



SCAN ME

*Research Paper*

**EFFECT OF THE COVID-19 PANDEMIC LOCKDOWN ON TRAUMA CASES REPORTED IN ACCIDENT AND EMERGENCY UNIT OF LADYSMITH REGIONAL HOSPITAL, LADYSMITH, KWAZULU-NATAL PROVINCE, SOUTH AFRICA**

**Omolajaiye, S. A.<sup>1</sup> and Azeez Adeboye<sup>2</sup>**

<sup>1</sup>Department of General Surgery and Urology,  
Ladysmith Regional Hospital, Malcom Road,  
Ladysmith. 3370 KwaZulu-Natal, South Africa.

<sup>2</sup>Department of Statistics, University of Fort Hare, Alice,  
South Africa.

**Abstract**

This study aimed to determine whether the introduction of Covid-19 lockdown orders had any significant changes in the incidence of trauma-related cases reported in the accident and emergency unit of the Ladysmith Regional Hospital. A comparative study conducted using data collected from the Medical Record Department of the Ladysmith Regional Hospital. Major trauma cases under study were Gunshot, Assault, Stab, and Road Accident. In total, 56% reduction was observed in all trauma-related cases that were studied. The outcome of research showed a significant reduction in all trauma cases as follows; Gunshot (13% reduction), Assault (41.3%), Stab (54.2%), and Road Accident (65.2%). The significant reduction in the incidence of trauma-related cases observed in this study showed that the introduction of the Covid-19 lockdown had positive effects on hospital admission of trauma cases. In view of this, immediate regulations are recommended to reduce rates of trauma-related cases and thereby lowering the burden on hospital facilities and the cost of patients' management.

Key words: Accident, Covid-19, Emergency, Incidence, Trauma.

**INTRODUCTION**

In the later part of 2019, the World Health Organization (WHO) outlined the cluster of pneumonia cases in Wuhan City, China and revealed that Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) globally known as Coronavirus Disease 2019 (COVID-19) is a causative agent for the pneumonic disease manifestation. Since the

discovery, the virus has rapidly spread across nearly all nations of the world including South Africa. The Covid-19 epidemic was declared a public health crisis on January 20, 2020, by World Health Organization [5, 9]. Like every other nation of the world, the national government of South Africa declared Covid-19 as a national disaster. The declaration prompted the government to announce some measures such as the partial closure of borders, banning visits to prisons, closing schools, banning of unwarranted and unauthorized movement, the prohibition of interprovincial movement, the prohibition of alcohol consumption and prohibiting events that involve the gathering of more than 20 people on March 15, 2020, to reduce and control the spread of the pandemic. However, the lockdown orders permit the citizens to seek medical needs and allow all essential services providers to operate [7].

The national lockdown has greatly given a new dimension into the understanding of the clinicians with regards to patterns of the epidemiology of trauma-related cases concerning the risk factors aiding the prevalence. The incidence of trauma-related injuries which account for the leading cause of death and disabilities in developing countries has not been on a decreased trend before lockdown [8]. The purpose of introducing lockdown measures was not to reduce the incidence of trauma-related cases but to control the spread of the pandemic by the novel disease. Despite the lockdown, almost all health facilities experience a daily increase in Covid-19 cases as the pandemic still soaring high globally. However, a drop in the incidence of trauma-related cases was observed and it has added another meaning to the lockdown as if it was meant to control trauma-related incidence going by our notice. In responding to the reason to quantify any change in the volume and incidence of injury during lockdown conditions compare to the period before lockdown.

We conducted this study to address the following: 1 - to provide information on the rate and volume of common trauma-related cases and the burden they impact on our limited hospital resources. 2- to provide purposeful information that will aid trauma awareness and prevention campaigns to reduce the incidence and admissions to hospital. 3 - to identify any anti-social or public factor or habit that may increase the incidence of trauma cases reported to the hospital.

## **METHODS**

A retrospective study was conducted on data collected from trauma-related cases registry records in the medical department of Ladysmith Regional Hospital. The data were that of two study groups from the year 2019 and 2020. The 2019 study group consisted of all trauma-related cases in March, April, and May when there was no pandemic nor lockdown while that of the year 2020 consisted all trauma-related seen in March, April, and May during lockdown as a result of Covid-19 pandemic. Data of common trauma-related cases which include Assault, Gunshots, Stabs, and Road Accidents cases for the period under study were collected and analyzed. Patients were grouped into 2019 and 2020 trauma-related cases admitted into Accident and Emergency Unit. We analyzed the total number of cases reported in 2019 and compared them to the total number of cases seen in 2020 during the lockdown. The study was used to identify a significant social habit that might have been contributed to the incidence of trauma-related cases. This study was approved by the management of Ladysmith Regional Hospital and the District Department of Health. Data analysis was performed using SPSS version 25 (SPSS Inc., Chicago, IL, USA) to provide descriptive statistics, frequency tables, and graphs. The Boxplot analysis was used to determine the

statistically significant differences in trauma cases at  $p < 0.5$  considered as statistically significant.

