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**Carine Milcent
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JEL Codes: .

Keywords: Teleconsultation; Obstetrics and gynecology; Training; Technology features.



Use of telehealth: evidence from French teleconsultation for women's healthcare, prior and during COVID-19 pandemic

Carine Milcent^{1*}

Saad Zbiri^{2*}

¹Paris-Jourdan Sciences Economiques, French National Center for Scientific Research (CNRS), Paris, France; Paris School of Economics (PSE), Paris, France

²EA 7285, Versailles Saint-Quentin University, Montigny-le-Bretonneux, France

* Corresponding author:

48 boulevard Jourdan, 75014, Paris, France

E-mail: carine.milcent@psemail.eu (CM), saad.zbiri3@uvsq.fr (SZ)

Abstract

BACKGROUND: Prior to the COVID-19 pandemic, teleconsultation were seldom used in France. The sanitary crisis has brought with it a great need for the use of teleconsultation and other interventions using digital technology.

OBJECTIVE: Identify how has French teleconsultation for obstetrics and gynecology care services been used prior and during this sanitary crisis.

METHODS: We first described the global picture of the teleconsultation context prior to the sanitary crisis and then during the first quarantine and lockdown measures. We set up three aspects, namely: 1-use of teleconsultation as regards to providers' ability; 2- use of teleconsultation as regards to technology features; 3- use of teleconsultation for which type of healthcare. Second, we studied the determinant factors of teleconsultation use and those of provider's satisfaction with teleconsultation practice.

RESULTS: We show the central role of training, the importance of some main digital technology benefits including improving public health, responding to patient's request and facilitating healthcare access, as well as the importance of some main digital technology drawbacks including lack of convenience and lack of veracity (truthfulness).

CONCLUSIONS: Our results guide the regulator on the suppliers' motivation and needs for teleconsultation adoption. They highlight the conditions for an efficient use of teleconsultation.

Keywords: Teleconsultation; Obstetrics and gynecology; Training; Technology features

1. Introduction

The US Health Resources and Services Administration (HRSA) defines telehealth as the use of electronic information and telecommunication technologies to support and promote long-distance clinical healthcare, patient and professional health-related education, public health and health administration (1). As explained by Goldstein et al. (2018), telehealth encompasses a variety of technologies and approaches to connect patients to healthcare resources with the goal of improving personalization, efficiency, access to care, and secure sharing of health information (2).

Teleconsultation is one branch of the telehealth. Aside from augmenting the broad spectrum of existing conventional medical services, teleconsultation is also used to simply overcome physical limitations. It allows to create a virtual relationship between patients and physicians. According to Lee and Hitt (2020), teleconsultation plays an important role, especially in well-woman care (3). A study of De Nicola (2020) showed that telehealth interventions were associated with improvements in obstetric outcomes, perinatal smoking cessation, breastfeeding, early access to medical abortion services, and schedule optimization for high-risk obstetrics. However, the authors concluded that further well-designed studies are needed to examine these interventions and others to generate evidence (4). Using a review of 71 published articles, van den Heuvel et al. (2018) underlined that despite the challenges of privacy, liability, and costs, eHealth is very likely to disperse globally in the next decade, and it has the potential to deliver a revolution in perinatal care. However, they accentuated the need for evidence for health outcomes, patient satisfaction, and the impact on costs of the possibilities of eHealth interventions in perinatal care (5). In the field of obstetrics and gynecology, Greiner (2017) studied US states telemedicine programs. He also concluded that they are clinically successful, but economic and cost-effectiveness data are lacking (6).

A number of countries across the world, especially high-income ones, have successfully introduced telemedicine systems, which allows patients to access general healthcare and specialist consultations regardless of the distance separating patients from physicians. In those countries, low-income pregnant patients are less likely to receive recommended prenatal care and are more likely to have severe maternal morbidity and mortality than high-income patients (Pehl et al., 2020 for the US context (7); Milcent and Zbiri, 2018 for the French

context (8)). Telemedicine has also been used in trials in low-income and middle-income countries, particularly in rural communities where access to antenatal care is challenging (9). In Poland, telemedicine consultations not only offer an easier access to consultations that are relatively difficult to obtain with a specialist in the field of gynecology and obstetrics, but may also be an alternative to conventional doctors' appointments (10).

In this paper, we studied the use of teleconsultation in the French context for obstetrics and gynecology. We first described the context prior to the COVID-19 sanitary crisis and the change due to the sanitary crisis. We then determined, during these two time periods, the factors impacting the probability of use of teleconsultation and those explaining the probability of provider's satisfaction with teleconsultation practice.

In the following section, we briefly present the practice of teleconsultations in the French context. The third section describe the data used for this study. The econometric strategy is also presented. We estimate the probability of teleconsultation used before the COVID-19 sanitary crisis as well as during the crisis. The results are reported in the fourth section. As an initial step toward understanding the specialists' practice in teleconsultation for women, we seek to describe the current landscape of teleconsultation interventions designed before the COVID-19 sanitary crisis compared with interventions designed specifically for the crisis. Finally, we discuss the results in the fifth section and conclude in the sixth section.

2. Teleconsultation in the French context

In France, teleconsultations were seldom used before the COVID-19 sanitary crisis. Women accessed general healthcare and specialist consultations in a traditional way: a face-to-face consultation. For pregnant women, the prenatal care was a mix between outpatient consultations in a hospital and visits to a doctor and/or a midwife in town.

In the midst of the COVID-19 outbreak, internet and mobile interventions were set up as one mean to deliver medical first aid and health problem-management messages to those in need. During the quarantine and lockdown measures in France, from March to May 2020, people who needed medical care were authorized to go and see a doctor or another health professional in town as well as in hospital. However, to lower their risk of exposure to the virus, part of them turned to teleconsultations. In the same time, physicians such as obstetricians and gynecologists as well as other health professionals needed to increasingly rely on teleconsultations to continue their work and support their clients.

