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## SHORT COMMUNICATION

# The COVID-19 crisis and ART activity in France



## BIOGRAPHY

Pierre-Louis Bithorel graduated as a data science and social science engineer in 2017. He works in collaboration with the StimHo research team, whose studies focus on fertility treatments. His research interests include studying social inequalities in health and access to sexual and reproductive health.

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## ABSTRACT

**Research question:** What was the impact of the COVID-19 pandemic on assisted reproductive technology (ART) activity in public and private hospitals in France in 2020?

**Design:** All women who underwent oocyte retrieval in 2020 (study group,  $n = 40,759$ ) or in 2019 (comparison group,  $n = 52,403$ ) were selected from French national health insurance databases. The weekly ART activity in 2020 was compared with the weekly ART activity in 2019.

**Results:** In 2020, annual ART activity dropped by nearly 30% compared with 2019. Whereas weekly ART activity was at its normal level at the beginning of 2020, it sharply decreased and was almost non-existent during the first French lockdown (March–May 2020) in both public and private hospitals. After the first lockdown, private hospitals returned to their normal activity level within 1 month. In contrast, the activity of public hospitals remained well below normal until the summer break, before peaking at 40% of normal activity compared with an expected level of 57%. During the second French lockdown, ART activity was only slightly affected, principally in public hospitals where ART activity was around 48% compared with an expected level of 57%.

**Conclusions:** In countries where intensive care units are principally in public hospitals, greater disruption in public than in private hospitals may have led to an increase in health inequalities for ART activity, as for other healthcare.

## INTRODUCTION

Coronavirus disease 2019 (COVID-19) was declared a pandemic on 11 March 2020 by the World Health Organization (WHO). In order to contain its spread and to avoid the collapse of their health systems, many governments introduced restrictive measures following COVID-19 waves. In France during the year 2020, two lockdowns were imposed, a very

strict one during the first wave (17 March to 11 May) and a light one during the second wave (30 October to 15 December).

Following the WHO alert, the American and European fertility societies independently released statements in mid-March 2020 to recommend the discontinuation of assisted reproductive technology (ART) care (*COVID-19 Task Force of the ASRM 2020*, *ESHRE COVID-19 Working Group et al., 2020*). On 13 July 2020, while the second

wave was looming, their recommendations changed radically and they jointly urged a rapid resumption of reproductive care despite the spread of COVID-19, claiming that ‘infertility is time-sensitive, and prognosis worsens with age’ (*Veiga et al., 2020*). The delay in ART care was reported as endangering the reproductive rights of infertile couples, which are basic human rights. However, in the field, the ability of ART centres to resume their activity

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## KEYWORDS

Assisted reproductive technology  
COVID-19  
Fertility services

may have been limited by the emergency reorganization of healthcare.

The aim of the present paper was to assess the impact of the pandemic on ART activity in France during the year 2020 with its two COVID-19 lockdowns.

## MATERIALS AND METHODS

French national health insurance covers 99% of the resident population and exhaustively records healthcare reimbursements (Tuppin *et al.*, 2017). This study included all women ( $n = 40,759$ ) who underwent oocyte retrieval (Supplementary Table 1) between 1 January 2020 and 31 December 2020. The comparison group included all women ( $n = 52,403$ ) who underwent oocyte retrieval between 1 January 2019 and 31 December 2019.

Weekly ART activity was observed from week 1 to week 52. This was recorded as  $ART_{y,i}$  and estimated as the total number of oocyte retrievals carried out

