacement
At any point during the COVID-19 pandemic, has your practice used the following strategies? *Select all that apply.*			- Renewed contraception prescriptions without requiring an office visit - Provided or prescribed emergency contraceptive pills in advance of need - Provided or prescribed a year's worth of oral contraceptives - Sent patient reminders about DMPA injections or IUD/implant removal/replacement
Just before the COVID-19 pandemic, which of the following applied to your practice? *Select all that apply.*		- Walk-in hours were available - Weekend/evening hours were available	
At any point during the COVID-19 pandemic, has your practice experienced any of the following issues related to providing family planning or STI services because of the pandemic? *Select all that apply.*	- STI testing services limited - IUD or implant placement services limited - IUD or implant removal services limited	- Fewer adolescents seeking care - Walk-in hours reduced - Weekend/evening hours reduced - Clinic closed for in-person appointments	- Confidentiality concerns with telehealth
In the past month, has your practice experienced any of the following issues related to providing family planning or STI services because of the COVID-19 pandemic? *Select all that apply.*	- STI testing services limited - IUD or implant placement services limited - IUD or implant removal services limited	- Fewer adolescents seeking care - Walk-in hours reduced - Weekend/evening hours reduced - Clinic closed for in-person appointments	- Confidentiality concerns with telehealth

DMPA = depot-medroxyprogesterone acetate; IUD = intrauterine device; SRH = sexual and reproductive health; STI = sexually transmitted infection.

male and female patients aged 15–19 years) per week just before the COVID-19 pandemic were included (n = 791). We examined individual physician characteristics (i.e., age, gender, race/ethnicity, specialty, years in practice) and clinical practice characteristics (i.e., individual outpatient vs. group outpatient, Census region, urbanicity, weekly patient volume, weekly pediatric patient volume) collected as part of the core survey.

To assess changes in availability of selected in-person SRH services (i.e., IUD or implant placement or removal and STI testing), we examined the proportion providing each service just before the COVID-19 pandemic and restricted all further analyses of that service to those physicians. For each service, we calculated the proportion indicating any service disruption, defined as the service was not provided or provided but limited at any point during the pandemic. We estimated service discontinuation as the proportion of respondents who indicated each service was not provided at any point during the pandemic. Finally, among those who indicated the service was provided at any point during the pandemic (i.e., not discontinued), we examined the proportion of physicians reporting the service was limited in the past month.

To examine changes in accessibility and utilization of services, we first examined the proportion of providers who reported their clinic closed for in-person appointments, at any point during the COVID-19 pandemic, and in the past month. Because we wanted to examine walk-in hours, evening/weekend hours, and patient volume independent of closures, analyses for these indicators were limited to respondents who did not report their clinic closed for in-person appointments. Among those who reported walk-in hours were available before the pandemic, we calculated the proportion reporting reduced walk-in hours at any point during the pandemic and in the past month. Similarly, among those who reported weekend/evening hours were available before the pandemic, we calculated the proportion reporting reduced weekend/evening hours at any point during the pandemic and in the past month. We examined the proportion of physicians reporting fewer adolescents seeking care overall and by whether walk-in and weekend/evening hours were reduced, using chi-square statistics to assess differences.

Finally, we calculated the proportions of the entire analytic sample using strategies to support provision of SRH services just

Table 2
Sample characteristics[a] (n = 791)

	% (n) or median (IQR)[b]
Physician characteristics	
Age, years	47.0 (15.0)
Gender	
Male	64.8 (513)
Female	35.2 (278)
Race/ethnicity	
White, non-Hispanic	59.7 (472)
Black, non-Hispanic	4.0 (32)
Hispanic	5.6 (44)
Other, non-Hispanic[c]	30.7 (243)
Physician specialty	
Family practitioner	46.0 (364)
Internist	31.2 (247)
Pediatrician	22.8 (180)
Number of years practicing	16.0 (13.0)
Clinical practice characteristics	
Primary work setting	
Individual outpatient practice	14.9 (118)
Group outpatient practice	85.1 (673)
Census region	
Northeast	20.1 (159)
Midwest	23.3 (184)
South	32.2 (255)
West	24.4 (193)
Urbanicity	
Urban	33.6 (266)
Suburban	53.4 (422)
Rural	13.0 (103)
Approximate household income of majority of patients	
<$25,000	5.1(40)
$25,000–$49,999	22.6 (179)
$50,000–$99,999	37.8 (299)
$100,000–$249,999	20.2 (160)
≥$250,000	14.3 (113)
Average weekly pediatric patient[d] volume at time of survey, absolute	
1–10 patients	16.7 (113)
11–50 patients	52.3 (353)
≥ 51 patients	31.0 (209)
Average weekly pediatric patient[d] volume at time of survey[e], percentage of total weekly patient volume	31.2 (61.2)
Average weekly adolescent patient[f] volume for SRH services just before the COVID-19 pandemic, absolute[g]	
1–10 patients	72.4 (573)
11–50 patients	23.3 (184)
≥ 51 patients	4.3 (34)

