Research Article

# Obstetric Referral System during COVID-19 Pandemic : Tertiary Referral Hospital Perspective

## Sistem Rujukan Obstetri dalam Masa Pandemi COVID-19 : Perspektif Rumah Sakit Rujukan Tersier

**Arietta R. D. Pusponegoro, Chakti A. Swastika, Junita Indarti**

Department of Obstetrics and Gynecology
Faculty of Medicine Universitas Indonesia
Dr. Cipto Mangunkusumo General Hospital
Jakarta

## Abstract

**Objective:** To evaluate the effectiveness of obstetric referrals to the dr. Cipto Mangunkusumo National Central General Hospital (RSCM), Jakarta, Indonesia, during the COVID-19 pandemic.

**Methods:** This was a cross-sectional that compared the effectiveness of referrals before (July-December 2019) and during the COVID-19 pandemic (March-August 2020) at the National Central General Hospital dr. Cipto Mangunkusumo (RSCM). Referral effectiveness is assessed based on two criteria, namely the suitability of the diagnosis and procedural compliance which includes communication through the integrated emergency response system (SPGDT), delivery by ambulance, and attachment of a referral letter.

**Results:** The study found 198 referral cases from 464 obstetric cases (42.67%) before the pandemic and 231 referral cases from 486 obstetric cases (47.53%) during the pandemic. The diagnostic concordance increased from 57.58% before the pandemic to 71.00% during the pandemic (p = 0.004). Referral procedural compliance increased from 28.28% before the pandemic to 45.45% during the pandemic (p < 0.001). Based on these criteria, the effectiveness of referrals at the RSCM during the COVID-19 pandemic era was found to be significantly higher, namely before the pandemic by 21.72% and during the pandemic by 40.26% (p < 0.001).

**Conclusion:** The effectiveness of referral to the RSCM based on the suitability of the diagnosis and the accuracy of the procedure during the COVID-19 pandemic was found to be better than before the pandemic.

**Keywords:** COVID-19, obstetric referral system, pandemic.

## Abstrak

**Tujuan:** Untuk menilai efektivitas rujukan obstetri ke Rumah Sakit Pusat Nasional dr. Cipto Mangunkusumo, Jakarta, Indonesia, selama pandemi COVID-19

**Metode:** Penelitian ini merupakan penelitian dengan desain potong lintang yang membandingkan efektivitas rujukan sebelum (Juli-Desember 2019) dan saat pandemi COVID-19 (Maret-Agustus 2020) di Rumah Sakit Umum Pusat Nasional dr. Cipto Mangunkusumo (RSCM). Efektivitas rujukan dinilai berdasarkan dua kriteria, yakni kesesuaian diagnosis dan kepatuhan prosedur yang meliputi komunikasi melalui sistem penanggulangan gawat darurat terpadu (SPGDT), pengantaran dengan ambulans, dan pelampiran surat rujukan.

**Hasil:** Penelitian menemukan 198 kasus rujukan dari 464 kasus obstetri (42,67%) sebelum pandemi dan 231 kasus rujukan dari 486 kasus obstetri (47,53%) saat pandemi. Kesesuaian diagnosis meningkat dari 57,58% sebelum pandemi menjadi 71,00% saat pandemi (p = 0,004). Kepatuhan prosedur rujukan meningkat dari 28,28% sebelum pandemi menjadi 45,45% saat pandemi (p < 0,001). Berdasarkan kriteria tersebut, efektivitas rujukan di RSCM pada era pandemi COVID-19 ditemukan lebih tinggi secara signifikan, yakni sebelum pandemi sebesar 21,72% dan saat pandemi sebesar 40,26% (p < 0,001).

**Kesimpulan:** Efektivitas rujukan ke RSCM berdasarkan kesesuaian diagnosis dan kepatuhan prosedur saat pandemi COVID-19 ditemukan lebih baik.

