

# The Response of Human Resources and Health Workers in the Surgical Operating Room Due to the COVID-19 Pandemic

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## Abstract

The COVID-19 pandemic that occurred around the world with infections that spread so fast has changed patterns of life, including social, economic, education, and health. The impact of the pandemic has changed the health system and requires new policies that can adapt to these conditions. K.R.M.T. Wongsonegoro Hospital, Semarang City, Indonesia, which is a referral hospital for Covid-19 patients, needs to prepare health infrastructure in COVID-19 services. We report the impact of the COVID-19 pandemic on surgical service activities and improving the quality of human resources, especially health workers in the Central Surgical Installation. The hospital is preparing a special operating room for COVID-19 patients so that it does not spread to health workers. There are 18 surgeons and 7 anesthetists. Assisted by 30 surgical nurses and 7 anesthetic nurses. Since the emergence of the COVID-19 case in Indonesia in March 2020, surgery is only carried out in emergency cases and has postponed elective surgery. So that there will be a 50% decrease in the number of surgical services in 2020 compared to 2019. Human resources involved in COVID-19 patient surgery activities must also be trained in knowledge in how to wear and remove Personal Protective Equipment, handling surgical linen and know the flow of patients into and out of the room surgery.

**Keyword:** COVID-19 Pandemic, Central Surgical Installation health personnel, Surgical service, Human resources

## Introduction

The 2019 novel coronavirus(2019-nCoV) was first reported by the Chinese Government to the World Health Organization (WHO) on Friday, December 31, 2019. This virus was found in patients with pneumonia, who came from Wuhan, Hubei Province, China. On January 28, more than 4,500 cases were confirmed, and more than 100 cases of patients died. This virus can be transmitted between infected humans to other humans. And 2019-nCoV has an incubation period between two to fourteen days, during which the incubation person is potentially infected with symptoms or without symptoms. Patients with 2019-nCoV infection experience various symptoms. The World Health Organization (WHO)

on March 11, 2020, has declared the new coronavirus (COVID-19) a global pandemic.<sup>1</sup>It was reported that the first time an adult patient was infected with Covid-19 in Semarang Indonesia was on March 17, 2020, and the first baby case was reported on April 3, 2020.<sup>2,3</sup>

With the COVID-19 pandemic, it has had a tremendous and comprehensive impact on human activities around the world, which has influenced changes in the social, economic, education, and health sectors. COVID-19 is an infection that is very easily transmitted from human to human, so the most effective way to prevent the spread of a contagious disease by maintaining a physical distance between people and reducing the number of times people come into close contact with each other.<sup>4</sup>The existence of this policy will have an impact on the services of RSUD K.R.M.T Wongsonegoro, especially surgical services at the Central Surgical Installation. With the limitation of surgical

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services, it is hoped that it can prevent the transmission of COVID-19 infection to health workers in the hospital. Surgery services only performed in emergency cases, while non-emergency operations can be postponed. Besides, the procedures for operating services at the Central Surgical Installation have also changed according to pandemic conditions. To support the operation of surgery in cases of confirmed COVID-19 patients, a special operating room, instruments, and other special supporting equipment are needed at Central Surgical Installation. This situation affects the development of human resources, especially the paramedics who work in the Central Surgical Installation.

### Methodology

Research at the Central Surgery Installation of KRMT Wongsonegoro Hospital, Semarang City, was conducted in December 2020. The research design used

was qualitative with a descriptive approach through an in-depth interview technique. Primary data were obtained through interviews with the Head of the KRMT Wongsonegoro Central Surgery Installation. Secondary data were obtained from the Information System and hospital management regarding data related to the problem under study and documents including profiles and data on Human Resources of IBS RSUD KRMT Wongsonegoro. The human resources who became the research samples were the surgical nursing staff and surgical doctor.

