

## Impact of the COVID-19 on the epidemiology of maxillofacial fractures surgically treated in a Cuban university hospital

Impacto del COVID-19 en la epidemiología de las fracturas maxilofaciales tratadas quirúrgicamente en un hospital universitario cubano

Ibraín Enrique Corrales Reyes<sup>1\*</sup> <https://orcid.org/0000-0002-2146-9014>

Alejandro Ernesto Núñez Blanco<sup>1</sup> <https://orcid.org/0000-0002-5237-7139>

Denia Morales Navarro<sup>2</sup> <https://orcid.org/0000-0001-6066-7235>

<sup>1</sup>Medical University of Granma. Carlos Manuel de Céspedes General University Hospital. Maxillofacial Surgery Department. Granma, Cuba.

<sup>2</sup>Medical University of La Habana. Faculty of Dentistry. La Havana, Cuba.

\*Corresponding author: [iecorralesr@infomed.sld.cu](mailto:iecorralesr@infomed.sld.cu)

### ABSTRACT

**Introduction:** COVID-19 pandemic has had a significant impact on people's behavior.

**Aim:** To evaluate the impact of the COVID-19 on the epidemiology of maxillofacial fractures surgically treated in a Cuban university hospital.

**Methods:** This research involved a 4-year descriptive, comparative, retrospective and cross-sectional study. Patients surgically treated between March 1 and December 31, 2020 (COVID-19 period) were compared with those who had undergone surgery between the same date in the years 2017-2019 (non-pandemic period). Age, sex, residence, year, month, alcohol consumption at the time of trauma, etiology, fractures types, and number of fractures per patient were recorded.

**Results:** A decline in patients with maxillofacial fractures in 2020 (n=25) was observed when compared to equivalent periods in the three previous years (2017: n=37; 2018: n=31; 2019: n=41), respectively, with an annual average reduction of 31.19 %. Interpersonal violence was found to be the paramount etiological factor for maxillofacial fractures during

the comparison periods (2017-2019); however, road traffic accident prevailed in the 2020 (n=12; 48 %). There was a small increase in the number of alcohol-related fractures (56 % in 2020 vs 46.34 %, 41.94 %, and 51.35 % in 2019, 2018, and 2017, respectively).

**Conclusion:** COVID-19 impacted on the epidemiology maxillofacial fractures surgically treated in this Cuban university hospital.

**Keywords:** epidemiological studies; maxillofacial trauma; facial bones; COVID-19; SARS-CoV-2.

## RESUMEN

**Introducción:** La pandemia de la COVID-19 ha tenido un impacto significativo en el comportamiento de la población.

**Objetivo:** Evaluar el impacto de la COVID-19 en la epidemiología de las fracturas maxilofaciales tratadas quirúrgicamente en un hospital universitario cubano.

**Métodos:** Esta investigación consistió en un estudio descriptivo, comparativo, retrospectivo y transversal de 4 años de duración. Se compararon los pacientes intervenidos quirúrgicamente entre el 1 de marzo y el 31 de diciembre de 2020 (periodo COVID-19) con los intervenidos entre la misma fecha en los años 2017-2019 (periodo no pandémico). Se registraron edad, sexo, residencia, año, mes, consumo de alcohol en el momento del traumatismo, etiología, tipos de fracturas y número de fracturas por paciente.

**Resultados:** Se observó un descenso de pacientes con fracturas maxilofaciales en 2020 (n=25) en comparación con periodos equivalentes de los tres años anteriores (2017: n=37; 2018: n=31; 2019: n=41), respectivamente, con una reducción media anual del 31,19 %. Se observó que la violencia interpersonal fue el factor etiológico primordial de las fracturas maxilofaciales durante los periodos de comparación (2017-2019); sin embargo, el accidente de tráfico prevaleció en el 2020 (n=12; 48 %). Hubo un pequeño aumento en el número de fracturas relacionadas con el alcohol (56 % en 2020 frente a 46,34 %, 41,94 % y 51,35 % en 2019, 2018 y 2017, respectivamente).

**Conclusiones:** La COVID-19 impactó en la epidemiología de fracturas maxilofaciales atendidas quirúrgicamente en este hospital universitario cubano.

