

violence prevention the evidence

Guns, knives and pesticides: reducing access to lethal means

Series of briefings on violence prevention

This briefing for advocates, programme designers and implementers and others is one of a seven-part series on the evidence for interventions to prevent interpersonal and self-directed violence. The other six briefings look at increasing safe, stable and nurturing relationships between children and their parents and caregivers; developing life skills in children and adolescents; reducing availability and misuse of alcohol; promoting gender equality; changing cultural norms that support violence; and victim identification, care and support.

For a searchable evidence base on interventions to prevent violence, please go to: www.preventviolence.info

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Overview

Evidence suggests that limiting access to firearms, knives and pesticides saves lives, prevents injuries and reduces costs to society.

Homicide and suicide claim 600 000 and 844 000 human lives respectively, each year worldwide. This comes at a terrible cost to society – psychological and financial – and inhibits progress towards all eight of the United Nations' Millennium Development Goals. This carnage could be significantly reduced, however, by limiting access to three of the most lethal means of violence: firearms, sharp objects (such as knives) and pesticides.

Firearms: Jurisdictions with restrictive firearms legislation and lower firearms ownership tend to have lower levels of gun violence.

Measures include bans, licensing schemes, minimum ages for buyers, background checks and safe storage requirements. Such measures have been successfully implemented in countries such as Austria and Brazil and in a number of states in the United States of America. Introducing national legislation can be complicated, but much can be done at local level. Stiffer enforcement, amnesties and improved security for state supplies of firearms are some of the other promising approaches. Multifaceted strategies are also needed to reduce demand for guns – diverting vulnerable youth from gang membership, for instance.

Sharp objects: As well as control measures, governments need broad strategies to reduce socioeconomic factors underlying the violent use of these weapons.

Less evidence is available on the impacts of efforts to reduce violence associated with sharp objects than for firearms. Until now concerned authorities have focused on similar measures to those used for the control of guns. In the United Kingdom these have included legislative reforms (bans on flick knives, minimum ages for purchasers etc.), stiffer enforcement ("stop-and-search" initiatives) and amnesties; however, their impact is not yet clear.

Pesticides: Safer storage, bans and replacement by less toxic pesticides could prevent many of the estimated 370 000 suicides caused by ingestion of pesticides every year.

Members of agricultural communities in low- and middle-income countries are heavily over-represented in the suicide death toll related to pesticides. Controlling access to pesticides is not only critical in reducing self-directed violence, it is key to preventing unintentional poisoning and terrorism. International conventions attempt to manage hazardous substances; however, many highly toxic pesticides are still widely used. Studies indicate that bans must be accompanied by evaluations of agricultural needs and replacement with low-risk alternatives for pest control.

Further research is needed, particularly in low- and middle-income countries.

The development of robust injury-data collection systems and further studies are required to deepen our understanding of the impacts of measures to reduce access to lethal means, especially in low- and middle-income countries.

1. Introduction

Each year, homicide and suicide take the lives of 600 000 and 844 000 people respectively, worldwide. Though not as devastating, in global terms, as diarrhoeal disease (which kills 2.16 million people each year) or HIV (2.04 million), these causes of death far exceed many others, including war and civil conflict (184 000) (1).

Evidence shows that preventing such interpersonal and self-directed violence demands broad strategies that limit access to common lethal means such as guns, sharp objects and pesticides, while reducing demand for these lethal means by addressing social determinants of this violence (2).

Whether people succeed in attempts at homicide and suicide depends heavily on the means used (3,4). Firearms and sharp objects are among the most common weapons used in homicide. The use of firearms accounts for 60% of all homicides, killing about 360 000 people per year, according to the latest estimates (5). Firearms are also commonly used in self-directed violence, as are acutely toxic substances such as pesticides. Ingestion of pesticides, for example, accounts for an estimated 370 000 suicides every year (6).

Access to and violent use of lethal means vary widely, as the below facts and figures on firearms, sharp objects and pesticides indicate (**Boxes 1, 4, 5**) (4,6–8). Equally variable is the staggering cost of lethal violence to society: its destruction of families, the heavy burden it places on public services and, in the case of interpersonal violence, the widespread fear it triggers. Reducing access to lethal

means is, therefore, a critical factor in addressing global priorities related to public health, access to basic needs, economic development and security. Specifically, lethal violence hampers progress towards all eight of the United Nations' (UN) Millennium Development Goals (9).

The good news is that violence is preventable. This briefing summarizes evidence from research on the impacts of strategies of violence prevention at all levels of government (national, state and local) that aim to reduce access to firearms, sharp objects and pesticides. The strategies addressed are legislative measures, enforcement of legislation, amnesties and collection schemes, managing state supplies, safer storage and safety features.

