



# BACKGROUND

The coronavirus disease 2019 (COVID-19) pandemic has greatly impacted the United States economy and health-care system. A recent Oxford Economics study ranked the 50 states in terms of their economic vulnerability due to the COVID-19 pandemic, with Nevada ranking number two. According to the United States Bureau of Labor Statistics, the unemployment rate of Las Vegas in April 2020 rose to 29.8%, more than two times the United States average of 14.4%. In addition, Nevada issued statewide closures of all casinos and non-essential businesses with subsequent issuance of statewide stay-at-home orders. The unique circumstances surrounding the COVID-19 pandemic constitute trying times for many Americans, with new socioeconomic stressors.

It is unclear how such a pandemic affects the volume and type of orthopaedic injuries. Many have raised concerns that the rates of interpersonal violence will increase during this time. According to the Las Vegas Metropolitan Police Department, as of May 1, 2020 aggravated assault increased 11.78%. How this increase in interpersonal violence affects orthopaedic trauma injuries is unknown.

# PURPOSE

We sought to quantify rates of interpersonal violence (IPV) of orthopaedic trauma during the time period encompassing social distancing and stay-at-home directives and compare them to previous years when such directives were not in place. We specifically focused on the number of gunshot wound (GSW) consultations and the percentage of operative gunshot wounds as a reflection of this shift in case presentation. To our knowledge, this retrospective study is the first to evaluate the effect of COVID-19 on orthopaedic trauma caused by interpersonal violence.

# METHODS

This retrospective study was reviewed and approved by the University Medical Center Institutional Review Board. Charts were reviewed for all consults placed to the Orthopaedic Trauma Service from March 17, 2020 to April 30, 2020. These dates were based on the timeline of the COVID-19 pandemic and the state social distancing and stay-at-home directives. Data such as patient age, sex, mechanisms of injury, and the presence or absence of injury-related interpersonal violence were recorded. We defined interpersonal violence as injuries resulting from assault and gunshot wounds inflicted not by one's self. Accidental self-inflicted gunshot wounds were not included in interpersonal violence and were included in a self harm group.

**Table 1. Incidence of interpersonal violence, for full sample and by study period.**

Interpersonal violence	2018	2019	2020	Total
Yes	20 (5.6%)	25 (5.9%)	33 (9.9%)	78 (7.0%)
No	336 (94.1%)	396 (93.8%)	297 (88.9%)*^	1029 (92.5%)
Suicide	1 (0.3%)	1 (0.2%)	4 (1.2%)	6 (0.5%)
	357	422	334	1113

**Table 2. Incidence of GSW vs. non-GSW as mechanism of injury, for full sample and by study period.**

Mechanism of injury	2018	2019	2020	Total
GSWs	14 (3.9%)	16 (3.8%)	28 (8.4%)*^	58 (5.2%)
Non-GSW	343 (96.1%)	406 (96.2%)	306 (91.6%)*^	1055 (94.8%)
	357	422	334	1113

**Table 3. Incidence of GSW vs. non-GSW as mechanism of injury for operative cases, for full sample and by study period.**

For operative cases	2018	2019	2020	Total
GSW	6 (3.8%)	5 (3.0%)	18 (11.7%)*^	29 (6.1%)
Non-GSW	150 (96.2%)	164 (97.0%)	136 (88.3%)*^	450 (93.9%)
	156	169	154	479

**Table 4. Incidence of interpersonal violence in GSW cases, for full sample and by study period.**

For GSW cases	2018	2019	2020	Total	
Interpersonal violence	Yes	11 (78.6%)	10 (62.5%)	22 (78.6%)	43 (74.1%)
	No	3 (21.4%)	5 (31.3%)	5 (17.9%)	13 (22.4%)
	Suicide	0 (0.0%)	1 (6.3%)	1 (3.6%)	2 (3.4%)
	14	16	28	58	

**Table 5. Proportion of interpersonal violence-associated GSW cases that were operative vs. non-operative.**

For GSW cases associated with Interpersonal Violence	2018	2019	2020	Total
Operative	5 (45.5%)	5 (50.0%)	15 (68.2%)	25 (58.1%)
Non-operative	6 (54.5%)	5 (50.0%)	7 (31.8%)	18 (41.9%)
	11	10	22	43

Gunshot wound (GSW)  
 \*Significantly different than 2018  
 ^Significantly different than 2019

# RESULTS

A total of 1,113 orthopaedic trauma consultation charts were reviewed. There were 357 orthopaedic trauma consultations in 2018, 422 in 2019 and 334 in 2020. Analysis via Chi-square goodness-of-fit showed a significant difference in the number of consults in both 2019 and 2020 from the number expected (371) if the number of consults had followed a uniform distribution across the study time periods ( $X^2=11.229$ ,  $df=2$ ,  $p=.004$ ).

There was an increase in the number of consultations associated with IPV from 2018 to 2019 (20 to 25) and from 2019 to 2020 (25 to 33). Similarly, the number of consults associated with suicide increased from 1 in both 2018 and 2019 to 4 in 2020, but this did not achieve statistical significance. (Table 1)

There were a total of 58 GSW consultations: 14 in 2018, 16 in 2019 and 28 in 2020. There was a statistically significant increase in the proportion of GSW consultations per year ( $X^2=9.728$ ,  $df=2$ ,  $p=.008$ ) when comparing 2018 to 2020 (3.9% vs 8.4%,  $p<.05$ ) and 2019 to 2020 (3.8% vs 8.4%,  $p<.05$ ); there was no significant difference when comparing 2018 to 2019 (3.9% vs 3.8%). (Table 2)

There were a total of 29 operative GSWs among the orthopaedic trauma consultations across the three study time periods: 6 in 2018, 5 in 2019 and 18 in 2020, representing 3.8% of operative orthopaedics trauma consultations in 2018, 3.0% in 2019, and 11.7% in 2020. This translated to statistically significant increases ( $X^2=12.779$ ,  $df=2$ ,  $p=.002$ ) from 2018 to 2020 ( $p<.05$ ) and from 2019 to 2020 ( $p<.05$ ), but no significant change between 2018 and 2019. (Table 3)

# CONCLUSIONS

Despite a decrease in the number of orthopaedic trauma consultations during the COVID-19 pandemic stay at home ordered, we experienced an increase in IPV cases as well as GSW consults and GSW operative cases. These results stress the importance of increased screening and documentation for IPV in addition to increased access to resources for patients during times of socioeconomic hardship.

# REFERENCES

Reference available upon request

