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COVID-19 Rapid Letter

# Ensuring safety and sustainability of radiotherapy services during the COVID-19 pandemic in resources constrain country: An Indonesian experience

Handoko [a], Tiara Bunga Mayang Permata [a], Angela Giselvania [a], Endang Nuryadi [a], Steven Octavianus [a], Vito Filbert Jayalie [a], Nicholas [a], Novi Elis Khumaesa [a,b], Putri Maharani [a,b], Fielda Djuita [b], I.G.A.G. Mahendra Wijaya [c], Yuddi Wahyono [d], Sugandi Hartanto [e], Rika Ruhama [f], Fathiya Juwita Hanum [g], Christina Hari Nawangsih P [h], Elia Aditya Bani Kuncoro [i,j], Fatmasari [k], Ulinta Purwati Pasaribu [l], Lulus Handayani [m], Aida Lufti Huswatun [n], Novina Fortunata [o], Arry Setyawan [p], Ericko Ekaputra [q], Adji Kusumadjati [r], Faisal Adam [s], Dini Andriani Pramitasari [t], Rita Budianti [u], Rosmita Ginting [v], Rudiyo [w], Nuraini Mutrikah [x], Isnaniah [y], Nadia Christina [z], Arundito Widikusumo [aa,bb], Nurul Fitri [cc], Annisa Febi Indarti [dd], Siti Khotimah [ee], Soehartati A. Gondhowiardjo [a,*]

[a] *Department of Radiation Oncology, Faculty of Medicine Universitas Indonesia – Dr. Cipto Mangunkusumo National General Hospital, Jakarta;* [b] *Department of Radiation Oncology, MRCCC Siloam Semanggi, Jakarta;* [c] *Department of Radiation Oncology, RSUP Sanglah, Denpasar, Jakarta;* [d] *Department of Radiation Oncology, Siloam Hospitals Simatupang, Jakarta;* [e] *Department of Radiation Oncology, Santosa Hospital Bandung Kopo (SHBK), Bandung;* [f] *Department of Radiation Oncology, Dr. M. Djamil Hospital, Padang;* [g] *Department of Radiation Oncology, RS Universitas Andalas, Padang;* [h] *Department of Radiology, Kariadi General Hospital/Diponegoro University, Semarang;* [i] *Department of Radiation Oncology, Ken Saras Hospital, Semarang;* [j] *MoH Polytechnic, Semarang;* [k] *Department of Radiation Oncology, RS Universitas Hasanuddin, Makassar;* [l] *Department of Radiation Oncology, Dr. Soetomo General Academic Hospital, Surabaya;* [m] *Cancer Center Adi Husada Hospital, Surabaya;* [n] *Department of Radiation Oncology, Persahabatan Hospital, Jakarta;* [o] *Department of Radiation Oncology, Gading Integrated Cancer Care, Gading Pluit Hospital, Jakarta;* [p] *Department of Radiation Oncology, Awal Bros Cancer Centre, Pekanbaru;* [q] *Department of Radiology – Radiation Oncology, RSUP Dr. Sardjito, Yogyakarta;* [r] *Department of Radiation Oncology, Hasan Sadikin General Hospital, Bandung;* [s] *Department of Radiation Oncology, RSUD Al Ihsan, Bandung;* [t] *Department of Radiation Oncology, Mohammad Hoesin General Hospital, Palembang;* [u] *Departement of Radiation Oncology, Dr. Moewardi General Hospital, Surakarta;* [v] *Departement of Radiation Oncology, RS H. Adam Malik, Medan;* [w] *Departement of Radiation Oncology, Murni Teguh Radiotherapy Centre, Medan;* [x] *Departement of Radiation Oncology, Gatot Soebroto Central Army Hospital Centre, Jakarta;* [y] *Department of Radiation Oncology, Wahidin Sudirohusodo Hospital, Makassar;* [z] *Department of Radiation Oncology, Indriati Hospital, Sukoharjo;* [aa] *Department of Radiotherapy, Prof Dr Margono Soekarjo General Hospital, Purwokerto;* [bb] *Faculty of Medicine, Universitas Jenderal Soedirman, Purwokerto;* [cc] *Department of Radiation Oncology, Dharmais Cancer Hospital, Jakarta;* [dd] *Department of Radiation Oncology, RSUD Pasar Minggu, Jakarta; and* [ee] *Department of Radiation Oncology, Navy Hospital dr Ramelan, Surabaya*

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ABSTRACT

The global COVID-19 pandemic has placed a significant burden on the healthcare sector, overwhelming health services in affected countries worldwide. As healthcare facilities reorganize their services to adapt to this challenging problem, it is important that the sustainability of essential oncology services, including radiotherapy, is maintained. This article describes the Indonesian experience in ensuring sustainability of radiotherapy services during the pandemic, highlighting various important adjustments which were made to allow radiotherapy centers nationwide to continue operating while protecting staff and patients from the risk of disease transmission. As the backlog of patients waiting to start treatment will inevitably grow, some insight on how to proactively manage this issue will also be described.