IQR = interquartile range; SRH = sexual and reproductive health.
[a] Analytic sample includes family practitioners, internists, and pediatricians who work primarily in an outpatient practice setting and who provided SRH services (family planning or STI services) to at least one adolescent patient (male or female 15–19 years) per week just before the COVID-19 pandemic began.
[b] Median (IQR) reported for age, number of years practicing, and average weekly pediatric patient volume at time of survey as a percentage of total patient volume; % (n) reported for all other variables.
[c] Includes multiracial.
[d] Defined as children age 17 years or younger.
[e] Survey was fielded September 14 to October 26, 2020.
[f] Defined as both male and female patients aged 15–19 years.
[g] Average weekly adolescent patient volume for SRH services just before the COVID-19 pandemic could not also be presented as a percentage of total patient volume because it was only measured categorically.

before and at any point during the COVID-19 pandemic, using McNemar's test to examine differences [26]. We also assessed initiation and discontinuation of each strategy during the pandemic. Initiation was defined as the percentage of physicians whose practices used the strategy at any point during the pandemic among those whose practices did not use the strategy just before the pandemic. Discontinuation was defined as the percentage of physicians whose practices did not use the strategy at any point during the pandemic among those whose practices used the strategy just before the pandemic. Among physicians whose practice offered telehealth for contraception or STI services during the pandemic, we examined the proportion reporting confidentiality concerns with telehealth overall and by physician specialty, using chi-square statistics to test differences. Because all analyses used deidentified data provided by Porter-Novelli, review by the Centers for Disease Control and Prevention Institutional Review Board was not required.

Results

About one-quarter (22.8%) of the 791 participants were pediatricians, and nearly one-third (31.2%) were internists (Table 2). The median physician age was 47.0 years, and the majority were male (64.8%) and non-Hispanic white (59.7%). Most physicians' primary work setting was a group practice (85.1%). Only 13.0% practiced in a rural setting, and a little over one-quarter (27.7%) reported that the household income of the majority of their patients was less than $50,000. Nearly three-quarters (72.4%) had low adolescent patient volume for SRH services just before the COVID-19 pandemic (i.e., 1–10 per week), but most (83.3%) had moderate (52.3%; 11–50 per week) to high (31.0%; ≥ 51 per week) pediatric patient (<18 years) volume at the time of the survey. Median weekly pediatric patient volume was about one-third (31.2%) of total weekly patient volume.

Availability of in-person SRH services

Among the third of physicians (32.6%) who reported their practice provided IUD or implant placement or removal services just before the COVID-19 pandemic, approximately half (51.2%) indicated any service disruption during the pandemic, and about one-fifth (21.3%) indicated services were discontinued since the pandemic began (Table 3). Of those who had not discontinued IUD or implant services, about one-quarter (26.1%) reported services were limited in the past month. Among the three-quarters of physicians (75.1%) whose practice offered clinic-based STI testing just before the COVID-19 pandemic, 35.9% indicated any service disruption, and 18.0% reported services were discontinued since the pandemic began. Of those who had not discontinued clinic-based STI testing, 16.8% reported services were limited in the month before survey completion.

Accessibility and utilization of SRH services

Table 4 presents the proportion of physicians reporting access and utilization issues among those whose clinics did not close for in-person appointments at any point (69.8%) or in the past month (85.6%). Half (50.9%) of those who had walk-in hours before the pandemic reported such hours were reduced at any point, and 37.8% were reduced in the past month. About two-fifths (42.4%) of those who had weekend/evening hours before the pandemic reported such hours were reduced at any point, and 31.0% were reduced in the past month. Overall, nearly half (49.6%) reported fewer adolescents seeking care at any point during the pandemic; 43.4% reported this issue in the past month. The proportion experiencing reductions in adolescent patient volume was higher

