

# Impact of the COVID-19 pandemic on orthopedic surgical practice: international study

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## Short Report

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# Abstract

**Purpose** The purpose of this study was to assess the impact of the COVID-19 pandemic on the clinical practice in orthopedic units.

**Methods** An online survey was sent by e-mail to orthopedic surgeons practicing in different parts of the world.

**Results** This study showed that orthopedic surgery plan management was adapted to respond more effectively to the COVID-19 pandemic while maintaining the continuity of health care and ensuring protection of medical staff and patients. Among the introduced measures, elective surgery was postponed to free-up beds for suspected or COVID-19 positive patients requiring hospitalization.

Additionally, the number of outpatient visits was considerably decreased and non-urgent visits were postponed to reduce the flow of patients in and out of hospitals and therefore minimize the risk of contamination.

Interestingly, data revealed the willingness of orthopedic surgeons to take care of COVID-19 positive patients and support their colleagues in intensive care units, if needed.

**Conclusions** Though, orthopedic surgeons are not in the frontline, they have an important role to play to face the increasing pressure due to the Covid-19 pandemic. Based on these findings, publication of international orthopedic practice guidelines during the COVID-19 pandemic would be of great benefit to health practitioners in general and orthopedic surgeons in particular.

## Introduction

The COVID-19 pandemic is one of the largest global healthcare crises in nearly a century. The novel coronavirus crisis started in Wuhan, China in late 2019 and has spread worldwide. [1]

On 11 March 2020, the World Health Organization (WHO) declared that the epidemic of Covid-19 had become a pandemic [2]. To face this global health emergency which has overwhelmed the health systems around the world, health institutions have had to readjust their functioning, to cope with COVID 19 while ensuring the continuity of care and protecting medical staff and patients. At first glance, orthopedic surgeons are not considered front-line staff in the fight against the COVID-19, comparing with our colleagues of other specialities: infectiologists, pneumologists and intensive care physicians. However, as part of the larger healthcare system, they also have an important role to play in reining in this pandemic [1,3]. The purpose of this study was to assess the impact of the COVID-19 pandemic on orthopedic surgeons' activities.

## Materials And Methods

All research were conducted with integrity and in line with generally accepted ethical principles and approved by the Research Ethics Committee of Centre hospitalier du Mans (France).

A 29-question anonymous survey (Table 1) was sent by e-mail to orthopedic surgeons practicing in different parts of the world. We developed an online, web-based survey using an online survey generator. The questionnaire was designed to assess the effect of the COVID-19 pandemic on the orthopedic surgeons' activities. We distributed the questionnaire by e-mail and collected relevant data. Results were exported to Microsoft Excel version 2010 for analysis.

The survey included different sections. The first one was about general information: country of practice, age, sector of activity and years of experience. Then, we asked about knowledge about the COVID-19: specific training, recommendations, risks and protection. The respondents were required to report their experience of care for COVID-19 positive patients and their motivation to work in COVID-19 units. Specific questions were asked about orthopedic and trauma activity: number of surgeries (planned or emergency), number of outpatient visits and supply of orthopedic equipment. They were also interrogated if they had reported symptoms or had suspected a COVID-19 infection and what were the measures taken about that. They were also required to report the level of personal protection at work, which equipment they used and which protection equipment is missing the most in their institution. Finally, the respondents were asked about their countries strategy and what do they think is the best solution to face the COVID-19 pandemic.

## Results

1163 orthopedic surgeons representing 85 countries (Table 2) participated to the study.

The mean age of participants was  $44 \pm 11$  years (min 29 years, max. 76 years old). 56% and 32% of participants have more than 10 and 20 years experience in orthopedic surgery, respectively.

67 % of orthopedic surgeons reported having extensive knowledge of COVID-19 and 66 % have confirmed having received relevant training at their place of work. 961 surgeons asked (83%) reported their awareness about measures of protection and risks for medical staff and patients.

