



RESEARCH NOTE

REVISED The impact of the COVID-19 crisis on meeting needs for family planning: a global scenario by contraceptive methods used [version 2; peer review: 1 approved, 2 approved with reservations]

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Abstract

The COVID-19 crisis could leave significant numbers of women and couples without access to essential sexual and reproductive health care. This research note analyses differences in contraceptive method mix across Sustainable Development Goal regions and applies assumed method-specific declines in use (from 0 per cent to 20 per cent) to produce an illustrative scenario of the potential impact of COVID-19 on contraceptive use and on the proportion of the need for family planning satisfied by modern methods. Globally, it had been estimated that 77 per cent of women of reproductive age (15-49 years) would have their need for family planning satisfied with modern contraceptive methods in 2020. However, taking into account the potential impact of COVID-19 on method-specific use, this could fall to 71 per cent, resulting in around 60 million fewer users of modern contraception worldwide in 2020. Overall declines in contraceptive use will depend on the methods used by women and their partners and on the types of disruptions experienced. The analysis concludes with the recommendation that countries should include family planning and reproductive health services in the package of essential services and develop strategies to ensure that women and couples are able to exercise their reproductive rights during the COVID-19 crisis.

Keywords

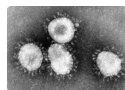
COVID-19, family planning, demand for family planning satisfied by modern methods, Sustainable Development Goals, contraceptive methods, scenario, global

Open Peer Review**Approval Status** ? ✓ ?

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Any reports and responses or comments on the article can be found at the end of the article.



This article is included in the [Coronavirus \(COVID-19\)](#) collection.

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REVISED Amendments from Version 1

We have revised the manuscript in response to the three reviewers' comments. The largest changes include:

Further elaborated on potential changes in demand for family planning, such as changes in fertility preferences and sexual activity, and added relevant references;

Added further discussion of method switching;

Added reference in the conclusions to the existing guidance from WHO, in particular, *Maintaining essential health services: operational guidance for the COVID-19 context* and revised the recommendations based on this guidance.

Any further responses from the reviewers can be found at the end of the article

Disclaimer

The views expressed herein are entirely those of the authors and do not necessarily reflect the views of the United Nations.

Introduction

Declared a global pandemic in March 2020, COVID-19 has come to affect the lives of billions of people around the world. It is the largest global public health emergency since the Spanish flu pandemic of 1918–1919 and has put many countries' health-care systems under severe stress. Most governments have responded by introducing far-reaching policies, including behavioural changes aimed at limiting transmission and saving human lives. This has impacted a multitude of sectors, including sexual and reproductive health care, for which an essential component is the provision of safe, effective, affordable and acceptable methods of contraception. The COVID-19 crisis could leave significant numbers of women and couples without access to essential sexual and reproductive health care.

COVID-19 is impacting women's ability to use contraception in a number of ways: disruptions to the supply chain are limiting the production, distribution and availability of contraceptive commodities, resulting in stock-outs (Purdy, 2020); some health-care facilities are reducing services (IPPF, 2020; MSI, 2020a); health-care providers are redirected from providing family planning services towards responding to COVID-19 (Santoshini, 2020); and many women are unable to visit health-care facilities due to lockdowns or fear of exposure to COVID-19 (UNFPA, 2020). When women's and couple's needs for family planning are not met, the number of unintended pregnancies is certain to rise, with life-long impacts on women and their families.

Riley *et al.* (2020) produced a scenario of 10 per cent decline in the use of short- and long-acting reversible contraception in low- and middle-income countries due to COVID-19, which resulted in an additional 49 million women with unmet need for modern contraception and an additional 15 million unintended pregnancies over the course of the year in low and middle-income countries. United Nations Population Fund (UNFPA, 2020) and Avenir Health modelled a range of scenarios

of unmitigated impact in 114 countries covering 93 per cent of users in low- and middle-income countries and projected 47 million women to be unable to use modern contraceptives due to the COVID-19 disruptions continuing for six months. It is possible that these scenarios provide conservative estimates of the global impact, since service providers have suggested even larger disruptions to services in 2020 (MSI, 2020b). These scenarios were produced for a selection of countries and limited to estimates of contraceptive use changes and their impact on a range of outcomes, such as unintended pregnancies, unsafe abortions and maternal deaths.

This research note presents a scenario of the impact of COVID-19 on the Sustainable Development Goals (SDG) indicator 3.7.1., the proportion of women who have their need for family planning satisfied by modern methods. The indicator is monitored annually by the United Nations Population Division. Globally, it was estimated that the proportion of women of reproductive age (15–49 years) who had their need for family planning satisfied with modern contraceptive methods increased slightly, from 74 per cent in 2000 to 77 per cent in 2020 (United Nations, 2020a) (Figure 1). It is projected to reach 78 per cent in 2030, with a 95 per cent uncertainty interval of 74 per cent to 81 per cent. Just half of the need is satisfied with modern methods in sub-Saharan Africa today.

The impact of the COVID-19 pandemic on meeting the demand for family planning will be influenced by many factors, one of them being the types of contraceptive methods used by women in each country. Individual contraceptive methods differ in terms of the need for contact with health-care providers, the periodicity of renewal, the susceptibility to stock-outs and global supply chains disruptions, and their effectiveness in preventing unintended pregnancies.

Estimates of contraceptive use by individual methods are available at the national, regional and global levels (United Nations, 2019). The prevalence of use of different contraceptive methods varies widely by region (Figure 2). For example, in Central and Southern Asia the most common method is female sterilisation (22 per cent of women of reproductive age rely on this method), while injectables are the dominant method in sub-Saharan Africa, with a prevalence of 9 per cent among women of reproductive age.

Methods

This research note analyses the differences in contraceptive method mix across regions and applies method-specific declines in use to produce an illustrative scenario of potential impact of COVID-19 on contraceptive use and the proportion of need for family planning satisfied by modern methods. The scenario is implemented in Microsoft Excel and is provided as *Underlying data* (Dasgupta *et al.*, 2020).

