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Association of New 30-foot US-Mexico Border Wall in San Diego with Increased Migrant Deaths, Trauma Center Admissions, and Injury Severity

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RESEARCH LETTER

Association of New 30-foot US-Mexico Border Wall in San Diego with Increased Migrant Deaths, Trauma Center Admissions, and Injury Severity

On January 24, 2017, "Border Security and Immigration Enforcement Improvements", an Executive Order was signed by President Trump. This resulted in replacement of 406 miles of existing 6-17 foot barriers with 30-foot-tall (9.1 m) steel barrier. An additional 49 miles of new barrier were also added.

The new 30' border wall was reported in lay media to be unclimbable. However, our Level 1 Trauma center experienced significant increases in the number and severity of patients with border wall fall injuries starting in 2019, as new wall construction concluded. We sought to characterize the changes in morbidity and mortality of border wall fall injuries after construction of the 30' border wall in San Diego and Imperial Counties, California.

METHODS

This is a retrospective trauma registry study of the University of California San Diego Level 1 Trauma Center, which receives border wall injured patients from San Diego County and Imperial County. The study was determined exempt from IRB review by institutional policy. Border wall fall admissions for 2016 to 2021 were collected. To normalize for changing migration rates, we calculated admissions per 100,000 U.S. Customs and Border Protection (CBP) apprehensions.

The period 2016-2018 was defined as "Before" construction of the 30' border wall and the period 2019-2021 was defined as "After". Hospital mortality, injury severity score (ISS), head/face abbreviated injury scale (AIS), length of stay (LOS), and inflation-adjusted hospital costs were collected. On-scene mortality of border wall falls was obtained from the San Diego County Medical Examiner.

RESULTS

During the Before period, there were 67 fall admissions from the border wall compared to 375 during the After period. This >5-times increase is still significant when admissions were normalized per CBP apprehensions (Figure 1). Mean ISS, median head/face AIS codes, median hospital LOS, ICU LOS, hospital and scene mortality all increased significantly in the After period (Table 1). The median hospital inflation-adjusted costs per admission increased significantly. The increased hospital costs of the surge in admissions exceeded $13 million in 2021 dollars.

DISCUSSION

Raising the US border wall to 30’ is associated with increased deaths, increased ISS, and increased healthcare costs. It increased the burden of complex injured patients at a Level 1 Trauma Center already dealing with a trauma surge and respiratory surge during the COVID-19 pandemic. The care of these injured immigrants is not only a humanitarian problem, but also a public health crisis that further worsened trauma center bed capacity, staff shortages, and

professionals' moral injury. Most of these patients had significant brain and facial injuries, or complex fractures of the extremities or spine, with many requiring ICU care and staged operative reconstructions. Lack of health insurance made most patients ineligible for rehabilitation facilities or post-discharge physical therapy, further lengthening prolonged hospital stays.

This study is limited by lack of a specific denominator for total numbers crossing the border, which required use of CBP apprehensions as a surrogate. However, the appearance of scene deaths was a new phenomenon with a strong temporal relationship after the increase in border height.

This surge of preventable border-wall injuries increased unfunded costs to our hospital system. In March 2020, President Trump ordered adoption of Title 42, allowing CBP to expel certain migrants without asylum screening. This may have increased the numbers and desperation of persons crossing the border away from Ports of Entry and increased the number of falls. Future border barrier policy decisions should include assessment of the effect of increased injuries on local healthcare systems as well as humanitarian consequences. We seek collaborators to prevent and mitigate the injuries and resultant suffering of those immigrants crossing the southern border.

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Author Contributions: Dr Doucet had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Liepert, Berndtson, Godat, Doucet, Costantini.

Acquisition, analysis, or interpretation of data: Liepert, Berndtson, Godat, Doucet, Costantini.

Drafting of the manuscript: Berndtson, Liepert, Weaver, Godat, Costantini, Doucet

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Table 1.	Before 18-30' Border Wall 2016-2018	After 18-30' Border Wall 2019-2021	Statistical Test	P
Border Wall Fall Admissions	67	375		
Mean ISS ± SD	8.3 ± 5.0	10.4 ± 7.9	ANOVA	0.018
Mean Head/Face AIS ± SD	1.9 ± 4.4	2.4 ± 8.8	ANOVA	0.032
Mean ICU LOS ± SD (days)	0.51 ± 1.1	2.1 ± 3.7	ANOVA	<0.001
Median LOS (IQR) (days)	4.0 (1.0-10.0)	6.0 (3.0-11.0)	Mann-Whitney U	0.019
Median (IQR) hospital inflation-adjusted costs	$30714 (16541-59732)	$44786 (26069-77273)	Mann-Whitney U	0.002
Hospital mortality (percentage of Admissions)	0 (0%)	2 (0.6%)	Chi Square	<0.001
San Diego-Imperial County CBP apprehensions	159175	159614	N/A	N/A
Scene mortality (rate per 100,000 San Diego-Imperial County CBP apprehensions)	0 (0)	14 (8.8)	Chi Square	<0.001

ISS: injury severity score, SD: Standard Deviation, AIS: abbreviated injury score, ICU: Intensive Care Unit, LOS: Length of Stay, IQR: Interquartile Range, CBP: U.S. Customs and Border Patrol, N/A – no test done.

