

Letter to the editor re:
DiMaggio, C. Et al.
"Changes in U.S. mass
shooting deaths
associated with the
1994–2004 federal assault
weapons ban: Analysis of
open-source data.
J Trauma Acute Care.
2019;86(1):11–19."

To the Editor:

Following a series of shooting rampages in the late 1980s and early 1990s, Congress passed the federal Assault Weapons Ban (AWB). Enacted on September 13, 1994, the law remained in effect for a 10-year period, before it was allowed to sunset on September 13, 2004. During that decade, it was illegal to purchase or possess assault weapons (as defined in Table 1) as well as large-capacity

magazines (capable of holding more than 10 rounds of ammunition).

The ban, however, contained several prominent loopholes, including exempting numerous firearms that might otherwise be considered assault weapons if they were specifically identified in the legislation as well as exempting firearms and magazines legally in circulation prior to the enactment date of the law.

As Congress again debates the merits of a nationwide AWB, the publication of a study by DiMaggio et al. in *The Journal of Trauma and Acute Care Surgery* assessing the impact of the 1994 AWB on mass shootings is a timely addition to the literature.¹ Specific to the use of assault weapons in mass shootings, DiMaggio et al. presented three key findings:

1. Of the 44 mass shootings identified by the study between 1981 and 2017, 34 (77%) involved assault weapons, and these 34 incidents accounted for 430 (86%) of the 501 fatalities incurred in the 44 total mass shootings.
2. During the 37-year period of 1981 to 2017, there were 24 years in which a mass shooting occurred, and assault weapons accounted for *all*

mass-shooting fatalities in 15 (63%) of those 24 years.

3. A statistical analysis of the 34 mass shootings involving assault weapons indicated that, during the decade that the AWB was in effect, seven preventable deaths were attributable to assault weapons alone.

There is only one conclusion to draw after reading the above findings: with regard to mass shootings, assault weapons are more lethal than other firearms, but tough restrictions on such military-style weapons, like the 1994 AWB, can save lives.

Unfortunately, the first two findings are incorrect, calling into question the third finding and any broader conclusion that can be drawn from the study regarding the impact of the AWB.

After reviewing the study's data set, I believe that the authors misidentified the involvement of assault weapons in roughly half of the incidents (Table 2) (the study examined 44 incidents, but the number should actually be 43, not 44, given that the authors erroneously coded the 2014 Isla Vista rampage as a mass shooting. While six people died in that attack, only three were shot to death. The other three were stabbed to death. As a result, this incident fails to meet the authors' criterion that a mass shooting results in a minimum of four people being shot to death).

When the erroneous cases are recalibrated, the number of incidents involving assault weapons drops 62% from 34 to 13, and the number of fatalities resulting from such shootings drops 46% from 430 to 232 (Table 2). This brings the percentage of mass shootings involving assault weapons in the DiMaggio et al. data set from 77% to 30%—which is consistent with other studies that have found that assault weapons are used in 25% to 36% of active shootings and mass shootings.^{2–5} Furthermore, the percentage of mass shooting fatalities resulting from incidents involving assault weapons decreases from 86% to 47%—which is consistent with other studies that have found that assault weapons account for 29% to 44% of active shooting and mass shooting deaths.^{3,5–7}

If my corrections to the data set are accurate, then assault weapons accounted for *all* mass-shooting fatalities in only 3—not 15—of the 23 years in which there was a mass shooting (Table 2). With such a large number of misclassifications, the study's overarching conclusion about the effect of the AWB is called into question.

Sincerely,

Louis Klarevas, Ph.D. / University of Massachusetts, Boston / louis.klarevas@umb.edu

J Trauma Acute Care Surg
Volume 86, Number 5

TABLE 1. Definition of an Assault Weapon Pursuant to 1994 Federal AWB

Firearm	Required Features	Additional Requirements
Handgun	<ul style="list-style-type: none"> • Semiautomatic • Ability to accept detachable magazine 	At Least Two of the Following Features: <ul style="list-style-type: none"> • An ammunition magazine that attaches to the pistol outside of the pistol grip • A threaded barrel capable of accepting a barrel extender, flash suppressor, forward handgrip, or silencer • A shroud that is attached to, or partially or completely encircles, the barrel and that permits the shooter to hold the firearm with the non-trigger hand without being burned • A manufactured weight of 50 ounces or more when the pistol is unloaded • A semiautomatic version of an automatic firearm
Rifle	<ul style="list-style-type: none"> • Semiautomatic • Ability to accept detachable magazine 	At Least Two of the Following Features: <ul style="list-style-type: none"> • A folding or telescoping stock • A pistol grip that protrudes conspicuously beneath the action of the weapon • A bayonet mount • A flash suppressor or threaded barrel designed to accommodate a flash suppressor • A grenade launcher
Shotgun	<ul style="list-style-type: none"> • Semiautomatic 	At Least Two of the Following Features: <ul style="list-style-type: none"> • A folding or telescoping stock • A pistol grip that protrudes conspicuously beneath the action of the weapon • A fixed magazine capacity in excess of 5 rounds • An ability to accept a detachable magazine

Source: 18 U.S.C. §921(a)(30) [1994]; repealed.