Evidence from research on measures to reduce access to firearms is far more abundant than the evidence available on policies and programmes for the control of sharp objects and pesticides. Furthermore, most studies of access to firearms and sharp objects have been conducted in higher income countries. Research on these topics in lower income countries is growing, however, and it warrants much greater support.

This document does not discuss international measures to control lethal means, though it recognizes that legal and illegal trade in lethal means operates across many borders. Controlling this trade through national, state-level and local interventions is the aim of a variety of international agreements and initiatives, and the responsibility of all nation states.

2. Reducing access to firearms

BOX 1

Firearms: facts and figures

- There are at least 875 million firearms in the world today of which 75% are owned by civilians (over a third by civilians in the United States). Just 9% of civilian firearms are estimated to be registered with authorities (8).
- An estimated 360 000 people are killed with firearms in non-conflict situations each year. A further 184 000 violent deaths occur annually in armed conflicts (1).
- Firearms are involved in the vast majority of homicides in many countries. In Medellín, Colombia, guns figure in 89% of homicides (10); Montenegro, 85% (11); Yemen, 80% (8); the United States, 70% (12); and Brazil, 69% (13). The proportion of homicides involving firearms ranges from 19% in western and central Europe to 77% in Central America (5).
- The proportion of suicides involving firearms ranges from 0.2% in Japan to 60.6% in the United States, among males, and from 0% in Iceland, Kuwait and other countries to 35.7% in Uruguay and the United States, among females (14). Among European males aged 15–24, the proportion of suicides involving firearms ranges from 2.3% in England to 43.6% in Switzerland (15).
- In South Africa, the cost of hospital treatment for serious abdominal firearms injuries alone is estimated at 4% of the annual national health budget (16). In England and Wales, each homicide is estimated to cost society £1.5 million (17).

Many studies have explored the impact of measures to reduce access to firearms on violence. Interventions discussed here include legislative measures, improving enforcement of legislation, firearms amnesties, managing state weapons supplies, promoting safer storage and firearm safety features. This range of interventions is by no means comprehensive – other activities that seek to reduce firearms access include preventing home manufacture of firearms or conversion of replica firearms and reducing illegal cross-border trafficking. Little research has been done, however, on the impact of such measures on violence prevention. Furthermore, while this briefing does not look at international firearms control measures, it is important to recognize that international agreements, specifically the UN *Protocol against the illicit manufacturing of and traf-*

ficking in firearms, their parts and components and ammunition (2001), commit signatory nations to implementing their own firearms legislation and control measures.

2.1 Legislative measures

Jurisdictions with more restrictive firearms policies and lower firearms ownership tend to experience lower levels of firearms violence (18–22). At all levels of government, therefore, measures to prevent violence involving firearms often focus on strengthening legislation to control the sale, purchase and use of these weapons. To be successful, such legislation must be effectively implemented, publicized and enforced. Legislative measures include:

- Bans on certain types of firearms;

- Licensing and registration schemes for owners and suppliers;
- Minimum ages for the purchase of firearms;
- Background checks and/or psychological testing of purchasers;
- Minimum waiting periods between licensing and purchasing;
- Limits on quantities purchased;
- Controls on the carrying of firearms; and
- Safe storage requirements.

Australia, Austria, Brazil and New Zealand provide examples of reforms of firearm laws at the national level that have had promising effects.

AUSTRALIA: Australian firearms laws were reformed in 1996 after a mass shooting. The new legislation prohibited semi-automatic and pump-action shotguns and rifles and introduced a national firearms licensing and registration scheme, including a written safety test for purchasers. The government also offered financial compensation to those surrendering weapons. Studies conducted after the reforms have provided mixed results and illustrated some of the difficulties in analysing the impacts of violence prevention measures (26–30). Some studies found reductions in both firearms homicides and firearms suicides (27,28), while another found only a decrease in firearms suicides (29). One study concluded that other methods of suicide had not increased, as firearm suicides decreased (27).

AUSTRIA: In 1997, Austria introduced new laws requiring that purchasers of firearms be at least 21, have a valid reason to purchase a firearm and undergo background checks and psychological testing. In addition, the legislation requires a three-day waiting period between licensing and purchasing, together with safer firearm storage. Suicide rates had been decreasing prior to the new laws, but the proportion of suicides involving firearms had been increasing. The reforms changed this dynamic, as the proportion of firearms suicides began to fall, without an accompanied increase in suicides by other means. Austria's new laws have also been associated with falling demand for firearms licences and a drop in the number of homicides involving guns (23).

