

Rate of Gun Deaths in Australia, 1993 to 2019.

Data are from GunPolicy.org.

70% of gun deaths), with no evidence of substitution in methods of suicide.² Globally, Australia was reported to have one of the largest annual rates of change in the number of firearm-related deaths between 1990 and 2016.³

Given potential confounding, it's difficult to establish a direct link between the 1996 legislation and changes in firearm-related mortality. The number of non-firearm suicides and homicides has also fallen during the past quarter-century in Australia. Reductions in gun deaths, however, have been much more substantial: between 1997 and 2013, there was a 55% reduction in the firearm-related suicide rate, as compared with a 16% reduction in the nonfirearm suicide rate, and a 62% reduction in the firearm-related homicide rate, as compared with a 44% reduction in the non-firearm homicide rate. Moreover, the drop in firearm-related deaths was largest in states where the most guns were surrendered and smaller than average in Victoria, which had already restricted access to semiautomatic long guns. A rare-events model provided strong evidence that the absence of mass shootings in Australia

between 1997 and 2017 wasn't merely a continuation of a pre-existing pattern.⁴ No other policy has been suggested to explain the large reduction in firearm-related mortality after the national revision of gun legislation.

As compared with the United States, Australia has fewer guns per capita, stronger gun regulations, and far lower firearm-related mortality. Studies have found that a country's estimated rate of firearm ownership is associated with its rates of firearm-related suicide and homicide.³ The effect of gun availability on violent death is substantial. For example, an international meta-analysis of intimate partner violence perpetrated by men found that having access to a gun was linked to an increase by more than a factor of 10 in the likelihood of killing a partner (as opposed to committing nonfatal violence).⁵


Although the scale of the challenge is clearly different in the United States than in Australia, the Australian experience provides important lessons for the United States and other jurisdictions with high rates of gun violence. This example demonstrates that taking a public health approach to

firearm-injury prevention by reducing access, strengthening regulation, and engaging the community can reduce gun deaths. It also shows that after mass-shooting incidents, countries have an opportunity to improve policies. Australia's policy change used a substantial amount of the relatively new — and right-leaning — Prime Minister John Howard's political capital. The support of many conservatives was crucial and was secured by opinion polls showing overwhelming support for firearm regulation and by media pressure. Gun-policy reforms were supported by all major political parties, whereas conservative parties in many other countries staunchly oppose such reforms. The success of firearm regulation became a source of pride for many Australians.

Mass shootings account for a small proportion of firearm-related deaths, but they tend to receive a substantial amount of media coverage and can focus the attention of the public and politicians on gun violence more broadly. The legislation's primary goal was to reduce access to the semiautomatic firearms that were responsible for the majority of

mass killings, but it also introduced and tightened public-safety policies, licensing requirements, and other regulations aimed at preventing more common forms of firearm-related injury and death.

Although preventing gun deaths is essential, focusing on deaths obscures another tragic reality of firearm violence. In addition to the people killed by firearms, a larger number are injured and have life-changing pain, disability, and psychological distress resulting from the use of firearms, which leads to substantial expenses related to medical care, mental health care, and rehabilitation.⁵ Australian firearm policy now focuses, more than it did in the mid-1990s, on domestic and family violence, which often involves additional victims besides intimate partners, including children.

 An audio interview with Dr. Negin is available at NEJM.org

The Australian experience shows that efforts to reduce gun violence benefit from the use of multipronged interventions, including gun registration, gun-owner licensing, safe-storage policies, and suicide-prevention programs.

Despite Australia's success, its gun laws are vulnerable to pres-

sure. Although the government destroyed a substantial proportion of privately owned firearms after the implementation of updated gun legislation, many single-shot rifles and shotguns have been imported to replace banned semiautomatic weapons. There are now more than 3 million registered firearms — a figure that is increasing — in a country of 25 million people. The rate of gun ownership is lower than it was in 1996, but Australia's sport-shooting community remains vibrant, and certain groups such as farmers use firearms in much the same way as they did before the new laws were enacted. A wealthy lobbying group with a national membership of 200,000 gun owners, which has grown over the past two decades, funds politicians who promise to chip away at firearm regulation. Such ongoing challenges serve as a reminder of the fragility of Australia's achievements and the need to avoid policy complacency, not just in Australia but around the world. On the 25th anniversary of the Port Arthur mass shooting, we believe that Australian policymakers should recommit to maintaining and strengthening firearm

regulation in recognition of the horror of that day and of the bold strides taken by legislators in the weeks and months that followed.

Disclosure forms provided by the authors are available at NEJM.org.

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1. Chapman S, Alpers P, Jones M. Association between gun law reforms and intentional firearm deaths in Australia, 1979-2013. *JAMA* 2016;316:291-9.
2. Chapman S, Alpers P, Agho K, Jones M. Australia's 1996 gun law reforms: faster falls in firearm deaths, firearm suicides, and a decade without mass shootings. *Inj Prev* 2006;12:365-72.
3. Naghavi M, Marczak LB, Kutz M, et al. Global mortality from firearms, 1990-2016. *JAMA* 2018;320:792-814.
4. Chapman S, Stewart M, Alpers P, Jones M. Fatal firearm incidents before and after Australia's 1996 national firearms agreement banning semiautomatic rifles. *Ann Intern Med* 2018;169:62-4.
5. Spencer CM, Stith SM. Risk factors for male perpetration and female victimization of intimate partner homicide: a meta-analysis. *Trauma Violence Abuse* 2020;21:527-40.

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Vaccination plus Decarceration — Stopping Covid-19 in Jails and Prisons

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Covid-19 has exposed the inadequacy of the public health infrastructure in the United States and forced us to confront associated biosocial dynamics that are driving the pandemic, including poverty, structural racism, distrust, unequal access to health care, and other social sources. But perhaps

no collective preexisting condition has been more acute and preventable than that associated with the U.S. system of mass incarceration. U.S. jails and prisons house nearly 25% of the world's incarcerated population even though the United States accounts for only 4.2% of the global popu-

lation. Because there is constant movement in and out of jails and prisons — where more than 620,000 Covid-19 cases have already been documented despite notable deficiencies in testing, transparency, and oversight — these facilities operate as epidemiologic pumps. Not only do carceral