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# Gun violence: insights from international research

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## ABSTRACT

This article reviews research undertaken over the past two decades to support international policy on small arms and light weapons (SALW) – which include firearms – and discusses its relevance to academic debates and policy on gun violence. It examines whether SALW research generated a greater understanding of the most problematic uses and users of firearms, and of the role of different weapons as instruments of violence. SALW research helped shift international policy from armed conflicts to gun violence occurring in a range of developing and post-conflict settings, and in Europe following the 2015–16 terror attacks. This work underscored the proximate weapons sources that armed groups often utilise, and the importance of flows of certain weapons – such as converted firearms – and ammunition in fuelling violence. Undertaking impact evaluations of novel interventions, monitoring the impact of new technologies, and investigating the relationship between ammunition supply and violence are suggested ways forward.

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## Introduction

Twenty years have passed since the international community adopted two multilateral arms control instruments<sup>1</sup> to address illicit trafficking in small arms and light weapons (SALW) and firearms<sup>2</sup>. This international momentum contributed to the growth of an interdisciplinary ‘SALW research’ epistemic community that responded to international demand for policy-relevant research and analysis on SALW. Applying concepts and methods from a range of fields – including conflict and development studies, public health, and criminology – SALW researchers have sought to increase empirical knowledge on the issue and support policy-making in developing and post-conflict settings where SALW data was scarce<sup>3</sup>.

In spite of significant output in the form of books and reports targeting policy-makers, SALW researchers’ footprint in the academic literature on gun violence has been relatively sparse. In fact, the peer-reviewed literature dealing with SALW examines the issue primarily from the perspective of international relations, security studies, and international law<sup>4</sup>. In contrast, US gun violence researchers have produced a wealth of systematic studies since the late 1970s dedicated to understanding the most problematic uses and users of firearms, and the role of guns as instruments of violence<sup>5</sup>. Central questions in the

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US literature have included examining whether firearms availability and regulation influence levels of violence – the accessibility thesis – and how and why the type of weapon used matters – the instrumentality thesis<sup>6</sup>. Data limitations in developing and post-conflict countries provided SALW researchers with few opportunities to produce quantitative data analyses comparable to those of the dominant US literature. As a result, only few SALW scholars have attempted to discuss the central debates of the mainstream academic gun violence literature<sup>7</sup>. Yet as this review will illustrate, twenty years of data collection and policy-making in regions highly affected by armed violence provided the SALW community with opportunities to produce valuable insight in the form of new empirical knowledge and innovative methodological approaches – efforts which have seldom been picked up in the mainstream gun violence literature.

This article uses US criminologist Franklin Zimring's framework of uses, users, and instruments to discuss the relevance of SALW research to mainstream academic gun violence discussions<sup>8</sup>. SALW researchers have previously referred to the Zimring formula as a template to frame and prioritise the most problematic dimensions of the SALW issue, drawing primarily from the US experience<sup>9</sup>. This review uses the same template to highlight the most dangerous uses and users of SALW, and the most dangerous guns, as documented by the international SALW research community itself. The article demonstrates how SALW researchers made significant headways in certain areas, and notably with respect to explaining the role of specific weapons, ammunition, and non-state armed actors in the gun violence equation. It showcases methodological approaches and research findings from a selection of works published in the last two decades by the main institutions involved in SALW research, including the Small Arms Survey<sup>10</sup>. While it does not claim to draw a comprehensive picture of SALW researchers' contributions to knowledge, it organises and shares insights and findings from international research on SALW that speak to several of the core themes of the mainstream gun violence literature.

The key questions raised in this article are as follows:

- Have SALW researchers succeeded in generating a greater understanding of the most problematic SALW uses, users, and instruments in the regions where they intervened?
- Do the conclusions offered by the SALW research community confirm or challenge the research of scholars working on firearms issues, notably in relation to the accessibility and instrumentality questions?
- Is there evidence that SALW research has impacted policy decisions both within and beyond the international SALW field?

The review is structured around three sections on uses, users, and instruments. The section on *uses* examines early efforts to consolidate global datasets and generate new empirical data on SALW misuse in data-scarce countries – including through field research in Africa and Latin America – which helped fill geographical gaps in global gun violence data. It also finds that SALW researchers' efforts to estimate the costs of violence in developing countries highlighted the instrumentality of SALW – i.e. the more serious societal impacts of firearm violence than those of violence involving other instruments. The second section, on *users*, looks at the emergence of a research agenda on armed actors from the mid-2000s, in terms of which SALW researchers no longer considered non-

state armed groups only as perpetrators of violence and illegitimate holders of SALW, but also – in certain situations – as part of the solution. This research offered a more comprehensive examination of the patterns of SALW procurement, management, control, and use among a broad range of armed actors, and underscored the potential role of armed actors' self-regulation mechanisms in reducing gun violence. The section also discusses the relevance of this broader research agenda for the study of gangs, which may be of specific interest for scholars of organised crime. The third section, on *instruments*, documents the increased precision with which SALW – and, crucially, the associated ammunition – have been monitored in situations of armed violence over the past 15 years, both in conflict areas as well as in the European context since the 2015–2016 terror attacks. This body of work contributed to an increasingly precise understanding of the most problematic types of SALW held by criminal and non-state armed groups – including, for instance, these actors' growing reliance on converted firearms in the European context. SALW researchers also innovatively applied field-based black-market price-monitoring techniques in conflict areas and showed that ammunition prices and war-related fatalities can be strongly correlated, which provides an important lead for further examining the accessibility thesis. The article concludes with a summary of SALW researchers' contributions and reflects on future avenues for bridging the gap between the fields of SALW and gun violence research.

### **Uses: the direct and indirect effects of SALW**

What are the most problematic uses of SALW? And what is the specific impact and weight carried by SALW within the broader phenomenon of armed violence? In the early 2000s SALW researchers focused particular attention on improving ways to measure the global distribution and effects of SALW misuse. Their contributions included expanding global datasets of firearms-related fatalities; estimating the cost of armed violence in developing countries; and using a mixture of social science methods to measure the impacts of SALW misuse country by country and expand the pool of empirical evidence.

### ***Assessing global firearms-related fatalities***

Estimates of the global human toll of SALW misuse in the 1990s claimed that half a million lives were being lost annually through the use of small arms. The majority of these deaths – 300,000 – were thought to be occurring in situations of armed conflict, with the remaining 200,000 occurring in other settings<sup>11</sup>. The credibility of these figures suffered from the dearth of data in the most affected regions, however, which critics argued distorted the analysis<sup>12</sup>. Because these early estimates relied on limited samples of countries, more representative datasets were needed to assess the scope of the issue and ensure that global figures did not obscure important regional and cultural differences. The first decade of the 21<sup>st</sup> century therefore saw institutions such as the Small Arms Survey working to systematise data collection on SALW-related deaths by mapping out relevant data sources and compiling global datasets.

