

## PERSPECTIVE

# Trauma and Acute-care Surgeons' Perception of Personal Safety during the COVID-19 Pandemic

Marcelo AF Ribeiro Jr<sup>1</sup>, Tercio de Campos<sup>2</sup>, Salomone Di Saverio<sup>3</sup>, Carlos Y Benítez<sup>4</sup>, Mohammad Azfar<sup>5</sup>, Antonio Marttos<sup>6</sup>, Sandro Rizoli<sup>7</sup>

## ABSTRACT

The World Health Organization recognized in March 2020 the existence of a pandemic of the new coronavirus that appeared in China in late 2019, which was named coronavirus disease 2019 (COVID-19). In this context, a survey was conducted with 125 trauma and emergency surgeons from across the world regarding the availability of personal protective equipment (PPE) and the role of the surgeon in the pandemic, using an electronic survey. The study findings suggest that many surgeons work under inadequate conditions, particularly in South America, without the necessary supplies and equipment such as N95 masks and facial shields when contacting potentially contaminated patients. The findings indicate an increased risk of contamination by healthcare workers, which may result in losses of working professionals. Immediate measures must be taken to guarantee access to safety equipment throughout the globe, since all patients with emergency surgical conditions must be managed as potentially carrying the COVID-19 virus.

**Keywords:** Coronavirus, Coronavirus infections, Pandemics, Personal protective equipment.

## RESUMO

A Organização Mundial da Saúde reconheceu em março de 2020 a existência de uma pandemia do novo coronavírus que apareceu na China no final 2019, e denominou esta doença de COVID-19. Neste contexto, uma pesquisa foi feita com 125 cirurgiões de trauma e emergência de várias regiões do planeta, sobre a disponibilidade de equipamentos de proteção individual (PPE) e o papel do cirurgião durante a pandemia, usando um questionário eletrônico. Os resultados deste estudo sugerem que os cirurgiões têm atuado em condições inadequadas, principalmente na América do Sul, com falta de materiais e equipamentos de proteção individual como máscaras N95 e protetores faciais para uso no atendimento de vítimas potencialmente contaminadas. Estes achados indicam um aumento no risco de infecção dos trabalhadores da saúde, e podem resultar em perdas destes profissionais nas equipes de saúde. Medidas imediatas devem ser tomadas para garantir o acesso à equipamentos de segurança em todo o mundo, uma vez que todos os pacientes precisand de cirurgias de emergência devem ser considerados como possíveis portadores do vírus COVID-19.

**Palavras chave:** Coronavírus, infecções por Coronavírus, pandemias, equipamentos de proteção individual.

*Panamerican Journal of Trauma, Critical Care & Emergency Surgery* (2020): 10.5005/jp-journals-10030-1282

## INTRODUCTION

The World Health Organization (WHO) recognized in March 2020 the existence of a pandemic for the new coronavirus disease 2019 (COVID-19) that appeared in China in late 2019. The virus has considerable capacity of transmission and propagation among the world population without natural defenses against the disease. COVID-19 transmission is airborne by droplets and has caused almost half-a-million deaths around the globe, most in the elderly and those with associated diseases. The overwhelming number of infected patients in need of hospital and intensive care admissions has threatened to collapse health systems, some of them in countries that already had baseline issues and shortage of essential equipment's both for patient care (i.e., mechanical ventilators) and personal protective equipment (PPE) for care providers. Health professionals are at a high risk of becoming infected themselves and unable to work. Shortage of healthcare professionals could compound the challenges and contribute to the collapse of the entire system. The principles for the personal protection of the health professionals have been clearly established by the WHO, including the use of PPE.

Furthermore, trauma and surgical emergencies continue to require hospital admission throughout the world. Presently, gun violence incidents have increased in cities such as New York 11.7%, Baltimore 2%, and Chicago 23% compared to 2019.<sup>1</sup> In these situations, surgeons are caring for patients with surgical disease and COVID-19 infection and often without appropriate PPE.