**Palabras clave:** estudios epidemiológicos; trauma maxilofacial; huesos faciales; COVID-19; SARS-CoV-2.

Recibido: 19/07/2021

Aceptado: 23/09/2021

## Introduction

In December 2019, a series of pneumonia cases of unknown origin were detected in the city of Wuhan-China, spreading with great ease.<sup>(1,2)</sup> Subsequently, a virus was identified as the causative agent. It was denominated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), while the disease, COVID-19.<sup>(3,4)</sup> On March 11, 2020, the World Health Organization declared the pandemic status due to this cause.<sup>(5)</sup>

Prolonged lockdown measures have been imposed on entire populations in order to slow down the spread of the virus and thus reduce the number of new SARS-CoV-2 infections, confirmed cases, and fatalities.<sup>(6,7,8,9,10,11)</sup> These measures have included restrictions on outdoor activities and sports, as well as bans on social outings, gatherings, and festivals. As a consequence, citizens' movements have been severely limited.<sup>(12,13,14)</sup>

The enforcement of these lockdown measures seems to have resulted in a significant decline in some of the main causes of trauma, such as sports and leisure trauma or car accidents, paralleled by a significant decline in facial trauma surgeries. It appears that this unprecedented phenomenon has not yet been enough documented in the literature.<sup>(15,16,17)</sup>

Community mitigation measures differ by geographic region and can be enacted at the town/city, county, state/province, or national level.<sup>(8)</sup> Following the growing trend of virus spread a bold decision was taken by the Cuban government to enact a lockdown, which included closure of all the commercial activities and restricting the modes of transportation.<sup>(18)</sup>

Apart from mitigating the rapid and widespread transmission of this disease, it is unclear how changes in behavior related to these policies affect the incidence and etiology of maxillofacial fractures. This article aims to evaluate the impact of the COVID-19 on the epidemiology of maxillofacial fractures surgically treated in a Cuban university hospital.

## Methods

The present research involved a 4-year descriptive, comparative, retrospective and cross-sectional study in patients with maxillofacial fractures who were surgically treated (open reduction and internal fixation) in the Maxillofacial Surgery department of Carlos Manuel de Céspedes General University Hospital, Bayamo, Granma, Cuba. This hospital is responsible for the secondary care of patients from the capital and other six municipalities of the Granma province. However, patients from other municipalities of the province with neurosurgical issues are attended too because the unique Neurosurgery Department of the province is located at this hospital.

The first three cases (all Italian tourists) were identified on March, 2020. This date represents the start of the epidemic in Cuba.<sup>(18)</sup> In this sense, patients treated between March 1 and December 31, 2020 (COVID-19 period) were identified and compared with those who had undergone surgery between the same date in the years 2017, 2018 and 2019 (non-pandemic period). The time periods were selected to capture patients who presented while measures of social distancing were and were not in effect and to provide a historical and temporal trend.

The study inclusion criteria were: a) patients of both sexes and all age groups; b) a history of an acute trauma episode; c) X-ray or computed tomography confirming the clinical diagnosis of fracture and evidencing its location and characteristics; d) signing of an informed consent by all patients, through which they agreed to the use of their medical data for scientific research. Patients with incomplete medical records or with unclear data were excluded. All the data were tabulated in a proforma specially designed for the study. During these four years, one hundred forty patients with maxillofacial fractures were surgically treated in our department. However, six cases had unclear/incomplete record and were excluded from the study.

Comparative analysis was performed for variables such as: number of trauma cases, sex, age at injury, residence (urban/rural), year, month, alcohol consumption at the time of trauma (yes/no), etiology (interpersonal violence, animal attacks, road traffic accidents (RTA), sport-related accidents, work-related accidents, home-related accidents, and complicated extractions), fractures types (mandible, zygomaticomaxillary complex, Le Fort

I, Le Fort II, Le Fort III, panfacial, and nasoorbitoethmoidal), and number of fractures per patient. Alcohol consumption information collected was based on medical record.

A database was created using Microsoft Excel (2019 version for Windows). Frequencies and percentages of all the variables were obtained. This study followed the Declaration of Helsinki on medical protocol. The Ethical Review Board of the hospital approved the study and provided permission to review the medical records of the patients.

## Results

As shown in table 1, 134 patients underwent surgery, mainly in 2019 (n=41; 30.6 %). The number of cases in the 2020 (n=25) was lower than the number in the 2017, 2018 and 2019 (n= 37.31, and 41, respectively). When comparing the percentage of patients with maxillofacial fractures surgically treated during the COVID-19 period to a non-pandemic period (mean value for the comparison period: March 1 to December 31 in the years 2017, 2018 and 2019), we found a reduction of 31.19 % (table 1).