Contraceptive prevalence is the percentage of women who report themselves or their partners as currently using at least one contraceptive method. Unmet need for family planning is the percentage of women who want to stop or delay childbearing for at least two years but are not using any contraceptive

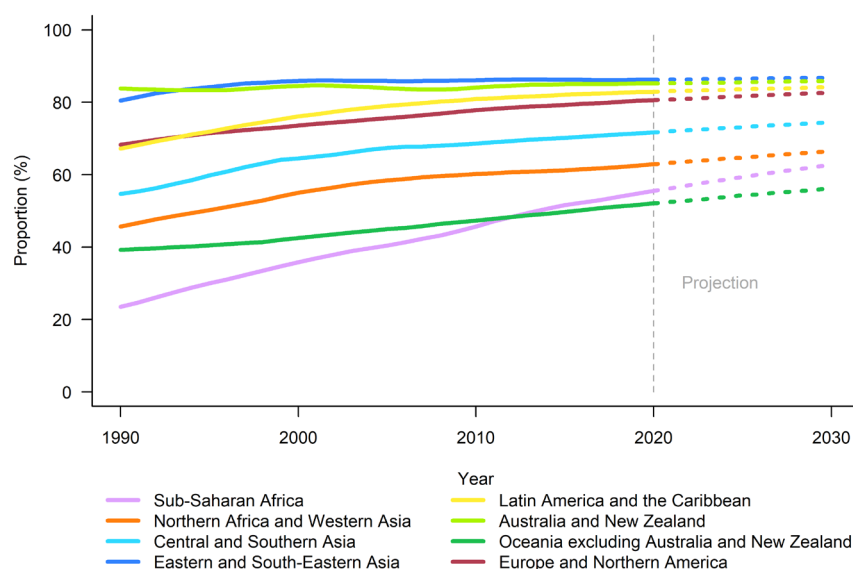


Figure 1. Trends in the proportion of women of reproductive age (15–49 years) who have their need for family planning satisfied with modern methods. Source: United Nations, Department of Economic and Social Affairs, Population Division (2020). *Estimates and Projections of Family Planning Indicators 2020*. This figure is reproduced here under a [Creative Commons Attribution 3.0 IGO license](#).

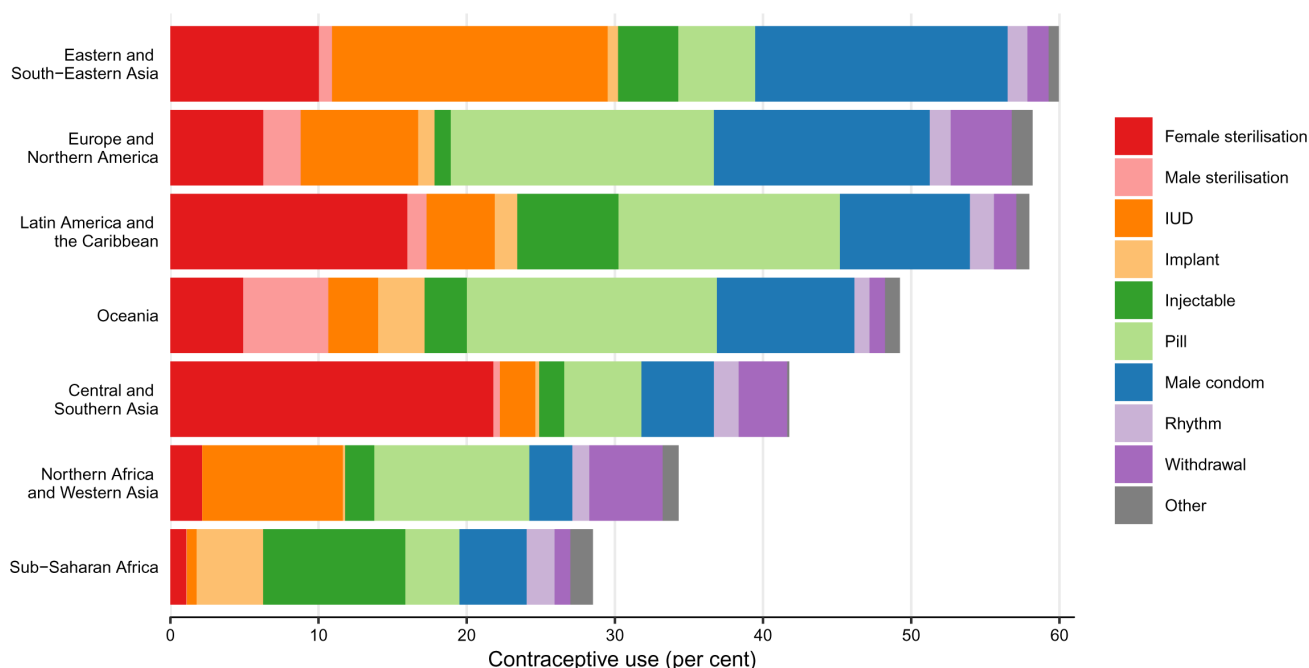


Figure 2. Contraceptive use by method among women of reproductive age (15–49 years), by region, in 2019. Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). *Contraceptive use by method 2019*. Note: In this figure, Oceania includes Australia and New Zealand. Abbreviations: IUD, intrauterine device. This figure is reproduced here under a [Creative Commons Attribution 3.0 IGO license](#).

method. Demand for family planning satisfied by modern methods (SDG indicator 3.7.1.) is modern contraceptive prevalence divided by total demand, which is the sum of contraceptive prevalence and unmet need.

The methods for national, regional and global estimates and projections of family planning indicators among women of reproductive age (15–49 years) used in this research note are described in [Kantorová et al., 2020](#). The estimates and

projections are available from 1990 to 2030 for all women of reproductive age (15–49) for 186 countries or areas with a total population of 90,000 people or more and with at least one observation of contraceptive prevalence, as well as for aggregate geographic regions (United Nations, 2020a). They are weighted by population and take into account changes in marital status. The survey data underlying the model-based estimates and projections are publicly available as a comprehensive data set of 1,317 survey-based observations for 196 countries or areas for the period 1950 to 2019 (United Nations, 2020b).

We applied the method-mix (United Nations 2019) to the contraceptive prevalence in 2020 (United Nations, 2020a) to produce estimates of method-specific prevalence for 2020. These were then reduced by method-specific declines (Table 1). The

resulting modern contraceptive prevalence was divided by total demand (United Nations, 2020a), in order to produce a scenario of demand for family planning satisfied by modern methods.

The scenario assumes no change in sexual activity, fertility intentions, or total demand for family planning, as was also assumed by Riley *et al.* (2020), and no difference in the impact of COVID-19 disruptions on married/in-union versus unmarried women.

The assumed percentage decline in use for each method is presented in Table 1. Where possible, we followed the UNFPA (2020) assumptions of service disruption according to their public sector medium scenario. Broadly, we assume a 10 per cent decline for commodities that can be sourced from a range of

Table 1. Scenario assuming declines in use by method, with justification.