One of the early Small Arms Survey yearbook chapters investigated the lethality of SALW misuse in non-conflict settings. It assembled a combination of public health and criminal justice data on firearm homicides and suicides covering 110 countries for at least

one year since 1995, and applied conservative regional-level multipliers to generate a global estimate. The chapter found that the figure of 200,000 deaths per annum was a credible estimate of the annual human toll of gun violence in non-conflict situations. In fact, these calculations suggested a range of 181,000–250,000 annual firearms-related deaths, including 144,000–199,000 from firearm homicides and 37,000–51,000 from firearm suicides<sup>13</sup>. While firearm suicide was a significant challenge for developed nations, firearm homicide rates were by far the highest in Latin America and the Caribbean<sup>14</sup>. In 2005 United States-based public health researchers, using different estimation techniques, validated these results by producing an estimated range of 196,000–229,000 global non-conflict-related firearm deaths for the year 2000<sup>15</sup>.

In contrast, the estimated annual toll of conflict-related deaths attributed to SALW was revised downwards from the 300,000 figure of the 1990s. Only about 52,000 direct conflict deaths were recorded annually for the period 2004–2007<sup>16</sup>. While these calculations did not include indirect conflict deaths due to malnutrition and disease, the updated figures demonstrated the disproportionate global weight of SALW misuse occurring in non-conflict settings. In the years that followed the Geneva Declaration Secretariat initiated the *Global Burden of Armed Violence* report series, whose three editions provided increasingly sophisticated estimates and analysis for conflict- and non-conflict-related violent deaths<sup>17</sup>. More recently, the Small Arms Survey estimated that 210,000 firearms-related violent deaths occurred in 2016<sup>18</sup>, including 15% of fatalities that occurred in conflict situations and 81% categorised as firearm homicides<sup>19</sup>.

Overall, the research underscored the global significance of firearms homicides when compared with conflict casualties, and therefore the central importance of engaging with the fields of crime prevention and public health when tackling global SALW-related violence. These findings gained international momentum and led to international recognition that the human toll of SALW-related violence was not limited to situations of armed conflict. In 2015, for instance, United Nations member states adopted Target 16.1 of the UN Sustainable Development Goals (SDGs), which commits them to achieving a significant reduction in violent deaths in both conflict and non-conflict settings by 2030<sup>20</sup>.

Another effect of this research has been the expansion of global firearm homicide statistics. As of 2020, for instance, the Small Arms Survey' Global Violent Deaths Database contained data for 209 countries and territories on firearm homicides for at least one year during the period 2010–2018<sup>21</sup>. This is a significant improvement on the 105 country data points on firearm homicides that were available in 2004<sup>22</sup>. SALW researchers therefore contributed to reassessing where, globally speaking, SALW were being the most misused. The following sub-sections will provide insight into the types of field work that allowed SALW researchers to collect additional data on the effects of firearms in previously data-scarce regions.

### ***Estimating the cost of armed violence in developing countries***

Between 2001 and 2006 SALW researchers developed conceptual frameworks and typologies to capture the multidimensional effects of SALW misuse<sup>23</sup>. Early Small Arms Survey yearbooks, for instance, created typologies of these effects, offering a distinction between the direct effects related to fatalities and injuries, and the indirect effects on public health,

humanitarian aid, and development<sup>24</sup>. Studies that measured the economic costs of gun violence also gained traction following the publication of a landmark study that estimated the total cost of gun violence in the United States to amount to USD 100 billion per year<sup>25</sup>.

In 2005–2006 the World Health Organization (WHO) and the US Centers for Disease Control and Prevention (CDC) started developing research guidelines and a *Manual for Estimating the Economic Cost of Injuries due to Interpersonal and Self-directed Violence* in order to promote costing research in a broader range of settings<sup>26</sup>. Moreover, a 2006 Small Arms Survey yearbook chapter offered a typology for conceptualising the economic costs of gun violence, and assessed the specific costs of firearms misuse through case studies undertaken with the participation of local researchers and hospitals in Brazil and Colombia<sup>27</sup>.

This work produced important new empirical data on the differentiated costs of violence perpetrated by different instruments in Brazil and Colombia (Table 1). Consistent with previous research undertaken in developed nations, it found that the direct medical costs and indirect losses of productivity were higher for firearm-related injuries than for those inflicted by sharp instruments. The disproportionately high costs of gun violence were notably due to the higher proportion of firearm-inflicted injuries that resulted in death or hospitalisation<sup>28</sup>. These findings challenged the substitution thesis, in terms of which some scholars have argued that if criminals could not access firearms, they would turn to other instruments, and their inability to obtain firearms would have no impact on overall levels of crime or violence<sup>29</sup>. On the contrary, the greater costs of firearms-inflicted injuries and fatalities compared with violence afflicted with bladed instruments support the instrumentality thesis that the type of weapon used affects the severity of the violent outcome and, by extension, its costs to society<sup>30</sup>.

The piloting of the WHO–CDC guidelines in Rio de Janeiro (Brazil), Bogotá, and Cali (Colombia) also demonstrated the feasibility of adapting gun violence costing methods for use in developing countries. SALW researchers' growing network and experience working with civil society and public health institutions in violence-affected developing countries meant that the pilot studies could benefit from adapted tools and direct cooperation with relevant actors on the ground. With limited resources prospective

**Table 1.** Average medical costs per injury by instrument in selected Brazilian and Colombian hospitals, 2005 (values expressed in 2003 purchasing power parity USD).

	Hospital da Geral in Nova Iguaçu, Rio de Janeiro, Brazil		Hospital Santa Clara, Bogotá, Colombia		Hospital Universitario del Valle, Cali, Colombia	
	Firearm	Sharp instrument	Firearm	Sharp instrument	Firearm	Sharp instrument
Ambulance	219	119	111	129	176	229
Bed*	2,044	702	0	0	2,470	1,355
Consultations	82	58	108	79	362	222
Examinations	195	161	681	337	1,229	384
Surgery	845	372	1,932	1,602	3,323	2,427
Medication	1,074	85	1,739	563	3,839	1,004
Transfusions**	37	8	0	0	0	0
Other*	24	24	2,233	1,291	4	7
Total	4,521	1,529	6,804	4,001	11,403	5,628

\* In Bogotá, bed costs are included under 'Other'.

\*\* In Bogotá and Cali, the costs of transfusions are included in other costs, such as those of surgery.

Source: Reproduced with authorisation from Small Arms Survey, *Unfinished Business*, 203.

data could be compiled to allow for the calculation of both direct medical costs and productivity losses due to violently inflicted injuries. The WHO and CDC published the final version of its manual two years later, together with three case studies on the costs of interpersonal violence in Brazil, Jamaica, and Thailand<sup>31</sup>. In Jamaica, notably, the initiative gained significant public policy utility and led to the regular monitoring of these costs and the integration of the data into national violence prevention policies<sup>32</sup>. At the international level the 2008 *Global Burden of Armed Violence* report also generated a global estimate of the cost of lost productivity from armed violence, which amounted to USD 95–163 billion for 2004<sup>33</sup>.