**Kata kunci:** COVID-19, pandemi, sistem rujukan obstetri.

## INTRODUCTION

Based on the 2019 Indonesian Health Profile, the Maternal Mortality Rate (MMR) in Indonesia has decreased from 390 per 100,000 in 1991 to 305 per 100,000 in 2015. However, this figure has not met the 2015 Millennium Development Goals (MDGs) target, which is 102 per 100,000 live births.[1] The MMR in Jakarta Special Capital Region in 2015 was quite good, at 38 per 100,000 live births.[2] This fact indicates that there is still a lot that needs to be improved in maternal health services in Indonesia, especially to achieve the MMR target based on the Sustainable Development Goals (SDGs), which is 70 per 100,000 live births.[3]

According to the International Federation of Gynecology Obstetrics (FIGO), the pillars of emphasis on maternal mortality include women's status and gender equality, family planning and reproductive health, clean, safe, and competent delivery, and basic and comprehensive emergency obstetric and neonatal services.[4] An important aspect of obstetric care is an effective referral system. Regulation of Minister of Health No. 001/2012 concerning the Individual Health Service Referral System states that health services are carried out in stages so that the initial treatment is carried out by primary health facilities.[5] Patients can be referred to a referral health facility based on medical indications and if the referrer is unable to provide health services.[6] This tiered referral system is also supported by the mandatory membership of the Health Social Security Administering Body based on Law no. 40/2004.[7]

The Coronavirus Disease 2019 (COVID-19) pandemic presents its challenges for the health situation in Indonesia. The Task Force for Handling COVID-19 on January 27th, 2021, reported 1,024,298 confirmed cases of COVID-19, 9.6% of whom were pregnant women. A total of 28,855 COVID-19 patients died, 0.3% of whom were pregnant women.[8] The pandemic in particular is feared to have an impact on the obstetrical referral system. Health facilities are not fully prepared to provide adequate obstetric services amid a pandemic due to limited personal protective equipment (PPE), infrastructure, and health workers. Hospitalization capacity is reduced to make room for the handling of COVID-19 patients. This limits the ability of referral health facilities to receive referrals. In response to this, primary-level health facilities are encouraged to conduct planned referrals using information technology and improve service quality to increase referral effectiveness.[9]

Concerns about the referral system are based on data from the Health Social Security Administering Body for the period January-February 2015. Primary health facilities were found to refer 15.3% of cases, higher than the mandated limit, which is below 5%.[10] The same data also found that 1.47% of referral cases did not need to be referred.[11] This shows that primary-level health facilities have not succeeded in becoming gatekeepers even in non-pandemic situations. Some of the reasons for the ineffectiveness of the referral system include the lack of public understanding of the referral system, the tendency of patients towards certain health facilities, non-compliance with standard operating procedures, weak regulations, and inadequate facilities.[12,13] Considering that there has never been an assessment of the effectiveness of the obstetric referral system during the COVID-19 pandemic, this study was conducted to determine the effectiveness of obstetric referrals to the dr. Cipto Mangunkusumo National Central General Hospital (RSCM) during the COVID-19 pandemic.

## METHODS

This was a cross-sectional study. This study had been approved by the Ethics Committee of the Faculty of Medicine Universitas Indonesia-RSCM and has received permission to research at the RSCM. The inclusion criteria for this study were all pregnant patients who came to the RSCM Emergency Installation in July-December 2019, March-August 2020 with a referral letter. The selection of the July-December 2019 timeframe as the reference inclusion criteria before the pandemic was carried out, because this timeframe was the closest timeframe before the pandemic which began in January 2020. Meanwhile, the selection of the March-August 2020 timeframe as the referral inclusion criteria during the pandemic was carried out by considering that the first case of COVID-19 in Indonesia only occurred in March 2020, even though the COVID-19 outbreak has spread in many parts of the world since January 2020. Patients with incomplete medical record data were excluded from this study. The research sample was taken by total sampling.

