Did the buyback save lives?

The public debate seemed frustratingly simplistic. Some anti-gun campaigners described firearms owners as ‘gun nuts’, and seemed to have difficulty understanding how anyone could enjoy gun collecting, target shooting or hunting. Conversely, gun-rights advocates would say things like ‘guns don’t kill people, people do’, which doesn’t take the debate very far, given that the same can be said for fragmentation grenades, poison gas and surface-to-air missiles.

With Christine Neill, an expatriate Australian now living in Canada, I set about analysing data on the buyback. One result was rock solid. In the decade before the gun buyback, Australia averaged more than one mass shooting per year (a mass shooting is where five or more people are killed). Between 1987 and 1996, a total of 94 victims were killed in mass shootings. Apart from Hoddle Street and Port Arthur, there were also mass shootings in the Top End (Northern Territory and Western Australia), Canley Vale (New South Wales), Queen Street (Victoria), Oenpelli (Northern Territory), Surry Hills (New South Wales), Strathfield (New South Wales), Terrigal (New South Wales), Cangai (New South Wales) and Hillcrest (Queensland).

In the wake of the Port Arthur massacre, newly elected Prime Minister John Howard worked with state and territory governments to implement tougher gun regulations. One of the strongest advocates was Walter Mikac, whose wife and two daughters had been murdered by Martin Bryant. Addressing a rally of 3000 people in the Sydney Domain, he said ‘as you know, three months ago to this day, I lost the entire reason for my existence.’

To make sure that the tougher rules actually reduced the number of weapons, they were also accompanied by a buyback program. From mid-1996 to mid-1997, anyone could take a gun to their local police station, and the police would pay its fair value. In total, nearly 650,000 weapons were handed in to police. While some of these were weapons had newly become illegal (pump-action shotguns and semi-automatic rifles), many people seem to have simply taken the chance to ‘clean out the closet’ by handing in weapons that were legal if the owner had an appropriate licence (such as .22 rifles). In the Northern Territory, police even paid compensation for a set of World War II aircraft cannons. According to one survey, the proportion of Australian households that had at least one gun dropped from 15 per cent to 8 per cent as a result of the buyback.

One of the topics covered in an address launching *The economics of just about everything: the hidden reasons for our curious choices and surprising successes*, at the University of Melbourne on 30 July 2014.
In the decade after the laws were changed, there was not a single mass shooting in Australia. The chance of this change being due to luck alone is less than 1 in 100. Judged by whether it prevented mass shootings, the Australian gun buyback was an unmitigated success. Yet impressive though this is, the number of people killed in mass shootings has never been particularly large. Even during the worst period for gun massacres, the odds of being killed in a mass shooting were about as large as the chances of being killed by a lightning strike.

Neill and I then set about looking at other types of gun deaths. We learnt that the person most likely to kill you with a gun is yourself. The next most likely person to kill you with a gun is your spouse. The next most likely people to kill you are household members, relatives and acquaintances. You are least likely to be killed by a complete stranger. So we decided to look at the impact of the gun buyback on the overall firearm homicide and firearm suicide rates.

We approached the question in two ways. First, we looked at national trends. We found that – notwithstanding the mass shootings – gun homicide and gun suicide rates had been steadily falling for nearly two decades before the buyback. Some fancy statistical analysis seemed to suggest that the buyback had caused the firearm homicide and suicide rates to fall a little faster, but it was difficult to be sure, so we tried another approach.

In some states, the number of firearms per person that were bought back was larger than in other parts of Australia. We asked the question a little differently: did places with more gun buybacks experience a larger drop in gun homicide and suicide? The answer turned out to be a resounding yes. For example, in the case of firearm suicide, the greatest reduction in weapons occurred in Tasmania, which was also the jurisdiction that saw the biggest drop in firearm suicide. Meanwhile, the smallest reduction in firearms per person was in Canberra, which also had the smallest drop in the firearm suicide rate. We did not find evidence of a corresponding increase in other forms of homicide (such as knife killings) or suicide (such as self-poisoning). Overall, we estimated that the Australian gun buyback saved at least 200 lives per year – mostly suicides.
Was the buyback worth it?

But the buyback had been expensive. Around half a billion dollars in compensation was paid to gun owners. Would Australia have been better off putting the money into other lifesaving measures, such as safer roads or better hospitals? To answer this question, we need a way of valuing gun deaths in monetary terms. For non-economists, this is sometimes regarded as a ghastly exercise: how can we put a dollar figure on a life? But for economists, having an estimate of the value of a statistical life helps us decide when a life-saving measure is cost-effective. By looking at how much people are willing to pay for health care and safety measures, economists are able to come up with a figure for the value of a ‘statistical life’.

