



ORIGINAL RESEARCH



## The Population-Based Study of Oncology Surgery Department Service During COVID-19 Pandemic in Indonesia Single Center Hospital



Authors' Contribution:

- A – Study design;
- B – Data collection;
- C – Statistical analysis;
- D – Data interpretation;
- E – Manuscript preparation;
- F – Literature search;
- G – Funds collection

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**Background and  
Aim of Study:**

**Abstract**

The COVID-19 pandemic has posed an unprecedented threat to global healthcare delivery. Moewardi Hospital was appointed by the government of Indonesia to be a COVID-19 one of regional hospital by June 2020. Other than COVID-19 cases, the hospital also provides care for other diseases which also provides care for oncology patients.

The aim of the study: to assess the impact of the social restriction on oncology services in this hospital.

**Material and Methods:**

This study compares the number of patients undergoing oncology surgery in the Central Surgery Unit and the number of patients attending the Outpatient Surgical Oncology Unit in March to July 2020 with the number of patients in the same timeframe in the previous year (2019).

**Results:**

The number of oncology operations in the Central Surgery Unit of Moewardi Hospital declined substantially during the 5-month pandemic period compared to the same period in the previous year, 2019 ( $p < 0.001$ ). There was also a significant drop in the number of patients attending the outpatient surgical oncology clinic during the pandemic period compared to the previous year ( $p < 0.001$ ). The lowest number of oncology surgeries occurred in April 2020, which was 20 patients. The lowest number of patients visited was 170 outpatients in March 2020. Thyroid and skin cancer cases were the most notable decline in surgical oncology cases in the Central Surgery Unit. The largest number of outpatients in the outpatient surgical oncology clinic during the COVID-19 pandemic was mammae and thyroid cancer.

**Conclusions:**

There was a decline in surgical oncology activities, which culminated in a significant decrease in surgical oncology patients in the Central Surgery Unit and the patient visit to the Moewardi Hospital outpatient oncology clinic during the COVID-19 pandemic.

**Keywords:**

oncology, surgery, oncology patients, COVID-19, Moewardi Hospital

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## Introduction

On December 31st, 2019, Wuhan Municipal Health Commission, China, reported a cluster of cases of pneumonia of unknown origin in Wuhan, Hubei province (Taylor & Johnson, 2020). The case was later identified as the novel strain of coronavirus. On January 5th, 2020, World Health Organization (WHO) published the first disease outbreak on the new virus. Coronaviruses are a large family of viruses that cause illnesses ranging from the common cold to more severe disease. The new virus was then named the “COVID-19 virus”. It may enter the host through the respiratory tract or mucosal surface (such as conjunctiva). Symptoms usually begin with nonspecific syndromes, including fever, dry cough, and fatigue. Multiple systems may be involved including respiratory, gastrointestinal, musculoskeletal, and neurologic (Sharma et al., 2021; Wu et al., 2020).

It was not until early March 2020 did WHO announce the COVID-19 as a pandemic, the same month the COVID-19 first case was announced in Indonesia by the President of Indonesia (Setiawaty et al., 2020). The cases were then increased with the first local transmission occurred to a man 59 years old on March 11th, 2020. The virus mainly spread through direct means (droplet and human-to-human transmission). It can infect other people via respiratory droplets when a patient coughs, sneezes, or even talks within six feet area. In response to the case increase, the large-scale social restriction was then being applied to essential activities only. Visits to healthcare facilities and hospital admission were limited to urgent and emergency cases (Lotfi et al., 2020).

The COVID-19 pandemic has posed an unprecedented threat to global healthcare delivery. To deal with infected patients, hospitals that have a high volume of patients requiring critical care have redeployed staff and converted operating rooms into intensive care units (Usman et al., 2021). Also, clinicians must balance standard cancer therapies with measures designed to limit the spread of COVID-19. At the same time, health care workers face many challenges, including shortage of resources (e.g., personal protective equipment), excessive working hours, and psychological distress (Richards et al., 2020; Rocco et al., 2021). Patients in the current pandemic may prefer to postpone non-essential elective surgery due to the risk of contracting the disease while in the hospital. However, this fear may cause patients to delay seeking care for conditions that would otherwise be correctable or curable if presented earlier; loss of function and reduced life expectancy may be the result of delayed presentation and an untimely diagnosis (Soreide et al., 2020; Uimonen et al., 2021).