### ***Expanding the knowledge base through country assessments***

The expanding global firearm mortality datasets and more transparent methodologies used by SALW researchers shed light on the scarcity of information in some regions, particularly in developing and post-conflict regions where the problems of SALW misuse were assumed to be the greatest. In the early 2000s international organisations were working to address SALW proliferation, misuse, and crime in fragile countries recovering from conflict, notably through voluntary weapons collection and disarmament, demobilisation, and reintegration (DDR) programmes. Faced with data scarcity in the countries where it intervened, the UN Development Programme (UNDP) in particular began investing in evidence-based assessments of the nature and scope of SALW proliferation and misuse at the national level to guide its interventions.

In 2002 the UNDP contracted the Small Arms Survey to support its Illicit Small Arms Control project in post-conflict Kosovo. Working with local social science research partners, the team formulated a research design that emphasised mixed methods. The data collection comprised a 1,264-person face-to-face household survey; focus group discussions with representatives of the population's main ethnic, age, and gender groups; key informant interviews with former combatants, security personnel, and school teachers; and access to the databases of the Kosovo Police Service and Pristina University Hospital<sup>34</sup>. The study was among the very first opportunities for SALW researchers to draw on a nationwide household survey and therefore replicate the previous efforts of prominent criminologists and public health researchers investigating gun violence in developed societies<sup>35</sup>. As the survey data that was produced was the first of its kind for Kosovo, it was limited to the year of the study, and as such could not allow for in-depth longitudinal analyses of the relationship between SALW availability and violence. The results – once combined with the firearm seizure and public health data – nevertheless made it possible to generate aggregate feasibility and volatility indices that could inform the selection of locations that were best suited to benefit from pilot interventions<sup>36</sup>.

Demand for additional national 'baseline assessments' expanded in the Western Balkans. The UNDP's specialised regional branch, the South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC), commissioned international NGOs, including the Bonn International Center for Conversion (BICC), Saferworld, and the Small Arms Survey, to carry out additional assessments on Macedonia<sup>37</sup> and South Serbia in 2003–2004<sup>38</sup>. During this time SEESAC also developed Regional Micro-disarmament Standards and Guidelines (RMDS/G)<sup>39</sup> to support various streams of SALW control measures, including 'SALW surveys' – the chosen term for

national SALW baseline assessments in the region. The new regional standards drew heavily on the experiences and methods developed in Kosovo and Macedonia, and called for a mixed-methods approach that assessed SALW distribution, impacts, perceptions, and capacities. The protocols required the collection of locally-available data on firearm-related crime, homicide, and availability that could also feed into the growing global datasets.

While few such assessments have been undertaken in developed countries<sup>40</sup>, SALW surveys are now recognised internationally through a dedicated module in the UN's Modular Small-arms-control Implementation Compendium (MOSAIC)<sup>41</sup>. SALW researchers have undertaken SALW surveys in a number of countries in Africa<sup>42</sup> and Central Asia<sup>43</sup>. As of 2020 SEESAC had produced 16 SALW surveys covering all the countries in the Western Balkans, including seven assessments published in 2019 alone<sup>44</sup> – illustrating the utility of these assessments in countries interested in curbing SALW-related crime and trafficking. These efforts, as a whole, contributed to expanding the pool of firearms-related data in developing and post-conflict societies.

Overall, the development and standardisation of methodologies for monitoring firearms-related mortality and undertaking SALW surveys has helped to reduce global knowledge gaps on the effects of small arms. Moreover, this work showed that approaches initially pioneered by criminologists and public health researchers in developed countries can be applied – with adaptation – in post-conflict and developing countries facing high levels of violent crime. Research on the costs of violence in developing countries directly supported the instrumentality thesis by demonstrating the more serious impacts and higher costs of firearm violence compared with those of violence using other instruments. These results led to several of these methods gaining recognition in international research-guidance documents, and to certain findings – such as the fact that the majority of firearm-related fatalities occur outside of conflict zones – ultimately influencing major international policy agendas such as the UN's SDGs.

### **Users: from perpetrators to armed actors**

As SALW researchers gained access to a range of conflict and post-conflict situations for their fieldwork, they increasingly included groups of users – or holders – of SALW among the subjects of their inquiries. Can interventions that target 'high-risk users' of SALW curb these groups' access to SALW and influence their capacity, motivations, and incentives to resort to armed violence? These questions are central to advancing the accessibility thesis, given that much lethal violence in highly impacted regions is 'carried out as part of an organized group or as an act of revenge or retaliation'<sup>45</sup>. SALW researchers' contributions to this discussion have included promoting a broader understanding of armed groups, both in terms of the types of actors that could be researched and the SALW-specific research questions to be examined. As global attention shifted to also include SALW use in non-conflict settings, SALW researchers increasingly became interested in the replicability of such research in analyses of other types of armed actors, notably gangs and private security companies (PSCs).



### ***Expanding the research agenda on armed groups***

In the 1990s and early 2000s, SALW researchers initially focused on documenting international transfers to insurgent groups, based on research that highlighted how some armed groups in conflict areas obtained their weapons through brokers and international trafficking<sup>46</sup>. While this focus succeeded in putting the SALW issue on the international agenda, it overshadowed important dynamics related to the local sources of supply, internal structures, and rules of behaviour of various types of armed groups, as well as the contexts and purposes of their use of SALW.

Taking advantage of their improving access to conflict and post-conflict areas, SALW researchers sought to gradually expand empirical knowledge of insurgents' , vigilante groups' , and pro-government militias' patterns of acquisition of SALW, notably in Central and West Africa<sup>47</sup>. Research methods included field-based key informant interviews and focus group discussions with members of non-state armed groups to discuss SALW-related issues<sup>48</sup>. This research highlighted the importance of local sources of supply for armed groups, such as battlefield capture and diverted state stockpiles, and therefore helped to generate a broader understanding of the multiple, context-specific, and dynamic sources of supply that armed groups used in conflict situations – even when international trafficking also took place<sup>49</sup>. This body of work helped to shift the SALW research and policy community's narrative from a focus on destabilising international arms transfers to a greater recognition of armed groups' reliance on locally sourced materiel<sup>50</sup>. At the international level, the shifting narrative was echoed by the consideration of a wider range of measures to tackle arms supplies in conflict zones, such as programmes to secure vulnerable state-held weapons and ammunition stockpiles<sup>51</sup>.

SALW research also succeeded in generating an arms-specific research agenda on armed groups that expands beyond the issue of weapons supply. This conceptual development involved examining a broader range of SALW-related questions encompassing these organisations' procurement, management, control, and use of weapons. Early research on Mali, for instance, provided insight into the importance of ammunition supplies for armed groups and the intra-group policies they adopted to preserve their stocks. Malian former combatants, for instance, explained how they would switch their automatic rifles to single-shot mode to avoid wasting cartridges, thereby also reducing the risk of stray bullets injuring civilians<sup>52</sup>. Researchers became increasingly interested in how groups' self-governance mechanisms – as sometimes codified in their codes of conduct and other written or verbal forms of internal regulation – affected the risk of SALW misuse<sup>53</sup>.