Data was collected from the administration book of the RSCM Emergency Unit and

medical records. The data taken included patient characteristics (age, education, marital status, history of parity, gestational age), data related to referral (origin of the referrer, availability of referral letters, referrals through the integrated emergency response system (SPGDT), transportation), and components of referral letters. (reason for referring, referral diagnosis, treatment, attachment of supporting examination). Referrals are said to be effective by looking at two indicators, namely the suitability of the diagnosis and the compliance of procedures based on three things; referral through SPGDT, transportation by ambulance, and attachment of referral letter.

The data obtained were entered into Microsoft Excel and analyzed using the Statistical Program for Social Sciences (SPSS) version 22.0. The descriptive and analytic statistics were conducted to describe the effectiveness of referrals, appropriateness of diagnosis, compliance with procedures, characteristics of referring health facilities, and cases referred to RSCM.

## RESULTS

**Table 1.** Characteristics of Patients

| Variables | Pre-Pandemic | | Pandemic | |
|---|---|---|---|---|
| | N = 198 | % | N = 231 | % |
| **Age group (y o)** | | | | |
| < 19 | 4 | 2.02 | 2 | 0.87 |
| 19-35 | 160 | 80.81 | 173 | 74.89 |
| > 35 | 34 | 17.17 | 56 | 24.24 |
| **Marital status** | | | | |
| Unmarried | 4 | 2.02 | 3 | 1.30 |
| Married | 194 | 97.98 | 228 | 98.70 |
| **Education** | | | | |
| Lower education | 16 | 8.08 | 24 | 10.39 |
| High school | 134 | 67.68 | 130 | 56.28 |
| Diploma/University | 48 | 24.24 | 77 | 33.33 |
| **Parity** | | | | |
| Nullipara | 71 | 35.86 | 74 | 32.03 |
| Primipara | 47 | 23.74 | 57 | 24.68 |
| Multipara | 80 | 40.40 | 100 | 43.29 |
| **Gestational age (weeks)** | | | | |
| < 14 | 10 | 5.05 | 6 | 2.60 |
| 14-28 | 28 | 14.14 | 18 | 7.79 |
| 29-36 | 90 | 45.46 | 88 | 38.10 |
| ≥ 37 | 70 | 35.35 | 119 | 51.51 |
| **Diagnosis** | | | | |
| Abortus | 5 | 2.53 | 5 | 2.16 |
| Dystocia | 7 | 3.54 | 6 | 2.60 |
| Eclampsia and severe preeclampsia | 56 | 28.28 | 52 | 22.51 |
| Ectopic pregnancy | 5 | 2.53 | 4 | 1.73 |
| Antepartum hemorrhage | 17 | 8.59 | 23 | 9.96 |
| High-risk pregnancy | 107 | 54.04 | 111 | 48.05 |
| Suspect COVID-19 | 0 | 0.00 | 24 | 10.39 |
| Not emergency | 1 | 0.51 | 6 | 2.60 |
| **Management** | | | | |
| Conservative | 6 | 3.03 | 9 | 3.90 |
| Curettage | 5 | 2.53 | 5 | 2.16 |
| Spontaneous | 37 | 18.69 | 43 | 18.61 |
| Induction | 13 | 6.57 | 16 | 6.93 |
| Vacuum | 7 | 3.54 | 7 | 3.03 |
| Forcep | 0 | 0.00 | 1 | 0.43 |
| C-section | 123 | 62.12 | 146 | 63.20 |
| Explorative laparotomy | 7 | 3.54 | 4 | 1.73 |

This study found that RSCM received more referral cases during the pandemic (231/484 cases, 47.53%) than before the pandemic (198/464 cases, 42.67%). Both before and during the pandemic, most of the referred patients were aged between 19-35 years (160/198, 80.81%; 173/231, 74.89%), married (194/198, 97.98%; 228/ 231, 98.70%), and have high school education (134/198, 67.68%; 130/231, 56.28%). Both before and during the pandemic, multiparous patients were the most referred to the RSCM (80/198, 40.40%; 100/231, 43.29%) compared to nulliparous and primiparous patients. Most patients who were 29 weeks gestation or more were referred either before or during the pandemic.

