

Do Mass Shooters Favor Using Large-Capacity Magazines?

Gary Kleck

College of Criminology and Criminal Justice

Florida State University

Tallahassee, FL 32306

March 6, 2020

Abstract

There are over 58.9 million firearms magazines holding over ten rounds in private possession in the U.S. and at least 14.8 percent of private guns are equipped with magazines this large, while no more than 15.8 percent of U.S. mass shootings (4+ dead) in 2012-2019 involved a shooter using such a magazine. Thus, mass shooters use LCMs with a frequency not significantly greater than one would expect based on the share of U.S. guns equipped with LCMs. This accords with previous research showing that LCM use is neither necessary nor helpful to offenders trying to shoot large numbers of victims in mass shooting incidents (Kleck 2016).

Introduction

One of the most commonly cited policies aimed at the problem of mass shootings in the United States is a ban on the large-capacity magazines (LCMs) that are used in semi-automatic firearms. A magazine is a device that holds multiple cartridges, and in those states that ban LCMs, “large-capacity” is typically defined as holding over ten rounds (over 15 rounds in a few states). Semi-automatic firearms are guns that fire only one shot per trigger pull, but automatically load a fresh round into the firing chamber after each shot is fired and (typically) cause the hammer to be pulled back into firing position.

Advocates of LCM bans argue that if mass shooters could be denied LCMs, and had to substitute smaller magazines such as those holding 10 or fewer rounds, they would have to change magazines more times to fire a given number of rounds, and as a result would kill or wound fewer victims. Shooters can fire just as many rounds with three 10-round magazines one 30-round magazine, but ban supporters assert that the additional magazine changes necessitated by use of smaller capacity magazines would lead to a lower casualty count in mass shooting incidents, for either of two reasons. First, in some incidents bystanders might take advantage of the shooter pausing in his firing to change magazines to tackle the shooter and end the attack sooner than it otherwise would have ended. Second, the additional time spans when the shooter was not firing due to magazine changes would provide additional time when prospective victims could escape (Violence Policy Center 2020; Kleck 2016).

The extent to which LCM bans could reduce the total number of people killed or wounded in mass shootings is partly a function of how large a share of mass shootings, under current conditions, involve the attacker using LCMs. And the feasibility of denying LCMs to future would-be mass shooters is partly a function of how many LCMs there already are in the

civilian stock. These two quantities bear on the issue of whether mass shooters favor the use of LCMs to carry out their massacres. If they are indifferent to magazine capacity, they should be no more likely use a gun equipped with an LCM in their attacks than the share of all guns in the entire general population as a whole that are equipped with LCMs.

How Common are LCMs in the United States Civilian Firearms Stock?

A national survey of U.S. adults, the National Study of the Private Ownership of Firearms in the United States, 1994, was conducted in November-December of 1994, asking respondents (Rs) about guns in their household. Rs who reported any guns were asked how many they had and what types the guns were (rifle, shotgun, revolver, pistol). To gain detailed information about the guns while limiting the burden on Rs, interviewers randomly selected one gun (for Rs who owned more than one) for which detailed information would be gathered. The following question was asked about the randomly selected gun: “How many rounds does this gun hold when fully loaded?” For Rs who used multiple different size magazines, interviewers asked about the one most commonly used. Rs then reported an exact number of rounds held by the magazine (National Institute of Justice 1998 – see Survey Instrument, Question 17).

By analyzing the publicly available raw data from this survey (ICPSR 1998), it was possible to establish what percent of U.S. guns held more than 10 rounds when fully loaded as of late 1994. The results are shown in Table 1. They indicate that 14.8% of firearms held more than 10 rounds when fully loaded. Alternatively, if one defined LCMs as magazines holding over 15 rounds, 5.3% of U.S. guns held over 15 rounds when fully loaded.

(Table 1 about here)

One can estimate a lower-limit estimate of the number of LCMs in the U.S. civilian stock by multiplying these percentages times the estimated size of the U.S. gun stock. One way to

obtain the latter figure is to tabulate the cumulative numbers of firearms manufactured in the U.S. for the civilian market, minus the number exported, plus the number imported. The relevant figures are shown in Table 2. There are no data on firearms lost or worn out, nor on firearms illegally manufactured or smuggled into the country, so we effectively assume that uncounted subtractions from the firearms stock are equaled by uncounted additions. Figures for years prior to 1946 can be considered only rough approximations, but this is of little consequence since pre-1946 guns account for less than 12% of the gun stock cumulated by 2016.