<sup>1</sup>Department of Surgery, Catholic University of São Paulo–PUC-Sorocaba, São Paulo, Brazil; Hospital Moriah, São Paulo, Brazil

<sup>2</sup>Department of Surgery, Faculdade de Medicina da Santa Casa de São Paulo, Brazil

<sup>3</sup>Department of General Surgery, University of Insubria, University, Varese, Italy; Hospital of Varese, ASST Sette Laghi, Regione Lombardia, Varese, Italy

<sup>4</sup>Department of Surgery, Royo Villanova Hospital/SALUD, AEC-Trauma and Emergency Surgery, DSTC-I Faculty, Zaragoza, Spain

<sup>5</sup>Department of General Surgery, Al Rahba Hospital, Abu Dhabi, UAE

<sup>6</sup>Global e-Health/Trauma Telemedicine, William Lehman Injury Research Center, Division of Trauma and Surgical Critical Care, Dewitt Daughtry Department of Surgery, University of Miami, Leonard M. Miller School of Medicine Miami, Florida, USA

<sup>7</sup>Department of Surgery, Division of Trauma, Hamad General Hospital, Doha, Qatar

**Corresponding Author:** Marcelo AF Ribeiro Jr, Department of Surgery, Catholic University of São Paulo–PUC-Sorocaba, São Paulo, Brazil; Hospital Moriah, São Paulo, Brazil, Phone: +55 (11) 96843 9911, e-mail: drmrribeiro@gmail.com

**How to cite this article:** Ribeiro Jr MAF, de Campos T, Di Saverio S, et al. Trauma and Acute-care Surgeons' Perception of Personal Safety during the COVID-19 Pandemic. *Panam J Trauma Crit Care Emerg Surg* 2020;9(2):155–157.

**Source of support:** Nil

**Conflict of interest:** None

Lack of protection equipment as well as exposure to COVID-19 result in health professionals feeling vulnerable. Many studies report that a few thousand health professionals have already been infected, while hundreds died from the disease. According to the New York Times, of the 40,000 cases in Spain, about 5,400 (14%) are health professionals. Similar figures were observed in other countries with high rates of infection.<sup>2</sup> By early March, China had reported over 3,300 infected health workers and at least 22 deaths.<sup>3</sup> The scope of personal protection extends beyond PPE and includes guidelines for invasive aerosol-producing procedures, most performed by trauma and acute-care surgeons. In Brazil, where the infection rates continue to grow, a recent paper reported that only 15.5% of the trauma surgeons feel safe and secure at work. In contrast, 32.4% feel unsafe and unprotected at work.<sup>4</sup>

In this context, we conducted a survey of trauma and acute-care surgeons from across the world. The survey inquired about access to PPE, compliance to invasive procedure guidelines, and the overall perception of the personal safety of the surgeons during the current pandemic.

## MATERIALS AND METHODS

The survey consisted of a questionnaire created using the SurveyMonkey tool (<http://www.surveymonkey.com>).<sup>5</sup> The survey was sent electronically (list of emails and WhatsApp groups) to a group of trauma and acute-care surgeons known to the principal author of the manuscript (M.R.). The survey was distributed to 500 surgeons from across the world. The questionnaire consisted of 17 questions, of which 16 were multiple choice and one asked the surgeon for a written response. The questions inquired about the type of institution, surgical services and country of work, overall perception of the personal protection conditions, and availability PPE when in direct contact with surgical patients with and without the diagnosis of COVID-19. The data obtained were automatically transferred to an Excel file and analyzed.

Participation in the questionnaire was voluntary, responses were anonymous, and conferred consent to analysis and publication.

## RESULTS

Of the 500 surveys sent out, 125 (25%) responses were obtained, most from surgeons working in South and Central America (58.4%). The other responses were from Europe (13.6%), Africa (11.2%), North America (8%), Asia (5.6%), and Middle East (3.2%). Most (89%) work in emergency departments and/or trauma resuscitation units. Considering that COVID-19 is primarily a medical disease, as expected, only 24% of the surgeons reported being directly involved in the care of infected COVID-19 patients.

Considering the type of institution where the responders work, most (64.8%) practice in public hospitals, while 46.4% practice in private hospitals or academic hospitals (38.4%). The responses indicate that many surgeons practice in more than a single institution, a common practice particularly in Latin America.

Regarding perception of own personal protection during the current COVID-19 pandemic, only 19.2% of the surgeons feel safe at work, while almost half (47.2%) fell only partially safe, and a third (32%) feel unsafe and unprotected when caring for potentially infected patients.