Both before and during the pandemic, high-risk pregnancies were the most common diagnosis of obstetric referral cases found in RSCM (107/198, 54.04%; 111/231, 48.05%). Antepartum hemorrhage was the third most common diagnosis before the pandemic (17/198 cases, 8.59%), while suspicion of COVID-19 was the third most common diagnosis during the pandemic (24/231 cases, 10.39%). Obstetric non-emergency referral cases were found to be higher during the pandemic (6/231 cases, 2.60%) than before the pandemic (1/198 cases, 0.51%). Cesarean section is the most commonly performed treatment for obstetric referral cases at RSCM.

Both before and during the pandemic, most referrals came from type-D hospitals (94/198, 47.47%; 87/231, 37.66%), On the other hand, referrals from type-A hospitals to RSCM were higher during the pandemic (19 /231 cases, 8.23%) compared to before the pandemic (1/198 cases, 0.51%). Both before and during the pandemic, most obstetric patients referred to the RSCM were not delivered via SPGDT (142/198, 71.72%; 126/231, 54.55%) and were not delivered by ambulance (142/198, 71.72%; 126/231, 54.55%). All patients were referred with the attached referral letter.

**Table 2.** Characteristics of Referrals

| Variables | Pre-Pandemic | | Pandemic | |
|---|---|---|---|---|
| | N = 198 | % | N = 231 | % |
| **Source of referral** | | | | |
| PHCs | 42 | 21.21 | 70 | 30.30 |
| Independent midwife practice | 13 | 6.57 | 15 | 6.49 |
| Type-D hospital | 94 | 47.47 | 87 | 37.66 |
| Type-C hospital | 2 | 1.01 | 10 | 4.33 |
| Type-B hospital | 46 | 23.23 | 30 | 12.99 |
| Type-A hospital | 1 | 0.51 | 19 | 8.23 |
| **Communication via SPGDT** | | | | |
| Done | 56 | 28.28 | 105 | 45.45 |
| Not done | 142 | 71.72 | 126 | 54.55 |
| **Patient's transport** | | | | |
| Ambulance | 56 | 28.28 | 105 | 45.45 |
| Personal vehicle | 142 | 71.72 | 126 | 54.55 |
| **Components of Referral Letters Diagnosis** | | | | |
| Included | 194 | 97.98 | 231 | 100.00 |
| Not included | 4 | 2.02 | 0 | 0.00 |
| **Supporting examinations** | | | | |
| Included | 153 | 77.27 | 192 | 83.12 |
| Not included | 45 | 22.73 | 39 | 16.88 |
| **Management** | | | | |
| Included | 82 | 41.41 | 120 | 51.95 |
| Not included | 116 | 58.59 | 111 | 48.05 |
| **Reason of Referral** | | | | |
| Included | 171 | 86.36 | 202 | 87.45 |
| Lack of human resources | 31 | 18.13 | 35 | 17.33 |
| Lack of facilities | 137 | 80.12 | 166 | 82.18 |
| Full capacity | 3 | 1.75 | 1 | 0.50 |
| Not included | 27 | 13.64 | 29 | 12.55 |

Both before and during the pandemic, most of the referral letters had included a diagnosis (194/198, 97.98%; 231/231, 100.00%) and supporting examinations (153/198, 77.27%; 192/231, 83.12%). More referral letters included management during the pandemic (12/231 cases, 51.95%) than before the pandemic (82/198 cases, 41.41%). Both before and during the pandemic, most of the referral letters also included the reason for the referral (171/198, 86.36%; 202/231, 87.45%). The absence of the required facilities is the most common reason for the referral of obstetric cases to the RSCM.