BRAZIL: In response to some of the highest homicide rates in the world, Brazil reformed its firearms legislation in 2003. The new laws raised the minimum purchase age to 25, made it illegal to own unregistered firearms, prohibited the carrying of firearms outside the home or workplace, introduced background checks for buyers and control-

led imports of firearms. A voluntary disarmament scheme was also implemented, which official sources report returned over 450 000 firearms. Analyses suggested that the reforms were followed by an 8.8% decrease in firearms mortality between 2003 and 2005, with decreases in both firearms homicides (8.0%) and suicides (8.2%). Accidental firearm deaths dropped by 15.2% and firearm-related deaths of “undetermined intent” dropped by 26.3%. Gun-related hospitalization, meanwhile, mostly following attempted suicide or unintentional injury, decreased by 4.6% (25).

NEW ZEALAND: After a mass-shooting in 1990, the government established a rigorous licensing system. This requires photos of firearms owners and regular renewals, tests to ensure that applicants understand laws governing firearms and police assessment of all applicants. It also calls for safe and locked storage of guns in areas separate from ammunition. The system has significantly reduced firearms suicides, particularly among people 25 years and under. Studies, however, have yet to determine whether other forms of suicide increased as firearms suicides decreased (24).

At the state and municipal levels in Colombia, El Salvador and the United States, innovative legislation has reduced access to firearms.

COLOMBIA: Local legislation here banned the carrying of firearms in the cities of Cali and Bogotá on holidays, weekends following paydays and election days. The bans were enforced with police checkpoints, searches during traffic stops and routine police work. Studies showed that the incidence of homicides dropped in both cities on days when the ban was in place, compared to similar days when people were allowed to carry guns (31).

EL SALVADOR: Municipalities in an Arms-Free Municipalities project, which began in August 2005, have made it illegal to carry firearms in parks, schools, plazas, recreation centres and other locations. The project also aimed to increase police capacity to enforce firearms bans, run a media campaign on the danger of guns and the nature of the new regulations, implement a voluntary firearms surrender and collection scheme and evaluate the project. Despite some difficulties in implementation, the project initially reported a 47% reduction in homicides in participating municipalities, among other successes; however, reductions in homicides were not sustained over the first year of the project (32,33).

UNITED STATES: Box 2, below, offers examples of the impact of state-level firearms legislation on violence. While a United States review of firearms laws found insufficient evidence to establish the effectiveness of either individual laws or combinations of laws on interpersonal or self-directed violence (34), the authors stressed that this did not necessarily mean such laws were ineffective. Rather, they argued, more rigorous data and research were required to strengthen the evidence base.

2.2 Improving enforcement of legislation

Legislation to reduce access to firearms can only be effective if it is enforced. For example, despite controls on firearms dealers in the United States, a small number of rogue dealers are often responsible for selling a large proportion of the weapons used in crime (44). Furthermore, most firearms used in crime are initially purchased legally, yet transferred by illegal means to criminal hands (45). This explains why most guns recovered in criminal investigations in Canada, Haiti and Mexico have

been illegally imported from the United States (45,46). Firearms licensing systems, however, can allow data on transactions (firearm serial numbers, details about purchasers and dealers, etc.) to be collected and used to trace firearms involved in crime and, thus, capture and punish offenders (47). However, proactive enforcement can have strong deterrent effects and thus be important in controlling access to firearms.

At the state and local levels, a variety of measures can be used to enforce firearms licensing legislation. In some states in the United States, police officers have posed as criminals in undercover operations to purchase firearms from licensed dealers. Such operations were found to significantly reduce the supply of firearms to criminals when followed by lawsuits against offending dealers and high-level media coverage. By contrast, results were less positive when legal action was not taken and operations were less publicized (48). In Boston, Operation Ceasefire, implemented through the multi-agency Boston Gun Project (49), used research and firearms tracing data

BOX 2

Examples of state-led legislative controls of firearms in the United States

BANS ON CERTAIN FIREARMS: Maryland's ban on small, low-quality, inexpensive handguns was associated with an increase in gun purchases prior to implementation and an increase in firearms homicides immediately after the ban. Firearms homicides then decreased (35), however, suggesting that the ban had a delayed effect.

ONE-GUN-A-MONTH: Laws that limit the purchase of firearms to one per individual per month aim to reduce access to weapons among potential traffickers. The use of such legislation in Virginia was found to reduce interstate trafficking of firearms purchased in the state (36).

KEEPING GUNS OUT OF REACH OF CHILDREN: Child-access prevention (CAP) legislation requires owners to store firearms safely away from children (e.g. under lock and key) and makes the failure to do so a criminal offence (37). Studies have associated CAP laws with modest reductions in firearms (and overall) suicides among adolescents (38) and, in states where violation of CAP laws is a serious crime (felony), reductions in unintentional firearms fatalities among children (39–41).

GUN SHOW REGULATION: In California, where gun shows are regulated, promoters must be licensed and private firearms sales are highly restricted. These restrictions are associated with a lower incidence

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