Concerning access to PPE, none of the 125 surgeons responding to the survey reported having unlimited access to all PPE items at all times. Even basic standard equipment such

as gloves (87.2%), surgical mask (74.4%), and caps (73.6%), which are expected to be continuously available, were lacking in some institutions. The N95 masks, a key protective equipment according to WHO rules, were reported available to only two-thirds (64.8%) of the surgeons.

When asked about the PPE used by the surgeons while performing hospital activities, a quarter (25.6%) reported using exclusively a conventional surgical mask. Overall, half (115, 56.8%) of the responders reported using conventional surgical masks while in the hospital. As for PPE use for non-COVID-19 patients, 59.2% of surgeons reported using conventional surgical masks, while 17.6% reported using N95 mask. The responses were identical for performing surgery in non-COVID-19 patients. When the question addressed patients with suspected COVID-19 infection, the use of N95 by the surgeons was 76.8% and face shield 32%.

We surveyed the surgeons regarding compliance to surgical recommendations by asking about laparoscopic surgery, which is considered as carrying a high risk of spreading the virus. We observed that approximately one-third (36.2%) of the surgeons are no longer performing laparoscopic procedures. Another 1/3 (33%) stopped performing laparoscopic procedures solely in suspected and/or confirmed cases, while 18.5% continue to do it as before.

Regarding surgical management of emergency cases (traumatic or not), we observed that 81 (37.1%) surgeons maintain their usual indications and approaches. In contrast, 22.5% order chest CT scan for all suspected patients, 26.6% in selected cases, and 9.6% opt for nonoperative treatment whenever possible.

Establishing a definitive airway is part of the day-to-day tasks of this group of professionals. We evaluated changes to the procedure imposed by the pandemic. For orotracheal intubation, most surgeons (64.9%) wear face shield while half (49.5%) use respiratory filters (49.5%). More than half of the surgeons (52.9%) reported using the video laryngoscope for intubation.

Of notice, most (63.7%) surgeons reported difficulties in accessing PPE in their hospitals, and 45.1% do not feel supported by their institutions.

Finally, of the 125 surgeons who responded the survey, 6 are infected by the COVID-19. When asked about fear of getting the disease, 77.6% expressed concern. On the other hand, two-third (60.8%) of the surgeons would not stop going to the hospital, even if they were offered the option.

## DISCUSSION

According to the Coronavirus Resource Center of Johns Hopkins University, the current pandemic of COVID-19 has affected more than 8.9 million people worldwide and caused the death of over 468,000 people around the world.<sup>6</sup> Currently, the United States and Brazil are the most affected countries in the World.

The safety of the healthcare professionals is a major global issue and threatens the global response to the pandemic. In Brazil, the lack of PPE affects 95% of the hospitals according to the Brazilian Medical Association, which accounts at least in part for the enormous national death toll.<sup>7</sup>

The present study reports that unfortunately none of the responders from across the world have unlimited access to PPE, even from wealthy countries.

Based on the responses, we propose that the lack of PPE is universal and affects all surgeons from around the world. Furthermore, in this analysis, we also found that most (up to 80%)

of the surgeons feel unsafe and unprotected when caring for patients, unsupported by the institutions and in fear of contracting the infection. In the United Kingdom, Rimmer reported that a third of surgeons (32.5% of a total of 1,978 responses) face restrictions in accessing protective equipment in their hospitals. More than half of the surgeons responding to the present survey claimed to have similar challenges concerning PPE supplies in their hospitals in the last 30 days.<sup>8</sup>

When asked about laparoscopic procedures for emergency surgeries, one-third completely stopped performing it, while a less number continue to practice it as before the pandemic. The warning about laparoscopic procedures have been raised by many medical societies concerned with the risk of contamination through aerosol emissions from pneumoperitoneum.<sup>9,10</sup> Since the start of the pandemic, several alternative methods have been described to manage surgical smoke evacuation and reduce the risks generated with the laparoscopic approach.<sup>11</sup>

Unfortunately, a rise in healthcare workers' casualties is expected to occur, whether by contamination of the surgeons working in the front lines or by the stress resulting from daily exposure to COVID-19. Lai et al. presented the psychological effects among 1,257 health professionals working in Wuhan, China, during the peak of the pandemic. The study identified high rates of depression (50.4%), anxiety (44.6%), insomnia (34%), and stress (71.5%) among respondents.<sup>12</sup>

