International Clinical and Medical Case Reports Journal
Research Article (ISSN: 2832-5788)

The Impact of COVID-19 Pandemic on Hospital Admissions, Operations, Heart attacks and Births in the Years 2018-2022 – Observational Study

Wojciech Krzyżanowski[1], Karolina Jasińska-Gniadzik[2], Maciej Kuśmierczyk[2*], Marta Szczerbińska[1], Paweł Natkowski[1], Marcin Grabowski[2]

[1]Cardiology Department, Masovian Specialist Hospital, Poland

[2]1st Chair and Department of Cardiology, Medical University of Warsaw, Poland

Citation: *Wojciech Krzyżanowski, Karolina Jasińska-Gniadzik, Maciej Kuśmierczyk, Marta Szczerbińska, Paweł Natkowski, Marcin Grabowski. The Impact of COVID-19 Pandemic on Hospital Admissions, Operations, Heart attacks and Births in the Years 2018-2022 – Observational Study. Int Clinc Med Case Rep Jour. 2024;3(4):1-8.*

Received Date: 07 April, 2024**; Accepted Date:** 12 April, 2024**; Published Date:** 14 April, 2024

[*]**Corresponding author:** Maciej Kuśmierczyk, 1st Chair and Department of Cardiology, Medical University of Warsaw, Poland

ABSTRACT

This article investigated the impact of the COVID-19 pandemic on healthcare system by examining the functioning of the Masovian Specialist Hospital in Ostroleka, Poland. The study included data gathered between January 1st, 2018 and July 7th , 2022. We considered March 14th , 2020 as the beginning of the pandemic in Poland and May 16, 2022 as the end. The total pool of patients admitted to the hospital in Ostroleka served as the study sample.

The analyzed metrics included hospital admissions, number of surgical operations, births and myocardial infarction cases. The data from the pre-pandemic and pandemic period were compared. The study found that during 2020 the total number of hospital admissions decreased by 17.1% compared to the previous year. In 2021, the situation improved by 8.2%. In 2020 there were 19.4% fewer operations than in 2019, and in 2021 it decreased by another 4.1%. In 2019 the number of births decreased by 20,2%, it increased in 2020 by 8,4%. A decrease by 21.2% was noted in 2021. In the first half of 2022 the monthly number of births oscillated only around 40. From January 2018 to July 2022, the number of heart attacks recorded did not change significantly.

Keywords: COVID-19; Sars-CoV2; Hospital functioning; Pandemic

INTRODUCTION

The COVID-19 pandemic significantly impacted the healthcare system worldwide, causing a drastic shift in the delivery of medical services. Hospitals were at the forefront of this change, with many experiencing significant changes in their daily functioning. As a result, certain services had to be prioritized or restructured, such as postponing elective surgeries and reducing outpatient appointments.

In this article we examined the impact of the pandemic on several key metrics: hospital admissions, number of operations, births and myocardial infarction (MI) cases in Masovian Specialist Hospital named after dr. Joseph

Psarski in Ostroleka over the period between the year 2018 and 2022. These categories were selected as they represent different areas of healthcare delivery. To assess the impact of the pandemic, we compared the data from the period of 2018 and 2019, with data from 2020-2022, during the pandemic. We aimed to identify any trends or changes in these key metrics that could be attributed to the pandemic.

By comparing the data from pre-pandemic and pandemic periods, we aimed to provide insights into the impact of COVID-19 pandemic on hospital services and patient outcomes. Our findings will undoubtedly contribute to the ongoing discussions on the long-term effects of the pandemic on the healthcare systems and inform future healthcare policies. To best of our knowledge it will be the first Polish article describing the impact of COVID-19 on hospital functioning.

METHODS

We conducted an analysis of the functioning of the Masovian Specialist Hospital named after dr. Joseph Psarski in Ostroleka in terms of: the total number of patient admissions, the number of deliveries, surgical operations and MI before and after the COVID-19 pandemic.