### Results

#### Human Resources

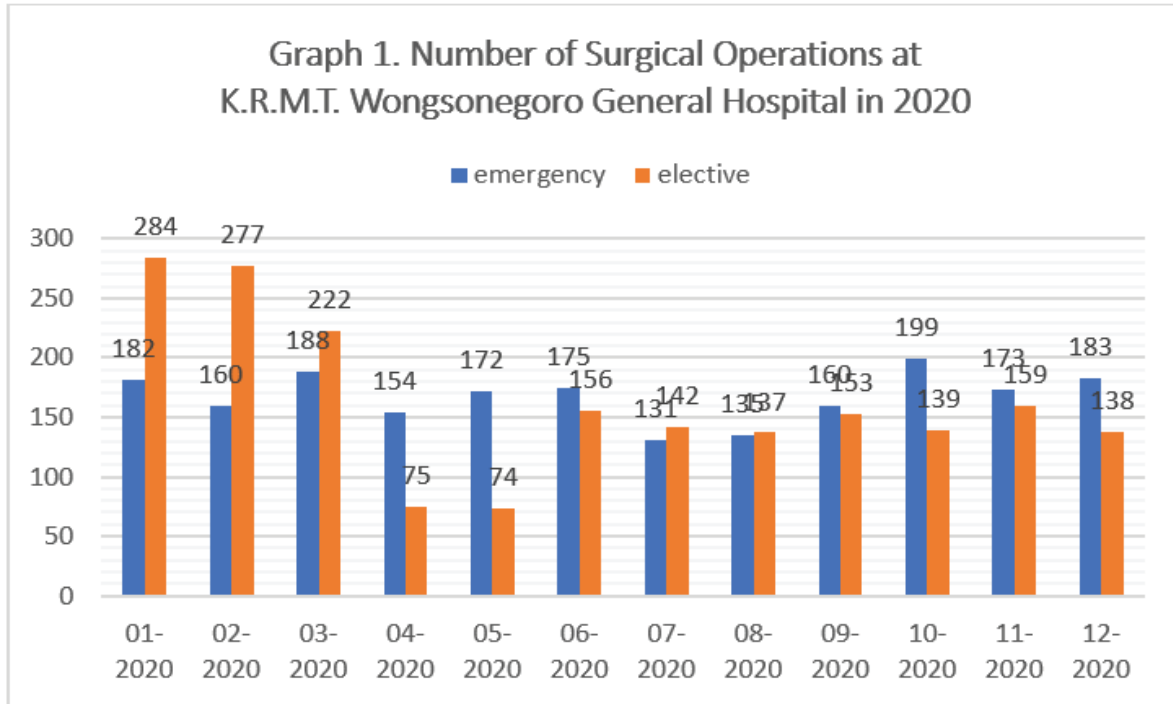
Several human resources provide operational services at the Central Surgical Installation of KRMT Wongsonegoro Hospital, Semarang city. The main health personnel is surgeons, anesthetists, assisted by surgical nurses, and anesthetic nurses.

**Table 1. Number of Doctors in the Central Surgical Installation**

No.	Medical specialist	total	Percentage (%)
1.	General Surgeon	3	
2.	Digestive Surgery Specialist	1	
3.	Orthopedic Surgeons	2	
4.	Urological Surgery specialist	1	
5.	Head-Neck Surgeon	1	
6.	Oral Surgeon	1	
7.	Neurosurgeons	1	
8.	Obstetrics and Gynecology Specialists	4	
9.	ENT specialist	2	
10.	Ophthalmologist	2	
11.	Anesthetist Specialist	7	
	Total:	18	

The total number of doctors who operated was 18 people, with 7 anesthetists and 4 of the surgeons who were mostly Obstetrics and gynecologists, and 3 general surgeons.

From table 2, the male gender is more dominant than the female, the most age is 20-29 years, and the most education level is the diploma.



**Graph 1. Shows a decrease in the number of surgical operations starting in March 2020 during the Covid-19 pandemic and the lowest number in April 2020. This has resulted in a change in the number of surgical nurses on duty in operating rooms. it also affects the surgical service protocol/procedure.**

**Table 2.The 2020 Surgical Nurse Training Plan has not been Implemented**

No.	Training Name
1.	Endoscopy-Laparoscopy Advanced Training
2.	Orthopedic Surgery Training
3.	Urological Surgery Training
4.	Neonate Emergency Training
5.	Advanced Eye Surgery Training
6.	Operating Room Management Training

The training planned to be held in 2020 was postponed indefinitely due to the Covid-19 pandemic outbreak. All activities that have the potential for crowd gathering and face-to-face learning are temporarily suspended.