SALW research generated a greater recognition of the roles the users of SALW could themselves potentially play in preventing or reducing certain forms of SALW misuse, including disproportionate, negligent, and accidental use of SALW, and for reducing the risk of accidental explosions in ammunition depots held by non-state actors<sup>54</sup>. In practice, engaging with armed groups on the issue of their weapons management policies is politically sensitive, and can be considered tantamount to providing them with illicit military support<sup>55</sup>. Yet in some transitional contexts where disarmament is stalling – such as in Libya in 2012 – the international community can have little choice but to work with armed groups to minimise the risks posed by the excessive amounts of SALW and unstable ammunition that these groups assembled during the conflict<sup>56</sup>.

With its peace support missions being increasingly confronted with complex scenarios, the UN began to recognise the need for 'second generation' DDR approaches for dealing with armed groups. In Afghanistan, for instance, the UN sought to regulate the regulation of weapons management by certain armed groups rather than disarm them<sup>57</sup>. In 2018 the UN released a handbook on *Planning Effective Weapons and Ammunition Management in a Changing DDR Context* that comprises specific guidance for 'Supporting the [weapons and ammunition management] capacity of non-State armed groups'<sup>58</sup>. The recommended measures, while subject to certain conditions, include moving armed groups' ammunition to secure storage areas located away from civilian dwellings and providing them with basic stockpile management advice to improve accountability with regard to their arsenals. Given these policy developments and the ever-growing prevalence of conflicts – and post-conflict scenarios – involving non-state armed groups, the relevance of research on armed groups' SALW-related self-governance mechanisms can only be expected to grow.

An open question is whether the above developments in knowledge and practice on armed groups' acquisition, management, control, and use of SALW in conflict situations are of relevance to research and policy dealing with firearms misuse by armed actors in non-conflict situations. From the instrumentality perspective, reducing gang reliance on and use of firearms should theoretically yield positive results and help to reduce the overall homicide rate, especially in locations where urban gangs account for most violence<sup>59</sup>.

In contexts not understood as war under international humanitarian law, the rationale for negotiating with gangs or other armed organisations on their use of particular forms of violence and weapons is not straightforward<sup>60</sup>. In the United States interventions such as Boston's Operation Ceasefire in the 1990s used 'focused deterrence' strategies to prevent gang reliance on gun violence<sup>61</sup>. This approach involves heightened sanctions for firearms-related crime rather than the more participatory types of negotiations regarding armed groups' behaviour and rules regarding the use of force taking place in conflict settings as described above.

Public health approaches that focus on changing norms and social acceptance of gun violence among individuals involved with gangs may offer greater opportunities to influence gang rules and practices related to the control and use of firearms<sup>62</sup>. Ethnographic gang research also suggests that – at least in some cases – it is not just the weapons themselves that gang members value, but rather possessing the skills to use them effectively<sup>63</sup>. While countering the symbolic and practical value of firearms for gang members is undoubtedly a significant challenge, more targeted research on the utility of engaging with urban gangs with regard to their firearms-related self-governance mechanisms, as part of broader strategies to reduce and prevent gang violence, seems warranted.

### ***Investigating firearms held by PSCs***

The global growth of the private security sector in the first decade of the 21st century raised concerns among both the public and academia over its implications for security sector governance. PSCs' use of force and military-grade weaponry in conflict situations stirred controversy due to high-profile incidents, such as the killing of civilians in 2007 in

Nisoor Square, Baghdad, by security personnel<sup>64</sup>. During this period, and as a response to the downsizing of public security institutions, PSCs operating in stable societies were also increasingly being entrusted with security functions that were previously assigned to the state – including prison surveillance, airport security, and immigration control. While a rich literature focused on discussing the implications of such neoliberal forms of governance and implications for the state monopoly on coercive force<sup>65</sup>, it generally did not examine the specific issues surrounding PSCs' acquisition, management, control, and use of SALW.

The apparent lack of systematic regulatory controls over the SALW held by PSCs in both conflict and non-conflict settings were central concerns for SALW researchers. As non-state actors that legally perform security functions and – in some jurisdictions – are allowed to hold and use firearms in their work, PSCs' SALW holdings might be misused or diverted to the illicit market if they are not adequately managed and regulated. In 2011, the Small Arms Survey assessed the scale of global PSC firearms holdings, as well as regulatory gaps relating to the acquisition, management, control, and use of these weapons<sup>66</sup>. Follow-up research examined the challenges associated with maritime PSCs' use of force and firearms at sea, and their reliance on contentious and poorly monitored 'floating armouries' to transfer weapons on the protected ships<sup>67</sup>.

SALW research on PSCs highlighted important gaps in the regulation of firearms held by the private security industry and the relevance of the issue in both conflict and non-conflict settings. It highlighted the disconnect between the private security sector's assurances that PSC personnel only perform defensive and protective functions and the undeniably offensive nature of some of the weapons deployed in conflict zones – including fully automatic machine guns and rocket-propelled grenade launchers. The research also documented the growth of the PSC industry in non-conflict settings, including in regions affected by high rates of firearms-related crime. Latin America in particular stood out due to its disproportionately high ratios of firearms per private guards<sup>68</sup>. This body of work finally underscored previously under-documented ways in which legally held firearms were being diverted into the illicit markets due to theft, negligence, or PSCs' failure to properly dispose of weapons at the end of assignments<sup>69</sup>.

The research and dissemination of findings occurred in parallel to the elaboration and rollout of a multi-stakeholder self-governance mechanism for PSCs – the International Code of Conduct for Private Security Providers (ICoC). Fifty-eight PSCs adopted the ICoC in November 2010, thereby committing to a set of common international principles that included general provisions governing the acquisition, management, control, and use of firearms by PSC personnel<sup>70</sup>. By February 2020, 95 PSCs had become members of the ICoC Association (the ICoC's governance body) and were either already certified or in the process of seeking certification of compliance with the standards<sup>71</sup>. As with any international or multi-stakeholder initiatives, the most acute future challenges lie in promoting implementation, monitoring compliance, and ensuring accountability with respect to these standards.

Overall, SALW researchers expanded their agenda from an initial focus on international trafficking to insurgent groups to a more comprehensive examination of armed actors' patterns of SALW procurement, management, control, and use. This work examined a broad range of actors able to contest the state's monopoly of coercive force, including PSCs operating outside conflict zones, thereby building further bridges with the fields of

crime prevention and security sector governance. This shift impacted policy through the greater recognition of armed actors' local sources of SALW procurement and through the consideration of self-governance initiatives inclusive of the SALW users themselves – whether armed groups or PSCs – which can serve to complement the state-centric international SALW control framework.

### **Instruments: the devil is in the detail**

What types of SALW have the most impact on the nature, scale, and effects of armed violence? This question has been at the centre of firearms-related academic and policy debates in the United States<sup>72</sup>. In the rest of the world, however, detailed data on the types, models, makes, and calibres of illicitly used firearms is generally scarce. Official firearm seizure statistics, for instance, are often aggregated in ways that do not make it possible to identify the context of the seizure or the emergence of newly trafficked models of firearms. Data on seized ammunition is barely reported and often lacks basic disaggregation by calibre.

