

Impact of the COVID-19 Pandemic on Urology Practice in Indonesia: A Nationwide Survey

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Abstract

Background.

Coronavirus disease 2019 (COVID-19) has affected daily practices in health care services. This study aimed to investigate the impact of COVID-19 on urology practice in Indonesia.

Methods.

This was a cross-sectional study using web-based questionnaire (Survey Monkey), which was distributed and collected within a period of three weeks. All practicing urologists in Indonesia were sent an e-questionnaire link via E-mail, WhatsApp Messenger application, and/or short message service, and the chief of residents in each urology centre distributed the e-questionnaire to urology residents.

Results

The response rate was 369/485 (76%) among urologists and 220/220 (100%) among urology residents. Less than 10 percent of the responses in each section were incomplete. There are 35/369 (9.5%) Nine percent of urologists and 59/220 (26.8%) of urology residents had been suspected as COVID-19 patients, of whom seven of them were confirmed to be COVID-19 positive. The majority of urologists (66%) preferred to continue face-to-face consultations with a limited number of patients, and more than 60% of urologists preferred to postpone the majority (66%) or all elective surgery. Most urologists also chose to postpone elective surgery in patient with COVID-19-related symptoms and patient who required post-operative ICU-care. Urologist and urology residents reported high rates of using personal protective equipment, except for medical gowns and N95 masks, which were in short supply. Several uro-oncology surgeries were considered to be the top priority for Indonesian urologist during COVID-19 epidemic period.

Conclusion.

The COVID-19 pandemic has had a major impact on urology practice in Indonesia.

Background

Firstly discovered on December 2019 in Wuhan, China, coronavirus disease 2019 (COVID-19) has spread rapidly and widely throughout the world. The World Health Organization (WHO) to declared a pandemic on 11 March 2020.^{1,2} The first positive case in Indonesia was confirmed in early March 2020, the number has increased exponentially with more than 10,000 cases and almost eight percent mortality rate within two months.³ This number of cases diagnosed in Indonesia is considered to be the “tip of the iceberg” and the number of cases is expected to continue to rise.

COVID-19 is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a single stranded ribonucleic acid (RNA) genetically similar to *Sarbecovirus*. and SARS-CoV-2 infection causes a wide range of clinical feature, from benign upper respiratory symptoms to deadly acute respiratory

distress syndrome (ARDS).⁴⁻⁶ Infection is very contagious and is transmitted from human-to-human via droplets or direct contact.⁷ Moreover, individuals with positive SARS-CoV-2 infection can be asymptomatic, have non-respiratory symptoms, and can act as carriers.^{8,9} Therefore, this pandemic has forced changes in many aspects of life, including healthcare practices.

Adjustments to this emerging situation are vital to healthcare providers in order to provide the best service to patients during the pandemic, while still maintaining the highest possible safety. Even though management of COVID-19 is a “different field” to urology practice, COVID-19 is having a great impact on daily urology practice. Several recommendations have been published on adapting to the current pandemic. They cover several aspects of daily practice, such outpatient clinics, surgeries, and utilization of personal protective equipment (PPE).^{10,11} Virtual clinics or use of tele-consultation use for outpatient clinics and postponement of non-urgent elective surgery are recommended.¹²

In Cipto Mangunkusumo Hospital, Indonesia’s national referral hospital, COVID-19 has greatly affected daily practices in many fields, including urology. Direct consultation in the outpatient clinic and elective surgery are still being performed, but with careful patient selection and restrictions. However, more data are needed to evaluate the extent of this situation and how it affects urology practices in other hospitals and whether other urologists also made these adjustments. Thus, this study is aimed to investigate the impact of the COVID-19 pandemic on urology practice in Indonesia.

Methods

Study Design and Population

This cross-sectional questionnaire-based survey and was conducted in April 2020. The survey targeted urologists registered in the Indonesian Urology Association (IUA) database and active urology residents in all centres across Indonesia. Retired urologists or those who have not practiced urology for more than 3 months were excluded. Urology residents who had not entered hospital rotation were also excluded.

Questionnaire construction

The questionnaire was prepared using Survey Monkey (www.surveymonkey.com), a cloud-based online survey and contained several sections including respondent demographics, public and private hospital urology practice, and surgery priority assessment. Some of the questions were adapted from questionnaire developed by Societe Internationale d’ Urologie (SIU).^{13,14} All questions were written in Bahasa Indonesia.

The first section contained questions on respondent demographic characteristics and COVID-19 status. In addition to age and occupation (urologist or urology resident), this section asked about the respondent’s COVID-19-related history and whether they had ever been examined for COVID-19. The second section explored the pattern of urology practice during the outbreak, in terms of outpatient clinics, surgery, and PPE utilization. This section contained questions on the number of patients in outpatient clinics and the

number of surgeries before and after the start of the COVID-19 epidemic. It also assessed respondent attitudes towards COVID-19-related symptoms and post-operative ICU care of patients undergoing elective (including laparoscopic) and emergency surgery. Last, this section also asked about the availability and utilization of PPE in both public and private hospitals. The last section assessed prioritisation of surgery and investigated other impacts of COVID-19.

The questionnaire was designed to require that respondents completed all the questions within each section before continuing to the next section.