**Table 1-** Patient's characteristics

Characteristics	Categories	Non-pandemic period			2020 (n=25) COVID-19 period
		2017 (n=37)	2018 (n=31)	2019 (n=41)	
Sex	Male	33 (89.19)	31 (100)	36 (87.80)	24 (96.00)
	Female	4 (10.81)	0	5 (12.20)	1 (4.00)
Age (years)	< 20	3 (8.11)	4 (12.90)	0	2 (8.00)
	20 – 39	16 (43.24)	14 (45.16)	13 (31.71)	7 (28.00)
	40 – 59	15 (40.54)	10 (32.26)	25 (60.98)	16 (64.00)
	≥ 60	3 (8.11)	3 (9.68)	3 (7.32)	0
	Mean ± SD	37.89 ± 14.51	35.71 ± 14.45	43.98 ± 12.71	41.16 ± 12.63
Residence	Rural	13 (35.14)	15 (48.39)	25 (60.98)	11 (44.00)
	Urban	24 (64.86)	16 (51.61)	16 (39.02)	14 (56.00)
Alcohol-related fractures	Yes	19 (51.35)	13 (41.94)	19 (46.34)	14 (56.00)
	No	18 (48.65)	18 (58.06)	22 (53.66)	11 (44.00)

In all years, a greater proportion of injured patients were males compared with females, resulting in a general ratio of 12.4:1. The age of patients at the time of injury ranged from

13 to 69 years, with a mean age of 39.86 ( $\pm 13.86$ ) years. In 2017 and 2018, the commonest age group was 20-39, reporting 16 and 14 cases respectively, but in 2019 and 2020 was 40-59. There was a small increase in the number of alcohol-related fractures (56 % in 2020 vs 46.34 %, 41.94 %, and 51.35 % in 2019, 2018, and 2017, respectively) (table 1).

Interpersonal violence was found to be the paramount etiological factor for maxillofacial fractures during the comparison periods (2017-2019); however, road traffic accident prevailed in the 2020 (n=12; 48 %). The commonest fracture type was zygomaticomaxillary complex (ZMC) fractures in all years. Most patients presented with more than two fractures, and the mean number of fractures per patient showed an increased in the 2020 compared to the 2017, 2018, and 2019 (mean =  $3.76 \pm 2.09$  in 2020;  $2.22 \pm 0.85$  in 2017;  $2.39 \pm 0.95$  in 2018, and  $2.39 \pm 0.95$  in 2019) (table 2).

**Table 2-** Trauma's characteristics

Characteristic s	Categories	Non-pandemic period			2020 (n=25) COVID-19 period
		2017 (n=37)	2018 (n=31)	2019 (n=41)	
<b>Etiology</b>	Interpersonal violence	15 (40.54)	14 (45.16)	21 (51.22)	8 (32.00)
	Animal attacks	4 (10.81)	2 (6.45)	3 (7.32)	0
	Road traffic accidents	12 (32.43)	10 (32.26)	10 (24.39)	12 (48.00)
	Sport-related accidents	2 (5.41)	2 (6.45)	0	0
	Work-related accidents	1 (2.70)	2 (6.45)	0	1 (4.00)
	Home-related accidents	0	0	0	0
	Falls	2 (5.41)	1 (3.23)	7 (17.07)	4 (16.00)
	Complicated extraction	1 (2.70)	0	0	0
<b>Fracture types</b>	Mandible	18 (48.65)	11 (35.48)	16 (39.02)	5 (20.00)
	Zygomaticomaxillary complex	18 (48.65)	22 (70.97)	23 (56.10)	16 (64.00)
	Le Fort I	2 (5.41)	3 (9.68)	0	2 (8.00)
	Le Fort II	0	0	1 (2.44)	0
	Le Fort III	1 (2.70)	0	0	0
	Panfacial	0	0	2 (4.88)	2 (8.00)
	Nasoorbitoethmoidal	1 (2.70)	0	0	0
<b>Number of fractures per patient</b>	1	8 (21.62)	6 (19.35)	8 (19.51)	2 (8.00)
	2	15 (40.54)	11 (35.48)	16 (39.02)	5 (20.00)
	3	12 (32.43)	10 (32.26)	9 (21.95)	4 (16.00)
	4	2 (5.41)	4 (12.90)	5 (12.20)	9 (36.00)
	$\geq 5$	0	0	3 (7.32)	5 (20.00)
	Mean $\pm$ standard deviation	$2.22 \pm 0.85$	$2.39 \pm 0.95$	$2.56 \pm 1.36$	$3.76 \pm 2.09$

The detail by years and months is presented in figure 1. In the majority of the months of 2020, the number of patients was lower than the number in the rest of the years. In March 2020, a peak in incidence was noted (n=10) and was related with an RTA in which seven patients were affected.