This study found more obstetric referrals to RSCM according to procedures during the pandemic (105/231 cases, 45.45%) than before the pandemic (56/198 cases, 28.28%). The accuracy of diagnosis was also found to be higher during the pandemic (164/231 cases, 71.00%) than before the pandemic (114/198 cases, 57.58%). The percentage of effectiveness of obstetric referrals before the pandemic was found to be 21.72% and during the pandemic, it was 40.26%. The bivariate analysis found significant differences in the three variables when compared before and during the pandemic.

**Table 3.** Effectivity of Referrals

| Variables | Pre-Pandemic | | Pandemic | | P-values |
|---|---|---|---|---|---|
| | N = 198 | % | N = 231 | % | |
| **Diagnostic accuracy** | | | | | 0.004 |
| Accurate | 114 | 57.58 | 57.58 | 71.00 | |
| Inaccurate | 84 | 42.42 | 42.42 | 29.00 | |
| **Procedural compliance** | | | | | <0.001 |
| Compliant | 56 | 28.28 | 28.28 | 45.45 | |
| Non-compliant | 142 | 71.72 | 71.72 | 54.55 | |
| **Referral effectivity** | | | | | <0.001 |
| Effective | 43 | 21.72 | 21.72 | 40.26 | |
| Ineffective | 155 | 78.28 | 78.28 | 59.74 | |

## DISCUSSION

This study found that RSCM received more referral cases during the pandemic than before the pandemic, in contrast to several studies that reported a decrease in obstetric cases during the pandemic. Twelve point nine percent reduction in admissions for obstetric cases[14]. Meanwhile, a decrease in obstetric case admissions of up to 49.8%, with the number of referral cases decreasing by 66.4%.[15] The decline in cases in these countries was due to lockdowns that restricted public movement and affected admissions, in contrast to Indonesia, which did not implement a lockdown. Public concerns also affect the decline in admissions.[14,15] On the other hand, although this study and both studies were conducted in a tertiary hospital, the position of the RSCM as the top referral hospital in the Indonesian health system may have caused the admission rate to increase during the pandemic.

Most of the obstetric referral patients were between 19-35 years old, either before or during the pandemic. This finding is almost the same as who reported that the proportion of patients aged 21-35 years was 66.1-78.8%.[16] Most of the referred patients in this study had a high school education. This is different from the findings

who reported more patients who graduated from elementary-junior high school (46.3%).[17] This difference can occur considering that this study was conducted at a referral center hospital in Jakarta, in contrast which uses data from the 2016 National Health Indicators Survey taken from all over Indonesia.[17]

Most of the patients referred to RSCM were multiparous patients both before and during the pandemic, in contrast to the findings that most of the referral patients were nulliparous patients, which ranged from 38.1 to 52.4%.[16] On the other hand, this study and the research of Madjid et al16 both reported patients of gestational age 29 weeks or more like the most frequently referred to the RSCM. The diagnosis of most obstetric referral cases is the high-risk pregnancy.[16] On the other hand, this study found the proportion of non-emergency cases was who reported the percentage of non-emergency cases in 2013-2014 of 6.1-6.9%.[16] The majority of referral cases in this study were managed by cesarean section. This figure is relatively higher than the percentage of cesarean sections in 2013-2014 of 35.9-49.6%.

The majority of referral cases came from type-D hospitals, different from the findings of Madjid et al16 in 2013-2014 which reported that most of the referrals came from community

health centers or clinics. With a reduced portion of referrals from community health centers or clinics and an increase in the portion of referrals from type-D hospitals, we suspect an increase in tiered referral compliance.[16] On the other hand, an increase in referrals from type-A hospitals to RSCM was found in this study. This is interesting, considering that it is not common for type-A hospitals to make referrals to another type-A hospitals. This could be due to the establishment of several type-A hospitals as COVID-19 referral centers.[18] This causes a limited number of non-COVID-19 patients to be admitted or have to be transferred to other hospitals.