Data collection

Data were collected within a three-week period (from April 8 to 24, 2020) and e-questionnaire link was delivered via e-mail, WhatsApp Messenger (WA) application (WhatsApp Inc.), and/or short message service (SMS). E-mail was sent through an IUA account to all registered urologists twice with the second email message delivered one week after the first email message. The WA application/SMS applications were used every three days for a total of six mailings. The first message via WA application/SMS was sent three days after the first email and the last message was sent the day before the deadline date. For urology residents, the e-questionnaire was distributed and followed up by the chief of resident in each urology center. Further information outside the questionnaire was obtained through interviews with the chief of residents.

All respondents were required to fill out their name or enter a unique code, which was given with the WA application/SMS message to prevent data duplication. The questionnaire contained a statement promising respondent confidentiality.

Data analysis and reporting

Data analysis was carried out using SPSS Version 23 (IBM Corp, Armonk, NY, USA). The four sections of the questionnaire were categorized into seven subsections for reporting the results: (1) respondent demographics and COVID-19-related characteristics, (2) general working conditions during the COVID-19 epidemic, (3) outpatient clinics, (4) types of surgery, (5) PPE, (6) selection and prioritisation of surgery, and (7) other COVID-19 impacts. Numeric data was presented as mean if it had normal data distribution and as median if it had abnormal data distribution. The percentage of respondents providing a given answer was calculated individually for each question so as to exclude questionnaires with missing responses from the denominator. The distribution of respondents was mapped and this map was combined with COVID-19 prevalence as of 26 April 2020. As mass testing using polymerase chain reaction (PCR) was not available in Indonesia, suspected cases were stratified into person-in-monitoring (PIM) and patient under surveillance (PUS). A PIM was defined as a person who exhibited COVID-19 related symptoms, such as fever or respiratory symptoms without pneumonia, and had a history of close contact with someone with confirmed COVID-19 or had travelled to areas where COVID-19 local transmission had been reported. A PUS was defined as a PIM with pneumonia symptoms.¹⁵ Tables and graphs were used to report the results to facilitate their interpretation. The results also contained a subgroup analysis of the responses of respondents aged 60 years and older.

Results

Of the total of 502 registered urologists within the IUA database, two urologists had not practiced urology for more than three months and 15 newly graduated urologists had not yet worked as an urologist leaving 485 eligible urologist respondents for this study. There were 247 registered urology residents from six centres in Indonesia, but only 220 residents had entered a clinical rotation in hospital and were eligible for the survey. A total of 369 urologists (76% response rate) and 220 urology residents (100% response rate) participated in this study with 89.7% and 97.7% overall completeness, respectively.

Respondent demographics and COVID-19-related characteristics

Urologist respondents who filled out the questionnaire came from 30 out of 34 provinces (Fig. 1). The characteristics of respondents and their COVID-19 related information are shown in Table 1. One urologist and five urology residents had tested positive using PCR testing of a swab specimen. One other urologist had tested positive using a rapid test and was still waiting for his swab test result when filling out this questionnaire

Table 1
Respondent's demographic and COVID-19 characteristics

Characteristics	Urologist	Urology Resident
N	369	220
Age (years old), median (range)	40 (30–77)	30 (24–38)
COVID-19- related history, n (%)	7 (1.9)	8 (3.6)
Fever	37 (10)	63 (28.6)
Respiratory tract symptoms	8 (2.2)	16 (7.3)
Both fever and respiratory symptom	18 (14.9)	35 (15.9)
Close contact to COVID-19 patient	40 (10.8)	21 (9.5)
Travel history to the area with local transmission		
Respondent underwent COVID-19 examination, n (%)	91 (24.7)	16 (7.3)
Rapid test	35 (9.5)	29 (13.2)
PCR / swab test		
COVID-19 respondent status, n (%)	28 (7.6)	52 (23.6)
PIM	7 (1.9)	7 (3.2)
PUS	2 (0.5)	5 (2.3)
Positive		
Quarantine respondents among suspected case, n (%)	21 / 35 (60)	37 / 59 (62.7)
Hospitalized respondents among suspected case, n (%)	2 / 35 (5.7)	5 / 59 (8.5)
COVID-19, Coronavirus disease 2019; PCR, polymerase chain reaction; PIM, person-in-monitoring; PUS, patient under surveillance		

General working condition during the COVID-19 period

There were 18, 97, and 243 urologist respondents who worked at public hospitals only, private hospitals only, and both types of hospital, respectively. However, among respondents who worked at both hospitals, 18 respondents did not complete the private hospital practice section of the questionnaire, thus, a total of 261 (70.7%) and 322 (87.2%) respondents worked at public and private hospitals, respectively. Almost 60% respondents worked in a COVID-19 referral public hospital.

Several strategies had been developed by urologists and their hospitals to adjust towards the COVID-19 epidemic situation, such as physician rotation (37% at public hospital and 4.3% at private hospital) and reduction of working hours (57.9% at public hospital and 53.7% at private hospital). However, 27.6% of respondents were the only urologist at their hospital and 33.2% had reduced their working hours as their

primary adjustment. Of the respondents who worked in public hospitals, five (1.9%) had stopped all their urology practice all together, but two of them had continued to practice in a private hospital. Of the respondents who worked in private hospitals, 15 (4.7%) had stopped their urology practice at the private hospital, but 11 of the 15 had continued to practice at the public hospital.