Method	Assumed percentage decline in use	Justification
Female sterilization	2%	Some existing female sterilization users age-out and are not replaced by adopters of sterilization. We applied the 20% decline to this fraction, estimated as 1/10, because the CYP for female sterilization is 10.
Male sterilization	2%	Some wives/partners of existing male sterilization users age-out and are not replaced by adopters of sterilization. We applied the 20% decline to this fraction, estimated as 1/10, because the CYP for male sterilization is 10.
IUD	4.3%	Some existing IUD users age-out or discontinue their use because the commodity expires. We applied the 20% decline to this fraction, estimated as 1/4.6, because the CYP for Copper T IUD is 4.6. The assumed decline is an overestimate, since existing users who require a resupply are likely to still be somewhat protected by their expired IUD.
Implant	5.3%	Some existing implant users age-out or discontinue their use because the commodity expires. We applied the 20% decline to this fraction, estimated as 1/3.8, because the CYP for Jadelle implant is 3.8. The assumed decline is an overestimate, since existing users who require a resupply are likely to still be somewhat protected by their expired implant.
Oral contraceptive pills	10%	Pills can be accessed from a variety of sources (e.g. pharmacies) with limited interaction with health care system. The 10% decline is consistent with UNFPA (2020) medium public sector scenario.
Condoms	10%	Condoms can be accessed from a variety of sources and distribution channels. Access does not require interaction with health care system. The 10% decline is consistent with UNFPA (2020) medium public sector scenario.
Injectables	20%	With the exception of self-injectables (e.g. Sayana press), the majority of injectable users require interaction with a service provider. This interaction is typically required every three months, so discontinuation is likely to be more heavily impacted by COVID-19. The 20% reduction is consistent with UNFPA (2020) medium public sector scenario.
Other modern methods (including vaginal barrier methods, emergency contraception)	10%	Consistent with UNFPA (2020) medium public sector scenario.
Lactational amenorrhea method	0%	No decline assumed since women can use this method without contraceptive commodity / service provision
Traditional methods including rhythm, withdrawal	0%	No decline assumed since women can use this method without contraceptive commodity / service provision. Any change in traditional use does not affect SDG 3.7.1. since the indicator is concerned with demand satisfied by modern methods.

CYP, couple years of protection; IUD, intrauterine device; UNFPA, United Nations Population Fund; SDG, Sustainable Development Goal.

distribution channels (e.g. condoms and oral contraceptive pill), and a 20 per cent decline for methods that require a service provision from a health care provider (e.g. injectables). For long-acting and permanent methods, all of which require a service from a health care provider, we use the metric couple years of protection (CYP) (USAID, 2019) to estimate the number of users requiring a service over the course of the year to maintain the existing number of users, and apply the 20 per cent decline to that portion. No decline was assumed for methods that do not require any commodity or contact with a service provider. Because of the lack of country-specific data, we assume no differences in method-specific decline across countries and regions, despite the fact that some countries and regions may be better prepared to handle the crisis than others. We also make no assumptions about switches between modern methods of contraception (e.g. from injectables to oral contraceptive pills or condoms). This does not mean there is no method-switching. Indeed, it is very possible that some women will switch from some methods to other methods, depending on their own context and the way that COVID-19 impacts specific methods in specific countries. Rather, the declines are an indication of the overall decline in use by method, after method-switching.

Regarding the time-frame of our analysis, we assume the disruptions take place over the year 2020 and calculate the estimates for this year. While the disruptions might not be equally spaced through 2020, we assume the impact is averaged over the year.

As a sensitivity test, we also prepared a separate scenario using an assumed 10 per cent decline in short-term and long-acting reversible contraception (the scenario is included in *Underlying data*) (Dasgupta *et al.*, 2020). This replicates the Riley *et al.* (2020) approach, but extends their analysis to the global level, and to the indicator demand for family planning satisfied by modern methods.

Results

In the scenario of method-specific declines, the proportion of women who have their need for family planning satisfied with modern methods could fall to 71 per cent in 2020 (Figure 3), which would be a regression to levels not seen at the global level since 1995. The largest declines would be in Latin America and the Caribbean (6.7 percentage points) and sub-Saharan Africa (6.8 percentage points), because these regions have a method-mix skewed towards short-term methods.