## RESULTS

### *Demography*

The total number of patients for the first group which consisted patients with trauma-related cases admitted to accident and emergency in March, April and May 2019 was 913 while that of the second group which consisted patients with trauma-related cases admitted to accident and emergency in March, April and May 2020 (during Covid-19 lockdown) was 443 (Table 1). The trauma-related cases under study include Assaults, Gunshots, Stab, and Road traffic accidents. In 2019, the number of patients according to the cases under study is as follow; Assaults 265 (29%), Gunshots 39 (4%), Stab 155 (17%) and Road traffic accident cases 454 (50%) while that of 2020 (during lockdown) include; Assaults 180 (40%), Gunshots 34 (8%), Stab 71 (16%) and Road traffic accident 158 (36%).

**Table 1: Comparison of Incidence of trauma-related case**

Cases	Year 2019	Year 2020	Reduction	% Reduction
Assaults	265	180	85	41.3
Gunshots	39	34	5	13.0
Stab	155	71	84	54.2
Road Traffic Accident	454	158	296	65.2
Total	913	443	470	51.4

### *Focus on Reduction*

In comparing the incidence of trauma cases in 2019 with that of 2020 when the Covid-19 pandemic lockdown was introduced, there were 470 reductions in the total cases which were 51.4% fall from the cases that occurred in 2019 when there was no

lockdown. The fall in the cases under study is as follows; Assaults 85 (41.3 % reduction), Gunshots 5 (13.0 % reduction), Stab 84 (54.2% reduction), and Road traffic accident 296 (65.2% reduction). There is a difference between the year of incidence and trauma-related causes. The year 2019 varied larger in the total cases of trauma-related while year 2020 tends to decrease in the amount of trauma-related cases due to the covid-19 pandemic (Figure 1). We noticed that there was a statistically different data points for a road traffic accident in the year 2019 but drastically reduced in the year 2020.



Figure 1: Comparison of reduction in the incidence of trauma cases

### Noticeable Risk factors

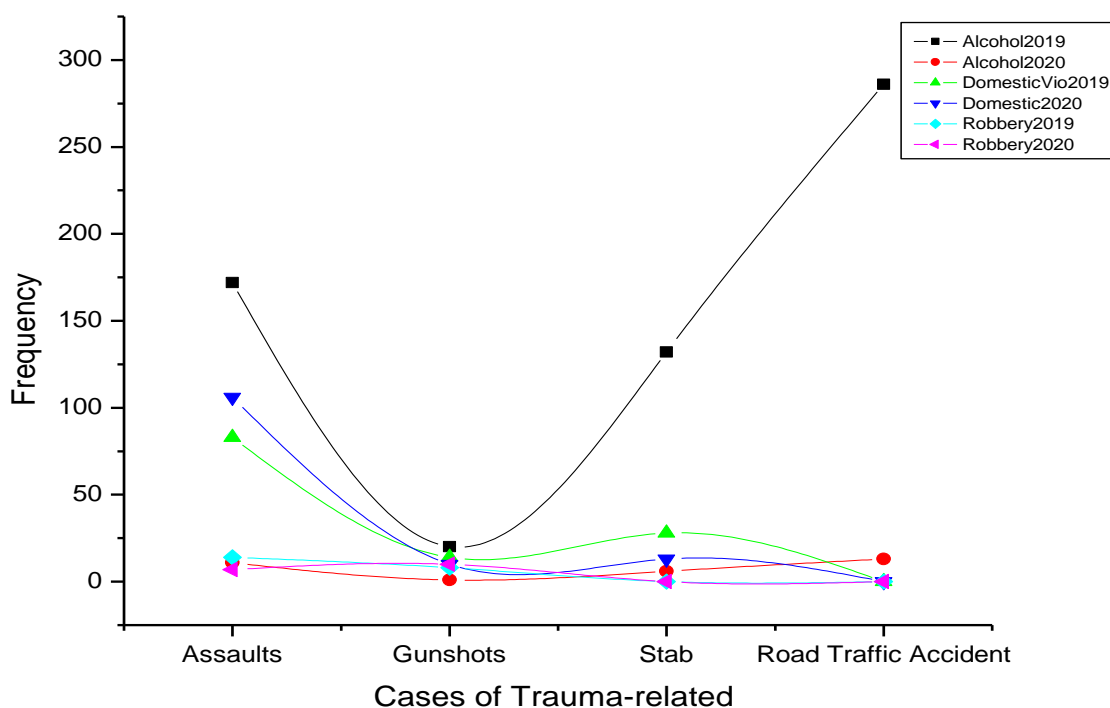
The main risk factor that influenced the incidence of trauma-related cases was found to be Alcohol (Table 2). In 2019, total numbers of 610 (66.8%) cases out of 913 were found to be associated with alcohol consumption. Therefore, in 2019 alcohol was found to be associated with each case under study as follows; Assaults 172 (65%), Gunshots 20 (52%), Stab 132 (85%), and Road traffic accident 286 (63%). However, in 2020 only