Of the urologist respondents, 31 (8.6%) were aged 60 years and older. Of these respondents, 15 worked in a private hospital only, 15 worked in both private and public hospitals, and one respondent did not complete the questionnaire except for demographic and COVID-19 related section. Among the 15 respondents who worked at both types of hospital, only 8 completed the private hospital section. Thus, we had data on a total of 15 and 23 respondents who worked in public and private hospitals, respectively. Only one had stopped all practice activities during the COVID-19 period.

Indonesia has six urology centres, each of which has affiliated hospitals where residents undergo rotation. However, during COVID-19 period, all centres called resident back from the affiliated hospitals, except Bandung urology center in West Java Province, which placed 9 of their residents in an affiliated hospital. Resident's shifts are divided into hospital and working from home in all urology centres, except for seven residents at affiliated hospital shift due to lack of medical personnel. Moreover, educational activities for urology residents were held using web-based video conference in all centres during the COVID-19 epidemic.

Outpatient service

The number of patients before the COVID-19 epidemic and practice pattern to adjust to the epidemic situation in outpatient clinics are shown in Figs. 2(a) and (b). Among respondents aged 60 years and older, most still held face-to-face consultations at both public (86.7%) and private (73.9%) hospitals, with only 33.3% and 26.1%, respectively, using teleconsultation.

Several measures had been taken to prevent COVID-19 transmission among patients in public and private hospital outpatient clinics, including triage for patients with history of respiratory tract symptoms (72.1% and 66.7%) and temperature screening (81.7% and 73.8) before entering the consultation room, requiring patients to use face masks (95% and 81.3%), and referring patients with suspected COVID-19 to other departments (73.3% and 65.8%). One public hospital had built a glass barrier between doctors and patients within the consultation room.

Surgery service

During the COVID-19 period, surgery, particularly elective surgery, is changing. The number of elective surgery cases before the COVID-19 pandemic and its adjustment during the pandemic can be seen in Fig. 2(c) and (d). Among respondents aged 60 years and older, 33.3% had stopped all elective surgeries.

Amongst urologists who continued to conduct elective surgeries, most conducted COVID-19 screening as part of elective surgery preoperative preparation (74.6% and 81.7% at public and private hospitals, respectively). Practices of urologists towards performing surgery on patients with COVID-19-related

symptoms and patients who would require post-operative intensive care unit (ICU) care are shown in Figs. 2(e) and (f). More than 50% of the urologists who continued to conduct elective surgery had never performed laparoscopic surgery in their practice. However, of those who had previously performed laparoscopic surgery, the majority (95.3% at public hospitals and 97.1% at private hospitals) did not continue to perform laparoscopic procedures during the COVID-19 pandemic. Measures that had been taken to prevent SARS-CoV-2 transmission in public or private hospitals, included reducing the number of operating rooms (ORs), reducing the number of staff (59.5% and 63.9%, respectively), and not rotating staff in the OR during surgery (26.6% and 33.6%). A small proportion of respondents (1.2%) had cancelled surgery that required general anaesthesia (GA) or had entered the OR after the intubation was completed by the anaesthesiologist.

When treating patients who required emergency surgery, most urologists (80.7% and 84.3% at public and private hospitals, respectively) treated patients as COVID-19 positive. Other responses towards this particular situation were to assess the patient's COVID-19 status but to conduct the surgery without any special precautions (14.5% and 12.2%).

Use of personal protective equipment

The use of PPE used by urologists and urology residents at public and private hospitals and its provision by the hospitals is shown in Fig. 2(g).

Selection and prioritisation of surgery

The Urologists' and urology residents' opinions regarding selection and prioritisation of surgery is shown in Fig. 3.

Other COVID-19 Impacts

Of the urologists and urology residents, 8.3% and 17.5% respectively, reported that they had treated patients with suspected COVID-19, and 9.1% of urologists and 16.6% of urology residents reported that they had treated patients without knowing their COVID-19 status and later discovered that they patients had been positive.

Both urologists (84%) and urology residents (85.7%) stated that they were concerned about contracting SARS-CoV-2 infection in their workplace.

Discussion

The COVID-19 pandemic is providing a major challenge for modern medicine in 2020. It has changed many aspects of medical services, with urology being no exception, and has forced medical providers to adapt their approach towards patient care, including outpatient care, inpatient care, and surgery services.^{16,17} This study investigated the impact of the COVID-19 pandemic on urology daily practice in Indonesia by means of a web-based questionnaire survey. This study had a 76% and 100% response rate

for urologists and urology residents, respectively, which is considered a very high response rate.¹⁸ Moreover, it was found that less than 10% of the questions in each section were incomplete.

Two urologists and five urology residents reported having contracted COVID-19. This suggests that urology residents were more likely than urologists to contract COVID-19. Residents are often on the front line of medical services, thus, extra precaution, particularly proper use of PPE, is a necessity. Among the 9.5% urologists and 27% urology residents who had been designated as a suspected case of COVID-19, only 60% of the urologists and 62.7% urology residents had been quarantined or undergone self-isolation. The reason behind this could not be determined from the responses. However, this should be investigated because all suspected cases supposed to undergo quarantine to stop the spread of the virus.

As of 5 May 2020, there had been a total of 12,071 confirmed cases of COVID-19 in Indonesia. However, only 88,924 people have been tested out of a population of more than 266 million (approximately 0.33 test per 1,000 people).^{19,20} This testing rate is lower than in other countries in the region, such as Singapore (21.1 tests per 1,000 people), South Korea (12.49 tests per 1,000 people), Malaysia (6.59 tests per 1,000 people) and India (0.86 tests per 1,000 people).²¹ This is why the number of COVID-19 cases in Indonesia is considered to be the “tip of the iceberg”. To overcome this limitation, Indonesia’s Ministry of Health has stratified suspected cases of COVID-19 into PIM and PUS.