In the French hospital healthcare system, there is a single-payer: the national health insurance fund (*Sécurité Sociale*). All households are compulsorily enrolled in this public health insurance, which is financed by deductions (or for the self-employed, mandatory contributions) of a percentage of income. Women using prenatal or postnatal obstetric services are reimbursed at 100% of the fee, regardless of hospital sector. For women in need for gynecologic care, a flat fee is reimbursed whatever the fee charged. Nonetheless, 95% of the French population has a supplementary private insurance (11). The level of reimbursement for these additional fees (the difference between the actual fee and the flat fee) depends on the private supplementary health insurance premium. Before the COVID-19 sanitary crisis, teleconsultations were badly reimbursed by the public health insurance. Public policy regarding telemedicine reimbursement has changed during this period. It was announced as a transitory policy measure. The flat fee reimbursed for a teleconsultation is now equivalent as the flat fee for a conventional consultation.

3. Materials and methods

3.1. Data collection

Our study used a survey of French healthcare practitioners specialized in dealing with every kind of obstetrics and gynecology problems. We prospectively obtained data from these women's health specialists who might use teleconsultations over the period between March 1, 2020 and April 31, 2020. We distinguished their practices prior to the COVID-19 sanitary crisis and during the first quarantine lockdown in France.

3.2. Study population

A total of 247 midwives, obstetricians and gynecologists have been surveyed. Their telemedicine consultations practice was studied. The sample was composed of 51.6% midwives, 26.8% obstetricians and 21.6% gynecologists (exclusively). 87.5% of the respondents were woman. These health professionals were mostly independent practitioners for their main activity (86.6%). However, they were 32.1% to practice in healthcare centers including hospitals. More accurately, they were 19.9% to work as main or secondary activity in a public hospital. Geographically, 20% of them had a mixed practice: their patients came from both rural as well as urban areas.

3.3. Study variables

Three groups of information regarding telemedicine consultations practice were collected, as follows:

- 1- Information on teleconsultation was included with details on ability for the providers to use teleconsultation. Information on the teleconsultation specific training was available as well as the practitioner's ability to use software for teleconsultation and the potential difficulties due to Wi-Fi connection. Here, the information related in particular to teleconsultation training with two dummy variables: training received and need of training.

2- Information on the use of teleconsultation as regards to digital technology features was collected and concerned the main benefits identified including four dummy variables: improving public health, responding to patient's request, facilitating healthcare access and ensuring patient's follow-up; as well as the main drawbacks identified including three dummy variables: not efficient, not convenient and not truthful. Not efficient dummy variable summed up the following information: not efficient for the patient consultation or no value added compared with conventional consultation. Not convenient dummy variable summed up the following information: requiring too high level of effort, not knowing how to use necessary software, or being not well-equipped (mostly, with Wi-Fi connection). Not truthful dummy variable summed up the following information: too high risk of malpractice, do not feel comfortable to use the teleconsultation for healthcare, or unreliable.

3- Information on teleconsultation was provided with an accentuation on teleconsultation for what (describing the specific type of consultations used regarding obstetrics or/and gynecology follow-up) including six dummy variables: gynecology follow-up, contraception, abortion, pregnancy follow-up, childbirth classes, and postpartum follow-up.

3.4. Data analysis

We first present preliminary statistics organized according to the three groups of information as described above: 1- use of teleconsultation as regards to providers' ability; 2- use of teleconsultation as regards to digital technology features; 3- use of teleconsultation for which type of healthcare. For each aspect, we used the information given about the period before the sanitary crisis and about the period during the lockdown measures. Also, for each period, we separately present statistics for all respondents and statistics for the subsample composed of only the respondents using teleconsultation during the specific period.

Then, we propose a logit model to identify the factors impacting the probability of practice of teleconsultation, using the sample of all respondents. The outcome measure in this analysis was the teleconsultation use (yes or no) from which we studied what relationships exists with teleconsultation training (two dummy variables as described above), main benefits of technology identified (four dummy variables as described above), main drawbacks of technology identified (three dummy variables as described above) and types of healthcare (six dummy variables as described above).

Finally, using a logit model, we also computed the probability of satisfaction with teleconsultation practice. The independent variable in this analysis was the satisfaction with teleconsultation use (yes or no, yes was assessed as from satisfied to very satisfied). The explanatory variables were, as described above, the variables related to teleconsultation training, main benefits of technology identified, main drawbacks of technology identified and types of healthcare. Here, we considered the subsample composed of only the respondents using teleconsultation.

For all models, we considered two periods, namely 1- prior to the COVID-19 crisis and 2- during the first lockdown. Therefore, the respondents' answers were the ones given for the respective period. For each healthcare professional respondent, we used the information given about the period before the sanitary crisis and the information given about the period during the lockdown measure. The results of the models are reported as coefficients with their standard errors. The significance levels are two-sided with a probability threshold of $p < 0.10$. The analyses were performed using Stata software (Stata Corporation, College Station, TX, USA) (12).

3.5. Ethics

The study was based on routinely collected consent, as regulated by French law. All participants gave their informed consent to participate in the study.

4. Results

We first present the descriptive results based on to the three groups of information available in the survey data. We then show the determinant factors impacting the probability of teleconsultation practice and those explaining the satisfaction with teleconsultation use.

4.1. Use of teleconsultation as regard to providers' ability

Teleconsultations were barely used before the COVID-19 sanitary crisis (Graph 1). Phone consultations were more used than online video consultations, respectively 23.2% versus 11%. In the sample, we observe that these percentages rose sharply. They reached + 52.4 percentage points for phone consultation (75.6%) and + 65.8 percentage points for online consultation (76.8%). Note that a phone consultation may be in addition to the online consultation. What about the charge for the patient? These online consultations were reimbursed as a conventional physical consultation. For what we know (there is only little official information on this matter), most of these online consultations were charged at the fixed fee reimbursed by the health public insurance.

[Insert Graph 1]

What about the teleconsultation training? From the survey, we observe an increase in the number of suppliers that participated to training for teleconsultation. On the sample, they were 12.2% to be trained prior to the COVID-19 crisis. On the same sample, the percentage increased to 26% during the lockdown.