A decline in the incidence of maxillofacial fractures could be observed in all months, except March and December. April and November had equal decrease (76.91 %, respectively) and a peak in reduction was noted in May (100 %) (fig. 2).

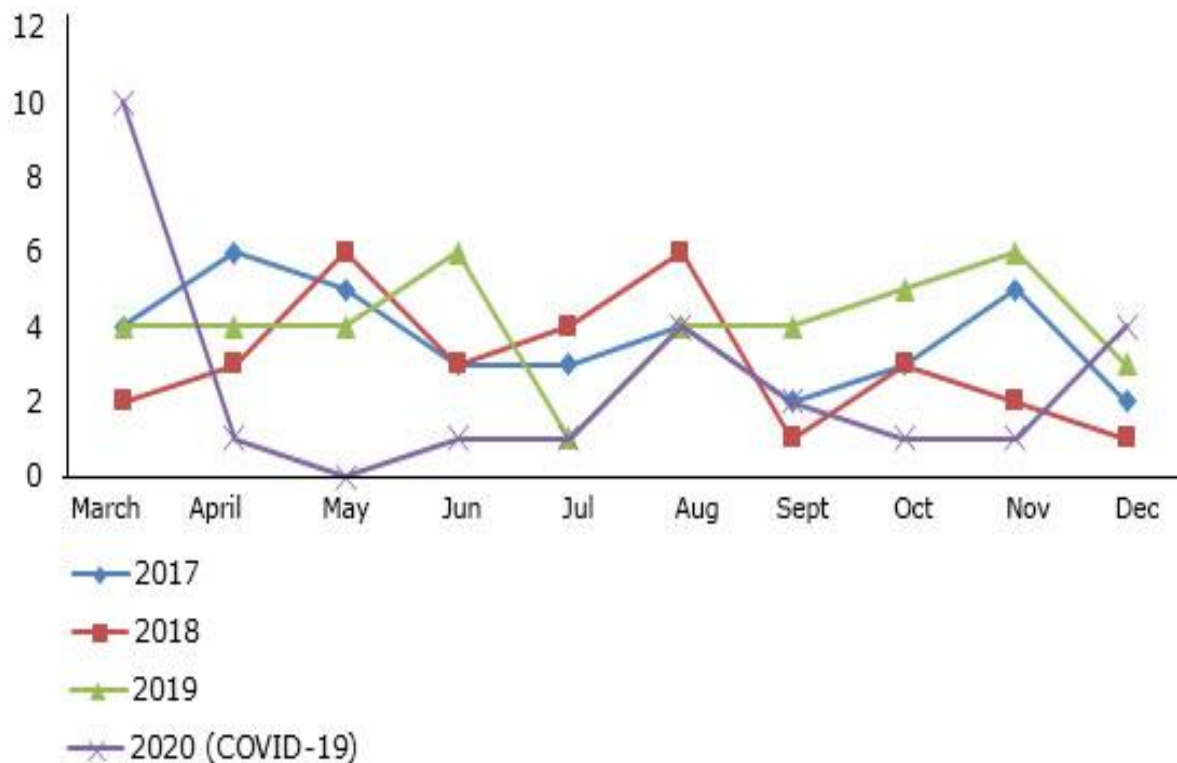
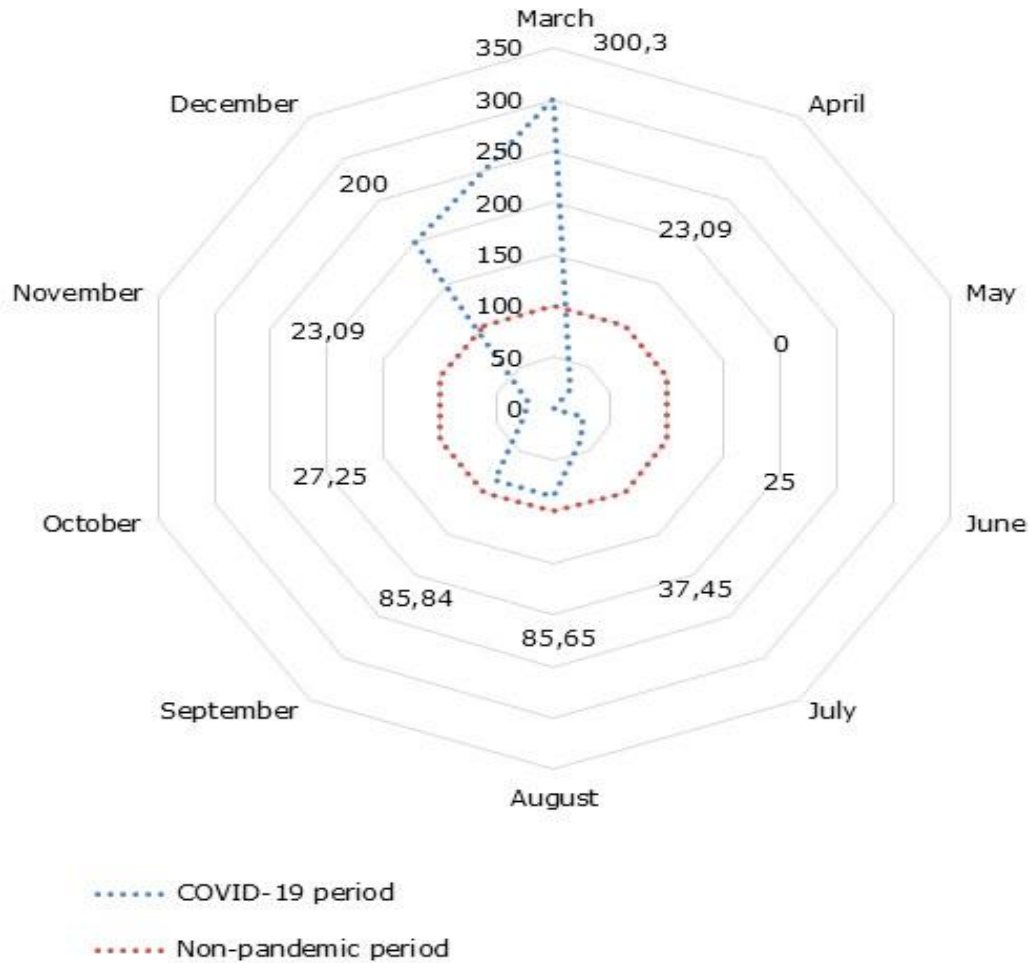