Table 3
Availability of in-person SRH services just before and during the COVID-19 pandemic

	Just before the COVID-19 pandemic	During the COVID-19 pandemic		
	Service provided[a]	Any service disruption[b]	Service discontinued since the pandemic began[c]	Service limited in the month before survey completion[d,e]
	% (n)	% (n)	% (n)	% (n)
IUD or implant placement or removal	32.6 (258)	51.2 (132)	21.3 (55)	26.1 (53)
Clinic-based STI testing	75.1 (594)	35.9 (213)	18.0 (107)	16.8 (82)

IUD = intrauterine device; SRH = sexual and reproductive health; STI = sexually transmitted infection.
[a] Among physicians overall (n = 791).
[b] Among physicians who reported the service was provided just before COVID-19 (n = 258 for IUD or implant placement or removal; n = 594 for STI testing), physicians who reported service was not provided at any point during the pandemic or if provided, was limited at any point during the pandemic.
[c] Among physicians who reported the service was provided just before COVID-19 (n = 258 for IUD or implant placement or removal; n = 594 for STI testing), physicians who reported service was not provided at any point during the COVID-19 pandemic.
[d] Among physicians who reported the service was provided just before COVID-19 and at any point during the pandemic (n = 203 for IUD or implant placement or removal; n = 487 for STI testing).
[e] Survey was fielded September 14 to October 26, 2020.

among physicians who reported reductions in walk-in hours (at any point: 70.1% vs. 57.6%, $p = .033$; past month: 65.1% vs. 42.9%, $p < .001$) and weekend/evening hours (at any point: 69.2% vs. 54.1%, $p = .011$; past month: 64.1% vs. 43.7%, $p < .001$) compared with those who did not.

Use of strategies to support provision of SRH services

Compared with just before the COVID-19 pandemic, there were increases in use of the following contraceptive provision strategies that minimize the need for in-person visits: telehealth for contraception, renewed contraception prescriptions without requiring an office visit, and provided or prescribed emergency contraceptive pills in advance of need (Table 5). The proportion using telehealth increased from 35.2% just before the pandemic to 60.7% at any point during the pandemic ($p < .001$), and of the nearly two-thirds (64.8%) whose practice did not offer telehealth for contraception initiation or continuation before the pandemic, 43.1% began telehealth for these services during the pandemic. For the other strategies to support contraceptive care, there were small increases or no changes, in part because the proportion initiating a given strategy was offset by the proportion discontinuing the strategy. For example, while 14.0% began providing or prescribing a years' worth of oral contraceptives, 12.8% discontinued doing so. For two strategies—providing or prescribing emergency contraceptive pills in advance of need and sending patient reminders about contraception injections or IUD/implant removal/replacement—initiation was reported by 13.6% and 4.3% of physicians, respectively, whereas about one-fifth of physicians discontinued use of each.

As for STI services, 43.5% offered services via telehealth during the COVID-19 pandemic (Table 5), which was a significant increase comparing just before and during the pandemic (21.7% vs. 43.5%, $p < .001$). Of the 78.3% who did not previously offer telehealth for STI services, 29.4% began doing so.

Among physicians offering SRH services via telehealth during the pandemic (n = 531), about one-quarter reported confidentiality concerns with telehealth as an issue providing family planning or STI services at any point in the pandemic (27.3%) and in the past month (24.5%). More pediatricians than general primary care physicians reported this concern (at any point: 36.9% [n = 41 of 111] vs. 24.8% [n = 104 of 420], $p = .010$; past month: 33.3% [n = 37 of 111] vs. 22.1% [n = 93 of 420], $p = .015$) (data not shown).

Table 4
Accessibility and utilization of SRH services during the COVID-19 pandemic

	Experienced at any point	Experienced in the month before survey completion[a]
	% (n)	% (n)
Clinic closed for in-person appointments[b]	30.2 (239)	14.4 (114)
Walk-in hours reduced[c]	50.9 (137)	37.8 (129)
Weekend/evening hours reduced[d]	42.4 (117)	31.0 (103)
Fewer adolescents seeking care[e]	49.6 (274)	43.4 (294)
By walk-in hour availability[c]		
Reduced	70.1 (96)*	65.1 (84)**
Not reduced	57.6 (76)	42.9 (91)
By weekend/evening hour availability[d]		
Reduced	69.2 (81)*	64.1 (66)**
Not reduced	54.1 (86)	43.7 (100)