In Singapore, interhospital movement of health providers is forbidden, thus all residents have to stay at an affiliated hospital for the full rotation. In Indonesia, however, the majority of urology center asked for all their residents to return from affiliated hospitals.²² This might have been a good decision since lack of shift rotation between residents and reduced working time provide residents with more time to rest. The questionnaire did not ask urology residents specifically regarding the impact of the COVID-19 pandemic on their training. However, since all the surgery and outpatient clinics were greatly reduced, the effect on their training is likely to be similar to the effect on Italian urology residents that 81.1% and 62.1% of them experienced more than 80% decreased in both clinical and surgical activities, respectively.²³

In reporting the results, we specifically highlighted the responses of urologists aged 60 years and older because of the more severe clinical manifestations and higher case fatality rate among people over the age of 60 years.^{24,25} However, we found that the practice pattern of urologists aged 60 years and older during the COVID-19 pandemic was similar to that of the respondents overall.

Indonesian urologists have a chance to practice in public and private hospitals and most of them have practices in both public and private hospitals. There might be different pattern of practice between public and private hospitals. However, it seems that the pandemic has had a similar effect on the outpatient clinic services and elective surgery services of both hospital types.

IUA, as an organization accommodating all Indonesian urologists, has published recommendations for urologists during the COVID-19 pandemic. These recommendations cover outpatient clinics, surgery services, and PPE use.²⁶ For outpatient services, this guidance recommend teleconsultation and

restricting the number of patient consultations. Most urologists had already complied with the recommendation to restrict the number of patients, but face-to-face consultation remained the primary consultation method for outpatient services. Even though telemedicine is being developed and the Indonesia government had been proactive by providing national policy support and for the development of telemedicine, telemedicine is still unpopular among urologists of whom less than one quarter have used telemedicine.^{27,28}

According to IUA recommendations, all elective surgeries should be postponed in order to increase the availability of healthcare workers, ICU beds, and inpatient rooms, in addition to preventing transmission of SARS-CoV-2.²⁶ However, only one-third of respondents stopped elective surgery, while most urologists reduced their elective surgery activity by more than two-thirds of cases. In line with IUA recommendations, most urologists conducted COVID-19 screening for patients undergoing elective surgery. Moreover, more than two-thirds of urologists cancelled elective surgery requiring post-operative ICU care and about 30% continued with planned elective surgery only if there was a risk of disease progression. The IUA guidance recommends that it should be assumed that all patients undergoing surgery have COVID-19 unless proven otherwise.²⁶

Most respondents who regularly do the laparoscopic surgery had temporarily abandoned this procedure. Even though it hasn't been proven that COVID-19 could be transmitted via laparoscopic surgical smoke, it should be avoided since several viruses, such as hepatitis B, human papillomaviruses, and HIV have a potential for laparoscopic transmission and SARS-CoV-2 might have similar properties.²²

In addition to emergency surgery, there are several urological procedures which are recommended to be done due to risk of disease progression. IUA recommends that procedures for patients with severe disease should not be deferred, including surgery for muscle invasive bladder cancer or in situ bladder cancer, testicular tumours, cT3 + kidney tumours, high-risk prostate cancer which cannot be treated by radiation therapy, upper tract urothelial tumours, adrenal cortical carcinoma, and penile tumours. This recommendation is in line with article written by Campi et al.²⁹ which discusses the prioritisation of urological surgery in Italy during the COVID-19 pandemic. Moreover, this recommendation is also in line with respondents' assessments of surgery priorities.

Surgical mask, face shields, medical gloves, and surgical cap were well utilized and provided by the hospital. This should be sufficient to protect healthcare workers in outpatient settings and inpatient settings without patients with suspected or confirmed COVID-19 based on IUA recommendations. However, medical gown availability appeared to be more limited among urology residents than among urologists. This study also revealed a shortage of N95 masks among urologist and urology resident in public hospitals. N95 masks are recommended for use in the care of patients with suspected or confirmed COVID-19. Therefore, this shortage of equipment needs to be addressed.

Conclusion

Even though this study has limitation such as incompleteness of data which could bias the result, it had a high response rate and provides a picture of the impact of COVID-19 on urology practices in Indonesia. This survey revealed that the COVID-19 pandemic has had a major impact on urology practice in Indonesia for both practicing urologists and urology residents.

Abbreviations

COVID-19

Coronavirus disease 2019

ICU

Intensive care unit

IUA

Indonesian Urology Association

PCR

Polymerase chain reaction

PIM

Person-in-monitoring

PPE

Personal protective equipment

PUS

Patient under surveillance

Declarations

Ethics Approval and Consent to Participate

Implied consent was obtained from study's participant since participant's confidentiality was promised, the participant had a choice to be anonymous (used specific code, instead of his name) and the participant also had a choice to participate or not in this study. Therefore, return of questionnaire was considered as active consent to participate in this study. Moreover, this study was approved by the Faculty of Medicine, Universitas Indonesia and Cipto Mangunkusumo Hospital ethical committee.