31 (7%) cases out of 443 were found to be associated with alcohol consumption while the following results were obtained for each case under study; Assaults 11 (6.1%), Gunshots 1 (3.0%), Stab 6 (8.4%) and Road traffic accident 13 (8.2%).

**Table 2: Prevalence of the main risk factor (Alcohol)**

Cases	Alcohol Associated	Non-alcohol associated	Unknown
Assaults	(172) 65%	(66) 25%	(27) 10%
Gunshots	(20) 52%	(14) 37%	(5) 11%
Stab	(132) 85%	(16) 10%	(7) 5%
Road Traffic Accident	(286) 63%	(91) 20%	(77) 17%
Total	(610) 67%	(187) 21%	(116) 12%

Other factors noticed to be associated with these cases were found to be domestic/community violence and housebreak or robbery cases (Figure 2). In 2019, domestic violence was found to be involved in 125 cases of trauma-related cases (with exception to a road traffic accident) which is 13.7% of the total, however, the following results were obtained for each case under study; Assaults 83 (31.3%), Gunshots 14 (35.9%), Stab 28 (18.1%) and Road accident 0 (0%). In 2020 during the lockdown, the total number of cases related to domestic/community violence 129 (29.1%) out of 443 with the following results obtained from each case under study; Assaults 106 (58.8%), Gunshots 10 (29.4%), Stab 13 (18.3%) and Road accident 0 (0%). In 2019 and 2020, robbery and house breaks were found not to be involved in both Stab and Road accident cases, however, in 2019, the total number of 22 (2.4%) cases out of 913 were found to be associated with robbery and housebreak with the following results obtained in each case under study; Assaults 14 (5.2%) and Gunshots 8 (20.5%) while in 2020 during the lockdown, the total number of cases relating to robbery and housebreak was 17 (3.8%) out of 443 with the following results obtained in each case under study; Assaults 7 (3.8%) and Gunshots 10 (29.4%).



**Figure 2: Factors associated with cases of trauma**

## DISCUSSION

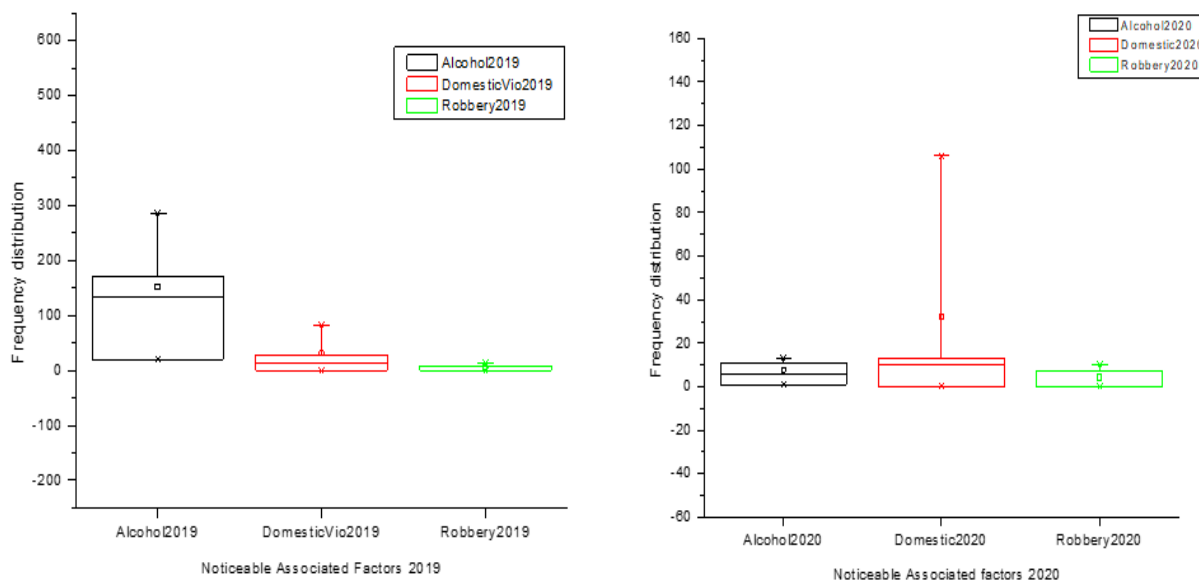
This study has significantly shown reductions of 51.4% in the overall number of all trauma-related cases admitted to the casualty unit during Covid-19 lockdown compared to that of 2019 when there was no pandemic. Four common causes which include; Assaults, Gunshots, Stab, and Road traffic accidents were studied. The greatest reductions were seen in major injuries as a result of road traffic accidents which is 65.2% while the lowest reductions were seen in Gunshots (Table S3). This suggests that people are at high risk of getting involved in non-lockdown activities such as road traffic crashes which could have been a result of people attending to their normal daily activities like work, business, and school. The outcome of this study is similar to that which was obtained from research conducted in New Zealand in which 43% reductions were recorded in all total trauma-related cases admitted to the emergency unit, while 50% reductions were recorded in major injury caused by road traffic accident [2]. Also,