SRH = sexual and reproductive health.
*$p < .05$ based on chi-square test comparing distribution of utilization indicator by each accessibility indicator.
**$p < .001$ based on chi-square test comparing distribution of utilization indicator by each accessibility indicator.
[a] Survey was fielded September 14 to October 26, 2020.
[b] Among physicians overall (n = 791).
[c] Among physicians who reported walk-in hours were available just before the COVID-19 pandemic and their clinic did not close for in-person appointments (n = 269 for experienced at any point during the COVID-19 pandemic; n = 341 for experienced in the month prior to survey completion).
[d] Among physicians who reported weekend/evening hours were available just before the COVID-19 pandemic and their clinic did not close for in-person appointments (n = 276 for experienced at any point during the COVID-19 pandemic; n = 332 for experienced in the month prior to survey completion).
[e] Among physicians who reported their clinic did not close for in-person appointments (n = 552 for experienced at any point during the COVID-19 pandemic; n = 677 for experienced in the month prior to survey completion).

Discussion

This analysis is among the first to examine the impact of the COVID-19 pandemic on provision of SRH care in the United States from physicians' reports. We specifically consider implications for adolescents by restricting analyses to primary care physicians who reported providing SRH services just before the pandemic to patients that include those 15–19 year of age and examining indicators particularly salient to this population.

Findings suggest selected in-person SRH services have been limited during the pandemic. Among physicians who provided

Table 5
Use of strategies to support provision of SRH services just before and during the COVID-19 pandemic

	Just before the COVID-19 pandemic		During the COVID-19 pandemic		
	Strategy used[a]	Strategy not used[a]	Strategy discontinued[b]	Strategy initiated[c]	Strategy used[a]
	% (n)	% (n)	% (n)	% (n)	% (n)
Contraceptive services					
Telehealth for contraceptive initiation or continuation	35.2 (278)	64.8 (513)	6.8 (19)	43.1 (221)	60.7 (480)**
Renewed contraception prescriptions without requiring an office visit	54.9 (375)	45.1 (308)	17.3 (65)	31.2 (96)	59.4 (406)*
Provided or prescribed a year's worth of oral contraceptives	46.7 (319)	53.3 (364)	12.8 (41)	14.0 (51)	48.2 (329)
Provided or prescribed emergency contraceptive pills in advance of need	30.9 (211)	69.1 (472)	20.4 (43)	13.6 (64)	34.0 (232)*
Sent patient reminders about DMPA injections or IUD/implant removal/replacement	17.9 (122)	82.1 (561)	20.5 (25)	4.3 (24)	17.7 (121)
STI services					
Telehealth for STI services	21.7 (172)	78.3 (619)	5.8 (10)	29.4 (182)	43.5 (344)**

DMPA = depot-medroxyprogesterone acetate; IUD = intrauterine device; SRH = sexual and reproductive health; STI = sexually transmitted infection.
*$p < .05$ based on McNemar's test comparing use just before and during the COVID-19 pandemic.
**$p < .001$ based on McNemar's test comparing use just before and during the COVID-19 pandemic.
[a] Among physicians overall (n = 791 for telehealth services; n = 683 for other strategies which were only fielded among physicians who reported they provided family planning services to at least one female patient of reproductive age [15–49 years] just before the COVID-19 pandemic).
[b] Among physicians who reported the strategy was used just before COVID-19, physicians who reported the strategy was not used at any point during the COVID-19 pandemic.
[c] Among physicians who reported the strategy was not used just before COVID-19, physicians who reported the strategy was used at any point during the COVID-19 pandemic.

the service just before the pandemic, half indicated a disruption in IUD or implant services, and more than one-third reported a disruption to clinic-based STI testing. This finding is not especially surprising given federal health officials recommended certain services be canceled or postponed in the early days of the pandemic [27]. However, despite later guidance for healthcare facilities on how to provide necessary in-person clinical services in the safest way possible [28], issues with service availability may be persisting. For example, among physicians who provided IUD or implant services just before the pandemic, about one-fifth indicated the service was discontinued since the pandemic began, and about one-quarter reported services were limited in the past month. Examining differences in availability of services by region may help to explain these findings given regional variation in COVID-19 cases [29,30] and the timing, duration, and extent of pandemic-related closures [31].