Improving the availability and quality of data on the SALW that are most often being misused is therefore critical. In the past 15 years SALW researchers have devoted considerable energy to compiling detailed information on SALW that are trafficked, seized, or misused. These efforts have included monitoring arms and ammunition prices at illicit markets in conflict-affected areas, and generating detailed profiles of the arms and ammunition held by armed groups and used in terrorist acts.

### ***Monitoring SALW and ammunition prices in conflict settings***

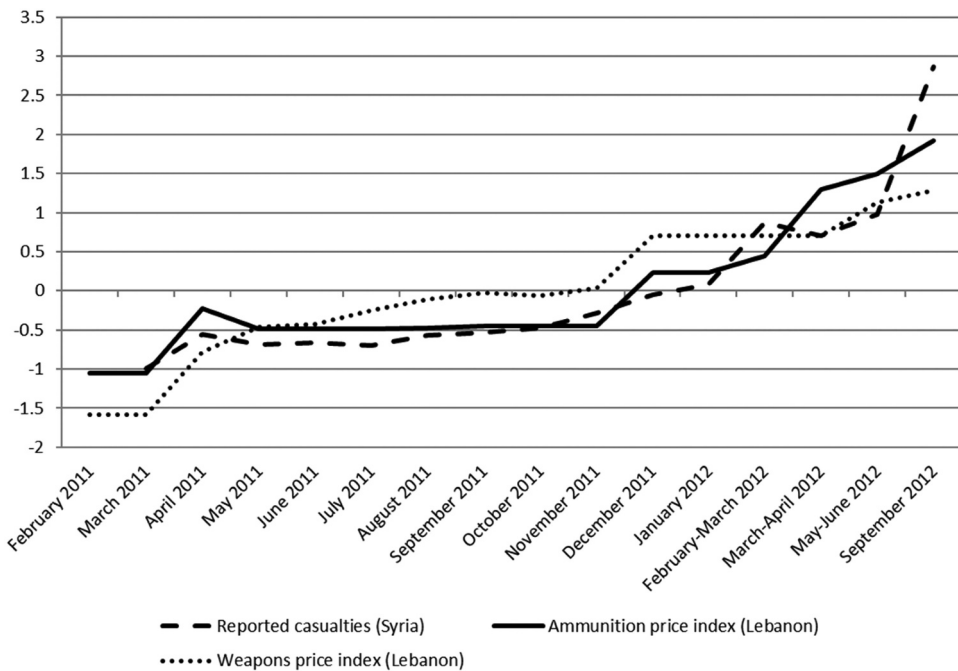
Monitoring the prices of firearms and ammunition on the black market is an important source of data for intelligence-led policing that relatively few academics have sought to exploit. In economic terms, prices are a factor of both supply and demand, and therefore can potentially shed important light on the availability of illicit arms and ammunition. Criminologists in the United Kingdom, for instance, analysed firearms and ammunition prices – obtained from interviews with convicted criminals – to map the country's firearms black market, identify the types of weapons most in demand, and gauge the effects of various interventions and regulations on criminals' access to firearms<sup>73</sup>.

Compiling data from case study research and media reports, economists have produced quantitative analyses comparing prices and their possible drivers across countries, focusing primarily on prices for AK-pattern rifles<sup>74</sup>. Open sources, however, often tend to refer to a variety of AK-pattern rifles simply as 'Kalashnikovs', which fails to recognise that dozens of variants of the rifle have been produced over the years, and can be sold on a single illicit market at widely different prices<sup>75</sup>. Overall, information on the context of illicit transactions, the specific models and quantities of firearms involved, and their condition is often absent from open sources. The literature also generally pays little attention to ammunition prices, in spite of the importance of ammunition supplies for sustaining conflict-related violence<sup>76</sup>.

In the early 2010s SALW researchers applied a more systematic and field-based approach to collecting data on the prices of arms and ammunition in conflict environments. Access to detailed information on illicit market prices is generally challenging, but

nevertheless possible in some regions affected by conflict and where the markets have become relatively open. As part of an experimental study, the Small Arms Survey worked with trusted local data collectors to systematically record price data on a bi-monthly basis in Lebanon, Pakistan, and Somalia during the period February 2011–September 2012<sup>77</sup>. The Lebanon case study, which covered the price variations of 19 specific models of SALW and their associated ammunition, was particularly significant in that the study period corresponded with the onset of civil war in neighbouring Syria, and therefore made it possible to statistically compare price data with reported levels of conflict-related violence in Syria.

Of relevance to the accessibility thesis, SALW research in Lebanon and Syria found a strong association between rising SALW and ammunition prices, on the one hand, and rapidly escalating armed violence, on the other hand (Figure 1). Reports of similar price trends observed at the time by war reporters in Syria confirm the validity of this observation<sup>78</sup>. Perceptions of insecurity linked to the growing lethality of conflict in Syria increased demand for SALW in Lebanon in a way that trumped the myriad other



**Figure 1.** Fatalities in Syria vs. arms and ammunition price trends in Lebanon, February 2011–September 2012. X axis: months. Y axis: price indices and casualties expressed as standardised Z scores. Notes: Correlation between Syria fatalities and Lebanon weapons price index:  $R = 0.81$ ;  $p < 0.001$ . Correlation between Syria fatalities and Lebanon ammunition price index:  $R = 0.93$ ;  $p < 0.001$ . When price data covered two months, the average of the corresponding two months of fatality data was used. A standardised Z score indicates by how many standard deviations an observation is above or below the average. Expressing values as Z scores preserves the overall trend line and makes it possible to compare indicators of armed violence with the prices of arms and ammunition on the same scale. Source: Reproduced with authorisation from Small Arms Survey, *Everyday Dangers*, 272.

factors that normally influence SALW markets. The existence of cross-border SALW trafficking between the two countries during the period under study also meant that some of the weapons being sold in Lebanon could have found their way into Syria itself<sup>79</sup>.

The Lebanon and Syria study also showed that prices for common weapons of war were high even before the outbreak of violence, and confirmed the conclusions of other case study research that observed the scarcity of weaponry in the early stages of some insurgencies<sup>80</sup>. To some extent, the findings echoed those of ethnographic research in Chicago that similarly illustrated how gangs' access to firearms is not straightforward, and how gang members acquired guns discreetly and at prices that exceeded those on the legal market<sup>81</sup>. These findings therefore provide important nuance to previous assertions that the availability of cheap SALW – such as those remaining from previous conflicts – is a factor that often contributes to the onset of conflict<sup>82</sup>.