224 respondents (19%) reported having operated on COVID-19 positive patients (Fig. a) but 56 % declared their willingness to operate suspected or COVID-19 positive patients with orthopedic pathology. 60 % of orthopedic surgeons declared being ready to work and help in intensive care units if needed. Concerning their specific activity, 848 surgeons (73%) have cancelled elective surgeries while 13% reduced their activity by about 90%. The number of emergency and trauma surgeries has decreased for the majority of physicians asked, by 90% for 23 % and by 50% for 21 % of them. 13% of surgeons declared having the same trauma activity as usual (Fig. b). In the same way, more than 70% notified a clear decrease on the number of traffic accidents. 35% reduced the number of outpatient visits by 90% while 302 surgeons (26%) have cancelled all outpatient visits. 804 doctors (69%) have used telemedicine with their patients during the COVID-19 pandemic (Fig. c). The supply of orthopedic equipment for the orthopedic

departments was not affected according to 46% of respondents. 315 surgeons experienced one or many symptoms suspecting a COVID-19 infection. The best option was to stay home and observe their symptoms for 52% of them. 54% of respondents reported self-isolating at home when they return back from work place. 44 % declared feeling anxious about this global pandemic (Fig. d). The equipment used for personal protection are medical masks, respirator N 95 or FFP2 masks, face shields, gloves, gowns and protective glasses. 52% of respondents estimated that their countries were under-equipped to deal with the COVID-19 pandemic while 66% were in agreement with their institutions strategies to face this crisis. To avoid COVID-19, orthopedic surgeons asked recommend to people: regular hands washing, hydro-alcoholic sanitizer, social distancing, face masks, gloves and of course to stay home. Finally, 41% of the interviewed doctors believe that the best solution for COVID-19 would be to make a specific vaccine while 28% proposed respect of quarantine as a preventive method to face the Covid-19 pandemic.

## Discussion

The COVID-19 pandemic presents significant challenges to healthcare professionals. The widespread effect of this pandemic has had an impact on the practice of health workers [4].

We invited orthopedic surgeons from different parts of the world to participate in this study.

1163 orthopedic surgeons representing 84 countries have confirmed their participation. The purpose of this study was to assess the impact of COVID-19 pandemic on the orthopedic surgeons' activities. The mean age of participants was  $44,6 \pm 11$  years. Apart from the information shared by healthcare institutions, healthcare professionals used various other sources of information such as television, social media and World Health Organization website (table 3) [5]. This study demonstrated high level of awareness amongst orthopedic surgeons about the risk of infection in healthcare professionals and patients as well as the preventive measures for stopping or minimizing spread of the disease. Given the increased risk for transmission COVID-19 virus in hospitals in general and operating theaters in particular, special personal protective measures must be provided. As surgeons, utmost care must be given to patients in the preoperative, intraoperative, and postoperative settings to minimize the risks of contamination. The risks and benefits of surgical management should be rationalized for each patient [3,5–7]. COVID-19 has shown more infectivity and a higher fatality rate than the H1N1 epidemic [2,5]. In addition, important clinical features of COVID-19 are currently unknown. These two elements may explain the number of interviewees (44%) who expressed reluctance to treat or operate non-urgent conditions in COVID-19 positive patients. Notably, the most common reason for their unwillingness to treat COVID-19 positive patients is due to their concern of getting the infection and transmitting the virus to their family members. With a better understanding of COVID-19 characteristics, we would expect a gradual increase in the number of medical staff who will be willing to treat infected patients [2,5]. The COVID-19 crisis has resulted in people working outside their speciality, providing support to infectiologist, pneumologist and intensive care physicians [1,8]. Orthopedic practice has been markedly affected by the emergence of the COVID-19 outbreak. Changes to clinical practice have been largely guided by clinical urgency, patients and medical staff protection and conservation of health-care resources. Having said that, changes to