Fig. 1- Temporal distribution of patients.



**Fig. 2-** Percentage of maxillofacial fractures during the COVID-19 period (March 1 to December 31, 2020) compared to a non-pandemic period (mean value for the comparison period: March 1 to December 31 in the years 2017, 2018 and 2019), for all patients and in each month.

## Discussion

Maxillofacial trauma needs special attention due to their close proximity to and frequent involvement of vital organs, and for this reason, thorough evaluation of the maxillofacial region is mandatory during the primary stages of trauma care.<sup>(19)</sup> As far as we know, there are still no Cuban published reports evaluating the effects of the lockdown on maxillofacial fracture patterns. In this study, we only included patients surgically treated in order to obtain a profile of the impact of the COVID-19 pandemic on the epidemiology of severe maxillofacial fractures in this Cuban university hospital.



Our investigation found that the number of patients was lower during the COVID-19 pandemic while social distancing policies were in place. In other words, the most evident effect of the measures taken by the Cuban government was a reduction of 31.19 % in the number of patients needing surgical treatment. This is similar to several reports in France,<sup>(7)</sup> United States,<sup>(8)</sup> India,<sup>(12)</sup> United Kingdom,<sup>(13)</sup> Italy<sup>(16)</sup> and New Zealand.<sup>(17)</sup> In South Africa, *Moriss*<sup>(20)</sup> found the number of trauma cases reduced to 39 % from 55 % in 2018 and 51 % in 2019 at the emergency department of an institute during the lockdown. *Núñez*<sup>(21)</sup> observed a significant reduction in the number of emergency trauma visits on comparison with the four periods for emergency trauma visits during COVID-19 pandemic in Spain. This was not unexpected because as the result of the pandemic and restrictions put in place, people are moving around less and staying at home more, making them less likely to sustain oral and maxillofacial injuries in the process.<sup>(7,8,12,13,16,17,20,21)</sup>