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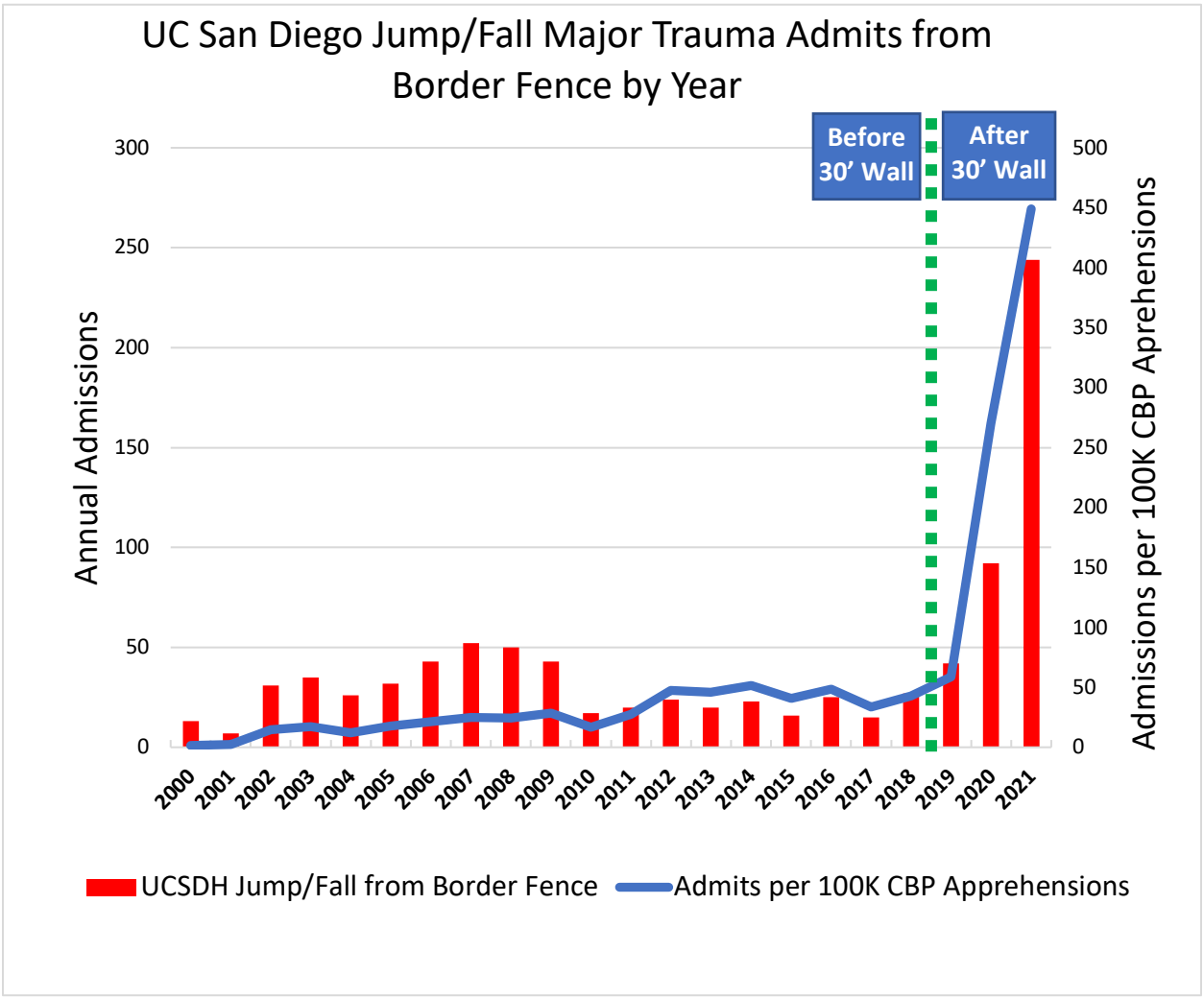
UC San Diego Jump/Fall Major Trauma Admits from Border Fence by Year
Before 30' Wall
After 30' Wall
Annual Admissions
Admissions per 100K CBP Aprehensions
300
250
200
150
100
50
0
500
450
400
350
300
250
200
150
100
50
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
UCSDH Jump/Fall from Border Fence
Admits per 100K CBP Apprehensions