Moewardi Hospital is one of the hospitals that was appointed by the government to be a COVID-19 one of regional hospital by June 2020. Other than COVID-19 cases, the hospital also provides care for other diseases which also provides care for oncology patients. Several studies have reported the subsequent impact of hospital visits and admission because of the measurement during pandemics (lockdown, social distancing, and restriction) (Lotfi et al., 2020; Reichardt et al., 2020; Setiawaty et al., 2020). To assess the impact of the social restriction on

oncology services in this hospital (both surgery and outpatient departments), we compared the number of oncology surgeries and outpatient visits to the oncology department in our hospital during 2 periods, the first 5 months early lockdown period and the same periods in the previous year (2019).

*The aim of the study.* To assess the impact of the social restriction on oncology services in this hospital.

## Materials and Methods

We conducted a comparison study on the oncology service between two periods: during the first 5 months of the early COVID-19 pandemic and on the same period in the previous year. We examined the number of oncology surgeries and outpatient visits from March to July 2020 and compared it with the same month in the year 2019. The number of surgeries and outpatient visits was then analyzed separately. Data were obtained from the medical records of the oncology surgeries and outpatient visits.

The mean surgeries and visits per month were then calculated for each case to find out the proportion of surgeries and visits during the early pandemic period and the same timeframe in the previous year. The mean difference was analyzed by comparing the mean of the total case between two periods. All statistical data were analyzed using the independent sample t-test, performed using the Statistical Package for the Social Sciences (SPSS) for Windows version 25.0. The results of the difference between the number of oncology surgeries and the number of outpatient visits between the two periods were considered statistically significant if  $p < 0.05$ .

## Results

Table 1 shows the results for the total number of surgical oncology patients in both periods (2020 and 2019).

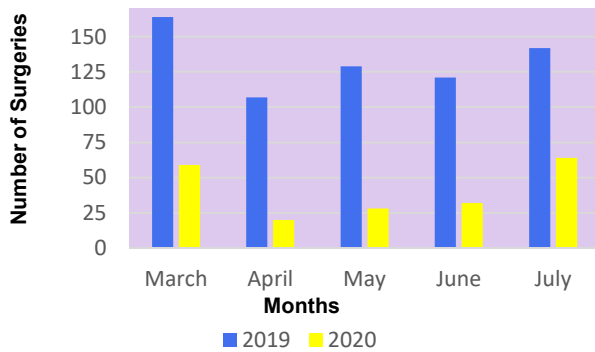
**Table 1**  
*The Number of Oncology Surgeries*

Month	Year	Surgery number	P value
March	2019	164	<0.001
	2020	59	
April	2019	107	<0.001
	2020	20	
May	2019	129	<0.001
	2020	28	
June	2019	121	<0.001
	2020	32	
July	2019	142	<0.001
	2020	64	

There was a significant decrease in the surgical oncology patients during the COVID-19 pandemic compared to the previous year. The number was notably low in the month after the first COVID-19 case was announced in Indonesia (April 2020), which was only a total of 20 patients of oncology surgeries compared to 107 patients in the same month the year before. The trend continued for few months and the number started to rise in June 2020 (Figure 1).



**Figure 1**  
 The Difference of Oncology Surgeries Between Two Periods



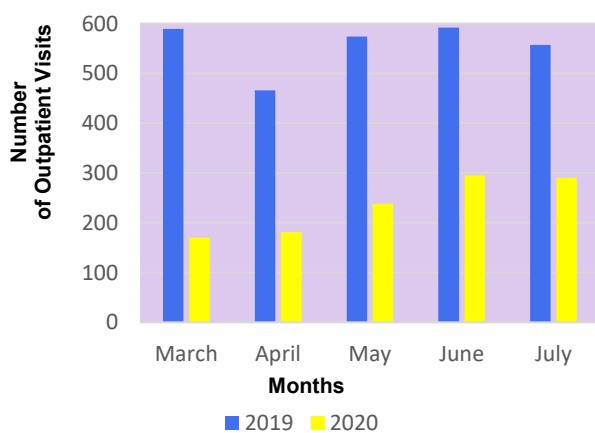
The same trends show on the outpatient visits to Oncology Unit (Table 2).

**Table 2**  
 The Number of Outpatient Visits

Month	Year	Outpatient visits	P value
March	2019	589	<0.001
	2020	170	
April	2019	466	<0.001
	2020	181	
May	2019	574	<0.001
	2020	238	
June	2019	592	<0.001
	2020	293	
July	2019	557	<0.001
	2020	290	

There was a significant decrease in the early pandemic period (March 2020) which was only 170 visits to the outpatient oncology unit, compared to the year before which was 589 visits. The number of the visits gradually rose and peaked in June 2020, and slightly decreased in July 2020, as seen in Figure 2.