However, based only on those professionals using teleconsultation whose percentage increased with the quarantine period, we observe that prior to the sanitary crisis, a higher proportion was trained to use teleconsultation (30.7% before the COVID-19 crisis versus 27.6% during the lockdown period). Besides, with the increase in the number of practitioners turning on teleconsultation, the need expressed for teleconsultation training from professionals using teleconsultation was slightly lower than prior to the COVID-19 crisis (Graph 2).

[Insert Graph 2]

Furthermore, providers encountered difficulties in the use of teleconsultation. Above difficulties due to Wi-Fi connection (audio or video difficulties), some of them experimented difficulties in the use of the software chosen. 28.9% expressed difficulties in starting teleconsultation during the lockdown period. This percentage was about 7% prior to the sanitary crisis. Suppliers also expressed difficulties in chatting with their patients but they were marginal (4% during the lockdown period). All these specific encountered difficulties may also explain the need for training for teleconsultation expressed by suppliers.

In terms of teleconsultation software, prior to the COVID-19 sanitary crisis, 35.8% of the suppliers considered themselves as not comfortable with this technology. During the lockdown, they were only 18.3%. This is a small number compared with the anterior context. However, this number remain quite high.

4.2. Use of teleconsultation as regard to digital technology features

Statistics are illustrated in Graphs 3 and 4. First of all, technology benefits for teleconsultation were much more cited during the COVID-19 crisis compared to prior the sanitary crisis: whatever the benefit given, the percentage of positive respondents was incredibly lower prior to the sanitary crisis than during the quarantine period (Graph 3, striped bars compared with fully colored bars).

During the first lockdown, the first benefit for teleconsultation was a matter of public health (more than 80%). As a second benefit, this was for demand accessibility (about 80%). It allowed patients to access specialist or midwifery consultations regardless of the distance separating patients from providers and travel constraints. In this sample, patient request as well as patient follow-up were a benefit for about 70% of the healthcare providers (Graph 3).

[Insert Graph 3]

Second, we focus on technology drawbacks for teleconsultation (Graph 4). We note that comparing the period prior to the COVID-19 crisis with the period during the lockdown, these technological drawbacks were less identified. However, the “not truthful” component resisted

to the shock of the lockdown measures. On the respondents of the survey, when we compare their mind set before the sanitary crisis (blue bar) and during the lockdown (red bar), we observe a change of about - 5 percentage points, which is incredibly small. Comparing the change in mind for the “not efficient”, which was also a technology disadvantage revealed, we also note a slight difference between the period prior to the sanitary crisis and during the quarantine period (first wave). This difference is - 10 percentage points. The main change was for the convenience of using teleconsultation. During the lockdown, the percentage of healthcare professionals estimating telepractice as not convenient decreased from 21.3% to 5.3% (Graph 4).

[Insert Graph 4]

Amongst the teleconsultation users (striped bars), prior to the sanitary crisis, almost half of the healthcare professionals found it not efficient. They were only one fifth during the lockdown (first wave) (Graph 4). This decrease between the two periods was also the case for the “not efficient” component but much less for the “not truthful” component.

Overall, the feedback on teleconsultation of suppliers using teleconsultation was quite mitigated. Only 72.8% of suppliers were satisfied with the teleconsultation practice. However, prior to the sanitary crisis, the percentage of healthcare professionals satisfied by using teleconsultation was as low as 38.7%.

4.3. Use of teleconsultation for which healthcare services

Graph 5 presents statistics on the type of teleconsultation provided to the patients. We observe that whatever the period, teleconsultations were mainly used for contraception consultation (striped bar and fully colored bar). However, before the sanitary crisis, teleconsultations were also mainly used for gynecology follow-up (striped bar). Thus, prior to the COVID-19 sanitary crisis, teleconsultation by midwives, obstetrics and gynecology specialists were mainly used for woman with gynecology concerns and very little for pregnancy follow-up. During the quarantine period, teleconsultations were also used for pregnancy follow-up, childbirth classes and postpartum follow-up. Overall, during the first quarantine and the lockdown measures, compared with the period before the sanitary crisis, we notice an increase in the use of all types of consultations without exception.

[Insert Graph 5]

4.4. Probability of provider's teleconsultation practice

Results are displayed in Table 1. First of all, we comment the results obtained on behavior of professionals in terms of teleconsultation use prior to the sanitary crisis (column 1 of Table 1). Holding other variables at a fixed value, the coefficient of training for teleconsultation is positive and significant, which indicates that the probability that a healthcare professional used teleconsultation was higher for professionals who got a training for teleconsultation compared to professionals who did not get this training. Also, responding to patient request as a reason for teleconsultation increased the probability of teleconsultation use. As well, for contraception consultation, the probability of use of teleconsultation by the professional is increased, given all other predictor variables in the model are held constant. Note that, for the period before the COVID-19 crisis, the model did not include the "non convenient" variable because it mainly concerns professionals using online consultation. As reported above, during this period, teleconsultations were usually performed by phone.

[Insert Table 1]

We now turn on the lockdown period when the healthcare access of patients was limited (column 2 of Table 1). The training for teleconsultation had no effect on the probability of use of teleconsultation. About the main benefits of teleconsultation revealed, we find that they were to resolve the healthcare access limitation and for public health motivation. Indeed, public health and healthcare access reasons led to an increase in the probability of teleconsultation.

Unlike the period prior the sanitary crisis where teleconsultations were usually performed by phone, during the sanitary crisis, teleconsultations were performed either by phone or online. We thus focus, in column 3 of Table 1, on online consultations only, as it is this type of telepractice that should take place. We show that providers need of training decreased the probability of use of online consultation. As observed for teleconsultation, public health motivation and healthcare access increased the probability of online consultation use. In terms of main drawbacks, the lack of convenience perceived for online consultation led to a

decrease in the probability of online consultation use. In the same line, for contraception and childbirth classes, the probability of provider's use of online consultation was increased.