the reductions noted in major trauma cases in this study could be corroborated by the outcome of the research conducted in Spain in which significant reductions were recorded in a total visit to the Department of Traumatology and Orthopedic Surgery, University Hospital of Vall d'Hebron, Barcelona [4]. The level of reductions noted in this research has also been supported by local reports on emergency cases in South Africa during the Covid-19 lockdown. For instance, the agencies responsible for emergency responses have reported a 40% reduction in the number of overall calls responded to (fire and special services like trauma incidents and motor vehicle accidents), a 74% drop in the number of trauma calls, a 60% drop in the number of medical calls, a 48% drop in the number of formal residential fires responded to, a 37% drop in the number of informal residential fires responded to. Also in his finding, Professor Sebastian van As, head of trauma at the Red Cross Children's Hospital, reported a 70% drop in road accident injuries but said the number of burn victims had risen notably [7].

In responding to possible associated factor(s) that play(s) key roles in the incidence of trauma cases, we noticed that alcohol played a significant role. From this study, alcohol was found to be associated with 66.8% of all trauma-related cases in 2019 when there was no Pandemic while it was just 7.0% in 2020 during the Covid-19 lockdown (Figure 3). The significant reductions could have been as a result of banning of alcohol consumption during Covid-19 lockdown. The significance of alcohol-related incidence of trauma-related cases or even deaths can never be overlooked globally. For instance, an estimation of over 80,000 people dies from alcohol-related causes annually, making alcohol the third leading preventable cause of death in the United States [1]. Also, South Africa has been highlighted as the worst country in the world for drunk driving, where as much as 58% of deaths on SA roads can be attributed to alcohol consumption [3].



Other factors that we noticed to have influenced the incidence of trauma-related in this study are domestic violence and robbery or housebreak. Although, there were reductions in all cases reported in this study, the analysis of each case showed that domestic violence was found to have been responsible for Assaults and Stab cases more in 2020 during lockdown than that of 2019. In 2019, 31.3% of cases of Assaults were influenced by domestic violence while 58.8% of cases of Assaults were influenced by domestic violence. Also, robbery or housebreak was found to have influenced the incidence of Gunshots as 20.5% cases of Gunshot was as a result of robbery or housebreak in 2019 compared to 29.4% in 2020. The outcome of this study is in line with various reports from various studies globally which confirmed a surge in domestic violence during lockdown [6]. The results obtained from this study can be corroborated with the reports made by the South Africa government who announced an increase in a loot of public property which warranted responses from the Police by using firearms [7]. Generally, the accident and emergency unit of Ladysmith Regional Hospital recorded a reduced number of trauma-related cases during the lockdown. It shows that the stay-at-home message of lockdown was heavily obeyed and promoted, implying that the public is mindful of the consequences of moderate-to-severe injury and are reducing their risks of injury in the home, community and public places.