SALW research on prices finally helped to underscore the importance of ammunition supplies in fuelling conflict and violence. While both weapons and ammunition are in high demand during the onset of conflict, the price of weapons is expected to stabilise once armament levels have peaked, because SALW are durable, reusable goods. On the other hand, ammunition is expendable and likely to remain in high demand throughout an active armed conflict. The research in Lebanon confirmed this theory, documenting how prices for some types of rifles started to decrease towards the end of the study period, while the associated ammunition remained in high demand<sup>83</sup>.

These are significant findings, given that ammunition transfers remain poorly regulated at the international level when compared with those of weapons<sup>84</sup>. Research on the impact of ammunition availability on levels of violence is relevant in the context of ongoing international processes concerned with the diversion of ammunition, such as the 2021 UN Group of Governmental Experts on Problems Arising from the Accumulation of Conventional Ammunition Stockpiles in Surplus. On the other hand, the impact of ammunition flows on levels of violence is a subject that the academic gun violence literature has very seldom addressed<sup>85</sup>, and for which more sustained inquiries could yield meaningful advances in knowledge of relevance to the accessibility thesis.

### ***Profiling illicit SALW and ammunition in Africa and Europe***

In the last 15 years UN monitoring bodies, research organisations, war reporters, and activists have documented SALW and ammunition found in situations of armed conflict with increasing precision<sup>86</sup>. Images of SALW and their markings often make it possible to identify several important characteristics of illicit SALW such as their model, calibre, producer, and period of manufacture. This information can help build datasets or 'profiles' of the main types of SALW and ammunition circulating over time, in different areas or held by different actors<sup>87</sup>.

SALW profiling can be subject to important methodological caveats, notably limitations regarding the representativeness of the materiel being examined. In conflict areas researchers typically access equipment seized from specific armed groups that is being held by state security forces or other armed groups. Not only are these samples small parts of the full universe of illicit weapons, but there is also a risk that the forces controlling the equipment manipulate the samples that researchers have access to. Reporting the context in which the information was collected and acknowledging data

limitations and caveats are therefore particularly important. When undertaken methodically, SALW profiles can nevertheless help to identify important trafficking patterns. For instance, documenting the presence of cartridges manufactured locally can help draw more attention to regional sources of supply and diversion, while documenting unusual materiel may point to new and more remote sources of supply<sup>88</sup>.

Researchers have undertaken comparatively little work of this kind in more resourced and stable regions such as continental Europe. European law enforcement agencies tend to prioritise the urgent need to identify and apprehend perpetrators over lengthier and more procedure-oriented investigations into the sources of the firearms used in crime. As a result, European law enforcement statistics on illicit firearms are often not stored or shared in ways that can enable meaningful trend analysis. As summarised in a recent assessment, data on the 'availability of various types of weapons . . . and developments in this regard are generally fragmented or often even lacking'<sup>89</sup>.

European firearms research nevertheless expanded in quantity and depth following the 2015–2016 wave of terrorist attacks, several of which involved the use of firearms. A notable example is the EU-funded project on Studying the Acquisition of Illicit Firearms by Terrorists in Europe (SAFTE)<sup>90</sup>. The case study on France – the country that suffered the largest number of firearm-related casualties from the attacks – provided a detailed analysis of illicit firearms in France and the ways in which terrorist networks have been able to access them. The chapter drew on detailed crime gun and firearms crime data collected from a range of institutions, including forensic laboratories. The data included the specific models of more than 50 firearms seized in the context eight terrorism-related cases and the results of the associated tracing procedures.

The analysis of firearms seized in the context of terrorism-related investigations in France highlights the diversity of weapons models held by the terrorist networks – ranging from antique and Second World War-era handguns, shotguns, and converted firearms to sub-machine guns and a variety of AK-pattern rifles<sup>91</sup>. The tracing information – when conclusive – pointed to the importance of intra-European sources of weapons for the terrorist actors, including intra-European trafficking, the theft of legally held handguns, and purchases made on local black markets through childhood acquaintances<sup>92</sup>. The presence in the terrorist arsenals of firearms diverted from the civilian market contrasts with the situation in war zones, where national stockpile diversion, trafficking, donations from foreign sponsors, and battlefield capture are arguably more significant sources of weapons and ammunition for armed groups<sup>93</sup>.

European research has also been successful in identifying new proliferation trends, such as the growing prevalence and criminal use of converted firearms<sup>94</sup>. The use of such weapons in terror attacks in Paris (January 2015) and Munich (July 2016) underscored the significance and regional dimension of the threat<sup>95</sup>. The fact that some European states allowed the sale of readily convertible firearms with few controls while others did not was a key factor in these weapons being converted and trafficked across European borders. European research on converted firearms also demonstrated terrorist networks' and criminals' readiness to use cheap 'junk' firearms that can be acquired more discreetly and locally without needing to rely on high-profile transnational criminal networks. The perpetrator of the 2016 Munich attack used a converted Glock pistol purchased on the Dark Web<sup>96</sup>, also illustrating novel methods of distribution and sale by criminal groups<sup>97</sup>. Other manifestations of this trend include the use of a homemade – but deficient – 'Luty'

sub-machine gun by the perpetrator of the Halle synagogue attack in 2019<sup>98</sup>. Terrorist and criminal interest in such weapons – even if they remain for now generally less reliable than industrial products – is particularly concerning, given the rapid development of technologies – including 3D printing – enabling the production of ‘desktop firearms’ at home<sup>99</sup>.

Overall, SALW research on the instruments of violence contributed to a more precise understanding of the most problematic types of SALW in various contexts. Researchers were able to replicate black-market price-monitoring techniques in conflict areas and found – of relevance to the accessibility thesis – that ammunition prices and conflict-related fatalities can be strongly correlated. Additional systematic and longitudinal field research on arms and ammunition prices and levels of violence has the potential to yield further insights into the nature of this relationship. The detailed profiling of seized SALW and ammunition has consistently underscored the importance of local sources of weapons for armed, criminal, and terrorist-designated groups. Some of these actors have turned to poorly controlled types of weapons previously considered ‘junk’, including converted and homemade firearms, which now create significant challenges in regions with open borders but inconsistent gun regulations.

## Conclusions and discussion

The SALW research community has generated knowledge of significance for both its international policy field and academic inquiry. The body of work reviewed in this article highlights significant and innovative contributions at the methodological, empirical, conceptual, and policy levels that have been picked up by practitioners and policy-makers and are of relevance to scholars in public health, conflict and development studies, and criminology, among others.

With respect to uses, the application of public health and mixed social science methods has helped to reduce knowledge gaps on the effects of SALW, and underscored the significance of lethal gun violence in non-conflict settings. Estimates of the costs of violence in developing countries supported the instrumentality of SALW – i.e. the more serious societal impacts of firearm violence than those of violence involving other instruments. SALW research on users contributed to expanding the agenda to a comprehensive examination of the patterns of SALW procurement, management, control, and use among a broad range of actors able to contest the state’s monopoly of coercive force – including armed groups, PSCs, and gangs. Work on the instruments of violence contributed to an increasingly detailed understanding of the most problematic types of SALW held by criminal and non-state armed groups – including the growing threat posed by homemade and converted firearms. Finally, field-based black-market price-monitoring showed that ammunition prices and war-related fatalities can be strongly correlated, and provides an important lead for further examining the accessibility thesis – i.e. the link between SALW availability and levels of violence.