inpatient and outpatient care have been accordingly tailored to reduce the risk of contamination in patients, medical staff and to allow hospitals to free up beds for treatment of patients with positive or suspected COVID-19 [3,8]. All elective surgical procedures should be cancelled and deferred until an opportune time [9]. Trauma cases surgeries should continue to proceed. Intraoperatively, full personal protection including surgical shields and goggles should be used. Operative times should be reduced whenever feasible, and surgical team should be kept to the minimum, whenever possible [3,8,10]. The reported decrease in the number of road accidents is due to the lockdown policy imposed by several countries worldwide and remote work adopted by a large number of institutions and organizations. Further measures may also be implemented. Hospitals should be in lockdown with no visitors allowed, social distancing at work (between coworkers) and at home (between cohabiting health-care workers). Physicians have also been advised to prolong the duration between non-urgent follow-ups to reduce patient overcrowding in hospitals [3,8,10]. Although non-urgent clinics and surgical procedures have been postponed until the situation improves, we must ensure that appropriate quality of care given to our patients is maintained. The emergence of such a crisis provides a timely opportunity for us to reflect and evaluate the use of novel technologies in the workplace. This includes the adoption of telemedicine and telerehabilitation initiatives, allowing patients to be consulted and followed-up in the comfort of their own homes [3,8,11–13]. We know that virus is likely to cause minor symptoms in majority (more than 80%) of infected people. Many healthcare workers are likely to fall into this category [1]. Orthopaedic surgeons have a reputation built on their versatility and strength. Emotional support is necessary for ourselves, colleagues, patients and families [1,14,15]. Most interviewed practitioners estimated appropriate protective measures have been provided at work (table 4). Provision of personal protective equipment to healthcare professionals has been a huge challenge in many countries [1,10,16]. Personal protective equipment included medical masks, respirator N 95 or FFP2 masks, face shields, gloves, gowns, and protective glasses [5,17,18]. Given the extent of the pandemic, a shortage of a widely used equipment has been reported with FFP2 masks arrive in the top of the list -reported by 53% of the interviewed participants- (table 5). Institutions and governments have put in place different strategies to face this shortage, notably, support increasing production capacity and accelerating approval of protective equipment during this crisis [18,19]. To help prevent spread of COVID-19, orthopedic surgeons recommendations were frequent hand washing for a minimum 20 seconds, use hydro-alcoholic sanitizer, social distancing, use of face masks, gloves and of course confinement while waiting to discover a specific treatment and to make a specific vaccine.

Our study has limitations. First, the severity of the outbreak was not the same in all countries, so the measures taken by governments and health institutions were different [6,7]. Second, the experience of the person who fills out the questionnaire may affect the results.

## **Conclusion**

The COVID-19 pandemic has posed an unprecedented challenge for healthcare systems and clinicians around the world. This pandemic has confronted the orthopedic community with challenges never

encountered by our profession. During this unprecedented time, we have to get out of our comfort zones to work as a team with all of our colleagues to face the Covid-19.

## Declarations

### Conflict of interest:

On behalf of all authors, the corresponding author states that there is no conflict of interest.

### Funding:

The authors received no external funding for this research project.

When we sent the survey emails to participants, we made it clear that this is an international study and that the results of this survey will be analyzed and will lead to the writing of an article which will be published, in order to make a scientific contribution during this COVID-19 pandemic.

By choosing to answer the questionnaire, colleagues gave their agreement for the use of anonymous data collected for scientific purposes.