TABLE 2. Recalibration of Original DiMaggio et al

Year	City	State	Reported Assault	Actual Assault	Reported Deaths	Actual Deaths	Reported Deaths	Actual Deaths	
			Involvement in Mass Shooting Incident	Weapons Involvement in Mass Shooting Incident	in Mass Shooting Incident	in Mass Shooting Incident	in Assault Weapons Incident	in Assault Weapons Incident	
1	1984	San Ysidro	CA	Y	Y	21	21	21	21
2	1986	Edmond	OK	Y	N	14	14	14	0
3	1989	Stockton	CA	Y	Y	5	5	5	5
4	1990	Jacksonville	FL	N	N	10	9	0	0
5	1991	Killeen	TX	Y	N	22	23	22	0
6	1991	Iowa City	IA	N	N	4	5	0	0
7	1992	Olivehurst	CA	N	N	4	4	0	0
8	1993	San Francisco	CA	N	Y	8	8	0	8
9	1993	Garden City	NY	Y	N	6	6	6	0
10	1998	Jonesboro	AR	Y	N	5	5	5	0
11	1999	Columbine	CO	Y	Y	13	13	13	13
12	1999	Atlanta	GA	Y	N	9	9	9	0
13	1999	Fort Worth	TX	Y	N	7	7	7	0
14	1999	Honolulu	HI	Y	N	7	7	7	0
15	2000	Wakefield	MA	Y	Y	7	7	7	7
16	2003	Meridian	MS	Y	N	5	6	5	0
17	2005	Red Lake	MN	Y	N	9	9	9	0
18	2006	Goleta	CA	Y	N	6	7	6	0
19	2006	Nickel Mines	PA	Y	N	5	5	5	0
20	2007	Salt Lake City	UT	N	N	5	5	0	0
21	2007	Blacksburg	VA	Y	N	32	32	32	0
22	2007	Omaha	NE	Y	Y	8	8	8	8
23	2008	DeKalb	IL	Y	N	5	5	5	0
24	2009	Binghamton	NY	Y	N	13	13	13	0
25	2009	Fort Hood	TX	Y	N	13	13	13	0
26	2010	Manchester	CT	Y	N	8	8	8	0
27	2011	Tucson	AZ	Y	N	6	6	6	0
28	2011	Seal Beach	CA	Y	N	8	8	8	0
29	2012	Oakland	CA	Y	N	7	7	7	0
30	2012	Aurora	CO	Y	Y	12	12	12	12
31	2012	Oak Creek	WI	Y	N	6	6	6	0
32	2012	Minneapolis	MN	Y	N	6	6	6	0
33	2012	Newtown	CT	Y	Y	27	27	27	27
34	2013	Santa Monica	CA	Y	Y	5	5	5	5
35	2013	Washington	DC	N	N	12	12	0	0
36	2015	Charleston	SC	N	N	9	9	0	0
37	2015	Chattanooga	TN	Y	Y	5	5	5	5
38	2015	Roseburg	OR	N	N	9	9	0	0
39	2015	San Bernardino	CA	Y	Y	14	14	14	14
40	2016	Orlando	FL	Y	Y	49	49	49	49
41	2016	Burlington	WA	N	N	5	5	0	0
42	2017	Fort Lauderdale	FL	N	N	5	5	0	0
43	2017	Las Vegas	NV	Y	Y	59	58	59	58
		Total deaths				495	497	424	232
		Total Y cases		33	13				
		Total N cases		10	30				

Note: Original DiMaggio et al. data set available at <http://www.injuryepi.org/styled-2> (Accessed 6 January 2019). The original data set contained an additional incident—the 2014 Isla Vista rampage—which was erroneously coded as a mass shooting. Including that incident in the original reported tallies increases the total incidents to 44, the total deaths to 501, and the total deaths attributed assault weapons incidents to 430 (although this case was originally miscoded as involving assault weapons, which it did not involve.)
Data set to correct errors.

DISCLOSURE

The author declares no conflict of interest.

Louis Klarevas, PhD

University of Massachusetts-Boston
Boston, Massachusetts

REFERENCES

1. DiMaggio C, Avraham J, Berry C, et al. Changes in US mass shooting deaths associated with the 1994-2004 federal assault weapons ban: analysis of open-source data. *J Trauma Acute Care Surg.* 2019;86(1):11–19.
2. Blau BM, Gorry DH, Wade C. Guns, laws and public shootings in the United States. *Appl Econ.* 2016;48(49):4732–4746.
3. Klarevas L. *Rampage Nation: Securing America from Mass Shootings.* Amherst, NY: Prometheus; 2016.
4. Koper CS, Johnson WD, Nicholas JL, Ayers A, Mullins N. Criminal use of assault weapons and high-capacity semiautomatic firearms: an updated examination of local and national sources. *J Urban Health.* 2018;95(3):313–321.
5. de Jager E, Goralnick E, McCarty JC, et al. Lethality of civilian active shooter incidents with and without semiautomatic rifles in the United States. *JAMA.* 2018;320(10):1034–1035.
6. Gius M. The impact of state and federal assault weapons bans on public mass shootings. *Appl Econ Lett.* 2015;22(4):281–284.
7. Brown JD, Pharm D, Goodin AJ. Mass casualty shooting venues, types of firearms, and age of perpetrators in the United States, 1982-2018. *Am J Public Health.* 2018;108(10):1385–1387.