In our study, the sex distribution of maxillofacial fractures incidence is highly frequent in males and the overall male to female ratio was 12.4:1. Our finding was higher than to several previously conducted studies in United States (2.92:1)<sup>(8)</sup> and Italy (2.59:1).<sup>(16)</sup> These results might be due to that men tend to be more often involved in aggressive and conflict-ridden situations and are mostly involved in outdoor activities than women. Lesser incidence of maxillofacial fractures in females could be because of lesser reporting of injuries -due to either the sex-based neglect still prevalent in many rural areas or domestic abuse.<sup>(22)</sup>

Our research showed a reduction in patients aged 20–39 years, as well as  $\geq 60$  years during the COVID-19 period in comparison with previous years. Due to social distancing, young and active people have in fact experienced the most radical change in lifestyle. The consequent elimination of activities involving a risk of injury among these subjects has caused a reduction in the occurrence of trauma. The benefits of this effect have been less evident among the elderly population, who are more prone to accidental fractures within the home environment.<sup>(16)</sup>

Interestingly, this study revealed a 56 % of alcoholic ingestion before the trauma during the 2020 (COVID-19 period). *Ludwig et al*<sup>(8)</sup> in United States reported that there was a trend during the COVID-19 pandemic in this country of more individuals presenting with positive alcohol or toxicology screen results. Alcohol involved facial injuries may be more

serious than non-alcohol related facial injuries as evident by higher proportion of patients requiring surgery. Facial injuries from alcohol-related trauma places a high burden on hospital resources. As alcohol-related maxillofacial trauma can be potentially preventable, educational programs and alcohol intervention strategies should be implemented to reduce such health hazards.<sup>(23)</sup>

There is a need to know the cause, severity and time distribution to set priorities for effective treatment and prevention of these injuries, which is related to the identification of possible direct or indirect risk factors for maxillofacial trauma.<sup>(24)</sup> Our study revealed changes in the etiology patterns. During the comparison period (2017-2019), interpersonal violence was found to be the main etiological factor for maxillofacial fractures; however, RTA prevailed in the 2020. There is an opposite experience reported by *Vishal et al*<sup>(12)</sup> in India. In this research, RTA was 85.44 % in the control period which significantly decreased to 61.11 % of total etiology during strict lockdown.

Concerning the fracture site, the ZMC bones were the most fractured followed by the mandible in all years. In a study conducted in United States by *Ludwig et al*,<sup>(8)</sup> excluding skull base and cranial vault, this relation is similar. These results can be due to these bones prominence in the viscerocranium, which makes it susceptible to trauma. Also, the ZMC is biomechanically the lateral weight-bearing pillar of the midface, absorbing a large part of the kinetic energy of the wounding agents.<sup>(25,26)</sup> Another aspect that should not be neglected is human defense instinct. People are frequently tempted to turn their head at the moment of the trauma, avoiding in this way frontal impact in the middle of the face.<sup>(26,27)</sup>

During the comparison period, the majority of the patients had two lines of fractures; however, in the 2020, this experienced a remarkable increase reaching a mean of 3.76 fractures per patient. Our finding was higher than to the study conducted in United States.<sup>(8)</sup>

The mentioned differences can be explained by the fact that the patterns of craniofacial fractures depend on a multitude of factors such as the type, direction, kinetic energy of the injuring agent or the position of the head at the time of the trauma, and especially on the fracture mechanism, leading to many possible variants of association of the fracture foci.<sup>(27)</sup>

The most marked reduction (100%) was recorded in May. In this month, Granma, the province where the hospital hosting this investigation is located, was seriously struck by the COVID-19 infection and this implied a more restrictive action to contain the contagion and

to limit the spread of the virus. We hypothesized that this may be the reason why this month experienced such a decreased rate of patients with maxillofacial fractures needing surgical treatment.

Limitations of the study is that being retrospective, it may be subject to information bias due to inaccurate initial examination and incomplete or incorrect documentation. In order to minimize this shortcoming, only full medical records were selected. It would be interesting to study the number of patients that might have refused surgery out of fear of contracting SARS-CoV-2 during their hospitalization.