**Table 3. Simple Training on Surgical Operation Service Procedures during the Pandemic**

No.	Type of Training
1.	Knowledge of the flow of patients into and out of the operating room
2.	How to use personal protective equipment and take it off
3.	Managing Linen: disposing of, washing, and storing
4.	Cleaning and storing consumables
5.	How to sterilize KN95 and N95 masks

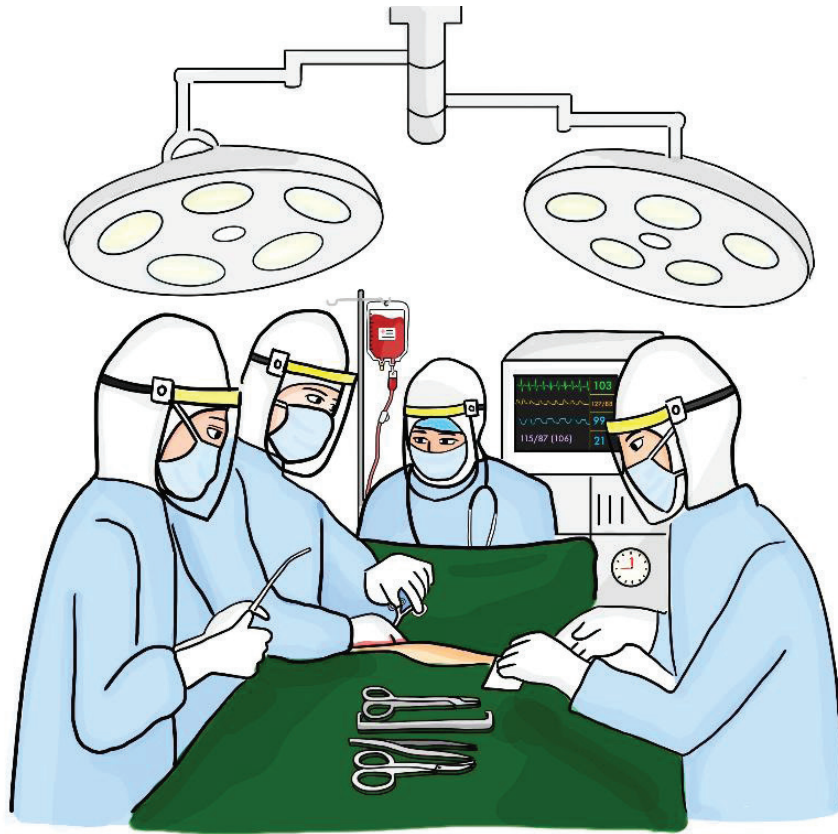
The Covid-19 pandemic has also had a positive impact on health workers because they have gained new knowledge in terms of Covid-19 patient care.



**Figure 1. Capsule Transport (equipped with capsule Hazardous Material Air Filtration /HMAF, portable stretcher, fogger portable, and decontaminating material)**



**Figure 2. Personal protective equipment for health workers in the operating room is categorized as: 1. Respiratory protection (wearing an N95 or KN95 mask) 2. Eye and face protection (goggles or face shield) 3. Hand protection (gloves for hand) 4. Foot protection (boots, boot covers); and 5. Body protection (Hazmat suit).<sup>16</sup>**



**Figure 3. Illustration of Personal Protective Equipment during surgical operations for Covid-19 patients**

### Discussion

With the COVID-19 pandemic, surgery is very limited. The elective surgery program has been reduced by almost 50%, starting in mid-March 2020. In our hospital, 18 specialist doctors perform surgery consisting of general surgeons, digestive surgery, surgery orthopedics, urological surgery, head and neck surgery, oral and dental surgery, neurosurgery, obstetricians and gynecologists, otorhinolaryngologist doctors, ophthalmologists and 7 anesthetists,

Most doctors have reduced surgical activities during the COVID-19 pandemic to avoid contact with COVID-19 patients or suspected COVID-19 infections. Operation is preferred only in emergency cases. This is done by considering the factors of medical human resources (surgeons, anesthetists), paramedics and personal protective equipment. The number of surgical operations during 2020 has greatly reduced compared to 2019 before the outbreak of the COVID-19 pandemic. In 2019 the number of surgeries was 6,012 cases, while

in 2020 (until November 2020) there were 3,547 cases, a decrease of around 2,465 surgical cases or around 41%. Patient visits during April 2020 were very low. When compared to January 2020, from 466 visits to 229 in April.