The study included data gathered between January 1st, 2018 and July 7th , 2022. We considered March 14th , 2020 as the beginning of the pandemic in Poland (the day when the state of epidemiological emergency was introduced) and May 16, 2022 as the end - when the state of emergency was lifted. The total pool of patients admitted to the hospital in Ostroleka served as the study sample. In order to conduct the study, we used data from the hospital's medical records, which were collected monthly, starting from the beginning of the study. In the analysis, in each of the four analyzed cases, we took into account only the number of patients, excluding information on their health, age or medical history. The results of the research are presented in the form of numerical and percentage charts. (Figures 1-4)

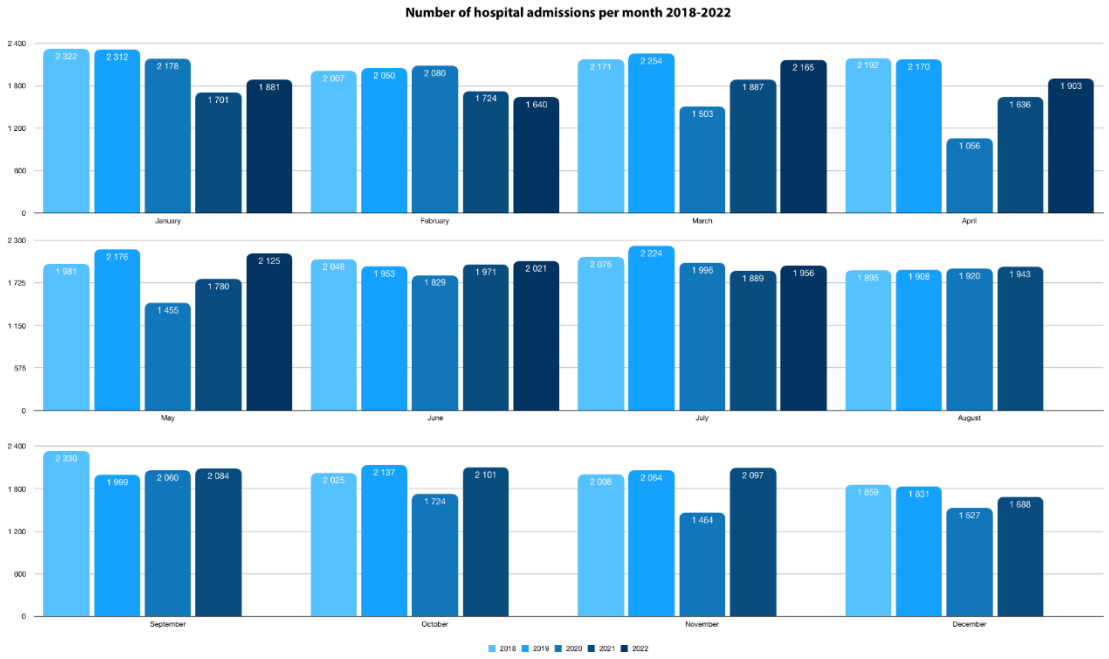

Figure 1

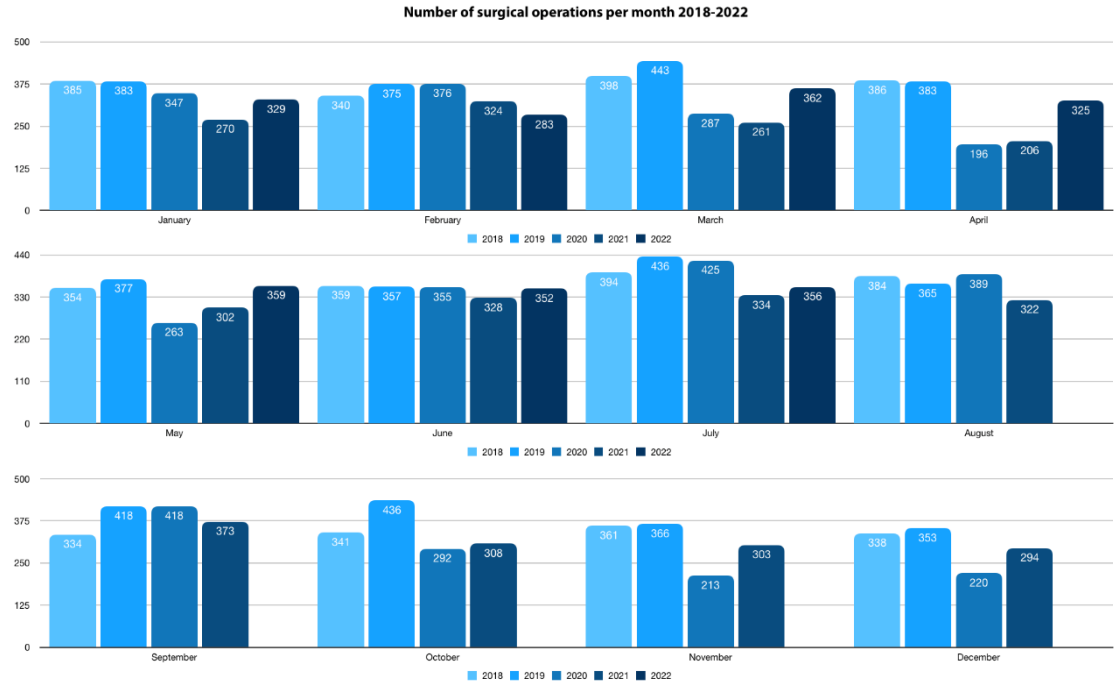

Figure 2

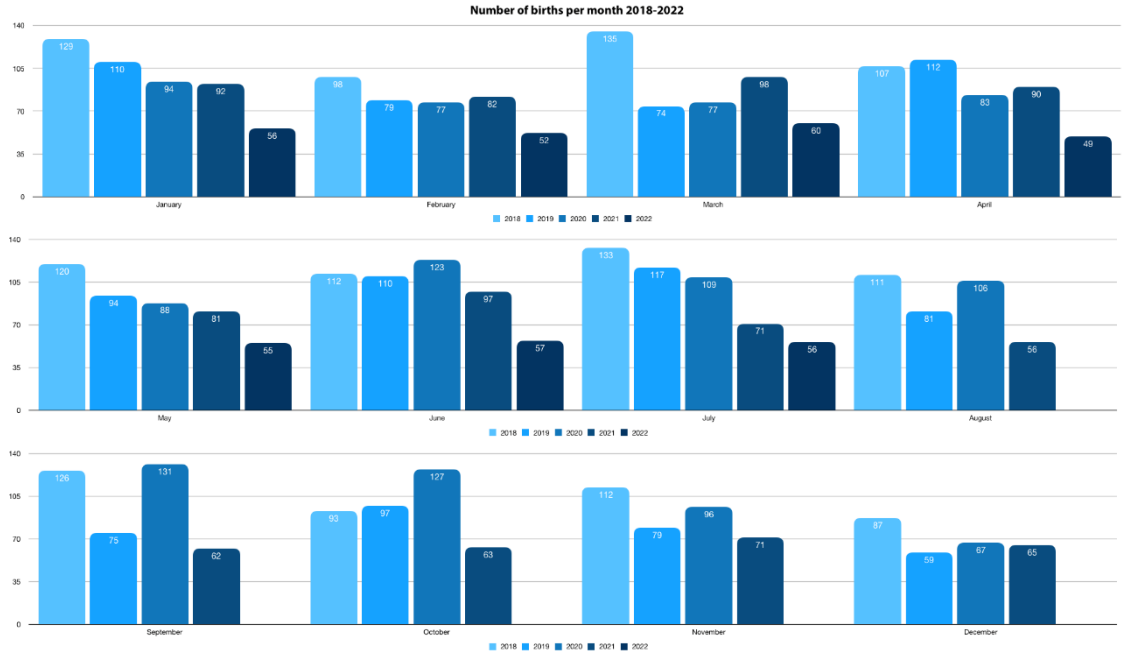

Figure 3

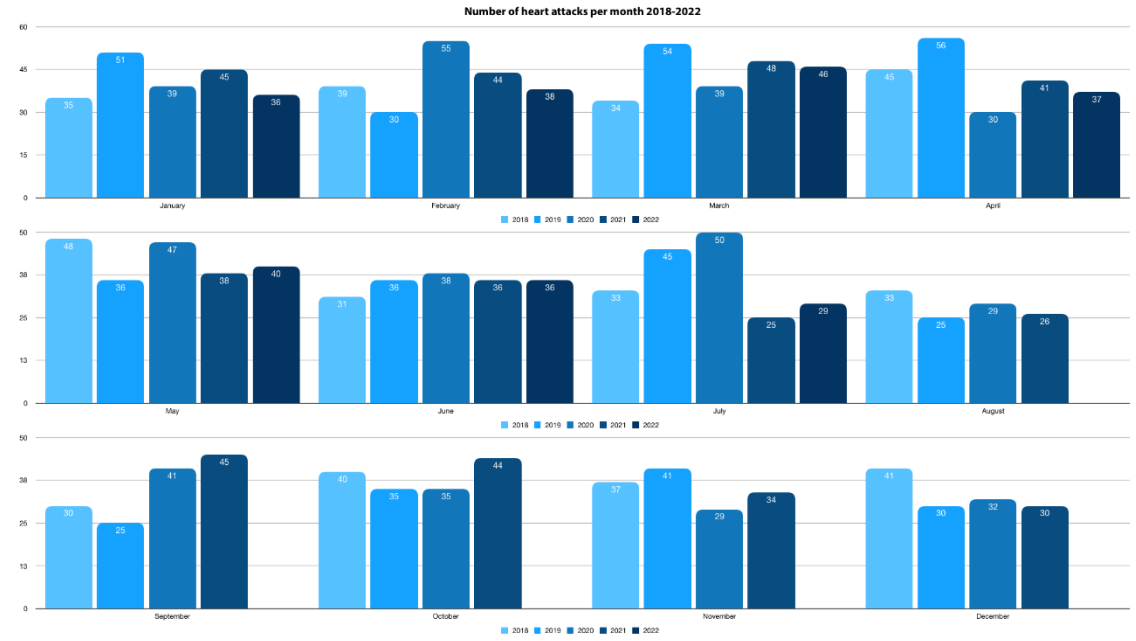

Figure 4

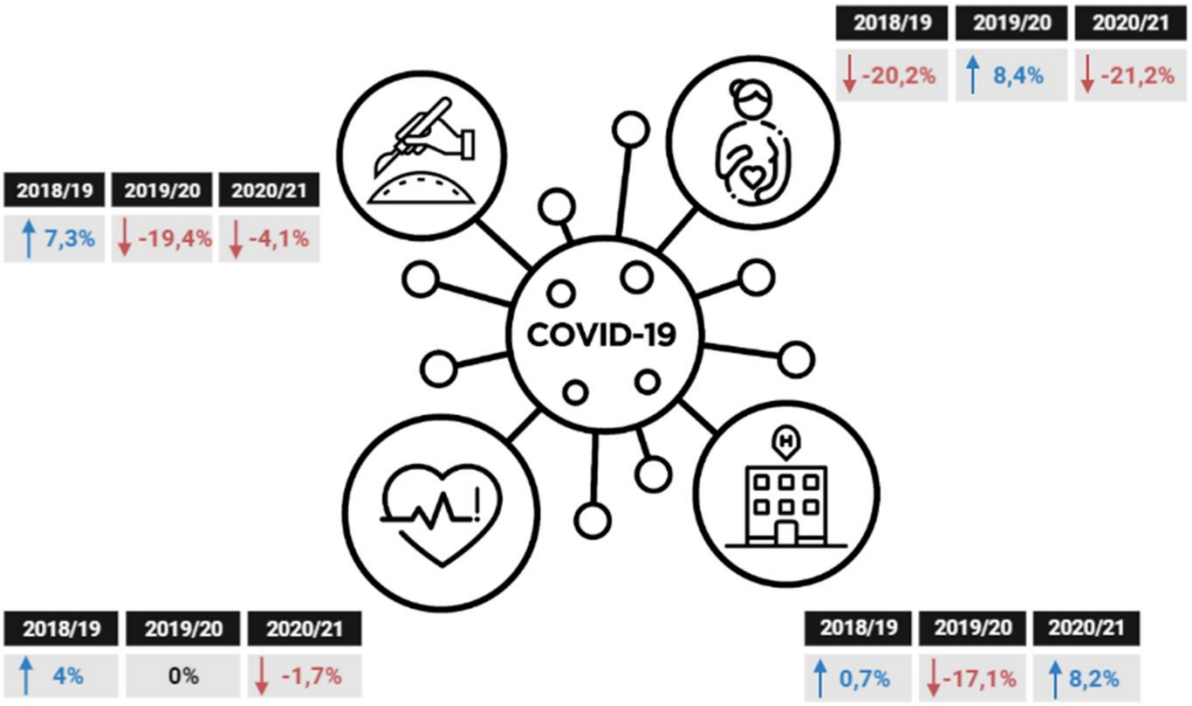

Figure 5

RESULTS

Hospital admissions

In the analyzed time periods, we described the total number of 106,975 patients admitted to the hospital, 2,321 of which due to SARS-CoV-2 infection. Prior to March 2020, the number of patients admitted each month fluctuated around 2,000 (Figure 1). Data shows that in the month when the COVID-19 pandemic began, this number fell to

1,503 (a decrease of 28% compared to the previous month), and in the following month, in April, there were 1,056 patients (a decrease of another 30% compared to March). There was an increase in May 2020, and more or less since then, the number of hospital admissions began to gradually increase month by month, reaching almost pre-pandemic numbers, but not breaking 2,000 admissions, until September 2020. Due to the second wave of the COVID-19 pandemic in the fall 2020, from October admissions fell again to around 1,500-1,700. This situation lasted until June 2021, where admissions began to return to pre-pandemic values and this number was maintained until the end of the study (July 2022). In total, during the pandemic year (2020), the total number of patients decreased by 17.1% compared to the previous year. In 2021, the situation improved by 8.2%.