(Table 2 about here)

The cumulated total of firearms in the civilian stock by the end of 2016 was about 397.8 million.¹ If the LCM-equipped share of firearms did not change from 1994 to 2016, so that it was still true that 14.8% were equipped with magazines holding over 10 rounds, and 5.3% were equipped with magazines holding over 15 rounds, then there were 58.9 million firearms ($397.8 \text{ million} \times .148 = 58.9 \text{ million}$) equipped with magazines holding over 10 rounds by the end of 2016, 21.1 million ($397.8 \text{ million} \times 0.053 = 21.1 \text{ million}$) of them equipped with magazines holding over 15 rounds.

The share of guns equipped with LCMs, however, has almost certainly increased since 1994. LCMs are used only in semi-automatic firearms, and the share of guns produced or imported since 1994 that are semi-automatic is far larger than the semi-automatic share of guns manufactured or imported before 1994. For example, ATF data indicate that only 46.5% of the handguns manufactured in the U.S. in 1986 were semi-auto pistols, but that this share had risen to 84.6% by 2016 (U.S. ATF 2018, p. 1).

Further, none of our figures reflect any additional magazines owned beyond the one that the owner stated was most often used with a given gun. We effectively assumed just one LCM

per LCM-equipped firearm, but many gun owners possess additional magazines. Therefore, our estimates of the LCM stock should be interpreted as conservative lower-limit estimates.

In sum, by the end of 2016 civilians almost certainly possessed a minimum of 58.9 million magazines holding over 10 rounds, and 21.1 million holding over 15 rounds. Thus, there are already enormous numbers of LCMs in private hands that would-be mass shooters could draw on, even if all further manufacture and importation could be immediately and totally eliminated. Eradicating this massive existing stock of big magazines would be a formidable undertaking.

What Share of Mass Shootings Involve the Use of LCMs?

Some advocates of banning LCMs have claimed that huge shares of mass shootings involve LCMs. Mother Jones magazine, for example, claimed that “half of all mass shooters used high-capacity magazines” (Mother Jones 2018; see also Violence Policy Center 2018 for a similar claim). The misleading character of this claim, however, becomes evident once one notes a key qualifier – the Mother Jones staff members stated that this claim only applied to the mass shootings that “we investigated.” The magazine’s staff apparently chose to investigate a tiny unrepresentative share of mass shootings that were unusually likely to involve use of LCMs, since data covering all mass shootings indicate that LCM use is far less common.

Over a 30-plus year period, the Mother Jones staff “investigated” just 62 mass shootings – only about two per year. The most comprehensive compilation of mass shootings available may be found at the Gun Violence Archive (2020) website, and it indicates far more than two mass shootings occur each year in the U.S. The first complete year for which the GVA has mass shooting data is 2012 and the latest complete year covered at the time of this research was 2019. These data indicate that, over the period 2012-2019, the U.S. experienced 152 mass shootings

(4+ victims killed), or an average of 19 per year – more than nine times the handful “investigated” by Mother Jones.

The number of mass shooting incidents in which an LCM was known to be involved was computed from the Violence Policy Center’s (2020) website, supplemented by multiple sources used in Kleck (2016). All sources ultimately rely largely on news accounts. It is a logical possibility that all news accounts could have missed some mass shootings or failed to note the use of LCMs by the shooter, but the number of incidents missed is unlikely to be large. For an LCM-involved mass shooting to be missed would require that *all* news outlets failed to report the incident at all, or that *every* news outlet that did report on a given incident failed to mention use of LCMs in their stories, notwithstanding the intense media interest in this topic. Furthermore, VPC supports banning LCMs, so their staff are strongly motivated to identify as many LCM-involved mass shootings as possible.

VPC used an unusually broad definition of mass shootings in that they included incidents in which only three people were killed, as well as incidents in which the fatality count reached four, but only if offender deaths were counted. These two kinds of incidents were excluded in the present analysis so as to accord with the most commonly used definition of a mass shooting as an incident in which four or more victims were killed.

For the eight-year period from 2012 through 2019, VPC identified 24 incidents with four or more victims killed (excluding offenders) in which a shooter was reported as using or possessing a magazine holding over 10 rounds. This number is generous because VPC appears to have included cases in which shooters were merely alleged to have *possessed* LCMs, but it was not reported that they actually fired a gun while it was equipped with an LCM. Further, VPC included cases in which the magazines possessed by shooters were vaguely described as

“large capacity, number of rounds unstated” or as an “extended magazine,” but the actual capacity in terms of number of rounds was not stated, raising doubts about whether the magazine really was an LCM. Further, VPC did not establish, for most of the purportedly LCM-involved incidents, whether the offender fired any more rounds than could have been fired using a magazine holding 10 or fewer rounds (Violence Policy Center 2020). Keeping these caveats in mind, *at most* 15.8% (24 of 152) of U.S. mass shootings in 2012-2019 involved use of LCMs. The share in which genuine LCMs were actually used in mass shootings is likely to be even smaller than this.