4.5. Probability of provider's satisfaction with teleconsultation practice

Results are displayed in Table 2. For health professionals before the sanitary crisis (column 1 of Table 2), we find that the determinants of satisfaction with teleconsultation were to solve the issue of healthcare access limitation. The satisfaction was improved for consultations given to woman for their gynecologic follow-up. During the quarantine period of the first wave (column 2 of Table 2), training for teleconsultation positively impacted the satisfaction. Besides, the satisfaction was impacted by the willing to provide public health and to replace the lack of healthcare accessibility. The convenience to use teleconsultations and the truthfulness of these teleconsultations played positively on the healthcare professionals satisfaction. For online consultation (column 3 of Table 2), we found that while training received increased the probability of satisfaction, the need of training decreased this probability. Also, as benefits revealed, public health and healthcare access increased the probability of satisfaction. However, the lack of truthfulness decreased the probability of satisfaction. Here, the "non convenient" variable was not included in the model as almost all health professionals who did use online consultation reported as convenient to use it. Lastly, whatever the period and the type of teleconsultation, we observe that the type of healthcare did not impact the level of satisfaction.

[Insert Table 2]

5. Discussion

5.1. Main findings

Our study shows that the COVID-19 sanitary crisis increased the percentage of use of teleconsultations, especially online consultations, as well as the percentage of provider's satisfaction with the teleconsultation practice. This increase concerned all types of healthcare services as regards to obstetrics and gynecology concerns. During this pandemic period, advantages of teleconsultations were much more reported by healthcare professionals while teleconsultation drawbacks were much less reported. Also, some healthcare services, such as contraception, were more frequently performed by teleconsultation than others. In terms of the determinant factors of both teleconsultation use and provider's satisfaction with teleconsultation practice, we highlight the importance of training and some main benefits of digital technology including improving public health, responding patient's request and facilitating healthcare access as well as some main drawbacks of digital technology including lack of convenience and lack of veracity (truthfulness).

5.2. Study strengths and limitations

Despite a limited population, this study may constitute a preliminary analysis of the practice of teleconsultations during the COVID-19 crisis, and as regard to the prior context. French women's healthcare professionals from different healthcare settings, different locations and with different individual characteristics responded to the survey. A lot of information was collected that allowed considering different characteristics of the use of digital healthcare. However, to confirm our findings, larger studies using additional information on technological healthcare and further analyses about other types of healthcare services are still needed.

5.3. Interpretation

Many recent studies reported an important increase in the use of telemedicine during the COVID-19 crisis. Mann et al. showed a rapid expansion of telemedicine use for both urgent and nonurgent healthcare delivery from one large health system (NYU Langone Health) at the

epicenter of the COVID-19 outbreak in the United States (13). Madden et al. analyzed trends in whether prenatal care visits were conducted in-person or via telehealth in two affiliated hospitals in New York city during the COVID-19 pandemic. During the study period, the use of telehealth, which corresponded to approximately one-third of all visits performed, rapidly increased (14). In a review article, Contreras et al. reported that the number of telemedicine visits, at many institutions, dramatically increased within days following the institution of novel COVID-19 restrictions on in-person clinical encounters (15).

Different previous studies showed the importance of training in the adoption of new digital technologies by health professionals. Sanders et al. conducted qualitative semi-structured interviews to explore barriers to participation and adoption of telehealth and telecare from the perspective of people who withdrew from or declined to participate in an UK trial. One of the main barriers revealed was requirements for technical competence and operation of equipment highlighting the need of adequate training (16). Young et al. reviewed 23 studies to summarize existing research on acceptance of tele-intensive care unit (tele-ICU) coverage among ICU staff. They reported training as a cited potential barrier of acceptance. In another systematic review of 30 articles, Kruse et al. evaluated barriers to adopting telemedicine worldwide. They found that the top barriers were technology-specific and could be overcome through training (17). On the other hand, other studies showed the lack of training of healthcare professionals. A recent national survey in medical schools in France observed that, although telemedicine education and training was integrated into initial medical education, it still remained limited even with the positive attitudes of deans and associate deans (18).

Several studies also reported the existence of different barriers and facilitators to adoption of telemedicine as regards to advantages and disadvantages of digital technology. Many analyses showed that practitioners are more likely to use telemedicine and are satisfied with this practice when they find it useful for the healthcare system such as in promoting public health, healthcare access or patient's request (19,20). In terms of disadvantages of the technology, Kruse et al. reported barriers to adopting telemedicine worldwide through the analysis of published work. Among these barriers, they found those related to the lack of convenience such as old equipment, no equipment, rural setting or ehealth literacy as well as those related to the lack of veracity (truthfulness) such as legal liability, privacy confidentiality or security of data (17).

Finally, some past studies showed the preference of practitioners for the use of teleconsultations for specific types of healthcare services in particular (5,21).

5.4. Public policy implications

With the COVID-19 pandemic, teleconsultation has been promoted as an effective healthcare practice to rationally allocate medical resources. This sanitary crisis accentuated the need for more investment in new healthcare practices, others than the classic ways of providing care, that may allow an easy access to care and ensure a continuity of care for the whole population (22,23).

The results of our study may have a number of health policy implications. The first implication would be that developing training programs for teleconsultation could incite health providers to the digital practice. Furthermore, health policies promoting a better understanding of the advantages of teleconsultation, in particular as regards to public health and patient's need, and the drawbacks of teleconsultation, especially those related to convenience and truthfulness of the digital practice, may also facilitate a wide use of teleconsultation.

Almost all countries, whether high, middle or low-income, and whatever the type of their healthcare systems, still show access-to-care difficulties (24–26). These problems of healthcare accessibility usually concern specific populations in particular. These are often people with low socioeconomic status, residing in environments with poor health resources, or lacking adequate health information (8,27). It would be interesting to study how teleconsultation may be helpful to increase access to healthcare services especially for this part of the population who can also be in difficulty of use of teleconsultation (28,29).

6. Conclusion

In conclusion, the COVID-19 sanitary crisis increased the use of teleconsultations, especially online consultations. This study shows the central role of training as well as some main benefits of digital technology including improving public health, responding patient's request and facilitating healthcare access and some main drawbacks of digital technology including lack of convenience and lack of veracity (truthfulness) in teleconsultation adoption or eviction by healthcare providers. Our results thus enlighten the regulator on the conditions for an efficient use of teleconsultation.