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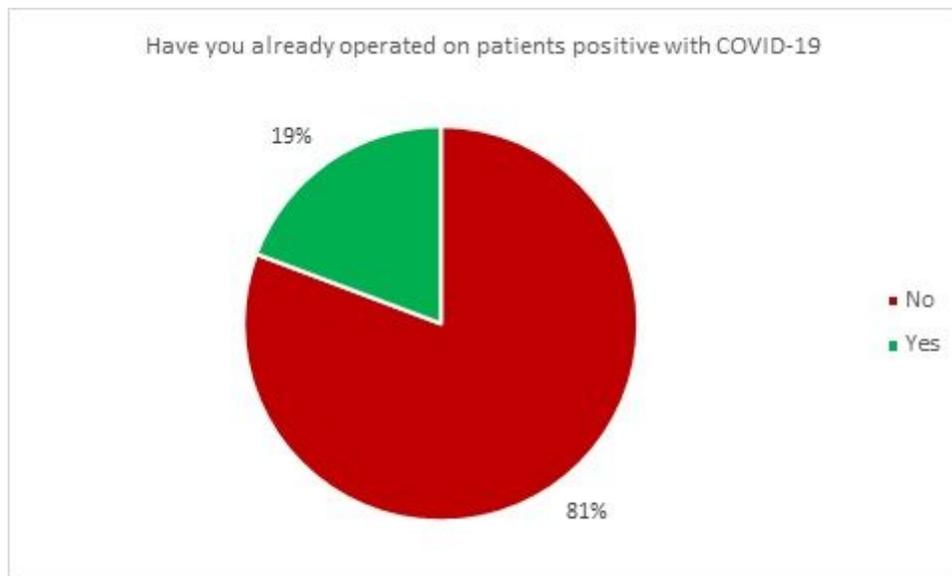
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## Tables

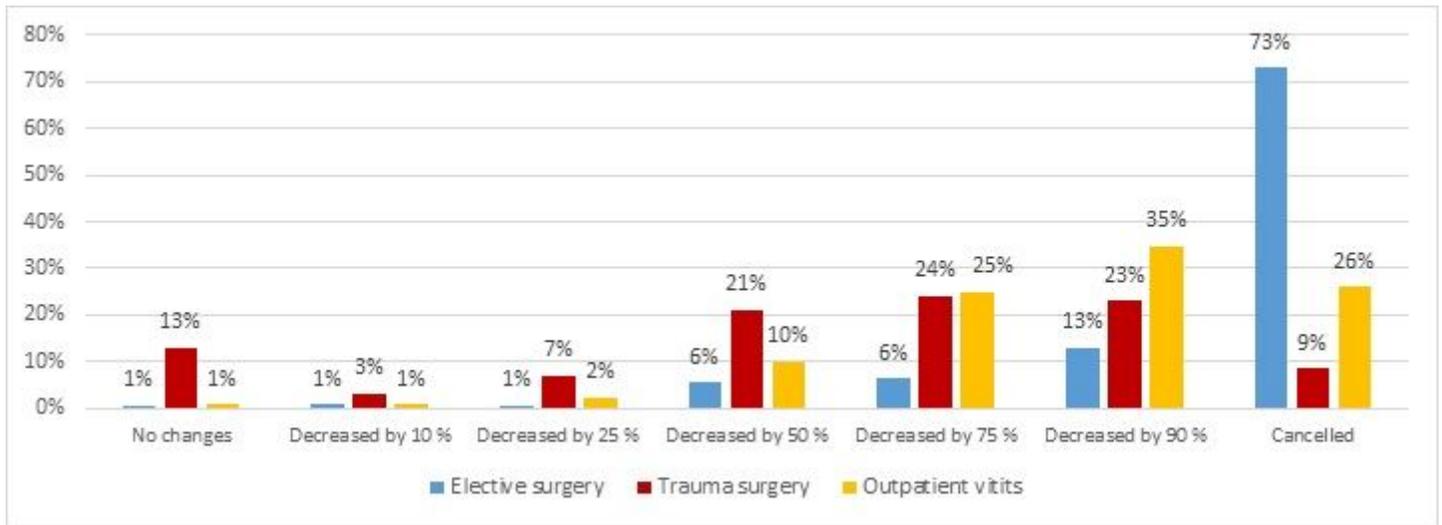
Due to technical limitations the Tables are available as a download in the Supplementary Files.