**Figure 2**  
 The Difference of Oncology Outpatient Visits Between Two Periods



There was a significant decline in the surgery numbers on 5 months pandemic period compared to the same timeframe in 2019 ( $p < 0.001$ ), as seen in Table 1. Similar findings were shown in outpatient visits, which was showing a significant decline each month when compared between two periods.

**Discussion**

The first two confirmed cases of COVID-19 in Indonesia was announced by the President of Indonesia on March 2nd 2020 (Lotfi et al., 2020). The cases then continued to rise as the government conduct the testing and tracing, and in response to the growing number, the Indonesian National Board for Disaster Management declared an emergency period for 91 days, effective until May 29th, 2020. On March 31st, 2020, President Joko Widodo declared a public health emergency and invoked the police to enforce a large-scale social restriction policy as stipulated by Law No.6/2018 on health quarantines (Wiratraman, 2020). Because of this measure, people are encouraged to stay at home and avoid all unnecessary activities including visits to the healthcare (GP practice, primary healthcare, and hospital) for non-emergency cases. In Moewardi Hospital, which is 1 of 3 COVID regional hospitals. The bed capacity for COVID-19 patients has increase from 7 beds in March to 57 beds in July 2020.

Lack of effective mitigation strategies against COVID and implementation lockdowns to control the spread of infection aggravated the healthcare crisis. COVID has a major adverse impact on cancer care delivery globally. Therefore, a hospital policy is not to accept new patients except for emergency patients or those with life-threatening conditions. The hospital also has a policy on cancer patient care, in this case, the surgery schedule (Usman et al., 2021). Our findings show that during the early pandemic period, especially the first two months after the first two cases were announced and the large-scale social restriction was implemented, there was a significant drop in the number of patient visits to oncology care in Moewardi Hospital ( $p < 0.001$ ). The number of oncology surgery was the lowest in April 2020, after the hospital was appointed by the government as COVID-19 referral hospital (by the end of March 2020). These findings are in line with the study by Reichardt, et al (2020) which reported there was a highly significant reduction in overall cancer admission in 75 Helios hospitals in Germany for the early lockdown period from March 13th to April 28th, 2020 compared to the same period in 2019 (Reichardt et al., 2020). A study by Mulholland et al. (2020) also had similar findings; there were sharp drops in both emergency and planned hospital admission. A similar result was also found by Stohr et al. (2020) who reported that there was a reduction in hospital admission following the government-imposed social restriction, even for emergency cases. Tzeng et al. (2020), reported that the high number of COVID-19 cases without symptoms was an obstacle for reduction in hospital admission for cancer sufferers.

The significant decline in oncology surgeries patient's visits might be due to the following reasons:

- 1) On the early pandemic year, people were encouraged to restrict their visits to healthcare facilities. Despite the unchanged oncology services in surgery and outpatient departments, people delayed their surgery and outpatient visit unless it's emergency cases;



2) Furthermore, people might have been reluctant to visit the hospital because they were afraid of contagion at the hospital;

3) There was also adjustment in the hospital, such as social distancing rules and COVID-19 screening before surgeries, which subsequently affect patients who wanted to undergo their surgeries or visit the outpatient department;

4) The patients also began to seek alternatives in medical assistance such as utilizing telemedicine or private home care (Kumar & Dey, 2020).

The risk of delay in carrying out health control and treatment of cancer patients is estimated to be an increase in the number of unresectable cancers as well as poor survival outcomes due to cancellations of follow-ups and postponements of surgeries (Stoss et al., 2021).

The remarkable frequency of delays and disruptions in health care, most of which were unintentionally related to the reduction of the COVID-19 burden, posed a significant risk to cancer care worldwide (Riera et al., 2021). Establishing strict protocols and administrative measures can help keep the COVID positivity rate low between patients and healthcare workers and provide uninterrupted oncology services. Keeping in mind the COVID pandemic and taking all necessary actions and experience from the ongoing oncology services, it is the best plan to serve patients in the best possible way (Sultania et al., 2020). In an analysis of patients with cancer that short delay (3 months) had a significant impact on patient survival in patients with aggressive cancer. Delay will also cause the tumor to become more advanced, which means that not only is survival lower, but the cancer will be more expensive to treat in terms of both surgery and/or chemotherapy (Department of Health and Health Service Executive, 2020; Sud et al., 2020). Based on our findings, the surgery numbers and outpatient visits gradually rose in July 2020, as the large-scale social restriction was slightly released. The “new normal” term and health protocol for COVID-19 were applied as declared in the Health Minister decree of Republic Indonesia on June 2020. The hospital’s service protocol for COVID-19 and non-COVID-19 patients were also getting clearer, so patients who might have delayed their medical attention started to get back to the hospital to make their outpatient visits or undergo some treatments.