This study found that both before and during the pandemic, most of the obstetric referral cases received by RSCM were not carried out with the right procedure. The procedural errors made were not communicating with SPGDT and not delivering by ambulance, while all of them included a referral letter. Most of the referral letters have included the patient's diagnosis, supporting examinations, and reasons for referral, with an improvement trend during the pandemic. The treatment that has been given is a component that is relatively rarely listed. This finding is almost similar to the study who reported the inclusion of a diagnosis in the referral letter was 98.4%[19]. On the other hand, the inclusion of supporting examinations, reasons for referral, and treatment in the referral letter found relatively higher the inclusion of anamnesis, physical examination, reasons for referral, and therapy in the referral letter was 57.1%, 52.4%, 52.4%, and 30.2%, respectively.[21]

The diagnostic suitability rate in this study was higher during the pandemic. When compared with a diagnostic concordance of 78.0-88.6% in 2013-2014, the diagnostic concordance found in this study was relatively low.[16] The finding of concordance with the diagnosis after the pandemic is slightly higher who reported a 59% percentage of concordance between the referral diagnosis and the diagnosis at admission.[20]

This study found a significant increase in the proportion of effective referrals during the pandemic ($p < 0.001$) based on two criteria; diagnostic suitability ($p = 0.004$) and procedure compliance ($p < 0.001$). The inclusion of procedural compliance considers by-passing, a referral action that skips the level of health services, as one of the problems of the referral system.[21] By-passing causes a disproportionate burden on referral health facilities that should

only handle complex cases, such as the RSCM as the top referral health facility in the Indonesian health system. Previous studies have used various definitions of referral effectiveness. Using the appropriateness of the diagnosis as a criterion, found referral effectiveness of 90.3% in 2013 and 83.2% in 2014.[16]

Although few studies have addressed the effects of the pandemic on pregnancy outcomes,[22] admissions,[14] to procedural compliance,[23] Researchers have not found other studies that discuss the effect of the pandemic on the referral system. Therefore, this study is one of the first to discuss the impact of the pandemic on the obstetrical referral system, particularly in Indonesia. However, this study has not explored the reasons for the change in referral effectiveness. Further research needs to be done to study the possible causes, for example, qualitative research using focus group discussions involving health workers in primary and advanced health facilities.

On the other hand, this study also did not measure the impact of the pandemic on obstetric outcomes. Research on a wider scale by measuring the impact of obstetric outcomes needs to be carried out to get a more complete picture of how the reproductive health system in Indonesia is affected by the COVID-19 pandemic. Thus, this series of studies can contribute to preparing the health system in Indonesia, both during this pandemic or in dealing with other global health problems in the future.

## CONCLUSIONS

The effectiveness of referral to the RSCM based on the suitability of the diagnosis and compliance with procedures during the COVID-19 pandemic was found to be better. Further qualitative research is needed to find out the factors that increase the effectiveness of obstetric referrals during the pandemic.

## REFERENCES

1. Indonesia KK. Profil kesehatan Indonesia tahun 2011.http://perpustakaan.depkes.go.id:8180/handle/123456789/3257
2. Dinas Kesehatan DKI Jakarta. Profil Kesehatan DKI Jakarta Tahun 2015. http://www.depkes.go.id/resources/download/profil/PROFIL_KES_PROVINSI_2015/11_DKI_Jakarta_2015.pdf
3. SDGs http://sdgsindonesia.or.id/index.php/sdgs/itemlist/category/29-sdgs?start=12
4. Kementerian Kesehatan RI. Pedoman Penyelenggaraan Puskesmas Mampu PONED. Jakarta; 2012.

5.  Kementerian Kesehatan RI. Peraturan Menteri Kesehatan Nomor 001 Tahun 2012. http://www.fkm.ui.ac.id/sjsn

6.  Info BPJS Kesehatan "Kapitasi Berbasis Komitmen Pelayanan Dorong FKTP Tingkatkan Mutu Pelayanan." 2016. 38th ed. :3–4.