We concluded that COVID-19 impacted on the epidemiology maxillofacial fractures surgically treated in this Cuban university hospital with an 31.19% reduction compared with the three previous year.

## References

1. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, *et al.* Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med.* 2020;382:1708-20. DOI: <https://doi.org/10.1056/NEJMoa2002032>
2. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, *et al.* A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med.* 2020;382:727-33. DOI: <https://doi.org/10.1056/NEJMoa2001017>
3. Wang C, Horby PW, Hayden FG, Gao FG. A novel coronavirus outbreak of global health concern. *Lancet.* 2020;395(102223):470-3. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30185-9](https://doi.org/10.1016/S0140-6736(20)30185-9)
4. Chan W, Yuan S, Kok KH, Kai K, Chu H, Yang J, *et al.* A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet.* 2020;395(102223):514-23. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30154-9](https://doi.org/10.1016/S0140-6736(20)30154-9)
5. Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A, *et al.* World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). *Int J Surg.* 2020;76:71-6. DOI: <https://doi.org/10.1016/j.ijsu.2020.02.034>

6. Rhotan AH, Byrareddy S. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *J Autoim.* 2020;109:102433. DOI: <https://doi.org/10.1016/j.jaut.2020.102433>
7. de Boutray M, Kün-Darbois JD, Sigaux N, Lutz JC, Veysiére A, Sesque A, *et al.* Impact of the COVID-19 lockdown on the epidemiology of maxillofacial trauma activity: a French multicentre comparative study. *Int J Oral Maxillofac Surg.* 2020;50(6):750-5. DOI: <https://doi.org/10.1016/j.ijom.2020.10.005>
8. Ludwig DC, Nelson JL, Burke AB, Lang MS, Dillon JK. What Is the Effect of COVID-19-Related Social Distancing on Oral and Maxillofacial Trauma? *J Oral Maxillofac Surg.* 2021;79(5):1091-7. DOI: <https://doi.org/10.1016/j.joms.2020.12.006>
9. Barca I, Cordaro R, Kallaverja E, Ferragina F, Cristofaro MG. Management in oral and maxillofacial surgery during the COVID-19 pandemic: our experience. *Br J Oral Maxillofac Surg.* 2020;58(6):687-91. DOI: <https://doi.org/10.1016/j.bjoms.2020.04.025>
10. Ghai S. Facial trauma management during the COVID-19 era: a primer for surgeons. *Curr Med Res Pract.* 2020;10(4):169-73. DOI: <https://doi.org/10.1016/j.cmrp.2020.07.011>
11. Holmes S, Bhatti N, Bhandari R, Chatzopoulou D. Toward a consensus view in the management of acute facial injuries during the COVID-19 pandemic. *Br J Oral Maxillofac Surg.* 2020;58(5):571-6. DOI: <https://doi.org/10.1016/j.bjoms.2020.03.024>
12. Vishal, Prakash O, Rohit, Prajapati VK, Shahi AK, Khaitan T. Incidence of Maxillofacial Trauma Amid COVID-19: A Comparative Study. *J Maxillofac Oral Surg.* 2020;21:420-5. DOI: <https://doi.org/10.1007/s12663-020-01484-y>
13. Yeung E, Brandsma DS, Karst FW, Smith C, Fan KFM. The influence of 2020 coronavirus lockdown on presentation of oral and maxillofacial trauma to a central London hospital. *Br J Oral Maxillofac Surg.* 2021;59(1):102-5. DOI: <https://doi.org/10.1016/j.bjoms.2020.08.065>
14. Blackhall KK, Downie IP, Ramchandani P, Kusanale A, Walsh S, Srinivasan B, *et al.* Provision of emergency maxillofacial service during the COVID-19 pandemic: a collaborative five centre UK study. *Br J Oral Maxillofac Surg.* 2020;58(6):698-703. DOI: <https://doi.org/10.1016/j.bjoms.2020.05.020>