There are limitations in this study. First, this study was only carried out in one hospital and might not reflect the condition in other healthcare facilities. Second, we did not include and compare the emergency visits and surgeries of life-threatening cases, so future studies may focus on the aspect.

### Conclusions

There was a decline in surgical oncology activities, which culminated in a significant decrease in surgical oncology patients in the Central Surgery Unit and the patient visit to the Moewardi Hospital outpatient oncology clinic during the COVID-19 pandemic. Strict protocols and administrative measures are needed in oncology services given the conditions in the COVID-19

pandemic. Hospital service protocols for COVID-19 and non-COVID-19 patients must be strictly defined, so that patients can receive medical care services according to their complaints. This is to prevent delays in diagnosis and treatment delays that increase patient mortality.

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### Ethical Approval

The study protocol was consistent with the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a prior approval by the Institution’s Human Research Committee.

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### References

- Department of Health and Health Service Executive. (2020). *National Cancer Control Programme: Cancer services in Ireland in the context of Covid-19*. <https://www.hse.ie/eng/services/list/5/cancer/>
- Kumar, D., & Dey, T. (2020). Treatment delays in oncology patients during COVID-19 pandemic: A perspective. *Journal of Global Health*, 10(1). Article 1010367. <https://doi.org/10.7189/jogh.10.010367>
- Lotfi, M., Hamblin, M. R., & Rezaei, N. (2020). COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clinica Chimica Acta*, 508, 254–266. <https://doi.org/10.1016/j.cca.2020.05.044>
- Mulholland, R. H., Wood, R., Stagg, H. R., Fischbacher, C., Villacampa, J., Simpson, C. R., Vasileiou, E., McCowan, C., Stock, S. J., Docherty, A. B., Ritchie, L. D., Agrawal, U., Robertson, C., Murray, J. L., MacKenzie, F., & Sheikh, A. (2020). Impact of COVID-19 on accident and emergency attendances and emergency and planned hospital admissions in Scotland: An interrupted time-series analysis. *Journal of the Royal Society of Medicine*, 113(11), 444–453. <https://doi.org/10.1177/0141076820962447>
- Reichardt, P., Bollmann, A., Hohenstein, S., Glass, B., Untch, M., Reichardt, A., Amrein, D., & Kuhlen, R. (2020). Decreased incidence of oncology admissions in 75 Helios Hospitals in Germany during the COVID-19 Pandemic. *Oncology Research and Treatment*, 44(3), 71–74. <https://doi.org/10.1159/000512935>
- Richards, M., Anderson, M., Carter, P., Ebert, B. L., & Mossialos, E. (2020). The impact of the COVID-19 pandemic on cancer care. *Nature Cancer*, 1(6), 565–567. <https://doi.org/10.1038/s43018-020-0074-y>
- Riera, R., Bagattini, Â. M., Pacheco, R. L., Pachito, D. V., Roitberg, F., & Ilbawi, A. (2021). Delays and disruptions in cancer health care due to COVID-19 pandemic: Systematic review. *JCO*