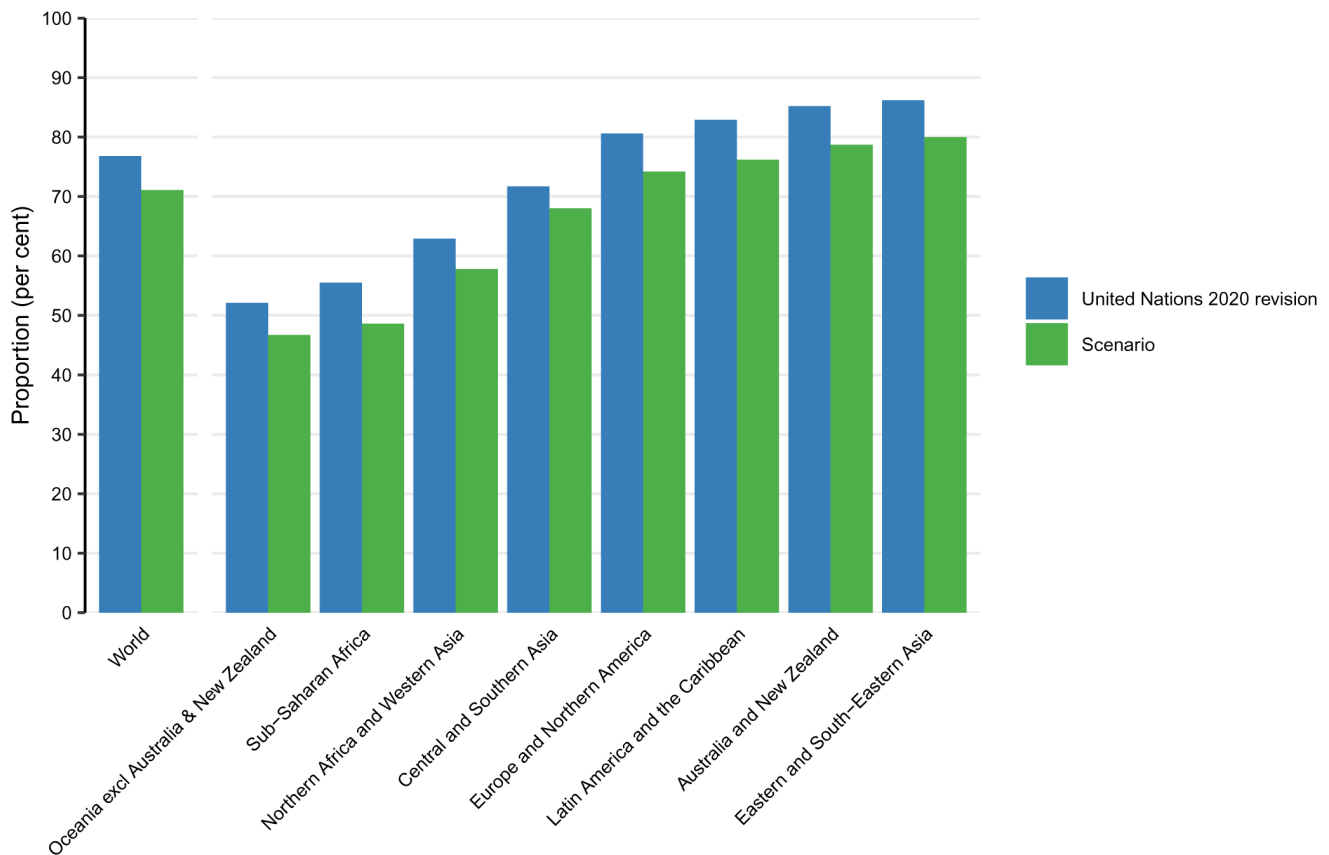


Figure 3. Proportion of women of reproductive age (15–49 years) who have their need for family planning satisfied with modern methods in 2020.

Central and Southern Asia would experience a smaller average decline (3.7 percentage points), because this region has a high proportion of women using female sterilization, which is least affected by short-term disruptions.

Under this scenario, the impact of the pandemic could be around 60 million fewer users of modern contraception worldwide in 2020.

Under the separate scenario with an assumed 10 per cent decline in all short-term and long-acting reversible contraception in line with the approach taken by [Riley *et al.*, 2020](#), the estimate of the need for family planning satisfied with modern methods in 2020 is 72 per cent. The difference to the method-specific decline scenario is small at the global level.

Overall declines in contraceptive use will depend on the methods used by women and their partners, and the types of disruptions experienced (availability of commodities, health care service provision). For example, countries with a high prevalence of long-acting and permanent methods (LAPM) would likely experience little change, as many LAPM users will continue to be protected. On the other hand, countries that rely more heavily on short-term methods such as injectables, requiring repeated contact with a service provider, would likely see a decline in use.

Conclusions

This scenario is intended to be illustrative of the potential impacts during 2020 of continued disruptions due to COVID-19 isolating the effect of differences in type of contraceptive methods used by women or their partners across regions. Although we applied simplified assumptions across all countries, not all countries will experience the same level of disruptions due to COVID-19. We have assumed that such disruptions could last for a full year, but a shorter disruption would obviously have less impact. For example, a six-month disruption would result in half the impact (the demand for family planning satisfied by modern methods in 2020 would be 74 per cent).

The COVID-19 pandemic has made the path towards achieving universal access to sexual and reproductive health-care services by 2030, including family planning, more uncertain. Once the disruptions due to COVID-19 are resolved, it is possible that contraceptive use – and therefore the SDG 3.7.1. indicator – could return to the pre-disruption levels relatively quickly. For short-term method users, assuming that methods require frequent resupply, the health system could in principle recover to pre-COVID-19 levels within a short period of time, once service activities have fully resumed. However, for long-acting methods, there could be a longer period to catch up on services that were not provided during COVID-19 disruptions.

Most crucially, for women – and their partners and families – who experienced an unintended pregnancy resulting from the

lack of access to contraception during COVID-19 disruptions, the impacts are long-lasting. To understand the impacts of COVID-19 disruptions on contraceptive services and use, countries and family planning service providers need to continue data collection through health management information systems, focusing on data quality and completeness during the crisis. This is especially needed because major survey programmes paused the data collection field work. By the time surveys have resumed, some of the gaps in contraceptive use may have recovered, as shown by research on contraceptive use during and after the West African Ebola crisis ([Bietsch *et al.*, 2020](#)), and so the decline in use during the crisis might not be observed in future surveys. The data from health management information systems and information about supply chains will also help to inform projections for year 2030.

While we do not yet know how fertility preferences will change in response to the COVID-19 crisis, it is likely that as a result of the economic downturn and increasing uncertainties, some women and couples who were planning a pregnancy may decide to postpone childbearing to a later period as was already documented for the United States ([Lindberg *et al.*, 2020](#)). These changes in childbearing preferences increase the need for family planning methods, and therefore our scenario could underestimate the potential impact of COVID-19. However, [Aassve *et al.* \(2020\)](#) hypothesized that — depending on the development level of the country — the changes in fertility preferences might not be present in all countries. Additionally, the frequency of sexual activity during the COVID-19 pandemic could have been impacted by health and behavioural changes. We did not explicitly include the changes in fertility preferences and sexual activity in the scenario, since our main purpose was to illustrate the impact of method-specific access disruptions.

Countries should include family planning and reproductive health services in the package of essential services and develop strategies to ensure that women and couples are able to exercise their reproductive rights during the COVID-19 crisis. WHO recommends practical actions that countries can take at national, subregional and local levels to reorganize and safely maintain access to high-quality, essential health services in the pandemic context ([WHO, 2020](#); on page 29), such as relaxation of requirements for a prescription for oral or self-injectable contraception and emergency contraception and provision of multimonth supplies with clear information about the method and how to access referral care for adverse reactions, and enabling pharmacies and drugstores to increase the range of contraceptive options they can provide. For the transition towards restoration of the services, it recommends to plan for clients whose choice are longer-term methods (such as IUDs, implants) or permanent methods, if these services were disrupted. The experience gained during the present pandemic should be used to develop preparedness and contingency plans for any future disruptions.

Data availability

Source data

Contraceptive prevalence data was retrieved from the United Nations, Department of Economic and Social Affairs, Population Division *Estimates and Projections of Family Planning Indicators 2020* (<https://www.un.org/development/desa/pd/node/3288>) and United Nations, Department of Economic and Social Affairs, Population Division *Contraceptive Use by Method 2019: Data Booklet* (https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Jan/un_2019_contraceptiveusebymethod_databooklet.pdf).

Source data are available under the terms of the [Creative Commons Attribution 3.0 IGO license \(CC BY 3.0 IGO\)](#).