Data also suggest potential challenges with access to services even if they are available. Around one-third of physicians whose clinic did not close for in-person appointments and whose practice offered walk-in or weekend/evening hours just before the pandemic reported reductions in these best practices [6] for adolescent access in the past month. Such changes may have contributed to the reports that fewer adolescents sought care given estimates were significantly higher among those who also reported reduced walk-in and weekend/evening hours. It is also possible that adolescents may be deferring care because of concerns about coronavirus exposure, which has been documented among adults [5] or may have less need for services owing to potential decreases in sexual activity during the pandemic [4].

Given these issues with availability, accessibility, and utilization, strategies to support provision of SRH service, including those that minimize clinic visits, are vital. It is promising that there were significant increases in telehealth for contraception and STI services compared with just before the pandemic. However, there are opportunities for improvement because 39% and 56% of physicians did not offer these services, respectively, during the pandemic. In addition, fewer than half of those who had not been providing telehealth for each service just before the pandemic began doing so. Furthermore, among physicians using telehealth, about one-quarter reported confidentiality concerns. The higher proportion among pediatricians suggests this may be a particular challenge in providing confidential telehealth care to adolescent patients. Promoting confidential telehealth encounters through use of headphones, chat functions, and closed-ended questions would enhance the promise of telehealth for providing SRH services, including to adolescents [9–11,32,33]. There is also a need to address broader barriers to telehealth, such as insufficient patient and provider infrastructure and reimbursement issues and concerns, that may contribute to limited implementation [34,35].

For other strategies to support contraceptive care (e.g., renewing prescriptions without an office visit), there were minimal or no net increases when comparing use just before and during the pandemic. As with telehealth, there are opportunities to enhance the proportion initiating these strategies. However, the proportions discontinuing strategies also suggest a need to understand drivers of discontinuation to inform resources for sustaining strategies used before the pandemic. For example, only 4% began sending reminders for depot-medroxyprogesterone acetate injections and IUD/implant removal/replacement, and 20% discontinued this strategy, perhaps reflecting competing priorities for staff related to COVID-19 testing and care or staffing shortages so less capacity for activities outside of direct patient care [3,5]. Limited use of this particular strategy during the pandemic may be a missed opportunity as patient outreach could potentially mitigate declines in adolescent patient volume. Automating patient reminders via text or portal messages may facilitate use and effectiveness of this strategy going forward [36].

This study has limitations, particularly regarding measurement. Few of the measures are specific to adolescent patients. Although the analytic sample is restricted to physicians whose practices deliver SRH care to patient populations that include adolescents, the absolute number of adolescents receiving SRH services per week just before the pandemic was low for most respondents so findings may not be particularly applicable to

adolescent-focused clinics where adolescent volume for SRH care would likely be higher. Minimal demand for SRH services may explain some of the findings regarding limited use of additional service delivery strategies. Service provision is used as proxy for service availability even though it may reflect patient demand, and "STI testing services limited" is used to describe limited provision of in-person services though the measure did not specify the setting. In addition, measures did not distinguish IUDs from implants though the procedures involved differ and provision of implants may be more common in primary care [37]. Another measurement limitation is that "just before" the pandemic was not defined, and differing interpretations could have influenced the results. Finally, providers were asked to report on their entire practice, and the validity of practice-level responses for most respondents, who worked primarily in group settings, is unclear.

There are also limitations related to the study sample. Given our focus on primary care physicians, we did not examine the practices of obstetricians/gynecologists, even though these specialists provide SRH services to adolescents and may serve as primary care providers for older adolescents in particular [17]. Internet-based panels have sampling limitations [38], and because the sample was not random, statistical inferences should be interpreted with caution, selection bias is possible, and findings are not generalizable, although response rates >60% are robust for provider surveys [39].

It will be important to apply a health equity lens to future research on provision of SRH services in the context of COVID-19 [40]. For example, examining implementation of telehealth by urbanicity could inform efforts to minimize disparities in access to SRH care for rural populations where clinic-based services are less available [41,42]. Additional research on adolescent sexual behavior and service receipt is also warranted to fully understand the impact of the pandemic on unintended pregnancies and STIs among young people, which remains an important outstanding question. The pandemic has underscored the importance of supporting contraceptive care to prevent unintended pregnancies among adolescents given increased risk for adverse outcomes among pregnant 15- to 24-year-old individuals infected with the coronavirus compared with their nonpregnant counterparts (although the absolute risks remain low) [43].