- Global Oncology*, 7, 311–323. <https://doi.org/10.1200/go.20.00639>
- Rocco, N., Montagna, G., Di Micco, R., Benson, J., Criscitiello, C., Chen, L., Di Pace, B., Colmenarejo, A. J. E., Harder, Y., Karakatsanis, A., Maglia, A., Mele, M., Nafissi, N., Ferreira, P. S., Taher, W., Tejerina, A., Vinci, A., Nava, M., & Catanuto, G. (2021). The impact of the COVID-19 pandemic on surgical management of breast cancer: Global trends and future perspectives. *Oncologist*, 26(1), e66–e77. <https://doi.org/10.1002/onco.13560>
- Setiawaty, V., Kosasih, H., Mardian, Y., Ajis, E., Prasetyowati, E. B., Siswanto, & Karyana, M. (2020). The identification of first COVID-19 cluster in Indonesia. *The American Journal of Tropical Medicine and Hygiene*, 103(6), 2339–2342. <https://doi.org/10.4269/ajtmh.20-0554>
- Sharma, A., Borah, S. B., & Moses, A. C. (2021). Responses to COVID-19: The role of governance, healthcare infrastructure, and learning from past pandemics. *Journal of Business Research*, 122, 597–607. <https://doi.org/10.1016/j.jbusres.2020.09.011>
- Soreide, K., Hallet, J., Matthews, J. B., Schnitzbauer, A. A., Line, P. D., Lai, P. B. S., Otero, J., Callegaro, D., Warner, S. G., Baxter, N. N., Teh, C. S. C., Ng-Kamstra, J., Meara, J. G., Hagander, L., & Lorenzon, L. (2020). Immediate and long-term impact of the COVID-19 pandemic on delivery of surgical services. *British Journal of Surgery*, 107(10), 1250–1261. <https://doi.org/10.1002/bjs.11670>
- Stöhr, E., Aksoy, A., Campbell, M., Al Zaidi, M., Öztürk, C., Vorloeper, J., Lange, J., Sugiura, A., Wilde, N., Becher, M. U., Diepenseifen, C., Heister, U., Nickenig, G., Zimmer, S., & Tiyerili, V. (2020). Hospital admissions during Covid-19 lock-down in Germany: Differences in discretionary and unavoidable cardiovascular events. *PLoS ONE*, 15(11), e0242653. <https://doi.org/10.1371/journal.pone.0242653>
- Stöss, C., Steffani, M., Pergolini, I., Hartmann, D., Radenkovic, D., Novotny, A., Friess, H., & Müller, M. W. (2021). Impact of the COVID-19 pandemic on surgical oncology in Europe: Results of a European survey. *Digestive Surgery*, 38(4), 259–265. <https://doi.org/10.1159/000515186>
- Sud, A., Jones, M. E., Broggio, J., Loveday, C., Torr, B., Garrett, A., Nicol, D. L., Jhanji, S., Boyce, S. A., Gronthoud, F., Ward, P., Handy, J. M., Yousaf, N., Larkin, J., Suh, Y. E., Scott, S., Pharoah, P. D. P., Swanton, C., Abbosh, C., ... Turnbull, C. (2020). Collateral damage: The impact on outcomes from cancer surgery of the COVID-19 pandemic. *Annals of Oncology*, 31(8), 1065–1074. <https://doi.org/10.1016/j.annonc.2020.05.009>
- Sultania, M., Muduly, D. K., Balasubiramaniyan, V., Imaduddin, M., Ephraim, R., Chaudhary, I., Singh, A., Jain, A., Colney, L., Ambre, S., Dipin, K. R., & Kar, M. (2020). Impact of the initial phase of COVID-19 pandemic on surgical oncology services at a tertiary care center in Eastern India. *Journal of Surgical Oncology*, 122(5), 839–843. <https://doi.org/10.1002/jso.26140>
- Taylor, C., & Johnson, M. (2020). SARS-CoV-2. *Materials and Methods*, 10, Article 2867. <https://doi.org/10.13070/mm.en.10.2867>
- Tzeng, C. W. D., Teshome, M., Katz, M. H. G., Weinberg, J. S., Lai, S. Y., Antonoff, M. B., Bird, J. E., Shafer, A., Davis, J. W., Adelman, D. M., Moon, B., Reece, G., Prabhu, S. S., DeSnyder, S. M., Skibber, J. M., Mehran, R., Schmeler, K., Roland, C. L., Tran Cao, H. S., ... Vauthey, J. N. (2020). Cancer surgery scheduling during and after the COVID-19 first wave. *Annals of Surgery*, 272(2), e106–e111. <https://doi.org/10.1097/SLA.0000000000004092>
- Uimonen, M., Kuitunen, I., Paloneva, J., Launonen, A. P., Ponkilainen, V., & Mattila, V. M. (2021). The impact of the COVID-19 pandemic on waiting times for elective surgery patients: A multicenter study. *PLoS ONE*, 16(7), e0253875. <https://doi.org/10.1371/journal.pone.0253875>
- Usman, H. A., Abidin, F. A. Z., & Maulana, A. (2021). The impact of Covid-19 pandemic on breast and thyroid cancer surgery: An advantage or disadvantage factor? *Indonesian Journal of Cancer*, 15(1), 32–36. <https://doi.org/10.33371/ijoc.v15i1.787>
- Wiratraman, H. P. (2020). Does Indonesian COVID-19 emergency law secure rule of law and human rights? *Journal of Southeast Asian Human Rights*, 4(1), 306–334. <https://doi.org/10.19184/jseahr.v4i1.18244>
- Wu, Y. C., Chen, C. S., & Chan, Y. J. (2020). The outbreak of COVID-19: An overview. *Journal of the Chinese Medical Association*, 83(3), 217–220. <https://doi.org/10.1097/JCMA.0000000000000270>

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