7.  Presiden RI. Undang-undang Republik Indonesia No. 40 Tahun 2004 tentang Sistem Jaminan Sosial Nasional-[PERATURAN]. 2004 http://perpustakaan.depkes.go.id:8180/bitstream/123456789/1957/1/UU2004-40.pdf

8.  Satuan Gugus Tugas Penanganan Covid-19. Data Sebaran 2020. https://covid19.go.id/peta-sebaran

9.  Pritasari K. Rujukan maternal di era pandemi COVID-19. Webinar Sistem Rujukan Maternal di Era Pandemi COVID-19; 2020 Apr 24.

10. Badan penyelenggara jaminan sosial kesehatan. Peraturan badan penyelenggara jaminan sosial kesehatan nomor 2 tahun 2015. 2015.

11. Tingkat Rujukan ke RS Tinggi 2015 . http://jkn.jamsosindonesia.com/home/cetak/462/Tingkat%20Rujukan%20ke%20RS%20Tinggi

12. Primasari KL. Analisis Sistem Rujukan Jaminan Kesehatan Nasional RSUD Dr. Adjidarmo Kabupaten Lebak. Jur Admin Kebijakan Kes. 2015;1(2):78–86.

13. Rukmini R, Ristrini R. Implementation of Maternal Reference System at Tambakrejo and Tanah Kali Kedinding Health Centres in Surabaya City. Buletin Penelitian Sistem Kesehatan. 2015;18 :365–75.

14. Anderson TS, Stevens JP, Pinheiro A, Li S, Herzig SJ. Hospitalizations for Emergent Medical, Surgical, and Obstetric Conditions in Boston During the COVID-19 Pandemic. J Gen Intern Med. 2020;35(10):3129–32.

15. Kumari V, Mehta K, Choudhary R. COVID-19 outbreak and decreased hospitalisation of pregnant women in labour. The Lancet Global Health. 2020;8(9):e1116–7.

16. Madjid OA, Pusponegoro ARD, Margatan IS. Evaluation of the Accuracy of Implementation of Obstetric Referral Cases to the Emergency in the JKN Era: Inajog. 2019;7(3):159-65.

17. Suparmi, Rizkianti A, Maisya IB, Saptarini I. Hubungan Kepemilikan Buku KIA Terhadap Peningkatan Pemanfaatan Pelayanan Kesehatan Maternal di Indonesia. Jur Kes Reprod. 2018;9(2):159–66.

18. Dinas Kesehatan DKI Jakarta. Jakarta Tanggap Covid-19. Jakarta Tanggap Covid-19. https://corona.jakarta.go.id/id

19. Nurrizka RH, Setiawati ME. Evaluasi Pelaksanaan Sistem Rujukan Berjenjang dalam Program Jaminan Kesehatan Nasional. Jurnal Kebijakan Kesehatan Indonesia : JKKI. 2019 ;8(1):35–40.

20. Setiawati ME, Nurrizka RH. Evaluasi pelaksanaan sistem rujukan berjenjang dalam program jaminan kesehatan nasional. Jur Kebijakan Kes Indones: JKKI https://doi org/1022146/JKKI. 2019;43843.

21. Ghardallou M, Limam M, Khelifi A, Khairi O, Khairi H, Mtiraoui A, et al. Obstetric referrals to a tertiary care maternity: a descriptive study. Pan Afr Med J. 2019;33(306). https://www.panafrican-med-journal.com/content/article/33/306/full/

22. McDonnell S, McNamee E, Lindow SW, O'Connell MP. The impact of the Covid-19 pandemic on maternity services: A review of maternal and neonatal outcomes before, during and after the pandemic. Eur J Obstet Gynecol Reprod Biol. 2020;255:172–6.

23. Kc A, Gurung R, Kinney MV, Sunny AK, Moinuddin M, Basnet O, et al. Effect of the COVID-19 pandemic response on intrapartum care, stillbirth, and neonatal mortality outcomes in Nepal: a prospective observational study. The Lancet Global Health. 2020 ;8(10):e1273–81.