Global COVID-19 pandemic has significant, far-reaching impact on almost all sector of industries and services worldwide [1]. The infection was fatal in small percentage but significant number of cases. The mortality rate generally ranged from 3% to up to 10%. In Indonesia the mortality rate was on the upper range, around 8% [2]. Due to the highly infectious nature of this COVID-19 resulting in significant amount of people infected, it is necessary to anticipate transmission of infection by regulating and adjusting many sectors.

Here, we will focus on radiotherapy services during this COVID-19 pandemic in Indonesia. We will share our perspectives on how

* Corresponding author at: Department of Radiation Oncology, Faculty of Medicine, Universitas Indonesia – Dr. Cipto Mangunkusumo National General Hospital, Jl. Salemba Raya No. 6, Jakarta 10430, Indonesia.
*E-mail address:* gondhow@gmail.com (S.A. Gondhowiardjo).

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radiotherapy centers nationwide in Indonesia respond to this crisis. We will also elaborate on various handy strategies which can be adopted by many other radiotherapy centers to handle the expected surging number of patients during and after this COVID-19 pandemic.

## Method

The consensus about various adjustment necessary for every radiotherapy centers in Indonesia during COVID-19 was reached during a national IROS teleconference which was held on 3rd April 2020. That was on the second month of COVID-19 pandemic in Indonesia. The main points and themes were collected and discussed in the following section. Furthermore, a rapid survey was carried out on the following week to assess the impact of various restriction implemented by government and each hospital during COVID-19 pandemic toward the practice and services of all the participating radiotherapy centers in Indonesia.

## Result

In early 2020, there were 43 active radiotherapy centers across Indonesia according to the data from the Indonesian Radiation Oncology Society (IROS) (see Fig. 1a). There were a total of 72 active machines (18 Coblat-60, 53 linear accelerators, and 1 Tomotherapy) in early 2020. With additional 78 machines projected to be installed through 2030 [3]. Among those 43 active centers, there were only 20 centers that provide brachytherapy services. Sixty percent of the centers were operating with just 1 machine. Therefore, in most centers, it was not possible to dedicate 1 machine for COVID-19 patient.

In total, 29 radiotherapy centers out of 43 active centers participated in this survey (see: Fig. 1b). During COVID-19 pandemic, radiotherapy centers in Indonesia underwent operations adjustments in 4 major aspects. These adjustments ranged from facility, operational, staffing, until patient treatment modification. The key summary of those adjustments and specific recommendation regarding staffs' personal protective equipment were compiled in Supplementary Table 1 and Table 2, respectively.

Furthermore, most centers reported reduction in number of treatment, both external beam radiotherapy (EBRT) and brachytherapy (see: Fig. 2). The changes of EBRT and brachytherapy treatment were calculated by subtracting number of cases during COVID-19 pandemic (March 2020) toward number of cases before the pandemic on the previous year at the same month (March 2019), then converted to how many times the reduction or increment of the cases.