Contrary to claims by Mother Jones magazine, and gun control advocacy groups like Brady: United Against Gun Violence, the Violence Policy Center, and others, mass shooters rarely use LCMs. Indeed, given that over 14.8% of all U.S. firearms are equipped with LCMs holding over 10 rounds, their use in mass shootings is no more frequent than one would expect if mass shooters simply randomly selected guns and magazines, without any preference for big magazines or guns equipped with them. The contrary impression that mass shooters “prefer” LCMs is partly a product of the practice by some analysts (such as the staffs of VPC and Mother Jones) of analyzing small unrepresentative subsets of mass shootings, rather than the full set – incidents that were unusually likely to have involved LCMs.

Conclusions

Enormous numbers of large-capacity magazines are owned by Americans. By the end of 2016, there were at least 58.9 million magazines with a capacity exceeding ten in the possession of the nation’s private citizens, and probably considerably more than that. At least 14.8 percent of private guns were equipped with LCMs back in 1994, and almost certainly even more are so equipped now. Notwithstanding this enormous number of LCMs and LCM-equipped firearms,

at most only 15.8 percent of the nation's mass shootings in 2012-2019 involved shooters using LCMs. Thus, mass shooters are no more likely to use LCMs than one would expect based on the share of guns in the general U.S. population that are equipped with LCMs.

In sum, mass shooters do not prefer to use of LCMs. This accords with analysis of the details of how mass shootings are actually carried out, which indicates that LCMs are neither necessary nor particularly helpful in wounding large numbers of victims. All U.S. mass shooters use multiple guns or multiple magazines, and can therefore fire large numbers of rounds without significant interruption, even if they possess only smaller capacity magazines. Further, no mass shooters using semiauto guns in the past 30 years are known to have been tackled by bystanders while reloading (as distinct from their guns jamming or their magazines failing to function), and reload times of 3 to 4 seconds do not materially increase the time for victims to escape (Kleck 2016).

Endnote

1. These cumulated gun totals accord closely with survey-based estimates of the national gun stock produced by Hepburn, Miller, Azrael, and Hemenway (2007). Their survey was conducted in 2004 and estimated that there were 283 million guns owned by the civilian population (p. 17). Our figures based on cumulations of guns manufactured or imported, minus exports, indicate that by the end of 2004 there were 281 million guns in the civilian stock (Table 2).

References

- Brady: United Against Gun Violence. 2020. "What Are Assault Weapons and High-Capacity Magazines?" <https://www.bradyunited.org/fact-sheets/what-are-assault-weapons-and-high-capacity-magazines>.
- Gun Violence Archive. 2020. Gun Violence Archive website at <http://www.gunviolencearchive.org/>.
- Hepburn, L., Miller, M., Azrael, D., and Hemenway, D. 2007. "The U.S. gun stock: results from the 2004 national firearms survey." *Injury Prevention* 13:15-19.
- Inter-university Consortium for Political and Social Research (ICPSR). 1998. National Study of the Private Ownership of Firearms in the United States, 1994 (Study 6955). Available online at <https://doi.org/10.3886/ICPSR06955.v1>.
- Kleck, Gary. 1991. Point Blank: Guns and Violence in America. NY: Aldine.
- Kleck, Gary. 2016. "Large-capacity magazines and the casualty counts in mass shootings: the plausibility of linkages." *Justice Research and Policy* 17(1):28-47.
- Mother Jones. 2018. "'A Killing Machine': Half of all mass shooters used high-capacity magazines." Mother Jones website at <https://www.motherjones.com/politics/2013/01/high-capacity-magazines-mass-shootings/>.
- National Institute of Justice. 1998. Codebook for National Study of Private Ownership of Firearms in the United States, 1994. ICPSR Study 6955. Available for download at <https://www.icpsr.umich.edu/icpsrweb/NACJD/studies/6955/version/1/datadocumentation#>.
- Newton, George D., and Franklin Zimring. 1969. Firearms and Violence in American Life. A Staff