Concerns over losses of contaminated health professionals, both temporarily or by death, weighs heavily on all countries and health systems. The safety of the health professionals must be a priority at this time as well as making information about the pandemic available to everyone. Many international surgical societies have issued clinical practice guidelines aimed to reduce the risk among the surgical communities worldwide.<sup>13-16</sup>

In conclusion, the trauma and acute-care surgeons feel vulnerable and at risk of contracting the disease while attending for traumatized and critically ill patients. Many surgeons reported working without the proper PPE and being exposed to contamination. The personal safety of all health professionals and access to proper PPE must be among the top priorities of the global response to the pandemic.

## REFERENCES

1. Sutherland M, McKenney M, Elbuli A. Gun violence during COVID-19 pandemic: paradoxical trends in New York city, Chicago, Los Angeles and Baltimore. *Am J Emerg Med* 2020. DOI: <https://doi.org/10.1016/j.ajem.2020.05.006>.
2. Minder R, Peltier E. Virus knocks thousands of health workers out of action in Europe. *The New York Times*, March 24th, 2020. (Online) (cited 2020 Apr 13). Available from: <https://www.nytimes.com/2020/03/24/world/europe/coronavirus-europe-covid-19.html>.
3. COVID-19: protecting health-care workers. *The Lancet* 2020;395(10228):922. (Online) (cited 2020 Mar 22). Available from: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30644-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30644-9/fulltext).
4. Ribeiro Jr MAF, de Campos T, Lima DS, et al. The trauma and acute care surgeon in the COVID-19 pandemic era. *Rev Col Bras Cir* 2020;47:e20202576. DOI: 10.1590/0100-6991e-20202576.
5. Survey Monkey: (Online). Available from: <https://pt.surveymonkey.com/r/7W3S5R3>.
6. Coronavirus Resource Center- Johns Hopkins University: (Online) (cited 2020 Jun 22). Available from: <https://coronavirus.jhu.edu/data/new-cases>.
7. Associação Médica Brasileira. Faltam EPI's em todo o país. (Online) (cited 2020 Jun 15). Available from: <https://amb.org.br/epi/>.
8. Rimmer A. COVID-19: third of surgeons do not have adequate PPE, royal college warns. *BMJ* 2020;369:m1492. DOI: 10.1136/bmj.m1492.
9. Zheng MH, Boni L, Fingerhut A. Minimally invasive surgery and the novel coronavirus outbreak: lessons learned in China and Italy. *Ann Surg* 2020(1). DOI: 10.1097/SLA.0000000000003924.
10. Ramos RF, Benevenuto DS. Recomendações do Colégio Brasileiro de Cirurgias para cirurgia Videolaparoscópica em pacientes com suspeita de infecção por COVID-19. (Online) (cited 2020 Jun 15). Available from: <https://cbc.org.br/wp-content/uploads/2020/04/Laparoscopia.pdf>.
11. MIS Filtration Group. How to manage smoke evacuation and filter pneumoperitoneum during laparoscopy to minimize potential viral spread: different methods from SoMe - a video vignette. *Colorectal Dis* 2020(6). DOI: 10.1111/codi.15086.
12. Lai J, Ma S, Wang Y, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open* 2020;3(3):e203976. DOI: 10.1001/jamanetworkopen.2020.3976.
13. Aranda-Narváez JM, Tallón-Aguilar L, Pareja-Ciuró F, et al. Emergency surgery and trauma care during COVID-19 pandemic. Recommendations of the spanish association of surgeons. *Cir Esp* 2020. S0009-739X(20)30168-8 10.1016/j.ciresp.2020.04.031.
14. American College of Surgeons. COVID-19 and Surgery. Resources for the surgical community. Available from: <https://www.facs.org/covid-19>.
15. Royal College of Surgeons. Coronavirus (COVID-19) Information Hub. Available from: <https://www.rcseng.ac.uk/coronavirus/>.
16. Benítez CY, Güemes A, Aranda J, et al. Impact of personal protective equipment on surgical performance during the COVID-19 pandemic. *World J Surg* 2020. DOI: [doi.org/10.1007/s00268-020-05648-2](https://doi.org/10.1007/s00268-020-05648-2).