First COVID-19 patient admissions began in March 2020 (7 patients). They peaked during the second wave of the pandemic (September 2020 - May 2021). Especially noteworthy are March and April 2021, where these numbers amounted to 243 and 235 patients, respectively.

Surgical operations

In the study period, a total of 18,838 surgical operations were performed (Figure 2). It can be observed that in 2018 and 2019, over 4,000 operations took place annually (4,374 and 4,692, respectively). In March 2020 there was a decrease in the number of procedures performed and it continued for 3 consecutive months until June. The next drop came during the second coronavirus wave in October. The downward trend continued until the end of the research, when in 2020 there were 19.4% fewer operations than in 2019, and in 2021 it decreased by another 4.1% compared to the previous year. The breakthrough year seemed to be 2022, when the trend was growing until the end of the research.

Births

Over the years we conducted the study, 4,941 deliveries took place in the hospital. Despite the fact that the largest number was recorded in 2018 and in 2019 this number decreased, in 2020 we did not document a decrease, and the value of births actually increased by 8,4% compared to the previous year. At the start of the pandemic in March and during the second wave in October 2020, the situation has not changed. A clear decrease in the number of births (by 21.2%) could be seen in 2021. The first half of 2022 was also not optimistic, where the monthly number of births oscillates only around 40, compared to maximum amount of 131 in September 2020 (Figure 3).

Heart attacks

From January 2018 to July 2022, the number of heart attacks recorded, year by year, did not change. Despite the fact that there were slight decreases in the months of the onset of the pandemic and the second wave, they did not affect the total annual result (Figure 4).

DISCUSSION

Our study investigated the changes in hospital admissions, surgical operations, births and MI during the pre-pandemic period and COVID-19 pandemic in one hospital. The findings showed that there was a significant decrease in hospital admissions and surgical operations during the pandemic. Births, on the other hand, decreased comparatively later – in 2021. The number of MI remained stable throughout the study period.

Regarding hospital admissions, the situation we have described is very similar to that described in Sierra Leone. Interestingly, there was a greater drop in admissions for men (by 18% compared to 12% for women).[5] Similarly, in the UK and Croatia, the number of patients admitted to hospital during the pandemic has decreased.[6,7]

In terms of the number of operations, we compared the results with a hospital in Brazil, where the number of corneal transplants also decreased.[8] Similarly, in China, where before the reorganization of hospitals and medical equipment due to the pandemic, the total number of operations decreased.[9] In an article from Spain, we can find that the waiting list for surgical procedures has increased dramatically.[10] The decrease in hospital admissions and surgical operations may have resulted from factors such as patient concerns about contracting COVID-19, the postponement of non-urgent procedures and redirections of healthcare sources to COVID-19 patients.

Some of our results were inconsistent with other ones. In studies conducted in Italy, admissions for acute MI (AMI) during the COVID-19 pandemic were reduced, whereas an increase in fatality and complications was observed.[1,2] These results were similar to ones conducted in America.[3] In one Chinese study, however, AMI admissions reduced in Beijing and an increase in heart failure admissions seven months post-pandemic period was not observed.[4]

Analyzing births, the hospital in Ostroleka stand out above others in their growth in 2020. This growth could be attributed to an increased time spent at home. When it comes to 2021, the situation here was similar to data from hospitals in Mexico, the USA and Australia. After the lockdown period, the number of births in 2021 decreased in each of the described cases,[11-13] presumably due to changes in family planning during unstable pandemic times. This trend is in line with global statistics - the world birth rate is constantly, minimally decreasing with each year.[14]

These findings suggest that the pandemic had a complex and multifaceted impact on healthcare systems and patient outcomes. It is important to note that the impact of the pandemic may vary depending on the hospital, region or population studied. Further research is needed to fully understand the long-term effects of COVID-19 pandemic on healthcare systems and patient outcomes. In Figure 5 we emphasized that COVID-19 is not only the pathogen of a serious infectious disease, but also a cause of many disturbances in healthcare system.