The Singapore study of surgical operations was also limited to emergency cases. Considerations for delaying or canceling elective surgical procedures are: One goal is to reduce the likelihood of undiagnosed COVID-19 patients entering clean operating rooms, which could pass the infection on to personnel.<sup>5</sup>

A study conducted by Dr. D. Nepogodiev et al., Involving an estimated 190 countries 28,404,60 the number of patients who postponed surgery in the peak 12 weeks of the COVID-19 pandemic. Cancer surgery was delayed by 39%, surgery for benign tumors was 81%, and obstetric surgery was 25%.<sup>4</sup> Postponing surgery will certainly have an impact on individual and social health so that the quality of life deteriorates and there can be unnecessary deaths.<sup>6-8</sup>

The paramedics in Central Surgery Installation K.R.M.T Wongsonegoro Hospital consist of 30 surgery assistants and 14 anesthesia assistants. Most of the surgical assistants were men (67%), with the age range mostly in 20-29 years old (43%) followed by 30-39 years old (36,7%) and only one person over 50 years old. The level of education mostly was diploma (17 people, 56,7%), bachelor (2people, 6,6%), and Ners profession (36,7%). The decreasing number of surgery service, it affects the performance among the paramedics. Because of that some of the paramedics in the central surgery installation were transferred to other divisions such as the COVID-19 isolation. But in October 2020 the number of surgery services in K.R.M.T. Wongsonegoro Hospital start to increase so the paramedics that have been transferred started to return to the Central Surgery Installation. The transfer of the paramedics in this hospital is a common thing to adjust the needs.

All surgical nurses already have a surgical certificate for basic skills, but to adjust to the needs of increasingly advanced and sophisticated services, nurses are expected to improve their skills. However, due to the COVID-19 pandemic, training activities were postponed indefinitely. WHO issued a policy on physical distancing and social distancing to reduce infection transmission in all forms of face-to-face activities that can be avoided, including learning and training for medical or paramedical personnel.<sup>9</sup> With the postponement of these training, the ability and skills of the surgical nurse are low. Research by John R. Sneyd et al., Reported that training for Anesthesia medical personnel and anesthesia nurses were postponed during the Covid-19 pandemic, and some trainings were conducted online. Although it is less satisfying than face-to-face training in the classroom.<sup>10</sup>

Consequences of COVID-19 impact on medical personnel and paramedics especially staff who work in the operating room. There are some basic changes and a need for a new policy about service procedure in Central Surgical Installation. Three types of patients who can enter the operating room, such as patients without COVID-19 infection, suspected COVID-19 and confirmed COVID-19. Therefore, the operating room is also divided into the operating room for non-COVID-19 patients and for patients with suspected or confirmed COVID-19. Allocation of operating room and types of

surgery give impact to make a new standard operating procedure (SOP). Medical personnel and paramedic need to gain knowledge and service procedure training for patients with confirmed COVID19 in the operating room. Training and simulation held by hospital Infection Prevention and Control team.

Some points that need attention by medical personnel in the operating room are 1). About entry and exit route of COVID-19 patients. Patients from ward: sent via a specific lift, the staff wears personal protective equipment and the patient is lifted by Apollo transport which is a modification of Capsule transport (figure 1) to prevent transmission of infection from patient to medical staff.<sup>11</sup> Particularly for COVID-19 patients coming from an emergency room, transportation to the Central Operation Theatre building is using ambulance mobile then moved by Capsule Transport to the operating rooms or back to the wards from the operating rooms. Post-operative COVID-19 patients are not placed in a recovery room but remain in the isolation operating room. After considered stable, they transferred to the wards. 2). Every isolation operating room for COVID-19 equipped with negative pressure and its own ventilation system with integrated high-efficiency particulate air (HEPA) filters. Traffic and the flow of contaminated air have been minimized through locking all the doors during operation, with only one route for entry or exit via the scrubroom.<sup>12,3</sup> Use of personal protective equipment (Figure 2,3), how to wear and remove it, how to dispose of linen and consumables, store or sterilize N95 or KN95 mask which may be reused. Use personal protective equipment when caring for patients with confirmed or suspected COVID-19 (N95 or higher respirator, Face shield or goggles, one pair of clean gloves, isolation gown or apron).<sup>13-15</sup>

## Conclusion

There was a significant decrease in the number of surgical services due to the impact of the COVID-19 pandemic at K.R.M.T.Wongsonegoro, the city of Semarang Indonesia. This occurs because to prevent the transmission of COVID-19 infection to health workers, surgery is done prioritizing emergency cases and delaying elective surgery. The positive impact of the pandemic is increasing knowledge about the management and service procedures for patients infected

with COVID-19, which is a new experience for health workers, including knowledge about: the use of personal protective equipment, special operating rooms for COVID-19 patients, and the flow of patients into and out of the operating room. as well as how to send patients.

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**Ethical Clearance:** Get permission from the Ethics Committee K.R.M.T. Hospital Wongsonegoro Semarang.

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