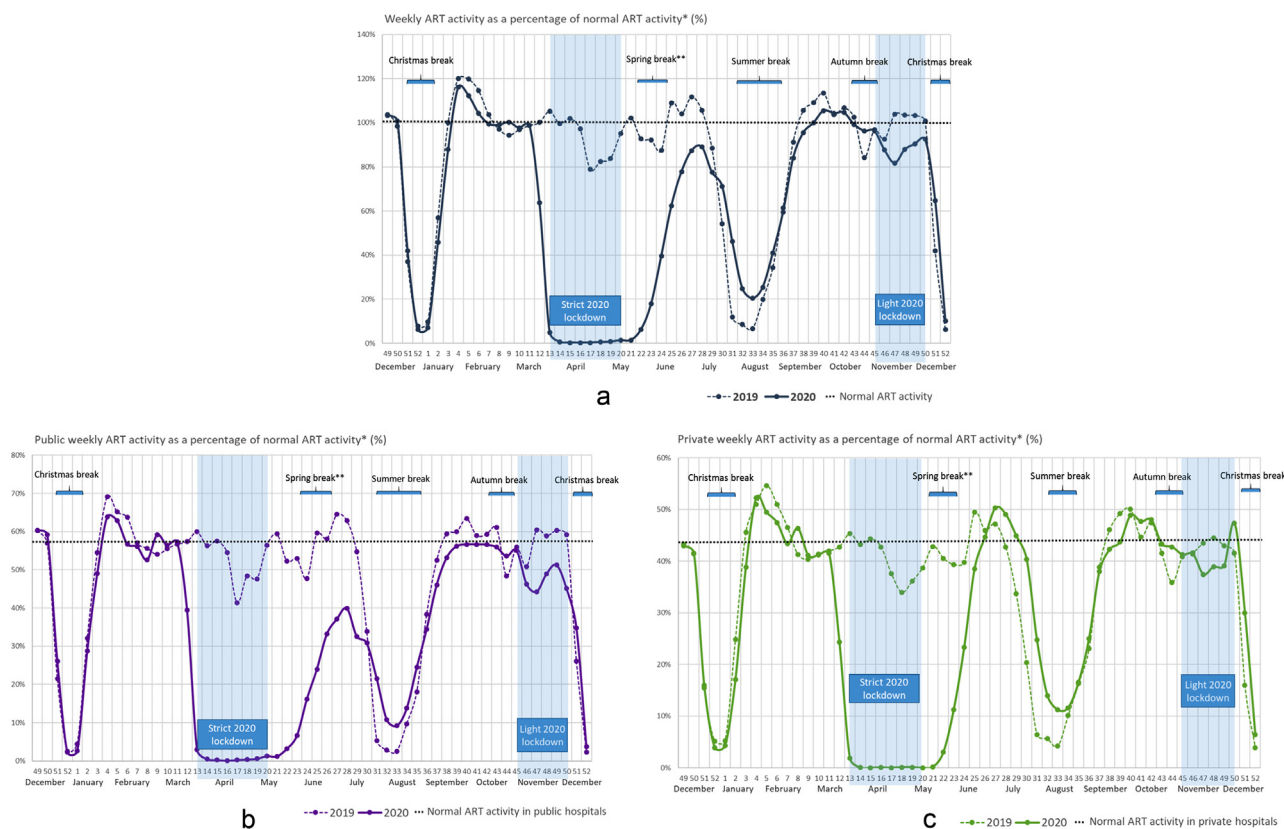
during week  $i$  of year  $y$  as a percentage of normal ART activity. Normal ART activity was the average weekly ART activity in 2019, after excluding the weeks with low activity due to the annual Christmas and summer breaks (Supplementary Figure). The indicator  $ART_{y,i}$  was expressed as a percentage, so that 100% indicated weekly ART activity identical to normal ART activity, 10% indicated weekly ART activity corresponding to only 10% of normal ART activity (i.e. a 90% decrease compared with a normal week) and 140% indicated a weekly ART activity that was 40% above normal ART activity.

Weekly ART activity was explored in all French hospitals and then analysed separately for public and private hospitals. In order to take into account the usual weekly variations in ART activity, all analyses were developed for 2020 (study group) and for 2019 (comparison group). Analyses were carried out using SAS version 9.4 (SAS Institute, Cary, NC).

## RESULTS

In 2020, ART activity decreased by nearly 30% compared with 2019 (Supplementary Table 2). FIGURE 1A shows the weekly ART activity for the year 2020 (solid curve) compared with 2019 (dotted curve). In 2019, ART activity varied around the normal ART activity level (black horizontal dotted line,  $\pm 20\%$ ) except during the Christmas and summer (August) breaks, when ART activity practically ceased. In 2020, from the start of the first lockdown, weekly ART activity sharply decreased to almost nil until 2 weeks after the end of the first lockdown. From then onwards, ART activity increased and was higher in the 2020 summer break than in the same period in 2019. ART activity returned to a normal level in mid-September 2020. During the second lockdown, at the end of 2020, weekly ART activity was slightly below normal.