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- Association Professionnelle de Sages-Femmes (APSF)

Author Contributions:

CM et SZ provided the data. CM analyzed the data. CM and SZ interpreted the results and wrote up the manuscript. CM and SZ read and reviewed the final manuscript.

Data Availability Statement:

The data were generated by the authors and are compiled, maintained, and distributed by them. The authors confirm that access to the data is publicly available.

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The authors declare that there are no competing interests.

References

1. Telehealth Programs | Official web site of the U.S. Health Resources & Services Administration [Internet]. [cited 2021 Jan 21]. Available from: <https://www.hrsa.gov/rural-health/telehealth/>
2. Goldstein KM, Zullig LL, Dedert EA, Alishahi Tabriz A, Brearly TW, Raitz G, et al. Telehealth Interventions Designed for Women: an Evidence Map. *J Gen Intern Med*. 2018 Dec;33(12):2191–200.
3. Lee S, Hitt WC. Clinical Applications of Telemedicine in Gynecology and Women's Health. *Obstet Gynecol Clin North Am*. 2020 Jun;47(2):259–70.
4. DeNicola N, Grossman D, Marko K, Sonalkar S, Butler Tobah YS, Ganju N, et al. Telehealth Interventions to Improve Obstetric and Gynecologic Health Outcomes: A Systematic Review. *Obstet Gynecol*. 2020 Feb;135(2):371–82.
5. van den Heuvel JF, Groenhof TK, Veerbeek JH, van Solinge WW, Lely AT, Franx A, et al. eHealth as the Next-Generation Perinatal Care: An Overview of the Literature. *J Med Internet Res*. 2018 Jun 5;20(6):e202.
6. Greiner AL. Telemedicine Applications in Obstetrics and Gynecology. *Clin Obstet Gynecol*. 2017 Dec;60(4):853–66.
7. Peahl AF, Smith RD, Moniz MH. Prenatal care redesign: creating flexible maternity care models through virtual care. *Am J Obstet Gynecol*. 2020 Sep;223(3):389.e1-389.e10.
8. Milcent C, Zbiri S. Prenatal care and socioeconomic status: effect on cesarean delivery. *Health Econ Rev*. 2018 Mar 10;8(1):7.
9. Reynolds RM. Telehealth in pregnancy. *Lancet Diabetes Endocrinol*. 2020 Jun;8(6):459–61.
10. Karwowski R, Gasiorowska J. Telemedicine consultations in obstetrics and gynecology - a population based study in Polishspeaking women. *Ginekol Pol*. 2018;89(12):677–81.
11. Batto V, Leduc A, Legal R, Louvel A, Montaut A, Pierre A, et al. La complémentaire santé: acteurs, bénéficiaires, garanties. 2016th ed. Ministry of health; (Panoramas de la DREES-Santé).
12. StataCorp. Stata Statistical Software: Release 16. USA: College Station, TX: StataCorp LP.
13. Mann DM, Chen J, Chunara R, Testa PA, Nov O. COVID-19 transforms health care through telemedicine: Evidence from the field. *J Am Med Inform Assoc JAMIA*. 2020 Jul 1;27(7):1132–5.
14. Madden N, Emeruwa UN, Friedman AM, Aubey JJ, Aziz A, Baptiste CD, et al. Telehealth Uptake into Prenatal Care and Provider Attitudes during the COVID-19

- Pandemic in New York City: A Quantitative and Qualitative Analysis. *Am J Perinatol*. 2020 Aug;37(10):1005–14.
15. Contreras CM, Metzger GA, Beane JD, Dedhia PH, Ejaz A, Pawlik TM. Telemedicine: Patient-Provider Clinical Engagement During the COVID-19 Pandemic and Beyond. *J Gastrointest Surg Off J Soc Surg Aliment Tract*. 2020 Jul;24(7):1692–7.
 16. Sanders C, Rogers A, Bowen R, Bower P, Hirani S, Cartwright M, et al. Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: a qualitative study. *BMC Health Serv Res*. 2012 Jul 26;12:220.
 17. Scott Kruse C, Karem P, Shifflett K, Vegi L, Ravi K, Brooks M. Evaluating barriers to adopting telemedicine worldwide: A systematic review. *J Telemed Telecare*. 2018 Jan;24(1):4–12.
 18. Yaghobian S, Ohannessian R, Mathieu-Fritz A, Moulin T. National survey of telemedicine education and training in medical schools in France. *J Telemed Telecare*. 2020 Jun;26(5):303–8.
 19. Odnoletkova I, Buysse H, Nobels F, Goderis G, Aertgeerts B, Annemans L, et al. Patient and provider acceptance of telecoaching in type 2 diabetes: a mixed-method study embedded in a randomised clinical trial. *BMC Med Inform Decis Mak*. 2016 Nov 9;16(1):142.
 20. Jacob C, Sanchez-Vazquez A, Ivory C. Social, Organizational, and Technological Factors Impacting Clinicians' Adoption of Mobile Health Tools: Systematic Literature Review. *JMIR MHealth UHealth*. 2020 Feb 20;8(2):e15935.
 21. Jain T, Schwarz EB, Mehrotra A. A Study of Telecontraception. *N Engl J Med*. 2019 Sep 26;381(13):1287–8.
 22. Fryer K, Delgado A, Foti T, Reid CN, Marshall J. Implementation of Obstetric Telehealth During COVID-19 and Beyond. *Matern Child Health J*. 2020 Sep;24(9):1104–10.
 23. Kronenfeld JP, Penedo FJ. Novel Coronavirus (COVID-19): telemedicine and remote care delivery in a time of medical crisis, implementation, and challenges. *Transl Behav Med*. 2020 Oct 24;
 24. Chevreul K, Berg Brigham K, Durand-Zaleski I, Hernandez-Quevedo C. France: Health System Review. *Health Syst Transit*. 2015;17(3):1–218, xvii.
 25. Dickman SL, Himmelstein DU, Woolhandler S. Inequality and the health-care system in the USA. *Lancet Lond Engl*. 2017 Apr 8;389(10077):1431–41.
 26. Boutayeb A, Helmert U. Social inequalities, regional disparities and health inequity in North African countries. *Int J Equity Health*. 2011 May 31;10:23.
 27. Rettenmaier AJ, Wang Z. Regional variations in medical spending and utilization: a longitudinal analysis of US Medicare population. *Health Econ*. 2012 Feb;21(2):67–82.