Underlying data

Harvard Dataverse: Supplementary material to “The impact of the COVID-19 crisis on meeting needs for family planning: A global scenario by contraceptive methods used”. <https://doi.org/10.7910/DVN/C6V7PN> (Dasgupta *et al.*, 2020).

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

Acknowledgements

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Open Peer Review

Current Peer Review Status: ? ✓ ?

Version 2

Reviewer Report 03 December 2020

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Mengjia Liang

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I went through the authors' detailed responses to my review and believe that they sufficiently addressed my comments. Therefore, I'm happy to change the status to 'Approved'.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 06 August 2020

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This research note adds to the growing model-based evidence on the disastrous indirect impacts that COVID-19 may have on essential sexual and reproductive health services. The researchers extend on prior work by producing global estimates for all countries (as compared to only low-

and middle-income countries), focus particularly on the impact on the Sustainable Development Goal 3.7.1 (demand for family planning satisfied with modern methods), and expand on earlier scenarios of method-specific service reductions to account for disruptions in new users and renewal of long-acting and permanent methods. These are important contributions in drawing attention to the impact of COVID-19 on SRHR-related development goals.

We had a few suggestions for how the authors could (1) further strengthen the underlying analysis, (2) frame the results to better center the impacts on individuals, and (3) make the underlying data available at the country-level.

- (1) While the prior modeling work on the impacts of COVID-19 on family planning were done in the early stages of the pandemic, this paper is coming out at a time when we are starting to know more about how services are being impacted across countries, and also on how well some of the original assumptions made by Riley et al. (2020) and UNFPA/Avenir (2020) hold up. As such, it would be great to see this paper tackle some of those underlying assumptions, either in the analysis itself, or through incorporating relevant literature.
 - Changes in demand: While prior work assumed no changes in fertility preferences, the authors hypothesize in the conclusions that couples may postpone childbearing. Since the SDG indicator of primary interest in this analysis is demand satisfied, it seems worth exploring how shifts in the denominator might also impact SDG 3.7.1. Could you build another scenario looking at how demand will likely shift? To do this you could draw from recent publications on an increased desire to delay or postpone childbearing in the US (<https://www.guttmacher.org/report/early-impacts-covid-19-pandemic-findings-2020-guttmacher-survey-reproductive-health#>), or other work laying out a theoretical model for how we might expect fertility to vary depending on regional income level (see Aassve *et al.*, 2020¹).
 - Method switching: If the disruptions in services are assumed to be greater for certain methods such as injectables, is it reasonable to assume that the full 20% of users would stop using any modern method entirely? It would be interesting to account for some degree of method switching, or show how sensitive the overall reductions in indicator 3.7.1. are to whether or not method-switching occurs. It would also be worth noting in the conclusions that in the face of disruptions to supply-based methods, women may at least be adopting other non-supply methods that afford them some protection from unintended pregnancy over non-use.
- (2) The authors note in the conclusions that prior research from the Ebola outbreak in West Africa showed a recovery back to prior levels of contraceptive use. This is an important point that we think is worth elaborating on more, and using in the framing of how the results are interpreted. The goal of this paper is to show the potential impact on the SDG indicator 3.7.1, and the effect of COVID-19 on our development goals. However, if we observe a similar trend to that of West Africa post-Ebola, it's possible that we could see a complete reversal on these declines in demand satisfied, putting us back on target with our development goals. The potential for a short, but not a long term impact on this goal is important to discuss further. It also highlights the need to frame the results more on the impact on women and couples, as opposed to just the indicator. While we could see a recovery in the indicator, the millions of women unable to access contraceptive methods in the intervening time will experience very real consequences of this disruption. It would be

great to see the authors stress this point more, and the importance of looking not only at the SDG indicator, but also considering the impact of even short-term disruptions in coverage on individual outcomes.

- (3) If it is possible, we urge the authors to consider releasing not just the underlying regional data for the analysis, but also the country-level data and underlying excel workbook. This would be a really valuable tool for use by stakeholders in countries who are monitoring their progress on the SDGs during this pandemic.

Other minor recommendations to consider:

- Abstract: It would help to provide detail in the abstract about the scenario itself, and the range of declines assumed across methods. This is important information with which to contextualize the decline in SDG indicator 3.7.1.
- Conclusions: The last point in the conclusion suggests improving access to LARCs because these methods are less impacted. This recommendation takes away from the importance of method choice and what people want to use. While LARCs are less impacted from disruptions, we don't want the unintended consequence of programs/countries just focusing on LARC access at the detriment to other methods to ensure choice.

References

1. Aassve A, Cavalli N, Mencarini L, Plach S, et al.: The COVID-19 pandemic and human fertility. *Science*. 2020; **369** (6502): 370-371 [PubMed Abstract](#) | [Publisher Full Text](#) | [Reference Source](#)

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: We are both currently working on an unrelated paper with the second author. We can both confirm that our collaboration on this upcoming paper has not affected our ability to provide an unbiased review.

Reviewer Expertise: Sexual and reproductive health, modeling impacts and costs of family planning services, abortion measurement

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however we have significant reservations, as outlined above.

Author Response 28 Aug 2020

Vladimira Kantorova, United Nations, 2 United Nations Plaza, New York, USA

Dear Elizabeth and Taylor,

We thank you for the very helpful comments on the paper.

Because some of the issues were raised by more than one of the reviews, we reply to some of the common themes first. The remaining comments are included below.

Changing total demand for family planning:

All reviewers commented on the possibility of changing demand, either by changes in fertility preferences or sexual activity, or both. We agree with the reviewers that the changes in demand for family planning during COVID-19 could have substantial impact on the values of the indicator of demand for family planning satisfied by modern methods. We explored this at length, but decided this is not something we should adjust in the scenario. It is unknown in which direction these components could move. For example, it's not clear whether sexual activity could increase or decrease, nor whether we could expect women would want to space/limit childbearing due to COVID-19, across all regions. There is an evidence for a postponement of childbearing in some countries, such as the study mentioned by reviewers for United States (Lindberg et al, 2020). The Aassve et al. (2020) paper hypothesised that fertility could move in different directions, depending on the development level of the country or within country.