The value of a statistical life most commonly used by Australian policy-makers is $2.5 million. On this basis, the economic value of saving 200 lives a year is around half a billion dollars, so the economic value of the gun buyback every year is about the same as the one-off cost paid in 1996-1997. Since it was implemented, the gun buyback has paid for itself more than ten times over. And the vast bulk of the benefit came not from reduced mass shootings, but from an entirely unexpected source: fewer gun suicides.

Fear of crime and wellbeing

While relatively few people die from mass shootings, the fear generated by the Port Arthur massacre should not be ignored. It is true that Australia probably lost as many people to road accidents in the week after the Port Arthur massacre as died on that tragic Sunday. But that simple analysis ignores the fact that fear of crime imposes a real cost on the community.

It was the nineteenth-century philosopher Jeremy Bentham who first argued that crime might have an impact on non-victims. A violent crime, Bentham suggested, did a ‘primary mischief’ to its victim but it also caused a ‘secondary mischief’. As reports circulated, people would go out of their way to avoid the spot where it happened. Some might spend money to protect themselves. Others could be too scared to leave their homes at all. Bentham reminded us that the ripples of crime spread out well beyond the event itself.

Fear of crime isn’t always proportional to the risk of crime. For example, women tend to be most fearful of violent crime, yet men are most at risk. We probably all know friends whom we think are too worried about crime. Perhaps because people’s worries don’t always match the true danger, the economics of crime has largely ignored fear.

To help fill the research gap, I carried out a study with British economist Francesca Cornaglia and US economist Naomi Feldman. In essence, we aimed to test Bentham’s theory in Australia. Matching up surveys of mental wellbeing with data on police crime reports, we found that an increase in crime was associated with lower levels of mental wellbeing for people who were not a victim of any crime. When crime surged, people in the neighbourhood who hadn’t been victims tended to experience more emotional problems, nervousness and depression. Moreover, we found that media reports of crime act as a ‘multiplier’ – causing crime to have an even larger negative impact on mental wellbeing.

This finding suggests that crime is yet more serious than we might have thought. As a community, we’ve always known that we need to cut crime to protect the man who might be assaulted, the family whose house might be broken into, and the woman whose car may be stolen. We also know now that we need to cut crime so that families can continue to let their children walk to school, women can go jogging at dusk and older people can feel safe catching the train.

What drives crime?

To understand what drives crime, let’s start by looking at crime rates in Australia over recent decades. Ideally, we would look at a wide range of crimes, but shifting definitions and changes in reporting rates have made long-term trends unreliable for some offences (for example, domestic violence is more often reported than in the past). So I’ll focus on the one crime that has the fewest problems in reporting: homicide.

From the end of World War II, Australia’s homicide rate climbed steadily – from an annual rate of
What can economics tell us about guns and crime?

around 1 per 100,000 in the 1940s to a peak of 2.4 per 100,000 in 1988. Thereafter, it slowly declined, staying below 2 people per 100,000 throughout the 1990s. In the most recent figures, the homicide rate was just above 1 person per 100,000. Your chance of being a victim of homicide in the late 2000s was around half of what it had been in the late 1980s.

What caused the drop? One of the lessons of economics is that government policies often have unintended effects, so let's start with two crime-reduction strategies you've probably never heard about: legalised abortion and unleaded petrol. The evidence for both effects originates in the United States, where crime has followed a similar pattern to Australia.

**Legalised abortion**

In the case of legalised abortion, the story starts in 1973 when the US Supreme Court decision in *Roe v Wade* effectively legalised abortion, leading to a dramatic increase in the number of terminations performed. The turning point in violent crime in the 1990s coincided with the period when children born in the post–*Roe v Wade* era would be reaching their late teens, and crime continued to fall as this generation reached the peak ages for criminal activity. Moreover, the handful of US states that legalised abortion before *Roe v Wade* were also the first to witness a fall in crime. Researchers John Donohue (Stanford University) and Steven Levitt (University of Chicago) concluded that legalised abortion accounted for a significant share of the drop in US crime rates.

When Justin Wolfers and I read the study, we decided to test the theory on Australia. Although Australian crime data aren't as good as US figures, we found some similar trends. While there is no single *Roe v Wade*-type decision in Australia, a number of seminal changes can be identified. Court decisions in Victoria in 1969 and New South Wales and the ACT in 1971 substantially broadened the circumstances in which abortions could be legally performed. Legislative changes in South Australia in 1969 and the Northern Territory in 1974 had a similar effect.