## Figures



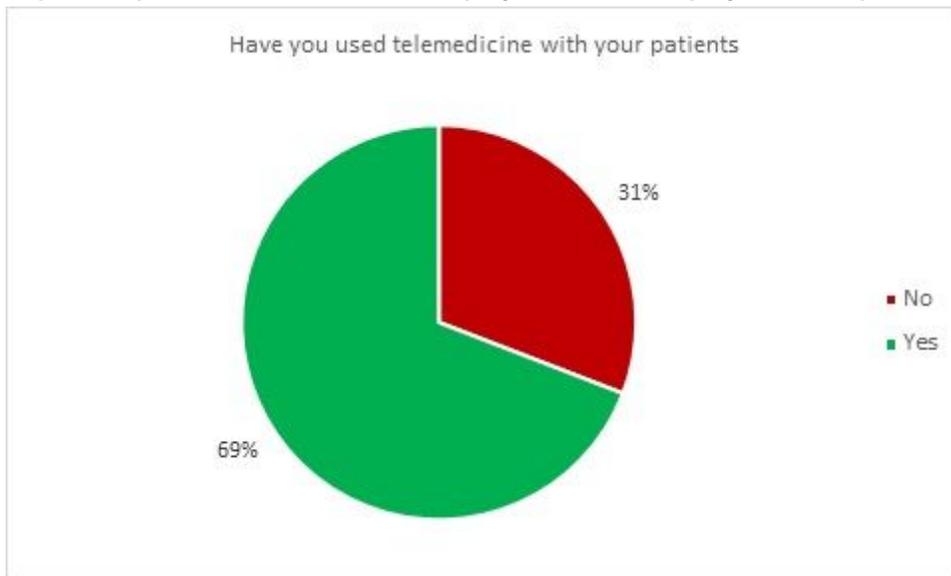
**Figure 1**

Fig. a. Surgeons operating on COVID-19 positive patients



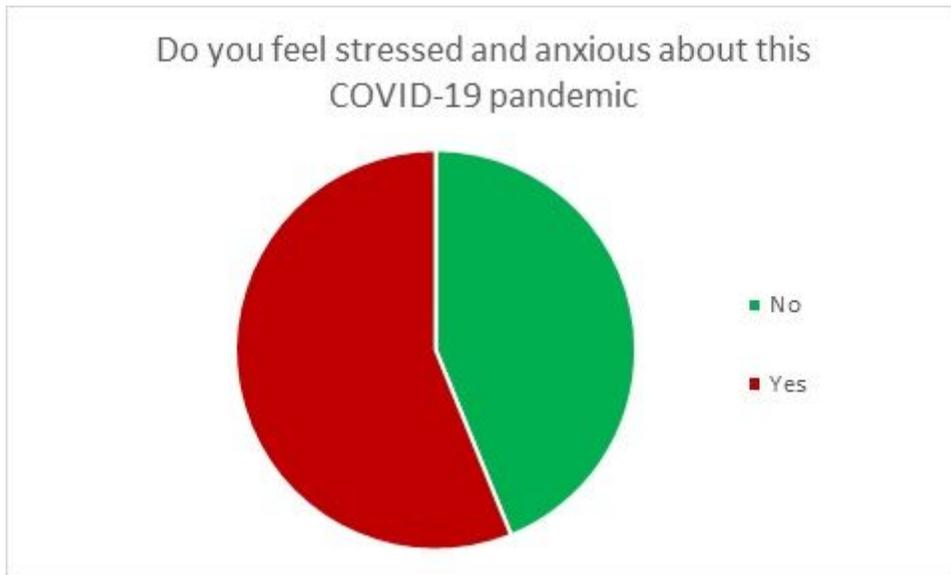
**Figure 2**

Fig. b. Impact on the elective surgery, trauma surgery and outpatient visits



**Figure 3**

Fig. c. use of telemedicine



**Figure 4**

Fig. d. Stress and anxiety about the COVID-19 pandemic

## Supplementary Files

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