Implicitly, our scenario assumes that the declines in users shift to the group of women with unmet need (since we assume no change in total demand). However, this does not account for the fact that some women who previously had no need for family planning (such as those who were planning a pregnancy) may shift into the group of women with unmet need. As we wanted to isolate only the potential impact of change in specific-method use on the demand for family planning satisfied by modern methods, we do not adjust possible changes in unmet need. We added this text in the Conclusions to strengthen this point:

However, Aassve et al. (2020) hypothesized that - depending on the development level of the country - the changes in fertility preferences might not be present in all countries. Additionally, the frequency of sexual activity during COVID-19 pandemic could have been impacted by health and behavioural changes. We did not explicitly include the changes in fertility preferences and sexual activity in the scenario, since our main purpose was to illustrate the impact of method-specific access disruptions.

Method switching:

We agree with reviewers that there could be some method-switching, and we added some text to the method section on this issue, since our scenario does not preclude the possibility

of method-switching occurring. From the perspective of the SDG 3.7.1. indicator, method-switching between modern methods would not influence the indicator. For example, if all women who were not able to use injectables due to COVID-19 disruptions would use male condoms or pills instead, the overall number of modern users would remain unchanged. To implement the method-switching in the scenario, we would need to assume that the disruptions have also influenced the availability and accessibility of the methods to which women switch. From a reproductive rights and choice perspective, women might not use methods that they wish to use. Additionally, method-switches are likely to be from more- to less-effective methods. This has crucial implications for prevention of unintended pregnancies and the implications for women who had to change to a less effective method because of the disruptions, rather than out of choice.

We added the following text in Methods:

This does not mean there is no method-switching. Indeed, it is very possible that some women will switch from some methods to other methods, depending on their own context and the way that COVID-19 impacts specific methods in specific countries. Rather, the declines are an indication of the overall decline in use by method, after method-switching.

Specific country analysis and presentation of results:

The analysis as presented was done at the regional and global level, and so we do not present country-specific scenarios, most especially because each country will be impacted differently and we do not wish to suggest that we know the disruptions across all countries included in the analysis. Instead, we have provided a framework with which countries themselves could run their own scenarios, adjusting the assumed declines in method-specific use according to the situations in each country. Estimates of use of contraceptive methods for all countries are available in the data booklet referenced in the paper (United Nations, 2019).

The role of long-acting and permanent methods:

We deleted the sentence “countries could improve access to long-acting methods because existing users of these methods are less impacted where there are disruptions to services”.

Post-COVID-19 recovery:

We added a comment in the conclusions around post-COVID-19 recovery and difference by methods.

The COVID-19 pandemic has made the path towards achieving universal access to sexual and reproductive health-care services by 2030, including family planning, more uncertain. Once the disruptions due to COVID-19 are resolved, it is possible that contraceptive use – and therefore the SDG 3.7.1. indicator – could return to the pre-disruption levels relatively quickly. For short-term method users, assuming that methods require frequent resupply, the health system could in principle recover to pre-COVID-19 levels within a short period of time, once service activities have fully resumed. However, for long-acting methods, there could be a longer period to catch up on services that were not provided during COVID-19 disruptions.

We have included information in the abstract on the range of declines assumed across methods, for the scenario presented in the paper.

We further elaborated the discussion of the potential impact of COVID-19 disruptions on the

SDG 3.7.1. We also stressed the importance of the very real impact on the lives of women that even short-term disruptions in the access to contraception have. Thank you for the suggestions on the wording.

The COVID-19 pandemic has made the path towards achieving universal access to sexual and reproductive health-care services by 2030, including family planning, more uncertain. Once the disruptions due to COVID-19 are resolved, it is possible that contraceptive use – and therefore the SDG 3.7.1. indicator – could return to the pre-disruption levels relatively quickly. [...]

Most crucially, for women – and their partners and families – who experienced an unintended pregnancy resulting from the lack of access to contraception during COVID-19 disruptions, the impacts are long-lasting.

Competing Interests: No competing interests were disclosed.

Reviewer Report 30 July 2020

<https://doi.org/10.21956/gatesopenres.14340.r29085>

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Mengjia Liang

Technical Division, United Nations Population Fund (UNFPA), New York City, NY, USA

This research note, published on Gates Open Research, presents the impact of COVID-19 pandemic on meeting contraceptive needs. The estimates are based on the 2020 Estimates and Projections of Family Planning Indicators published by the United Nations Population Division and assumptions of service disruption.

I find the research note generally convincing and welcome, especially considering the pandemic is still rapidly evolving in many parts of the world. The paper is a considerable first step for more specific country analysis when country-specific service data become available, and has important policy implications.

The scenario presented in the note assumes no change in sexual activity and total demand for contraceptives. This assumption may lead to an overestimate of the demand given previously sexually active women who are not married or living with a partner may experience a decrease in sexual activity, leading to lower or no demand for contraceptives during a lockdown. The research team may consider limiting the research scope to married or in-union women only, suggesting further assumptions for un-married/in union sexually active women, or providing a brief discussion of the implication.

The research team also makes no assumptions about the method switch, but no further details are provided. A brief discussion of the implication of this assumption would be desired.

The authors indicate that a separate scenario using an assumed 10 percent decline in both short-term and long-acting reversible contraception is prepared as a sensitivity test. However, the results of this different scenario are not presented in the paper, nor are any comparisons and discussions provided.

Lastly, in the conclusion section, the authors suggest that “countries could improve access to long-acting methods because existing uses of these methods are less impacted where are disruptions to services.” This statement may be premature as we don’t fully understand how the pandemic evolves in different parts of the world and how countries and local governments mitigate the risks. The suggestion may lead to unintended consequences, such as promoting long-acting methods even after the pandemic. Methods should be about women’s choices not to be limited by method availability.

Despite the limitation, the paper provides timely insights and reflects the global interest in women’s access to contraceptives in the pandemic. I would recommend the article for indexing with minor revisions.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Sexual and reproductive health and rights

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 28 Aug 2020

Vladimira Kantorova, United Nations, 2 United Nations Plaza, New York, USA

Dear Mengjia,

We thank you for the very helpful comments on the paper.

Because some of the issues were raised by more than one of the reviews, we reply to some of the common themes first. The remaining comments are included below.

Changing total demand for family planning:

All reviewers commented on the possibility of changing demand, either by changes in fertility preferences or sexual activity, or both. We agree with the reviewers that the changes in demand for family planning during COVID-19 could have substantial impact on the values of the indicator of demand for family planning satisfied by modern methods. We explored this at length, but decided this is not something we should adjust in the scenario. It is unknown in which direction these components could move. For example, it's not clear whether sexual activity could increase or decrease, nor whether we could expect women would want to space/limit childbearing due to COVID-19, across all regions. There is an evidence for a postponement of childbearing in some countries, such as the study mentioned by reviewers for United States (Lindberg et al, 2020). The Aassve et al. (2020) paper hypothesised that fertility could move in different directions, depending on the development level of the country or within country.