Consent for Publication

Not applicable

Availability of Data and Materials

Datasets are available from corresponding author upon reasonable request

Competing Interests

All authors declare that there is no conflict of interest to disclose regarding the publication of this manuscript

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Author Contributions

NR and PB provided the idea to conduct this study. NR, PB, DP and FR constructed questionnaire. NR and PB directed the manuscript construction. FR distributed the questionnaire and collected the data. DP and FR wrote the manuscript. NR and PB reviewed the manuscript. All authors approved the final version of the manuscript.

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Figures

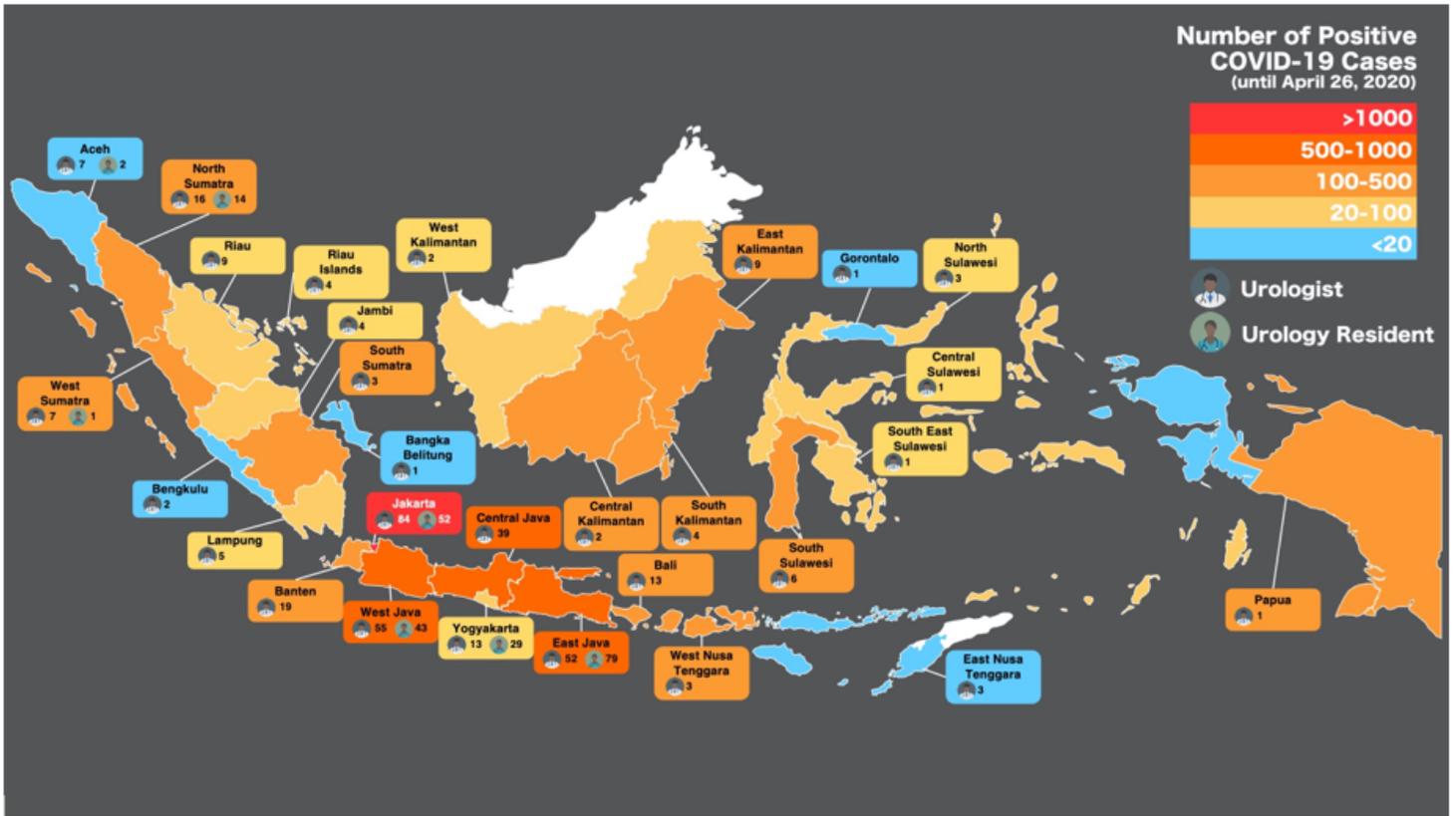
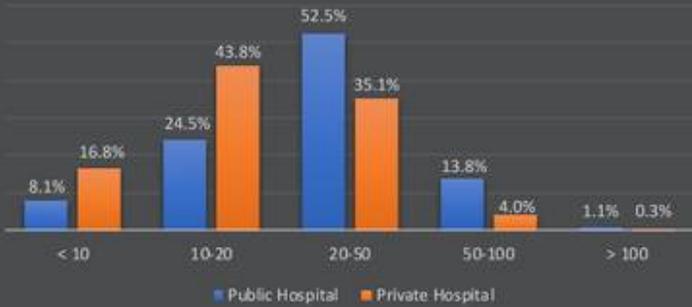


Figure 1

Respondent Distribution and Province COVID-19 Prevalence Map.3 (Template of Indonesia's map was taken from www.freepik.com).