Disruption of SRH services during the pandemic among primary care providers who serve adolescents is concerning, and reductions in walk-in and weekend/evening hours and adolescent patient volume suggest limited accessibility and utilization of services. However, increases in SRH service provision via telemedicine are promising, and there are opportunities to improve use of this and other service delivery strategies to ensure continuity of adolescent SRH care during the pandemic and beyond.

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2021.06.002.

References

[1] Finer LB, Zolna MR. Declines in unintended pregnancy in the United States, 2008-2011. N Engl J Med 2016;374:843–52.

[2] Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance, 2019. Atlanta: U.S. Department of Health and Human Services; 2021.

[3] Ott MA, Bernard C, Wilkinson TA, et al. Clinician perspectives on ethics and COVID-19: Minding the gap in sexual and reproductive health. Perspect Sex Reprod Health 2020; 52:145-9.

[4] Lindberg LD, Bell DL, Kantor LM. The sexual and reproductive health of adolescents and young adults during the COVID-19 pandemic. Perspect Sex Reprod Health 2020; 52:75-9.

[5] Mmeje OO, Coleman JS, Chang T. Unintended consequences of the COVID-19 pandemic on the sexual and reproductive health of youth. J Adolesc Health 2020;67:326–7.

[6] Brittain AW, Williams JR, Zapata LB, et al. Youth-friendly family planning services for young people: A systematic review. Am J Prev Med 2015;49:S73–84.

[7] Atherly A, Van Den Broek-Altenburg E, Hart V, et al. Consumer reported care deferrals due to the COVID-19 pandemic, and the role and potential of telemedicine: Cross-sectional analysis. JMIR Public Health Surveill 2020;6:e21607.

[8] Czeisler ME, Marynak K, Clarke KEN, et al. Delay or avoidance of medical care because of COVID-19-related concerns - United States, June 2020. MMWR Morb Mortal Wkly Rep 2020;69:1250–7.

[9] Barney A, Buckelew S, Mesheriakova V, et al. The COVID-19 pandemic and rapid implementation of adolescent and young adult telemedicine: Challenges and opportunities for innovation. J Adolesc Health 2020;67:164–71.

[10] North S. Telemedicine in the time of COVID and beyond. J Adolesc Health 2020;67:145–6.

[11] Evans YN, Golub S, Sequeira GM, et al. Using telemedicine to reach adolescents during the COVID-19 pandemic. J Adolesc Health 2020;67:469–71.

[12] Centers for Disease Control and Prevention. Contraception. Available at: https://www.cdc.gov/reproductivehealth/contraception/index.htm. Accessed November 10, 2020.

[13] Committee on Adolescence. Contraception for adolescents. Pediatrics 2014;134:e1244–56.

[14] Centers for Disease Control and Prevention. Guidance and resources during disruption of STD clinical services. Available at: https://www.cdc.gov/std/prevention/disruptionGuidance.htm. Accessed November 10, 2020.

[15] Nagendra G, Carnevale C, Neu N, et al. The potential impact and availability of sexual health services during the COVID-19 pandemic. Sex Transm Dis 2020;47:434–6.

[16] Thomson-Glover R, Hamlett H, Weston D, et al. Coronavirus (COVID-19) and young people's sexual health. Sex Transm Infect 2020;96:473–4.

[17] Rand CM, Goldstein NPN. Patterns of primary care physician visits for US adolescents in 2014: Implications for vaccination. Acad Pediatr 2018;18:S72–8.

[18] National Research Council and Insitute of Medicine. Adolescent Health Services: Missing Opportunities. Washington, DC: The National Academies Press; 2009.

[19] Marcell AV, Burstein GR, Committee on Adolescence. Sexual and reproductive health care services in the pediatric setting. Pediatrics 2017;140:e20172858.

[20] Alexander SC, Fortenberry JD, Pollak KI, et al. Sexuality talk during adolescent health maintenance visits. JAMA Pediatr 2014;168:163–9.

[21] Romero LM, Middleton D, Mueller T, et al. Improving the implementation of evidence-based clinical practices in adolescent reproductive health care services. J Adolesc Health 2015;57:488–95.

[22] Heintzman J, O'Malley J, Marino M, et al. SARS-CoV-2 testing and changes in primary care services in a multistate network of community health centers during the COVID-19 pandemic. JAMA 2020;324:1459–62.

[23] American Academy of Family Physicians. Table 2: Demographic characteristics of AAFP members. Available at: https://www.aafp.org/about/dive-into-family-medicine/family-medicine-facts/table2.html. Accessed June 2, 2021.