Implicitly, our scenario assumes that the declines in users shift to the group of women with unmet need (since we assume no change in total demand). However, this does not account for the fact that some women who previously had no need for family planning (such as those who were planning a pregnancy) may shift into the group of women with unmet need. As we wanted to isolate only the potential impact of change in specific-method use on the demand for family planning satisfied by modern methods, we do not adjust possible changes in unmet need. We added this text in the Conclusions to strengthen this point:

However, Aassve et al. (2020) hypothesized that - depending on the development level of the country - the changes in fertility preferences might not be present in all countries. Additionally, the frequency of sexual activity during COVID-19 pandemic could have been impacted by health and behavioural changes. We did not explicitly include the changes in fertility preferences and sexual activity in the scenario, since our main purpose was to illustrate the impact of method-specific access disruptions.

Method switching:

We agree with reviewers that there could be some method-switching, and we added some text to the method section on this issue, since our scenario does not preclude the possibility of method-switching occurring. From the perspective of the SDG 3.7.1. indicator, method-switching between modern methods would not influence the indicator. For example, if all women who were not able to use injectables due to COVID-19 disruptions would use male condoms or pills instead, the overall number of modern users would remain unchanged. To implement the method-switching in the scenario, we would need to assume that the disruptions have also influenced the availability and accessibility of the methods to which women switch. From a reproductive rights and choice perspective, women might not use methods that they wish to use. Additionally, method-switches are likely to be from more- to less-effective methods. This has crucial implications for prevention of unintended pregnancies and the implications for women who had to change to a less effective method because of the disruptions, rather than out of choice.

We added the following text in Methods:

This does not mean there is no method-switching. Indeed, it is very possible that some women will switch from some methods to other methods, depending on their own context and the way that COVID-19 impacts specific methods in specific countries. Rather, the declines are an indication of the overall decline in use by method, after method-switching.

Specific country analysis and presentation of results:

The analysis as presented was done at the regional and global level, and so we do not present country-specific scenarios, most especially because each country will be impacted differently and we do not wish to suggest that we know the disruptions across all countries included in the analysis. Instead, we have provided a framework with which countries themselves could run their own scenarios, adjusting the assumed declines in method-specific use according to the situations in each country. Estimates of use of contraceptive methods for all countries are available in the data booklet referenced in the paper (United Nations, 2019).

The role of long-acting and permanent methods:

We deleted the sentence “countries could improve access to long-acting methods because existing users of these methods are less impacted where there are disruptions to services”.

Post-COVID-19 recovery:

We added a comment in the conclusions around post-COVID-19 recovery and difference by methods.

The COVID-19 pandemic has made the path towards achieving universal access to sexual and reproductive health-care services by 2030, including family planning, more uncertain. Once the disruptions due to COVID-19 are resolved, it is possible that contraceptive use – and therefore the SDG 3.7.1. indicator – could return to the pre-disruption levels relatively quickly. For short-term method users, assuming that methods require frequent resupply, the health system could in principle recover to pre-COVID-19 levels within a short period of time, once service activities have fully resumed. However, for long-acting methods, there could be a longer period to catch up on services that were not provided during COVID-19 disruptions.

We agree with you that frequency of sexual activity during COVID-19 pandemic could have been impacted by health and behavioural changes. We also agree that in most settings, the frequency of sexual activity among unmarried women was potentially reduced more than among married women. Less frequent or no sexual intercourse would lead to lower demand for contraception. Additionally, some women and their partners lacking access to modern contraception could abstain from sex because of the lack of access to safe and effective contraceptive methods. As with potential changes in demand for family planning, we did not consider it feasible to include the changes in sexual activity in our scenario illustrating the impact of method-specific disruptions. Hopefully, some of the surveys taking place during COVID-19 will ask the relevant question about sexual activity. will ask the question about sexual activity.

We added this text in Conclusions:

However, Aassve et al. (2020) hypothesized that - depending on the development level of the country – the changes in fertility preferences might not be present in all countries. Additionally, the frequency of sexual activity during the COVID-19 pandemic could have been impacted by

health and behavioural changes. We did not explicitly include the changes in fertility preferences and sexual activity in the scenario, since our main purpose was to illustrate the impact of method-specific access disruptions.

The results of the scenario of 10% decline was shown in a footnote. We have now moved this to the main body of the paper – thanks for the suggestion.

Competing Interests: No competing interests were disclosed.

Reviewer Report 28 July 2020

<https://doi.org/10.21956/gatesopenres.14340.r29087>

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Michelle Weinberger 

Avenir Health, Washington, DC, USA

This research note presents estimates of the potential impact of COVID-19 on global contraceptive use. It builds on estimates already published by others by (1) taking a global scope to include all countries of the world, and (2) quantifying the impact on SDG indicator 3.7.1 the proportion of women who have their need for family planning satisfied by modern methods.

As acknowledged by the authors, they present results based on a simplified set of assumptions to provide illustrative results of the potential impact of COVID-19 on the achievement of SDG 3.7.1. These results provide useful evidence to support advocacy efforts for the importance of sustaining access to contraception during COVID-19. While there is value in such a simple set of assumptions/scenarios, there could also be benefit in the authors exploring some additional considerations, for example:

- Including a starker scenario in their sensitivity testing to explore a full range of possibilities given the large uncertainty about the potential impacts of COVID-19 (so that the detailed scenario presented in the paper is a middle ground between the 10% declines and some higher level of decline). This would be useful, especially as in the introduction the authors note that existing scenarios may provide “conservative estimates” of impact.
- Quantifying the impact of potential increases in demand as a result of COVID-19. The authors acknowledge fertility preferences may change in response to COVID-19. While there is not yet data to understand these changes, such changes would lead to changes in the denominator of the demand satisfied indicator. The paper already explores changes to the numerator (mCP). Adding a simple set of assumptions to quantify potential denominator changes would provide useful context, especially as a focus on demand satisfied is a unique aspect of this research note.

Finally, a few more specific notes regarding the research note:

- It may help to add some detail to the methods section to more closely follow the calculations shown in the Excel file. For example, that method mix is applied to the projected CP in 2020 to estimate method prevalence, then prevalence by method is reduced based on the %s in Table 1, then a new mCP is constructed and divided by the 2020 total demand projection to estimate a new demand satisfied measure.
- In discussing the declines in demand satisfied in the results the numbers presented are percentage point declines, not percent changes. The language should be edited to clarify this.
- The authors may wish to cite existing guidance (from groups such as WHO, FIGO and FSRH CEU) in the final paragraph of their conclusion on the use of self-care methods and other strategies to minimize the impact of COVID-19.
- Given the focus on an SDG indicator, the authors may wish to add some text to the conclusion about how COVID-19 may impact on 2030 SDG achievement; do they hypothesize these changes to be short term, or, potentially have lasting impacts on trajectories towards 2030?