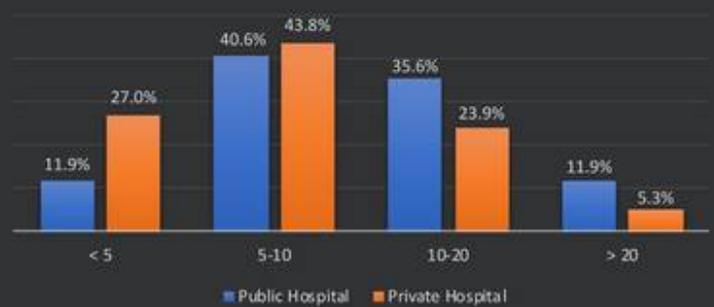
Before COVID-19 Period

Number of Patients in Outpatient Clinic / Day



(a)

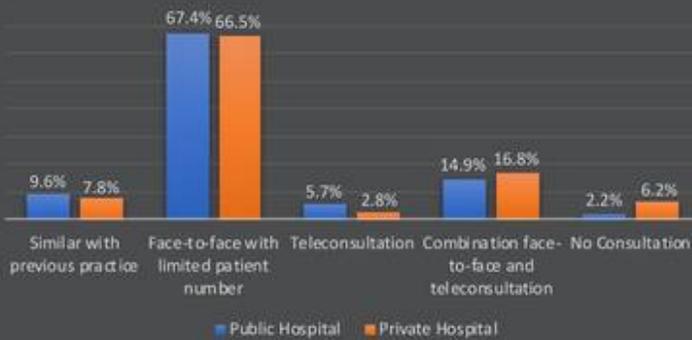
Number of Elective Surgery Cases / Week



(c)

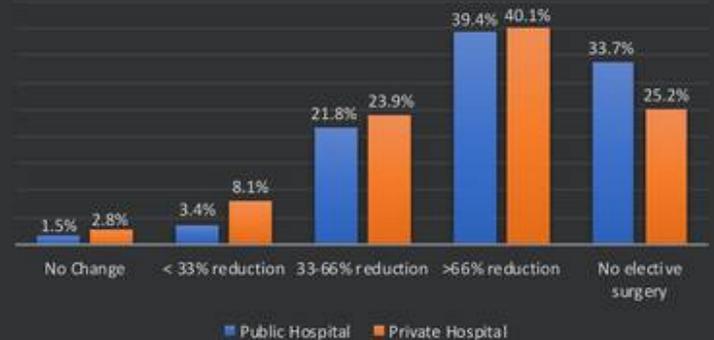
During COVID-19 Period

Pattern of Outpatient Clinic Practice



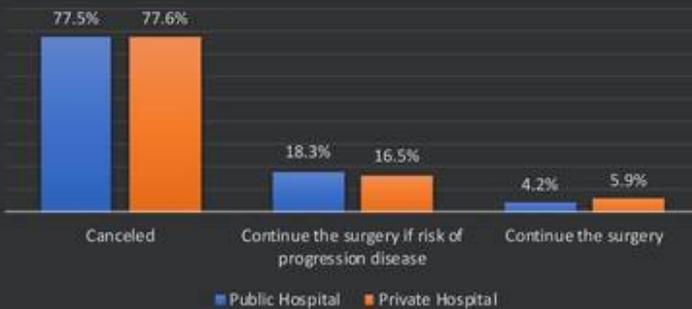
(b)

Adjustment of Elective Surgery Case



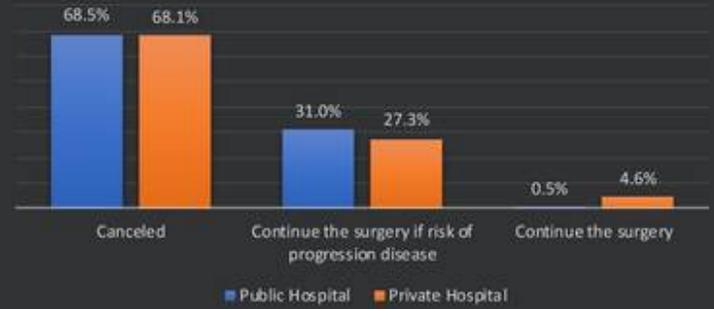
(d)

Elective Surgery in COVID-19-Related Symptom Patient



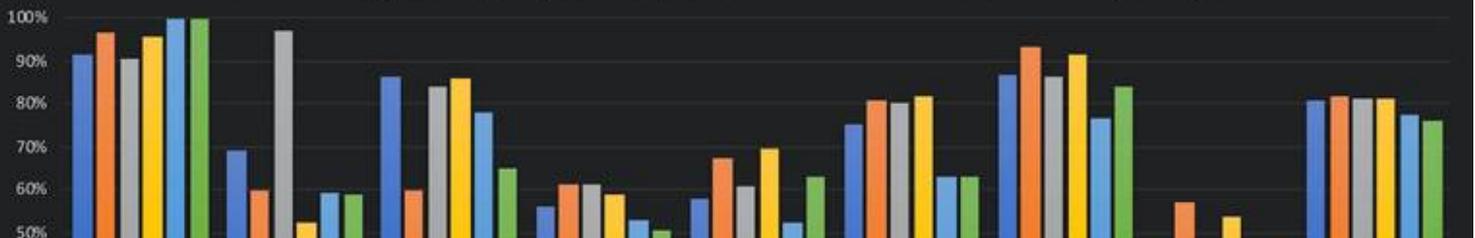
(e)