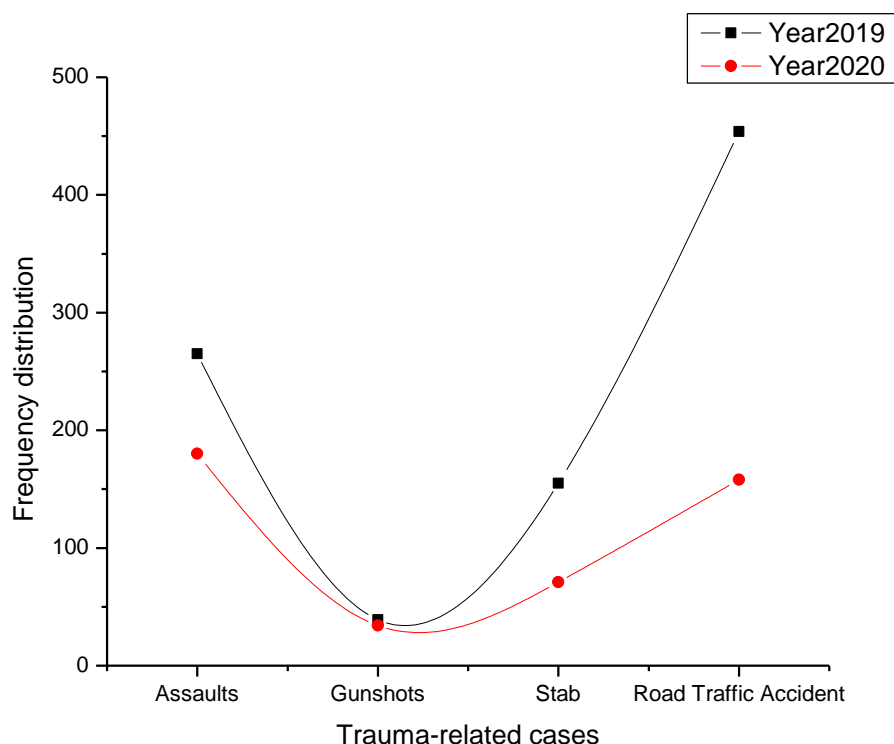


**Figure 3: Comparison between the year 2019 and 2020**

Effect of the COVID-19 Pandemic Lockdown On Trauma Cases Reported In Accident And Emergency Unit Of Ladysmith Regional Hospital, Ladysmith, KwaZulu-Natal Province, South Africa.

**Table S3: Noticeable Associated factors**

CASES	Alcohol Associated		Domestic/Community Violence		Robbery/house break	
	2019	2020	2019	2020	2019	2020
Assaults	(172) 65.0%	(11) 6.1%	(83) 31.3%	(106) 58.8%	(14) 5.2%	(7) 3.8%
Gunshots	(20) 52.0%	(1) 3.0%	(14) 35.9%	(10) 29.4%	(8) 20.5%	(10) 29.4%
Stab	(132) 85.0%	(6) 8.4%	(28) 18.1%	(13) 18.3%	(0) 0%	(0) 0%
Road Traffic Accident	(286) 63.0%	(13) 8.2%	(0) 0%	(0) 0%	(0) 0%	(0) 0%
Total	(610) 66.8%	(31) 7.0%	(125) 13.7%	(129) 29.1%	(22) 2.4%	(17) 3.8%



## CONCLUSION

Trauma-related cases occur in many forms and severities among all age groups and genders globally. Most of these cases occurred as a result of highly preventable conditions. Introduction of Covid-19 Pandemic lockdown which pronounced bans on the social gathering, school activities, intra/inter-provincial vehicular movement, and most important alcohol consumption has greatly caused a significant reduction in volumes of fatalities and casualties. This has reduced unnecessary burdens being experienced on the limited resource available in our hospital facilities. In terms of alcohol usage, it is recommended that the government must ensure tougher alcohol consumption regulation that will reduce fatalities secondary to alcohol use. In terms of injury prevention awareness, the actions of the general public to reduce the risk of domestic-based trauma during lockdown should be exhausted and encouraged. Continuous emphasis could be placed on peoples' needs to reduce domestic violence at

various homes and communities. Knowing fully well that essential activities are not prohibited during the lockdown, therefore, emphasis on reducing road trauma during essential activities is also recommended.

### **LIMITATIONS AND STRENGTHS**

As the analysis of progression and effects of COVID-19 lockdown on the incidence of trauma-related cases become a necessity and a matter of urgency to provide rapidly needed and reliable information for the district, provincial and national health department to work on, hence, there is a limited choice for us to use smaller population for this study.

Another limitation is our inability to maximally get the detailed information regarding the involvement of some associated noticeable social factors as many of the patients' files didn't show any information regarding that.

### **ETHICAL CONSIDERATION**

Ethical review board approval was not required for this study as no human subjects were involved.

### **COMPETING INTERESTS**

The authors declare no competing interests.

### **AUTHORS' CONTRIBUTIONS**

All the authors have read and agreed to the final manuscript.

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