- Report to the National Commission on the Causes and Prevention of Violence.
Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of Alcohol, Tobacco and Firearms. 1975-1984. Alcohol, Tobacco and Firearms Summary Statistics. Annual issues covering fiscal years 1973 through 1982. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of Alcohol, Tobacco and Firearms (ATF). 1989. Letter to author dated 6-29-89 detailing 1984-1987 gun production figures. Unpublished.
- U.S. Bureau of Alcohol, Tobacco and Firearms (ATF). 1994. ATF Ready Reference 1994. Public Affairs Branch, ATF. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). 2018. Firearms Commerce in the United States: Annual Statistical Update 2018. Available online at <https://www.atf.gov/resource-center/docs/undefined/firearmscommercestatisticalupdate20185087-24-18pdf/download>.
- U.S. Bureau of the Census. 1979. Statistical Abstract of the United States 1976. Washington, D.C.: U.S. Government Printing Office.
- Violence Policy Center. 2020. "High-capacity ammunition magazines are the common thread running through most mass shootings in the United States." Violence Policy Center website at http://vpc.org/fact_sht/VPCshootinglist.pdf.
- Zimring, Franklin. 1975. "Firearms and federal law: the Gun Control Act of 1968." Journal of Legal Studies 4:133-98.

Table 1. Number of Rounds Held by Firearms when Fully Loaded, U.S., 1994

<u>Number Of Rounds</u>	<u>Frequency</u>	<u>Percent</u>
1-10	480	85.2
11-15	84	9.5
16 or more	30	5.3
Total	594	100.0

Source: Secondary analysis of Inter-university Consortium for Political and Social Research (ICPSR) (1998). National Study of the Private Ownership of Firearms in the United States, 1994 (Study 6955).

Table 2. Size of the U.S. Civilian Gun Stock, 1945-2016

Year	Net Additions to Stock ^a			Cumulated Stock ^b		Guns/1000 pop ^c	
	Handguns	Long Guns	Total	Handguns	Total	Handguns	Total
1899-							
1945	12657618	34251565	46909183	12657618	46909183	94.9	351.6
1946	176745	1356620	1533365	12834363	48442548	91.2	344.3
1947	264256	1836669	2100925	13098619	50543473	91.3	350.8
1948	444034	2215524	2659558	13542653	53203031	92.7	362.6
1949	262504	1940925	2203429	13805157	55406460	92.9	371.1
1950	278038	2217583	2495621	14083195	57902081	93.5	381.3
1951	348373	1738210	2086583	14431568	59988664	94.1	389.6
1952	454229	1503422	1957651	14885797	61946315	95.6	396.1
1953	415857	1583063	1998920	15301654	63945235	96.7	402.3
1954	376455	1236362	1612817	15678109	65558052	97.3	405.0
1955	429237	1399846	1829083	16107346	67387135	98.0	408.2
1956	534964	1513834	2048798	16642310	69435933	99.5	413.1
1957	538032	1442544	1980576	17180342	71416509	100.8	417.2
1958	519362	1227579	1746941	17699704	73163450	102.1	420.1
1959	648672	1526066	2174738	18348376	75338188	103.9	425.3
1960	602843	1560034	2162877	18951219	77501065	105.4	430.6
1961	561742	1473809	2035551	19512961	79536616	106.6	434.6
1962	598649	1467719	2066368	20111610	81602984	108.3	439.3
1963	676062	1555762	2231824	20787672	83834808	110.3	444.8
1964	744273	1778620	2522893	21531945	86357701	112.6	451.8
1965	1013300	2107921	3121221	22545215	89478922	116.5	462.4
1966	1212817	2309250	3522067	22758062	93000989	121.5	475.5
1967	1673417	2413345	4086762	25431479	97087751	128.8	491.7
1968	2414724	2799776	5214500	27846203	102302251	139.7	513.1
1969	1725383	3084186	4809569	29571586	107111820	146.8	532.0
1970	1673227	3132686	4805913	31244813	111917733	153.2	548.7
1971	1777862	3233186	5011048	33022675	116928781	160.1	567.3
1972	2106883	3269316	5376199	35129558	122304980	168.7	587.7
1973	1781261	3930432	5711693	36710819	128016673	175.9	610.3
1974	2175818	4394790	6570608	39086637	134587281	184.9	637.0
1975	1995077	3332767	5327844	41081714	139915125	192.8	657.1
1976	2026689	3708975	5735664	43108403	145650789	200.8	678.5
1977	1914050	3183161	5097211	45022453	150748000	208.1	696.7
1978	1972498	3444020	5416518	46994951	156164518	215.3	715.6
1979	2231088	3493255	5724343	49226039	161888861	219.2	720.9
1980	2481230	3311496	5792726	51707269	167681587	227.5	737.9
1981	2612200	2868968	5481168	54319469	173162755	236.5	753.9
1982	2469671	2486464	4956135	56789140	178118890	244.8	767.8
1983	1943069	2111304	4054373	58732209	182173263	250.7	777.6
1984	1904029	2506575	4410604	60636238	186583867	257.1	791.2
1985	1684754	2289515	3974269	62320992	190558136	261.9	800.9
1986	1538080	2178190	3540637	63959072	194196773	266.3	808.7