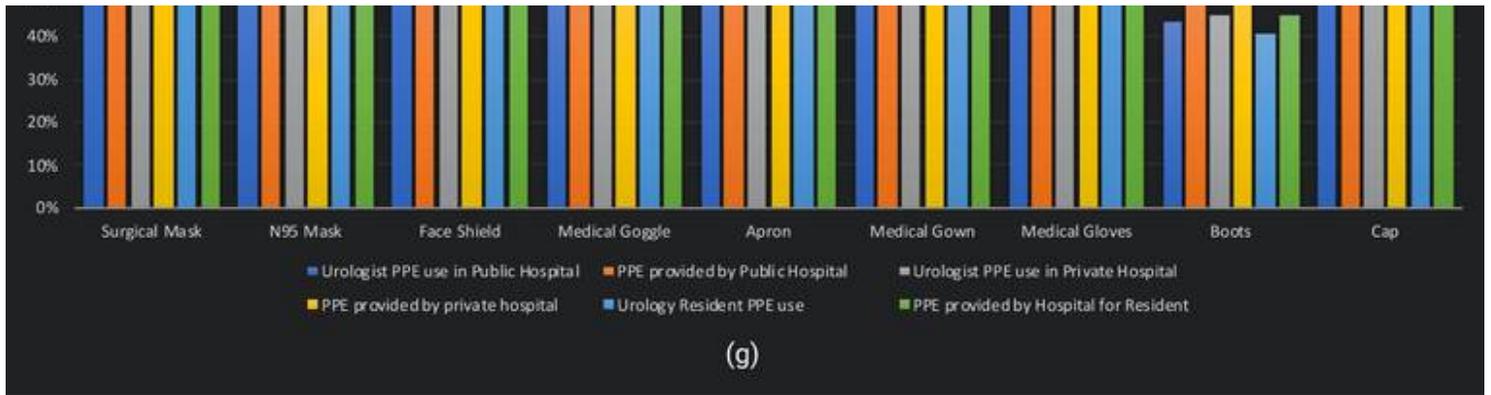
Elective Surgery in ICU-Required Patient



(f)

PPE Used by Urologist/Urology Resident and its Provision by Hospital



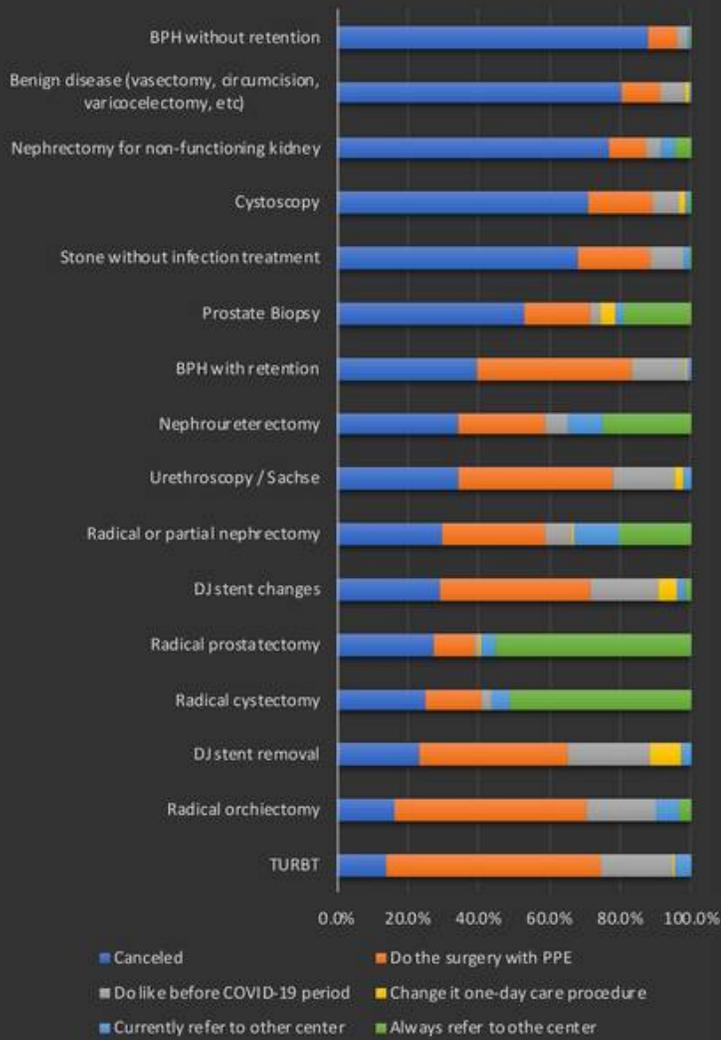


(g)