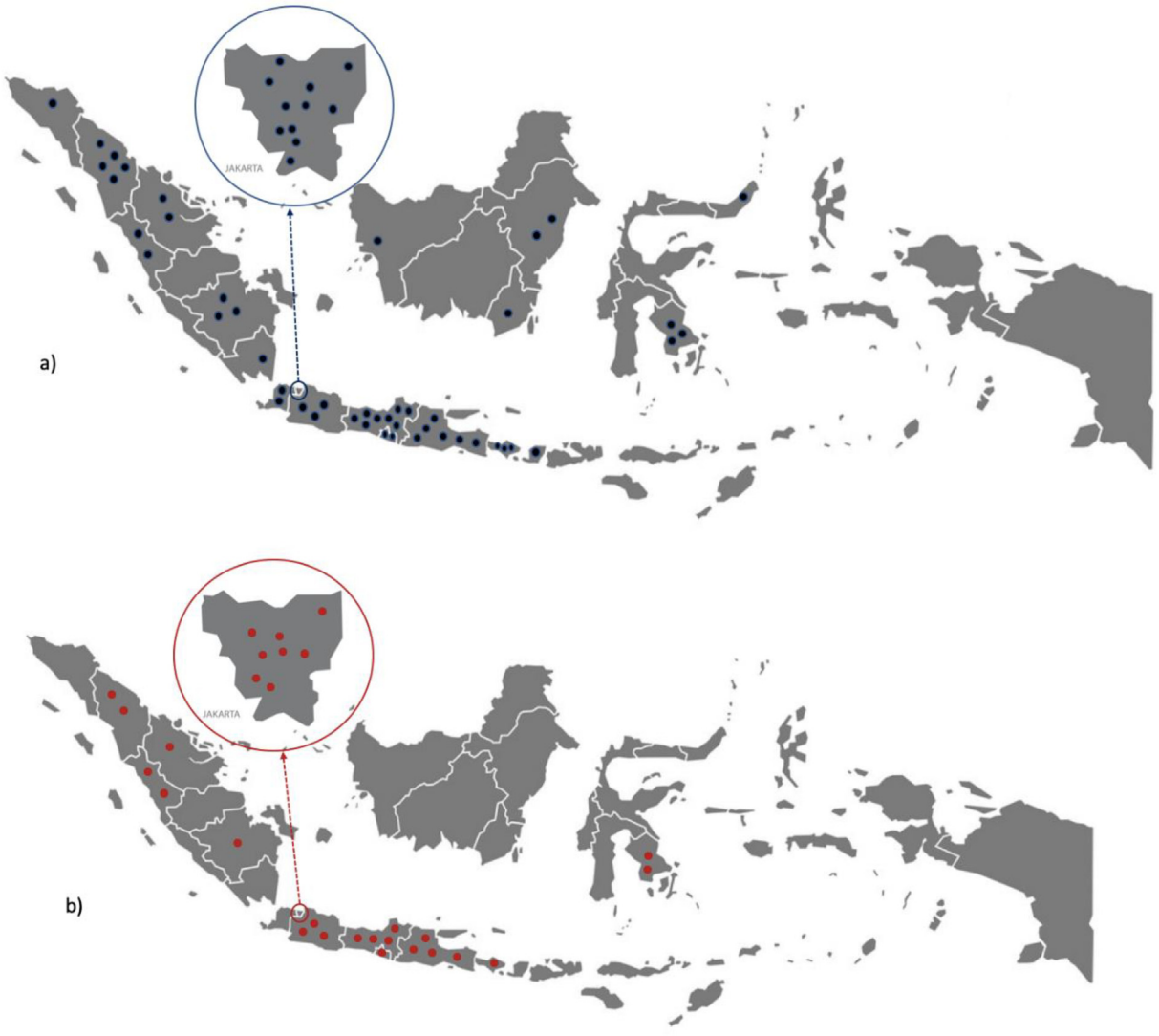


**Fig. 1.** Indonesian archipelagoes. (a) Each dot represents active radiotherapy centers in Indonesia. (b) Each dot represents participating centers in the survey.