28. Latulippe K, Hamel C, Giroux D. Social Health Inequalities and eHealth: A Literature Review With Qualitative Synthesis of Theoretical and Empirical Studies. *J Med Internet Res*. 2017 Apr 27;19(4):e136.
29. Gagnon M-P, Duplantie J, Fortin J-P, Landry R. Implementing telehealth to support medical practice in rural/remote regions: what are the conditions for success? *Implement Sci*. 2006 Aug 24;1:18.

Tables

Table 1. Probability of use of teleconsultation (coefficients).

	Prior to the COVID-19 crisis	During the first lockdown	
	Teleconsultation	Teleconsultation	Online consultation
Training			
Training received	1.751*** (0.596)	2.126 (1.352)	-0.0863 (0.601)
Need of training	0.174 (0.401)	-0.569 (0.815)	-1.541*** (0.558)
Main benefits			
Public health	1.200 (1.354)	3.131** (1.227)	2.462*** (0.634)
Patient's request	1.585** (0.650)	0.250 (0.996)	0.483 (0.557)
Healthcare access	0.984 (0.642)	2.117** (0.955)	1.893*** (0.567)
Patient's follow-up	0.240 (0.714)	1.259 (1.099)	0.123 (0.567)
Main drawbacks			
Not efficient	-0.691 (0.448)	-1.481 (0.962)	-0.328 (0.737)
Not convenient		-1.146 (1.024)	-4.394*** (1.187)
Not truthful	0.354 (0.493)	1.482 (1.106)	0.200 (0.737)
Type of healthcare			

Gynecology follow-up	2.014 (1.506)	0.813 (1.341)	0.134 (0.642)
Contraception	2.178** (1.053)	0.794 (1.054)	1.073* (0.637)
Abortion	-2.686 (1.891)	-0.753 (1.410)	-0.0509 (0.626)
Pregnancy follow-up	0.242 (1.709)	-1.054 (1.153)	0.311 (0.577)
Childbirth classes	-0.605 (1.228)	-1.441 (1.013)	1.450*** (0.548)
Postpartum follow-up	-0.745 (1.518)	0.703 (1.149)	-0.913 (0.621)
Constant	-1.687*** (0.285)	-0.195 (0.826)	-2.325*** (0.737)
Observations	247	247	247
Pseudo R-squared	32.87	55.94	54.49

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2. Probability of provider's satisfaction with teleconsultation practice (coefficients).

	Prior to the COVID-19 crisis	During the first lockdown	
	Teleconsultation	Teleconsultation	Online consultation
Training			
Training received	1.133 (1.186)	1.615*** (0.620)	1.504** (0.711)
Need of training	-0.5327 (1.126)	-0.475 (0.472)	-1.209** (0.540)
Main benefits			
Public health	-0.2078 (1.124)	2.241*** (0.640)	1.710** (0.815)
Patient's request	0.777 (0.970)	-0.0841 (0.527)	-0.165 (0.618)
Healthcare access	2.210** (1.010)	0.926* (0.511)	1.138* (0.604)
Patient's follow-up	0.580 (1.239)	0.717 (0.484)	0.232 (0.577)
Main drawbacks			
Not efficient	-1.002 (1.319)	-0.215 (0.611)	0.478 (0.756)
Not convenient		-1.691* (0.942)	
Not truthful	-1.881 (1.651)	-1.715*** (0.576)	-1.849*** (0.637)
Type of healthcare			
Gynecology follow-up	3.707** 1.520	0.201 (0.487)	0.773 (0.558)

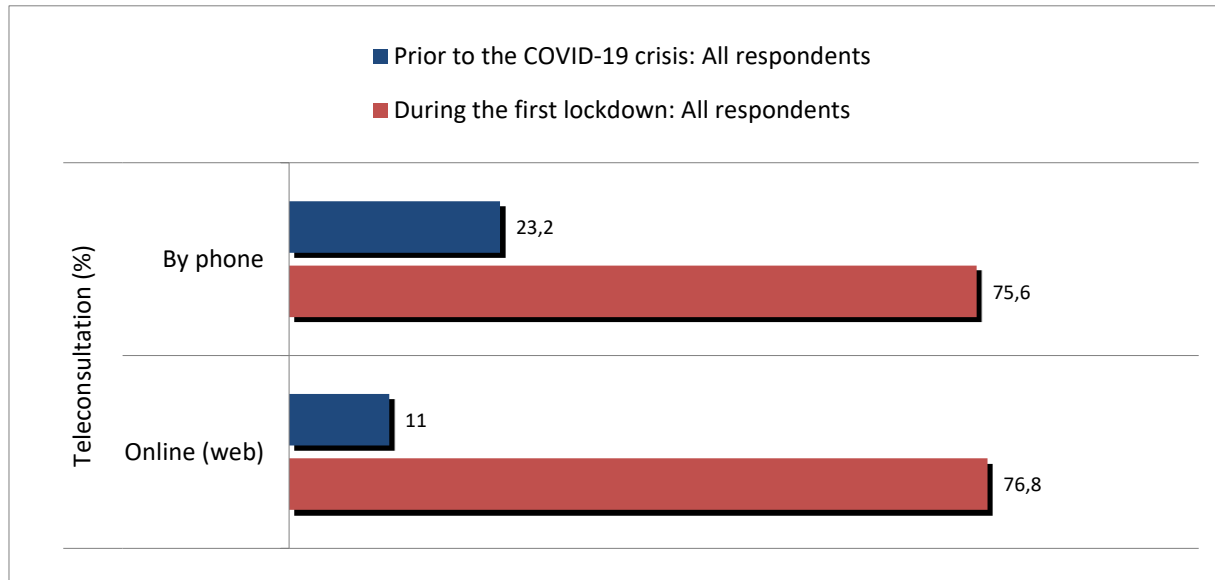
Contraception	0.901 1.208	0.468 (0.579)	-0.536 (0.723)
Abortion	-3.214 2.095	0.493 (0.535)	-0.0793 (0.579)
Pregnancy follow-up	-4.590 (3.906)	-0.265 (0.505)	0.175 (0.555)
Childbirth classes	2.787 (1.959)	0.211 (0.470)	0.309 (0.541)
Postpartum follow-up	1.392 3.296	0.662 (0.480)	0.711 (0.545)
Constant	-2.742*** 0.894	-2.092*** (0.744)	-0.769 (1.065)
Observations	75	228	187
Pseudo R-squared	44.64	36.40	23.24