In 2019, public hospitals accounted for 57% of the total ART activity (FIGURE 1B) and private hospitals for 43% (FIGURE 1C). After the first lockdown, private hospitals caught



**FIGURE 1** Variations in weekly assisted reproductive technology (ART) activity in 2019 and 2020 in French public and private hospitals. (A) All hospitals, (B) public hospitals, and (C) private hospitals. Normal ART activity was the average weekly ART activity in 2019 after excluding the weeks with low ART activity due to the annual Christmas and summer breaks. \* The dates of the spring break vary each year and differ between the three large regions of France.

up from nil to normal ART activity in 1 month, whereas public hospitals remained well below their normal activity, peaking at 40% of normal activity compared with an expected level of 57%. On average, public hospitals accounted for only 43% of ART activity in France from the end of the first lockdown to the summer break (weeks 23–33) compared with the normal level of 57%. In both private and public hospitals, ART activity was higher in the 2020 summer break than in 2019. During the second lockdown, ART activity decreased only slightly compared with 2019, with the greatest deviation from normal ART activity being observed during week 47 in public hospitals.

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## DISCUSSION

Following the European and American guidelines, ART activity completely ceased during the first French lockdown whereas it only slightly decreased during the second one. After the first lockdown, catch-up was faster in private than in public hospitals.

Differences in catch-up between private and public hospitals probably reflected the tremendous mobilization of public hospitals for COVID-19 care, in France as in other countries. In most European countries, emergency services and intensive care units are largely located in public hospitals because of their high cost. Public hospitals were therefore under the greatest pressure during the pandemic. After the first COVID-19 wave, the resumption of other activities such as ART may have been delayed in public hospitals because ventilators, ultrasound equipment and staff were likely to be still reassigned to COVID-19 wards (*ESHRE COVID-19 Working Group, 2021*).

The greater disruption in public than private hospitals observed in this French study on ART probably reflected a much wider phenomenon that may have been observed in other countries where intensive care units are mostly in public hospitals, and in areas of healthcare other than ART. A lower ability of public than private hospitals to deliver current care during the pandemic may have played a part in the increase in health inequalities during this period.

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## DATA AVAILABILITY

Data will be made available on request.

## ACKNOWLEDGEMENTS

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## ETHICAL APPROVAL

This study is part of the StimHo research project that analyses data included in the French SNDS (*Système national des données de santé*) database that was created by National Decree (no. 2016-316, 13 October 2016; <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000033704169&fastPos=1&fastReqId=1623803831&categorieLien=id&oldAction=rechTexte> [open access]). French law (Deliberation no. 2016-263, 21 July 2016; <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000033028290> [open access]) allows the use of personal data from the SNDS for health research without requiring the express or written consent of individual participants. The French National Consultative Ethics Committee (CCNE) analysed ethical issues of big data and approved the use of personal data without requiring the individual's consent, considering that their use for public health research corresponds to an ethical principle of solidarity and fraternity (committee's opinion no. 130 in open access; [https://www.ccne-ethique.fr/sites/default/files/2021-02/avis\\_130.pdf](https://www.ccne-ethique.fr/sites/default/files/2021-02/avis_130.pdf) [open access]). All data of the SNDS are pseudonymized. Both authors (P.-L.B., E.L.R.) took SNDS training courses and obtained permission to access data remotely for the duration of the present project under the legal responsibility of Ined, which has permanent access (National Decree no. 2016-1871, 26 December 2016; <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000033702840&fastPos=14&fastReqId=129473540&categorieLien=id&oldAction=rechTexte> [open access]). The StimHo project received approval from the Ined ethics committee (March 2019).

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## AUTHORS' ROLES

P.-L.B. and E.L.R. were involved in the conception and design of the study. P.-L.B. and E.L.R. have access to the data. P.-L.B. managed the data and carried out statistical analysis with the help of E.L.R. Both authors interpreted the data, drafted the manuscript and read and approved the final version.

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## SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.rbmo.2023.02.004](https://doi.org/10.1016/j.rbmo.2023.02.004).

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