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: The reviewer and the first author are currently drafting a commentary piece together on an unrelated topic. I confirm that this hasn't affected my ability to write an objective and unbiased review of the article.

Reviewer Expertise: family planning, modeling health impact

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have

significant reservations, as outlined above.

Author Response 28 Aug 2020

Vladimira Kantorova, United Nations, 2 United Nations Plaza, New York, USA

Dear Michelle,

We thank you for the very helpful comments on the paper.

Because some of the issues were raised by all three reviews, we reply to some of the common themes first. The remaining comments are included below.

Changing total demand for family planning:

All reviewers commented on the possibility of changing demand, either by changes in fertility preferences or sexual activity, or both. We agree with the reviewers that the changes in demand for family planning during COVID-19 could have substantial impact on the values of the indicator of demand for family planning satisfied by modern methods. We explored this at length, but decided this is not something we should adjust in the scenario. It is unknown in which direction these components could move. For example, it's not clear whether sexual activity could increase or decrease, nor whether we could expect women would want to space/limit childbearing due to COVID-19, across all regions. There is an evidence for a postponement of childbearing in some countries, such as the study mentioned by reviewers for United States (Lindberg et al, 2020). The Aassve et al. (2020) paper hypothesised that fertility could move in different directions, depending on the development level of the country or within country.

Implicitly, our scenario assumes that the declines in users shift to the group of women with unmet need (since we assume no change in total demand). However, this does not account for the fact that some women who previously had no need for family planning (such as those who were planning a pregnancy) may shift into the group of women with unmet need. As we wanted to isolate only the potential impact of change in specific-method use on the demand for family planning satisfied by modern methods, we do not adjust possible changes in unmet need. We added this text in the Conclusions to strengthen this point: *However, Aassve et al. (2020) hypothesized that - depending on the development level of the country - the changes in fertility preferences might not be present in all countries. Additionally, the frequency of sexual activity during COVID-19 pandemic could have been impacted by health and behavioural changes. We did not explicitly include the changes in fertility preferences and sexual activity in the scenario, since our main purpose was to illustrate the impact of method-specific access disruptions.*

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methods that they wish to use. Additionally, method-switches are likely to be from more- to less-effective methods. This has crucial implications for prevention of unintended pregnancies and the implications for women who had to change to a less effective method because of the disruptions, rather than out of choice.

We added the following text in Methods:

This does not mean there is no method-switching. Indeed, it is very possible that some women will switch from some methods to other methods, depending on their own context and the way that COVID-19 impacts specific methods in specific countries. Rather, the declines are an indication of the overall decline in use by method, after method-switching.

Specific country analysis and presentation of results:

The analysis as presented was done at the regional and global level, and so we do not present country-specific scenarios, most especially because each country will be impacted differently and we do not wish to suggest that we know the disruptions across all countries included in the analysis. Instead, we have provided a framework with which countries themselves could run their own scenarios, adjusting the assumed declines in method-specific use according to the situations in each country. Estimates of use of contraceptive methods for all countries are available in the data booklet referenced in the paper (United Nations, 2019).

The role of long-acting and permanent methods:

We deleted the sentence “countries could improve access to long-acting methods because existing users of these methods are less impacted where there are disruptions to services”.

Post-COVID-19 recovery:

We added a comment in the conclusions around post-COVID-19 recovery and difference by methods.

The COVID-19 pandemic has made the path towards achieving universal access to sexual and reproductive health-care services by 2030, including family planning, more uncertain. Once the disruptions due to COVID-19 are resolved, it is possible that contraceptive use – and therefore the SDG 3.7.1. indicator – could return to the pre-disruption levels relatively quickly. For short-term method users, assuming that methods require frequent resupply, the health system could in principle recover to pre-COVID-19 levels within a short period of time, once service activities have fully resumed. However, for long-acting methods, there could be a longer period to catch up on services that were not provided during COVID-19 disruptions.

For comparison, we have prepared a starker “high disruption” scenario, by using the assumptions of “high” percent reduction in service utilization from UNFPA (2020), using public sector high decline (e.g. 40% decline for methods requiring service provision, 20% decline for methods that can be sourced from alternative places). Under the “high disruption” scenario, the estimate of the need for family planning satisfied with modern methods in 2020 could fall to 65%. In sub-Saharan Africa, the estimate for year 2020 would be 42%, as compared to 55% in pre-COVID situation.

All scenarios are purely illustrative and the “high disruption” scenario gives information about an upper range of possible impact. While for some regions, the “high disruption” scenario is indeed within the range of possibilities, in other regions the impact could be smaller. Therefore, we suggest not to present a global value in the paper and not to include

the regional estimates in the figure. Such calculations can be easily done in *Underlying data*.

We have added more detail to the methods section to more closely follow the calculations shown in the Excel file, thank you for the suggestion:

We applied the method-mix (United Nations 2019) to the contraceptive prevalence in 2020 (United Nations, 2020a), to produce estimates of method-specific prevalence for 2020. These were then reduced by method-specific declines (Table 1). The resulting modern contraceptive prevalence was divided by total demand (United Nations, 2020a), in order to produce a scenario of demand for family planning satisfied by modern methods.

We clarified in the results section the numbers presented are percentage point declines. Thank you for pointing that out.

We added reference in the conclusions to the existing guidance from WHO, in particular, *Maintaining essential health services: operational guidance for the COVID-19 context* recommending practical actions that countries can take at national, subregional and local levels.

The text now reads:

WHO recommends practical actions that countries can take at national, subregional and local levels to reorganize and safely maintain access to high-quality, essential health services in the pandemic context (WHO, 2020; on page 29), such as relaxation of requirements for a prescription for oral or self-injectable contraception and emergency contraception and provision of multimonth supplies with clear information about the method and how to access referral care for adverse reactions; and enabling pharmacies and drugstores to increase the range of contraceptive options they can provide. For the transition towards restoration of the services, it recommends to plan for clients whose choice are longer-term methods (such as IUDs, implants) or permanent methods, if these services were disrupted.

Competing Interests: No competing interests were disclosed.