CONCLUSIONS

In conclusion, our study found a decrease in hospital admissions, surgical operations and births during the COVID-19 pandemic, which is consistent with findings of other research teams conducted in different parts of the world. The stable number of MI recorded throughout the study period may suggest that he pandemic did not have a significant impact on the incidence of this condition. However, it is important to note that the findings of our study and other studies may be influenced by various factors, such as healthcare system's capacity to manage the pandemic, patient behavior and government policies. An additional factor hindering the analysis and conclusions is the fact that wards/hospitals were temporarily closed due to COVID-19 or retrained into centers dedicated only to the treatment of patients with COVID-19.

Declarations

-Ethics approval and consent to participate : The article was approved by a Bioethics Committee of Medical University of Warsaw.

-Consent for publication : Not Applicable
-Availability of data and materials : All the datasets used are included in the published article.
-Competing interests : All authors have no competing interests to declare
-Funding : The research did not require any funding.
-Authors' contributions : K. W. - methodology, resources, supervision, formal analysis, J-G. K. - conceptualization, data curation, project administration, visualization, writing, K. M. - conceptualization, data curation, project administration, visualization, writing, S. M. - methodology, resources, investigation, N. P.. - methodology, resources, investigation, G. M. – supervision.
- Acknowledgements: Not applicable
- Authors' information: Not applicable

REFERENCES

1. De Rosa S, Spaccarotella C, Basso C, Calabrò MP, Curcio A, Filardi PP, et al. Reduction of hospitalizations for myocardial infarction in Italy in the COVID-19 era. Eur Heart J. 2020;41: 2083–2088.
2. De Filippo O, D'Ascenzo F, Angelini F, Bocchino PP, Conrotto F, Saglietto A, et al. Reduced Rate of Hospital Admissions for ACS during Covid-19 Outbreak in Northern Italy. N Engl J Med. 2020;383:88–89.
3. Solomon MD, McNulty EJ, Rana JS, Leong TK, Lee C, Sung S-H, et al. The Covid-19 Pandemic and the Incidence of Acute Myocardial Infarction. N Engl J Med. 2020;383: 691–693.
4. He L, Lu F, Du X, Long D, Sang C, Tang R, et al. Impact of COVID-19 Pandemic on Hospital Admissions of Acute Coronary Syndrome: A Beijing Inpatient Database Study. Lancet Reg Health West Pac. 2022;19:100335.
5. Sevalie S, Youkee D, van Duinen AJ, et al. The impact of the COVID-19 pandemic on hospital utilisation in Sierra Leone. BMJ Global Health. 2021;6:e005988.
6. Kalanj K, Marshall R, Karol K, Kujundžić Tiljak M, Orešković S. The Impact of COVID-19 on Hospital Admissions in Croatia. Front Public Health. 2021:9:720948.
7. Reschen ME, Bowen J, Novak A. et al. Impact of the COVID-19 pandemic on emergency department attendances and acute medical admissions. BMC Emerg Med. 2021;21(1):143.
8. Moriyama, Aline Silveira MD, Erbs Pessoa, João Luís PhD, Silva Bessa, Taciana Ribeiro DDM Pereira, et al. The Impact of the COVID-19 Pandemic on Corneal Transplantation in Brazil. Cornea. 2022;41(3):322-327.
9. Wei Y, Yu C, Zhao TX. et al. The impact of the COVID-19 pandemic on pediatric operations: a retrospective study of Chinese children. Ital J Pediatr. Ital J Pediatr . 2020;46(1):155.

10. García-Rojo E, Manfredi C, Santos-Pérez-de-la-Blanca R, et al, Impact of COVID-19 outbreak on urology surgical waiting lists and waiting lists prioritization strategies in the Post-COVID-19 era. Actas Urol Esp (Engl Ed). 2021;45(3):207-214.
11. Azcorra H, Salazar-Rendón JC, Rodríguez L, Vázquez-Vázquez A, Mendez-Dominguez N. The impact of COVID-19 on the number of births in Yucatan, Mexico. Am J Hum Biol. 2023;35(4):e23849.
12. Rodney A. McLaren Jr MD, Fatima Estrada Trejo MD, Matthew J. Blitz MD, MBA, et al, COVID-related "lockdowns" and birth rates in New York. Am J Obstet Gynecol MFM. 2021;3(6):100476.
13. Stansfield S, Rattan A, Mol BW, Rolnik DL, Malhotra A. Impact of the COVID-19 pandemic and multiple community lockdowns on total live birth rates and preterm births in Melbourne, Australia. Aust N Z J Obstet Gynaecol . 2022;62(5):786-789.
14. United Nations, Department of Economic and Social Affairs, Population Division, accessed 10 May 2023.