So, what next? In the face of an overwhelming global stockpile of more than one billion firearms<sup>100</sup>, the prioritisation of research into the most dangerous uses, users, and instruments appears to be an ineluctable necessity. In spite of advances such as those documented in this review, important gaps remain. The geographical expansion of global datasets on violent deaths, for instance, has not yet been matched by an improvement in



the depth of the available data<sup>101</sup>. Research on engagement with armed actors on SALW-related issues is still emerging and often sensitive, and the effectiveness of these initiatives remains to be thoroughly assessed. Crucially, SALW researchers have generally shied away from discussing the central accessibility and instrumentality theses that assume causality between access to SALW and levels of violence. I would highlight four main areas for future focus that would assist the SALW research field in consolidating its relevance.

Firstly, there is a need to harness the lessons learned from SALW researchers' extensive use of social science methods in complex environments and to analyse implications for the measurement of SALW availability and the incidence of violence. US gun violence researchers have regularly highlighted methodological challenges and biases related to the use of household surveys that are relevant to the broader social sciences<sup>102</sup>. SALW researchers have also acquired considerable experience of implementing such methods in challenging post-conflict and transitioning environments, and documenting the lessons they have learned would be of great interest to academia. Some international researchers are for instance developing new survey-based techniques to measure firearms availability through the indirect network scale up method<sup>103</sup>. Applying such methods in a broad range of settings and comparing results with those of the more traditional and direct methods of surveying firearm ownership could constitute significant contributions to both the academic and international research agendas on gun violence.

Secondly, SALW researchers need their own Boston Operation Ceasefire gun project experiment – a high-profile quantitative impact evaluation of interventions providing compelling measures of success or failure. While they have undertaken post facto, mainly qualitative evaluations of interventions, SALW researchers have yet to engage in the same type of embedded cooperation with practitioners and authorities that US gun violence researchers have showed can take place. Engaging in scientifically robust monitoring and evaluations of the most novel interventions – such as those focusing on the management and use of SALW by armed actors – would represent significant contributions to both the SALW policy field and to gun violence research. International researchers have demonstrated the feasibility of undertaking quasi-experimental research to evaluate the impact of community policing initiatives in developing countries, for instance<sup>104</sup>. SALW researchers could apply similar methods to evaluate interventions to engage armed groups and gangs on preventing and reducing gun violence, which will not only be beneficial to the SALW policy community but will also be of strong interest to scholars of organised crime and gun violence.

Thirdly, various streams of SALW research – including weapons profiling and pricing studies, as well as inquiries among a range of armed groups – have highlighted the importance of ammunition flows to sustaining conflict and violence. US gun violence researchers have, however, largely overlooked the question of ammunition. Cooperation to increase knowledge on the types and sources of ammunition used in violence, its black-market price variations, and the effects of its availability – and regulation – on levels of violence has the potential to represent a major contribution to the accessibility discussion. Promising avenues to improve the measurement of illicit ammunition flows include cooperation with ballistics institutions to extract contextual data and imagery of cartridges and bullets retrieved at crime scenes. Such information allows SALW researchers to analyse the ammunition's headstamp markings and therefore to correlate the precise variety of ammunition used in crime with the type of crime perpetrated and the

associated spatiotemporal data<sup>105</sup>. Examining these trends and relationships longitudinally has great potential for informing discussions on the accessibility and instrumentality of these.

Finally, monitoring and anticipating the evolution of new technologies and their impact on the criminal distribution and sale of firearms represents a crucial challenge. The recent advances observed in 3D printing and the role of the Dark Web have proven more significant and rapid than expected with potentially significant implications for illicit arms flows and regulatory regimes. Researchers can play an important role in documenting new trends, highlighting regulatory gaps, and analysing policy implications. Priority areas include cooperation with forensic specialists to scientifically assess the reliability and strength of new generations of 3D printed weapons, exploring avenues to improve the traceability of converted, modified, and homemade firearms, and scrutinising developments related to the illicit manufacture and trafficking of ammunition.

Moving forward on these priorities will require continuing resources and engagement from a range of actors to allow SALW and gun violence researchers to think beyond the thematic and geographical scope of the projects they usually work on. Developing a more coherent global research agenda on SALW and ammunition is critical at a time of financial duress, when multiple crises highlight the ever-growing importance of sound evidence for policy-making in this field.

## Notes

1. The 2001 United Nations Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects (UN PoA) and the Protocol against the Illicit Manufacturing of and Trafficking in Firearms, Their Parts and Components and Ammunition (Firearms Protocol). UNGA, 'Programme of Action', and UNGA, 'Firearms Protocol'.
2. The term 'small arms and light weapons' (SALW) is used in the UN PoA framework and more generally in the conflict and arms control literature. It covers both military-style small arms and light weapons, and commercial firearms (handguns and long guns). Firearms are the category of weapons referred to in the framework of the UN Firearms Protocol, and more generally in the fields of crime prevention and criminology. Firearms include all small arms and certain (but not all) categories of light weapons. See Jenzen-Jones and Schroeder, *Introductory Guide to Small Arms*, 27–29.
3. Batchelor and Kenkel, *Controlling Small Arms*.
4. See, for instance, Bourne, 'Powers of the Gun'; Carpenter, 'Vetting the Advocacy Agenda'; Cooper, 'Arms Transfer Controls'; Greene, 'International Responses'; and Stavrianakis, 'Small Arms Control'.
5. Zimring, 'Firearms, Violence, and Public Policy'.
6. Braga et al., 'Firearm Instrumentality'; Cook, 'The Great American Gun War'.
7. Exceptions include Marsh, 'The Availability Puzzle'; and van Kesteren, 'Gun Ownership and Violence'.
8. Zimring, 52.
9. Laurance and Meek, 'Micro-disarmament', 27.
10. The Small Arms Survey, established in 1999 in Geneva and hosted by the Graduate Institute of International and Development Studies in Switzerland, has been one of the leading producers of SALW research of the past 20 years.
11. Small Arms Survey, *Rights at Risk*, 174.
12. See Kopel, Gallant, and Eisen, 'Global Deaths from Firearms.'
13. Small Arms Survey, *Rights at Risk*, Annexe 6.1.