Figure 2

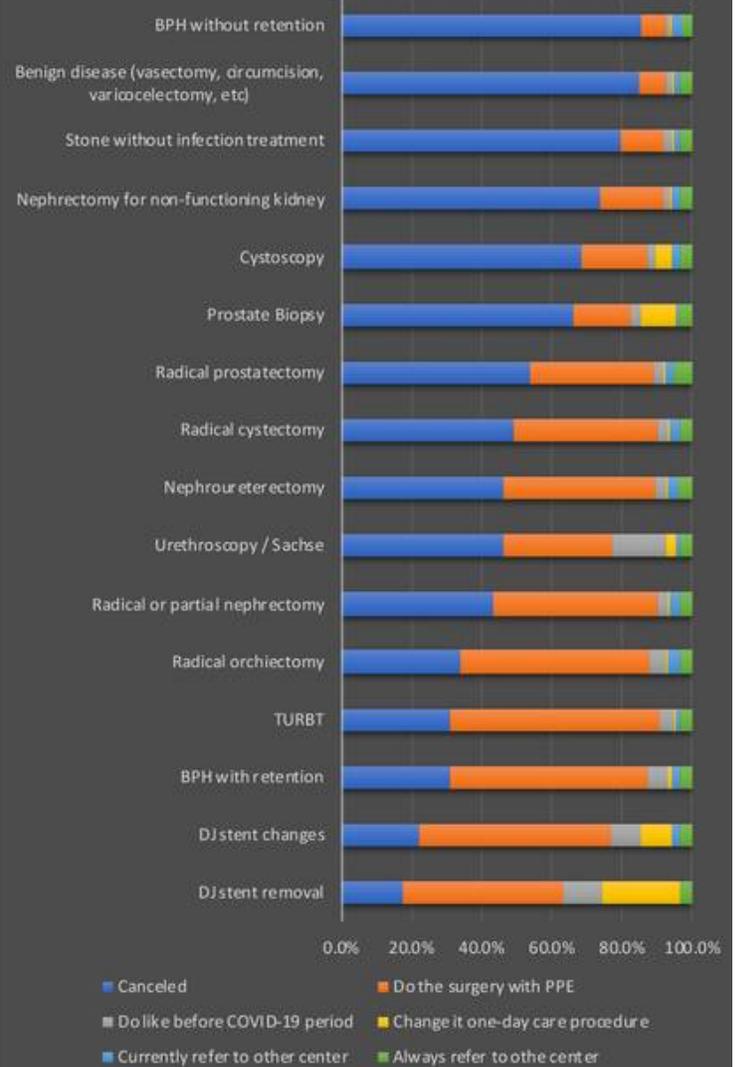
Urologist practice patterns and PPE use: (a) number of patients in outpatient clinic per day before the COVID-19 period, (b) number of elective surgery cases per week before the COVID-19 period, (c) pattern of outpatient clinic practice during the COVID-19 period, (d) adjustment of elective surgery cases during the COVID-19 period, (e) elective surgery in patients with COVID-19-related symptoms, (f) elective surgery in patients requiring intensive care unit (ICU) care, and (g) PPE used by urologists and urology residents and its provision by the hospitals.

Urologist Surgery Selection during COVID-19 Period



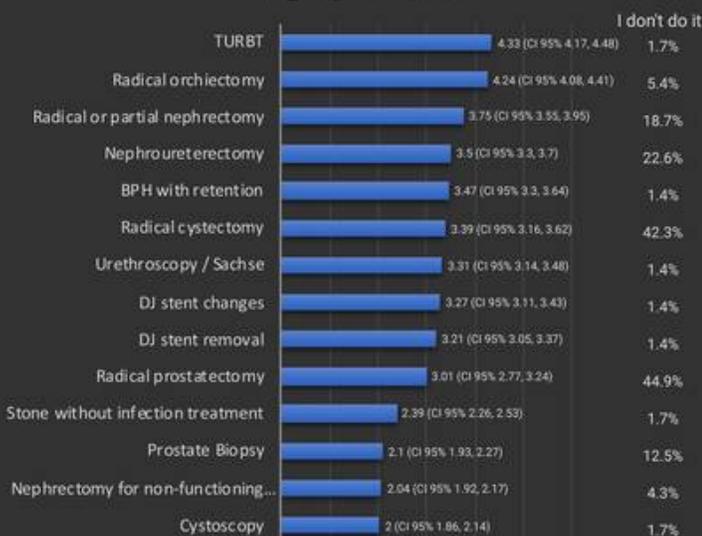
(a)

Urology Resident Opinion toward Surgery Selection during COVID-19 Period



(b)

Urologist's Assessment of Surgery Priorities



Urology Resident Opinion of Surgery Priorities

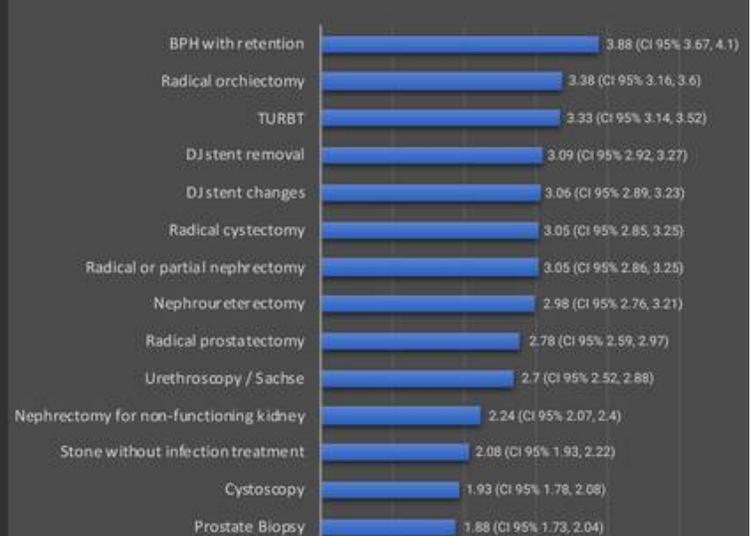




Figure 3

Selection and prioritisation of surgery: (a) urologists' surgery selection, (b) urology residents' opinions towards surgery selection, (c) urologist's assessment of surgery priorities, and (d) urology residents' opinions of surgery priorities

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [QuestionnaireEnglishVersion.pdf](#)
- [STROBEchecklist.doc](#)