[24] American Academy of Family Physicians. Table 3: Ethnicity/race and sexual orientation of AAFP members. Available at: https://www.aafp.org/about/dive-into-family-medicine/family-medicine-facts/table3.html. Accessed June 2, 2021.

[25] American Academy of Pediatrics. Pediatricians' practice and personal characteristics: US only, 2018-2019. Available at: https://www.aap.org/en-us/professional-resources/Research/pediatrician-surveys/Pages/Personal-and-Practice-Characteristics-of-Pediatricians-US-only.aspx. Accessed June 2, 2021.

[26] Fagerland MW, Lydersen S, Laake P. Recommended tests and confidence intervals for paired binomial proportions. Stat Med 2014;33:2850–75.

[27] Centers for Medicare and Medicaid Services. Non-emergent, elective medical services, and treatment recommendations. Available at: https://www.cms.gov/files/document/cms-non-emergent-elective-medical-recommendations.pdf. Accessed December 22, 2020.

[28] Centers for Disease Control and Prevention. Healthcare facilities: Managing operations during the COVID-19 pandemic. Available at: https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-hcf.html. Accessed February 2, 2021.

[29] Jones B, Kiley J. The changing geography of COVID-19 in the U.S. Available at: https://www.pewresearch.org/politics/2020/12/08/the-changing-geography-of-covid-19-in-the-u-s/. Accessed June 2, 2021.
[30] Romano SD, Blackstock AJ, Taylor EV, et al. Trends in racial and ethnic disparities in COVID-19 hospitalizations, by region - United States, March-December 2020. MMWR Morb Mortal Wkly Rep 2021;70:560–5.
[31] Hallas L, Hatibie A, Koch R, et al. Variation in US states' COVID-19 policy responses. Available at: https://www.bsg.ox.ac.uk/sites/default/files/2021-05/BSG-WP-2020-034-v3.pdf. Accessed June 2, 2021.
[32] Thompson TA, Sonalkar S, Butler JL, et al. Telemedicine for family planning: A scoping review. Obstet Gynecol Clin North Am 2020;47:287–316.
[33] Williams RL, Meredith AH, Ott MA. Expanding adolescent access to hormonal contraception: An update on over-the-counter, pharmacist prescribing, and web-based telehealth approaches. Curr Opin Obstet Gynecol 2018;30:458–64.
[34] Weigel G, Ramaswamy A, Sobel L, et al. Opportunities and barriers for telemedicine in the U.S. during the COVID-19 emergency and beyond. Available at: https://www.kff.org/womens-health-policy/issue-brief/opportunities-and-barriers-for-telemedicine-in-the-u-s-during-the-covid-19-emergency-and-beyond/. Accessed December 22, 2020.
[35] Lieneck C, Garvey J, Collins C, et al. Rapid telehealth implementation during the COVID-19 global pandemic: A rapid review. Healthcare (Basel) 2020;8:517.
[36] Zapata LB, Pazol K, Rollison JM, et al. Family planning reminder systems: An updated systematic review. Am J Prev Med 2018;55:716–24.
[37] Berlan ED, Pritt NM, Norris AH. Pediatricians' attitudes and beliefs about long-acting reversible contraceptives influence counseling. J Pediatr Adolesc Gynecol 2017;30:47–52.
[38] American Association for Public Opinion Research. Report on Online Panels. 2010. Available at: https://www.aapor.org/Education-Resources/Reports/Report-on-Online-Panels.aspx#ExecutiveSummary. Accessed February 12, 2021.
[39] McLeod CC, Klabunde CN, Willis GB, Stark D. Health care provider surveys in the United States, 2000-2010: A review. Eval Health Prof 2013;36:106–26.
[40] Dasgupta S, Bowen VB, Leidner A, et al. Association between social vulnerability and a county's risk for becoming a COVID-19 hotspot - United States, June 1-July 25, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1535–41.
[41] Bennett T. Reproductive health care in the rural United States. JAMA 2002;287:112.
[42] Lee H, Hirai AH, Lin CC, Snyder JE. Determinants of rural-urban differences in health care provider visits among women of reproductive age in the United States. PLoS One 2020;15:e0240700.
[43] Zambrano LD, Ellington S, Strid P, et al. Update: Characteristics of symptomatic women of reproductive age with laboratory-confirmed SARS-CoV-2 infection by pregnancy status - United States, January 22-October 3, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1641–7.