14. Ibid., 174, 178.
15. Richmond, Cheney, and Schwab, 'The Global Burden'.
16. Geneva Declaration Secretariat, *Global Burden of Armed Violence*, 2.
17. Ibid.
18. This figure does not include firearms-related suicides.
19. Mc Evoy and Hideg, *Global Violent Deaths*, 12.
20. The SDGs' Target 16.1 aims to 'Significantly reduce all forms of violence and related death rates everywhere' (emphasis added) by 2030. UNGA, *The 2030 Agenda*.
21. Small Arms Survey, GVD Database.
22. Small Arms Survey, *Rights at Risk*, 175.
23. Batchelor and Kenkel, 121–27.
24. For instance, Small Arms Survey, *Development Denied*, pp. 154–201.
25. Cook and Ludwig, *The Real Costs*.
26. Butchart et al., *Cost of Injuries*.
27. Small Arms Survey, *Unfinished Business*, pp. 188–213.
28. Ibid., 199, 204, 206.
29. Braga et al., 'Firearm Instrumentality', 9.7.
30. Ibid.; Cook, 'The Great American Gun War'; van Kesteren, 'Gun Ownership and Violence'.
31. Butchart et al.
32. Ward et al., 'Costs of Violence in Jamaica'.
33. Geneva Declaration Secretariat, 89.
34. UNDP and Small Arms Survey, *Kosovo and the Gun*, 1.
35. For instance, Hemenway, 'Firearms Availability and Female Homicide'; Killias, van Kesteren, and Rindlisbacher, 'Guns, Violent Crime, and Suicide.'
36. UNDP and Small Arms Survey, 62–63.
37. Renamed the Republic of North Macedonia in 2019.
38. See the full list of national assessments published by SEESAC at <<http://www.seesac.org/SALW-Surveys/>>.
39. Available on the SEESAC website at <<http://www.seesac.org/Survey-Protocols/>>.
40. The work of Squires with Grimshaw and Solomon, *Gun Crime*, in the United Kingdom is a somewhat rare example of a mixed-methods country-level assessment undertaken in a developed country.
41. See UNODA, MOSAIC Module 05.10 on SALW Surveys.
42. For instance Small Arms Survey, *National Small Arms Assessment in South Sudan*.
43. Including Torjesen, Wille, and MacFarlane, *Tajikistan's Road to Stability*.
44. Available at <<http://www.seesac.org/SALW-Surveys/>>.
45. Marsh, 12.
46. See, for instance, Lumpe, *Running Guns*.
47. See, for instance, Berman, *La République Centrafricaine*; and Small Arms Survey, *Armed and Aimless*.
48. Small Arms Survey, *Armed and Aimless*, 47–49.
49. Ibid., 159–177.
50. Jackson, 'From under Their Noses', 136.
51. UN Secretary-General reports on SALW have stressed the importance of weapons diversion and poor stockpile management in allowing 'rebels, gangs, criminal organizations, pirates, terrorist groups and other perpetrators to exponentially bolster their power.' UNSC, *SALW Report of the Secretary-General*, 1.
52. Small Arms Survey, *Armed and Aimless*, 48.
53. Bangerter, *Internal Control*.
54. Small Arms Survey, *Groups, Gangs, and Guns*, 305–6.
55. The DRC sanctions regime, for instance, forbids the 'provision of any assistance, advice or training related to military activities, to all foreign and Congolese armed groups and militias' UNSC, Resolution 1493, para. 20.
56. On the challenges of SALW control in post-2011 Libya, see McQuinn, *After the Fall*.

57. UNDPKO, *Second Generation DDR*, 55.
58. de Tésières, *DDR Handbook*, 47.
59. For a discussion, see Cook, 'The Great American Gun War', 34, 52–54; and Marsh, 'The Availability Puzzle', 13.
60. Bradley, 'From Armed Conflict to Urban Violence'.
61. Braga, Hureau, and Papachristos, 'Impact of Operation Ceasefire.'
62. Butts et al., 'Cure Violence.'
63. Rodgers 2017, 'Broderes in Arms', 653–57.
64. Scahill, *Blackwater*.
65. For instance, Abrahamsen and Williams, 'Security beyond the State'.
66. Small Arms Survey, *States of Security*, 101–133.
67. Small Arms Survey, *Weapons and the World*, 219.
68. Small Arms Survey, *States of Security*, 101–2, 115.
69. *Ibid.*, 119–24.
70. FDFA, *International Code of Conduct*, paras. 31–32, 56–62.
71. ICoCA, 'Members'.
72. Braga et al., 'Firearm Instrumentality', 9.8.
73. Hales, Lewis and Silverstone, *Gun Crime*, 39–58.
74. Small Arms Survey, *Everyday Dangers*, 250–81.
75. *Ibid.*
76. Pézard & Anders, *Targeting Ammunition*.
77. Small Arms Survey, *Everyday Dangers*.
78. Chivers, 'Arming for the Syrian War'.
79. Florquin, 'Prices and Conflict Onset', 327.
80. McQuinn, 38.
81. Cook et al., 'Underground Gun Markets'.
82. Small Arms Survey, *Everyday Dangers*, 258.
83. *Ibid.*, Fig. 11.3.
84. Krause, 'Global Public Policy Challenge', 11; Small Arms Survey, *Women and Guns*, 82.
85. Tita et al., 'Criminal Purchase of Ammunition', and de Vries, 'Agent of Harm', are notable exceptions.
86. See, for instance, Bevan, *Blowback*; CAR, *Weapons of the Islamic State*; and UNSC, S/2020/482 of 2 June.
87. Small Arms Survey, *Women and Guns*, 179.
88. *Ibid.*, 180, 192.
89. Duquet and Goris, *Firearms Acquisition by Terrorists*, 162.
90. *Ibid.*
91. Duquet, *Triggering Terror*, 210.
92. *Ibid.*, 207, 210–12.
93. Marsh, 11, 15.
94. See, for instance, Hannam, *Trends in Converted Firearms*. Converted firearms are objects that look like firearms but were initially designed to be incapable of firing a projectile, and were subsequently illegally transformed into real and lethal firearms. They include deactivated weapons and a range of imitation firearms that were subsequently modified to fire live ammunition.
95. Small Arms Survey, *From Legal to Lethal*, 38.
96. The Dark Web can be defined as self-regulated parts of the Internet accessible via specific protocols (for example, TOR or I2P). See Broadhurst et al., 'Darknet Markets', and Rhumorbarbe et al., 'Monitoring New Psychoactive Substances'.
97. See above 95., 38.
98. TFB, 'The Halle Attack'.
99. Hays and Ivan with Jenzen-Jones, *Desktop Firearms*.
100. Karp, *Estimating Global Civilian-held Firearms*.

101. Indeed, the disaggregation of these statistics by basic variables such as victims' age and sex is still not possible for more than three-quarters of the world's countries. Alvazzi del Frate, Hideg, and LeBrun, *Gender Counts*, 4.
102. For instance, Cook in 'The Great American Gun War', 22, 39, observed biases – including gender-related ones – relating to using surveys for estimating the prevalence of gun ownership, the incidence of gunshot wounds in assaults, and the frequency with which guns are used in self-defence. See also Kleck, 'Measures of Gun Ownership'.
103. See USAID, UNDP, The Central Statistical Office of Saint Lucia, UNODC, and the Center of Excellence in Statistical Information on Government, Crime, Victimization, and Justice, 'Saint Lucia National Crime Victimization Survey (SLNCVS) 2020'.
104. See Wisler et al, 'Impacts of Community Policing on Security'.
105. Desmarais et al, 'Monitoring Illicit Ammunition'.

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