15. Sundaram DS, Oommen AJ, Jenifer D, Vinitha G, Ebenezer J. Conservative approach for treatment of isolated mandibular fractures, the adaptations during COVID 19 Pandemic. *J Maxillofac Oral Surg.* 2022;21:426-32. DOI: <https://doi.org/10.1007/s12663-020-01489-7>
16. Salzano G, Dell'Aversana G, Audino G, Vaira LA, Trevisiol L, D'Agostino A, *et al.* Have There Been any Changes in the Epidemiology and Etiology of Maxillofacial Trauma During the COVID-19 Pandemic? An Italian Multicenter Study. *J Craniofac Surg.* 2021;32(4):1445-7. DOI: <https://doi.org/10.1097/SCS.00000000000007253>
17. Christey G, Amey J, Campbell A, Smith A. Variation in volumes and characteristics of trauma patients admitted to a level one trauma centre during national level 4 lockdown for COVID-19 in New Zealand. *NZMJ.* 2020 [access 08/07/2021];(1513):81-8. Available at: [https://assets-global.website-files.com/5e332a62c703f653182faf47/5ea0c175826d433832a2ee34\\_Christey%20FINAL.pdf](https://assets-global.website-files.com/5e332a62c703f653182faf47/5ea0c175826d433832a2ee34_Christey%20FINAL.pdf)
18. Galbán E, Más P. COVID-19 in Cuba: Assessing the National Response. *MED Rev.* 2020;22(4):29-34. DOI: <https://doi.org/10.37757/MR2020.V22.N4.5>
19. Satpathy M, Gupta MK, Kumar A, Prabhu S, Tiwari S, Jain N. Maxillofacial Fractures in Bhopal, India: analytic study of 1268 Cases. *J Maxillofac Oral Surg.* 2016;15(1):25-31. DOI: <https://doi.org/10.1007/s12663-015-0802-5>
20. Morris D, Rogers M, Kissmer N, Du Preez A, Dufourq N. Impact of lockdown measures implemented during the Covid-19 pandemic on the burden of trauma presentations to a regional emergency department in Kwa-Zulu Natal, South Africa. *Afr J Emerg Med.* 2020;10(4):193-96. DOI: <https://doi.org/10.1016/j.afjem.2020.06.005>
21. Nuñez JH, Sallent A, Lakhani K, Guerra-Farfan E, Vidal N, Ekhtiari S, *et al.* Impact of the COVID-19 pandemic on an emergency traumatology service: experience at a tertiary trauma centre in Spain. *Injury.* 2020;51(7):1414-18. DOI: <https://doi.org/10.1016/j.injury.2020.05.016>
22. Agarwal P, Mehrotra D, Agarwal R, Kumar S, Pandey R. Patterns of Maxillofacial Fractures in Uttar Pradesh, India. *Craniofacial Trauma Rec.* 2017;10(1):48-55. DOI: <https://doi.org/10.1055%2Fs0036-1597581>

23. O'Meara C, Witherspoon R, Hapangama N, Hyam DM. Alcohol and interpersonal violence may increase the severity of facial fractures. *Br J Oral Maxillofac Surg.* 2012;50(1):36-40. DOI: <https://doi.org/10.1016/j.bjoms.2010.11.003>
24. Silveira DF, Gurgel FW, López CD, de Barros PG, Marinho TM, Rodriguez FS, *et al.* Occupational group, educational level, marital status and deleterious habits among individuals with maxillofacial fractures: retrospective study. *Med Oral Patol Oral Cir Bucal.* 2018;23(1):e13-22. DOI: <https://doi.org/doi:10.4317/medoral.21969>
25. Obimakinde OS, Ogundipe KO, Rabiou TB, Okoje VN. Maxillofacial fractures in a budding teaching hospital: a study of pattern of presentation and care. *Pan Afr Med J.* 2017;26:218. DOI: <https://doi.org/10.11604/pamj.2017.26.218.11621>
26. Țeș Ț PA, Juncar RI, Juncar M. Clinical patterns and characteristics of midfacial fractures in western romanian population: a 10-year retrospective study. *Med Oral Patol Oral Cir Bucal.* 2019;24(6):e792-8. DOI: <https://doi.org/doi:10.4317/medoral.23153>
27. Li R, Zhang R, Li W, Pe F, He W. Analysis of 126 hospitalized elder maxillofacial trauma victims in central China. *Med Oral Patol Oral Cir Bucal.* 2015;20:e464-70. DOI: <https://doi.org/10.4317/medoral.20551>

### Author contributions

*Conceptualization, data curation, formal analysis, investigation, methodology, resources, writing-original draft, writing-review & editing:* Ibraín Enrique Corrales Reyes.

*Data curation, investigation, resources, writing-review & editing:* Alejandro Ernesto Núñez Blanco.

*Investigation, resources, writing-review & editing:* Denia Morales Navarro.