Standard errors in parentheses

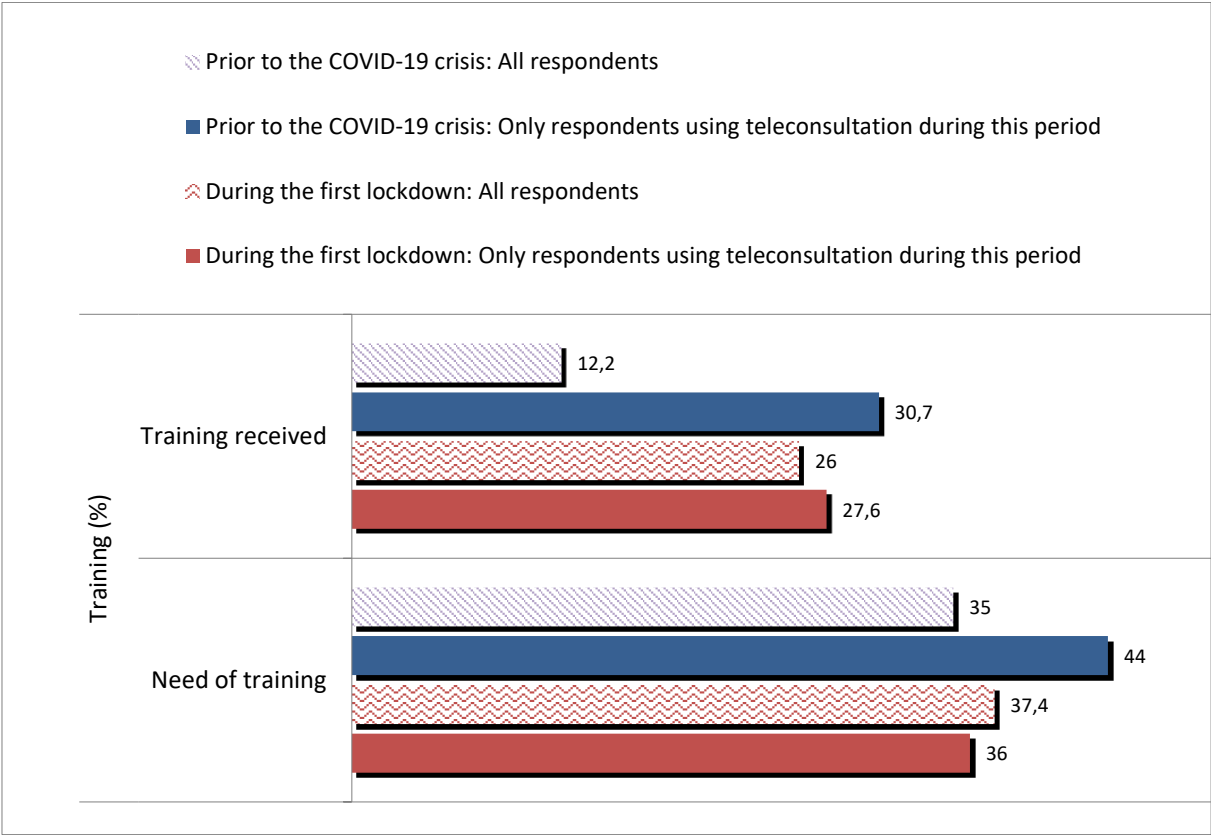
*** p<0.01, ** p<0.05, * p<0.1

Figures

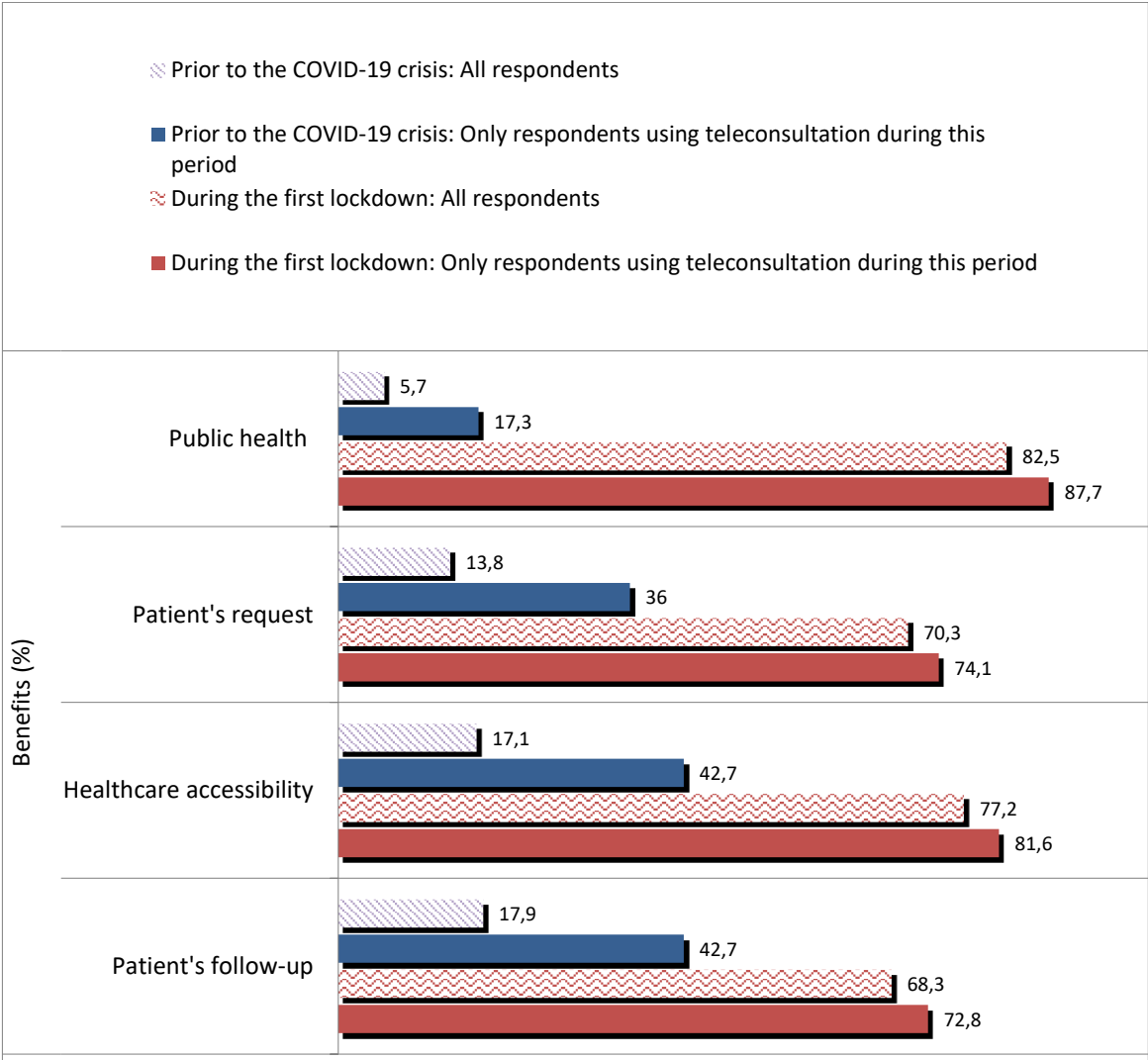
Graph 1: Use of teleconsultation (%)



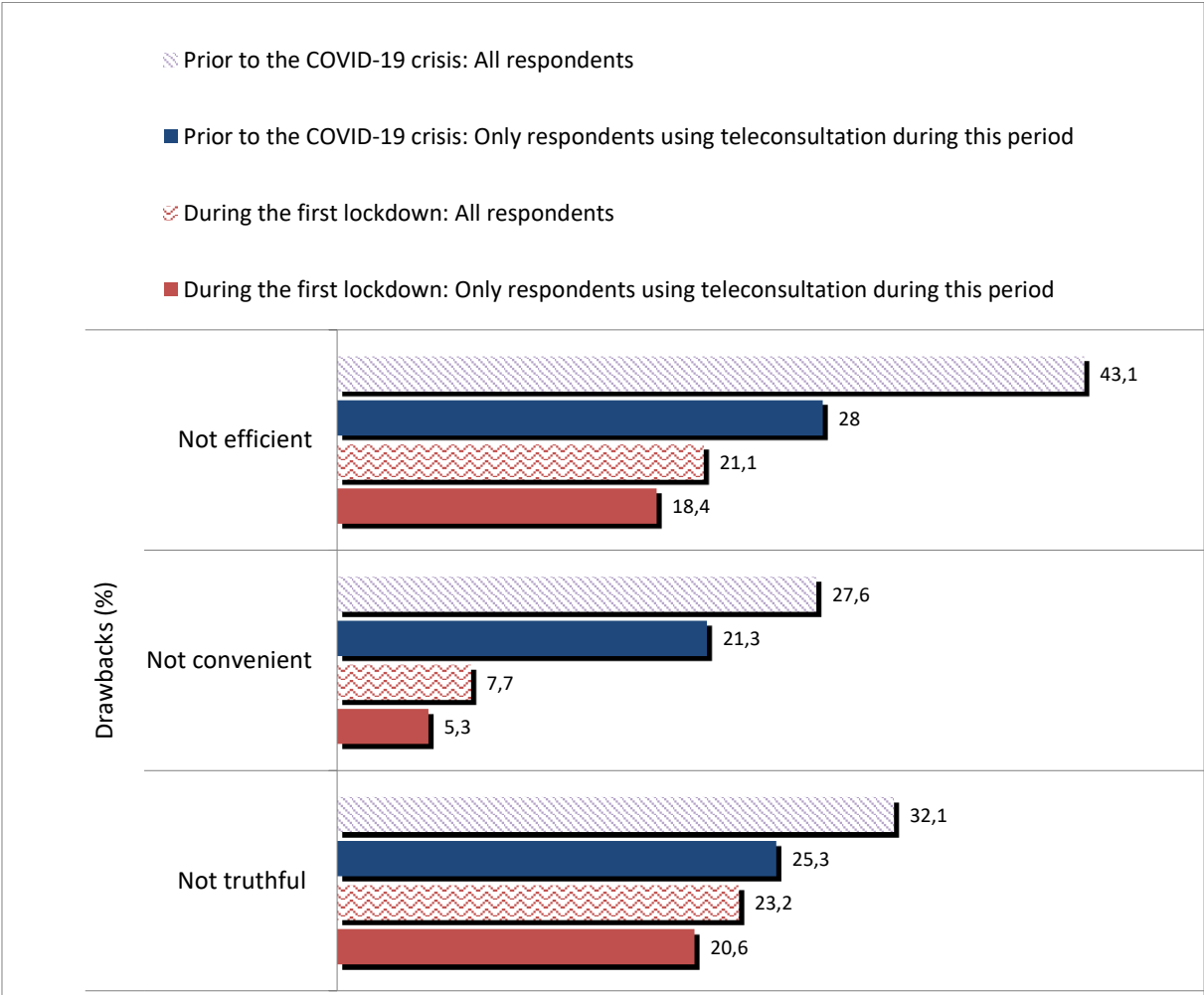
Graph 2: Training for teleconsultation (%)



Graph 3: Main benefits of teleconsultation (%)



Graph 4: Main drawbacks of teleconsultation (%)



Graph 5: Teleconsultation for which type of healthcare (%)