Table 2 (continued)

Year	Net Additions to Stock ^a			Cumulated Stock ^b		Guns/1000 pop ^c	
	Handguns	Long Guns	Total	Handguns	Total	Handguns	Total
1987	1842145	2668607	4323951	65801217	198522724	271.6	819.4
1988	2234883	2604824	4830214	68036100	203352938	278.3	831.7
1989	2353087	2769701	5113576	70389187	208466514	285.2	844.6
1990	2109394	2224544	4318410	72498581	212784924	290.4	852.4
1991	1941977	1930422	3837827	74440558	216622751	294.3	856.3
1992	2802490	3675942	6469113	77243048	223091864	301.1	869.7
1993	3880773	3878055	7756056	81123821	230847920	312.1	888.2
1994	3324238	3316541	6634310	84448059	237482230	320.9	902.5
1995	2199420	2712789	4902135	86647479	242384365	325.4	910.3
1996	1820847	2569347	4378347	88468326	246762704	328.4	916.0
1997	1772849	2469663	4289499	90241175	251052203	331.0	920.8
1998	1727548	2716952	4464837	91968723	255517040	333.4	926.3
1999	1556003	3124416	4683654	93524726	260200694	335.2	932.5
2000	1205095	2391755	3596850	94729821	263797552	335.6	934.7
2001	882166	1867508	2749674	95611987	266547226	335.1	934.2
2002	1995332	3117157	5112489	97607319	271659715	338.9	943.3
2003	1923026	2625708	4548734	99530345	276208449	342.3	949.8
2004	1828395	2952787	4781182	101358740	280989631	345.9	958.9
2005	1883511	2974636	4858147	103242251	285847778	349.1	966.5
2006	2358631	3095672	5454303	105600882	291302081	353.7	976.4
2007	2914690	3344090	6258280	108515572	297560361	359.8	986.7
2008	3165183	3155843	6321026	111680755	303881387	366.9	998.4
2009	4514639	3855386	8370025	116195394	312251412	378.5	1017.1
2010	4402181	2761267	7163448	120597575	319414860	388.7	1029.6
2011	4752010	4573483	9497402	125349585	328912262	402.3	1055.6
2012	6634485	6210392	13135646	131984070	342047908	420.5	1089.8
2013	8073647	7445169	16031210	140057717	358079118	443.0	1132.7
2014	6695705	5506759	12202524	146753482	370281642	460.6	1162.1
2015	6749106	5750678	12499784	153502588	382781426	478.1	1192.3
2016	8667213	6382174	15049387	162169801	397830813	501.9	1231.2

Notes:

a. Domestically manufactured guns minus exported guns plus imported guns within each gun type category.

b. As of the end of the calendar year.

c. Based on resident population as of July 1.

Net Additions to Stock equals the number of firearms manufactured, minus the number exported, plus the number imported in each calendar year. Totals manufactured exclude firearms made for the U.S. military but include guns purchased by domestic law enforcement agencies. Import figures prior to 1992 covered Fiscal years; these figures have been treated as if they apply to the corresponding calendar year. Import

figures for 1992 covered five quarters because this was a transitional year from the fiscal year period to the calendar year period; they were treated as if they pertained to calendar year 1992. "Total" columns include gun types not separately tabulated in the Handguns and Long guns categories. "Handguns" figures encompass pistols and revolvers while "Long guns" figures encompass rifles, shotguns, and combination guns. See Kleck (1991 pp.17-18 451-454) for further details and limitations of the data.

Sources: 1945-1968 - Newton and Zimring (1969 p.174)

1969-1972 - Zimring (1975 pp. 168-69 Table 4 ATF column; Table 5); U.S. Bureau of the Census (1979 p. 156); U.S. Bureau of Alcohol Tobacco and Firearms (ATF) (1976).

1973-1982 - U.S. ATF (1976-1984).

1983 - U.S. ATF (1989).

1984-1985 - U.S. ATF (1994).

1986-2016 - U.S. Bureau of Alcohol Tobacco and Firearms, Firearms Commerce in the United States: Annual Statistical Update 2018. Available online at <https://www.atf.gov/resource-center/data-statistics>.