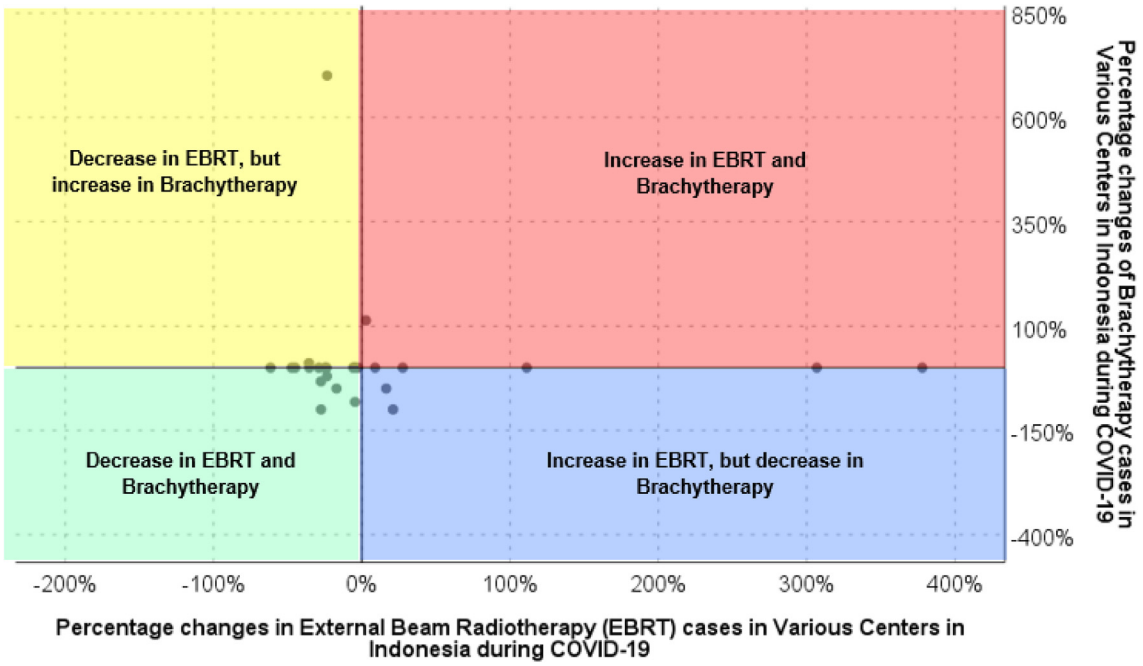


**Fig. 2.** Percentage changes in number of cases underwent External Beam Radiotherapy (EBRT) and brachytherapy in 29 participating centers in the survey during COVID-19 pandemic in Indonesia. Each dot represents a center. Changes of number of cases was calculated by subtracting the number of cases during COVID-19 pandemic and the number of cases on the same month on the previous year then converted to how many times the reduction or increment of cases.

In Indonesia, all centres with the exception of seven centers with equipment breakdown or limited operation in the previous year, reported reduction of number of treatment, for both EBRT and brachytherapy during COVID-19 pandemic. The reduction of cases treated in most centers were not just due to the adjustments done by the centers. The external factors also contributed to reduction of cases. The restriction of people mobility within the country by the government also impacted the ability of the patients to come for treatment.

## Discussion

In Indonesia, most of the radiotherapy centers had a high workload. Even with the restriction in place, some centers could not reduce the number of cases underwent treatment. A surging number of cancer patients lining up for radiotherapy during and after the resolution of the pandemic is almost inevitable. Various strategies to handle the surge are necessary. One of the strategy must include a preventive maintenance program. A performance verification and safety testing is required with additional analysis of some other factors depending on the manufacturer specification of each equipment as part of preventive maintenance program [4]. With a well-planned program, it is expected that no treatment interruption will occur.

Improving staff competency during COVID-19 pandemic is another feasible strategy especially for those staffs who work from home. They can be provided with various online tools to develop a new set of knowledge and skills. International organizations (ie. IAEA) [5,6] national professional societies (ie. pori.or.id, peraboi.com, papdi.or.id) and academic institutions (ie. edx.org, futurelearn.com) have provided various freely available online resources used as a capacity development program. Thus, after the pandemic is over, staff will return to work in a higher level of competence and productivity.

Furthermore, the way radiotherapy being delivered to cancer patients can be tweaked. There has been a mounting evidence indicating hypofractionated radiotherapy turns out to be as effective as a more prolonged course of radiotherapy in some selected cases [7–11]. For instance, in a radiotherapy to chest wall in breast cancer patients, conventional radiotherapy will require 25 fractions (5 weeks), while a more hypofractionated regimen will complete the treatment in just 15 fractions (3 weeks) [7]. The increase in radiotherapy dose daily will only result in increased treatment time in a fraction of minutes. Thereby allowing more patients to be treated with the same amount of capacity.

Finally, radiotherapy could also be postponed or omitted in some cases (ie. low risk prostate managed with watchful waiting, endocrine therapy for Luminal A breast cancer) [12]. Those cases can be safely managed with simple and less resource intensive treatment. Therefore, we could optimize the utilization of healthcare resources in the coming months/years following the pandemic, as the world is clearly bracing for the upcoming socioeconomic impact post COVID-19.

The availability of radiotherapy services during COVID-19 pandemic was essential. A thorough and well planned strategy was necessary to prevent interruption of services. It was nonetheless, inevitable that some adjustments were necessary from the provider until the patients' aspects. There would possibly a need for stricter radiotherapy indication. Even after the pandemic was over, there was still a need to prepare for expected surging number of patients requiring radiotherapy, therefore a plan has to be worked out early to handle the upcoming new crisis.

## Conflict of interest

None to be declared.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.radonc.2020.05.044.

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