The changes did not occur in every jurisdiction. In Tasmania, Queensland and Western Australia, the legal status of abortion remained unclear throughout the 1970s. But, for more than two-thirds of the Australian population, the change occurred in the late 1960s or early 1970s – or about twenty years before the drop in crime rates. Wolfers and I also found some evidence that the drop in homicide occurred first in the states that legalised abortion the earliest.

The reaction to the two sets of findings could not have been more different. In the US, Donohue and Levitt earned the opprobrium of both those who are Pro-Life (who thought the researchers were arguing that the murder of a million foetuses could be offset by 6500 fewer homicides) and those who are Pro-Choice (who thought the researchers were suggesting that we could weed out society’s villains in the womb). In Australia, the publication of my research with Wolfers garnered a single letter to the newspaper.

Now that the dust has settled, it’s worth noting that legalised abortion has only a minor effect on the number of children brought into the world – its main effect is to change when they are born. Thus, the main effect is not that families have fewer children, but rather that all of these children are born when the parents feel ready to raise them. In *Freakonomics*, Levitt (writing with Stephen Dubner) argued ‘when the government gives a woman the opportunity to make her own decision about abortion, she generally does a good job of figuring out if she is in a position to raise the baby well. If she decides she can’t, she often chooses the abortion’.

**Unleaded petrol**

The other major cause of the crime drop was unleaded petrol. In the 1920s, fuel companies began adding lead to petrol to improve performance. At the time, people knew that high quantities of lead could cause poisoning, but didn’t realise that even small amounts of lead can be harmful – particularly for children. Several research papers have found that children with moderately high levels of lead in their blood are more hyperactive, impulsive and easily distracted. With difficulty controlling their
behaviour, children who have more exposure to lead are more likely to commit crimes as adults. Lead exposure increases the chance of ADHD and it boosts the chance of children having a low IQ, a predictor of committing crimes later in life. Although children can also ingest lead from house paint, leaded paints were largely phased out in the 1950s and 1960s, leaving leaded petrol as the largest risk to children.

In a careful analysis of the US experience, Jessica Wolpaw Reyes of Amherst College uses the fact that the Clean Air Act phased out lead from petrol over the period 1975 to 1985, but did so differentially across states. When Reyes analysed the changes in violent crime two decades later, she observed that the drop in crime was sharpest in the states that were first to reduce their lead levels. Moreover, the effect is independent of the change in abortion laws, which happened at a similar time, but did not perfectly coincide with the drop in lead levels.

In Australia, the phase-out of leaded petrol did not start until 1986, but took place at the same time nationwide (preventing me from replicating Reyes’ cross-state comparison for Australia). Yet if we assume that the impact on crime was similar in both countries, it suggests that unleaded petrol might have been responsible for reductions in crime in Australia as late as the mid-2000s. Tragically, Reyes' results also suggest that if Australian policymakers had banned leaded petrol when their US counterparts did, then tens of thousands of children may have grown up with better life chances, and thousands of crimes might have been averted.

So far, I’ve talked about three factors that affected crime in surprising ways. The gun buyback reduced firearms deaths, but mostly through fewer domestic shootings and suicides, not by its effect on reducing mass murders. In the case of abortion laws, the reduction in crime came because these laws helped women bear children when they felt ready to raise them. And unleaded petrol dramatically reduced young children’s exposure to a substance that we now know is associated with impaired brain development.

Policing and punishment

Political debates about crime aren’t generally focused on these more distant causes. When that well-known state candidate Laura Norder is on the ballot paper, it’s typically because voters want more police on the streets and more criminals in jail. So let’s review what we know about the way that policing and punishment affect crime.

According to the leading economic studies on the issue, both police officers and imprisonment cut crime. Police numbers affect crime because the more police there are on the beat, the higher the probability that a criminal will get caught. For every 10 per cent increase in police numbers, crime rates fall about 4 per cent. Yet although the number of Australian police officers per person rose in the 1970s, it hasn’t changed much since then. So it stands to reason that police numbers cannot be a major driver of the drop in violent crime over recent decades.

Incarceration reduces crime through two channels: deterrence and incapacitation. Deterrence works because would-be criminals look at those behind bars and decide not to commit an offence. Incapacitation works because while you’re locked up, you can’t commit a crime (more specifically, you can’t commit a crime on the general population). Like sports players, criminals tend to have short careers, peaking in their late teens and early twenties. So if you lock up criminals for a few years, you dramatically reduce their lifetime propensity to commit violent crimes. Overall, every 10 per cent increase in the prison population cuts crime by around 3 per cent.

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Reference