AMMUNITION CONTROL PRACTICES IN LATIN AMERICA AND THE CARIBBEAN
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During the past two decades, controls over small arms and light weapons have been strengthened by the adoption of a set of key international instruments, such as the UN Programme of Action to Prevent, Combat and Eradicate the Illicit Trade in Small Arms and Light Weapons in All Its Aspects and the International Tracing Instrument, the Firearms Protocol and, most recently, the Arms Trade Treaty. Furthermore, target 16.4 of the Sustainable Development Goals specifically calls for significantly reducing illicit arms flows by 2030, in a bid to build peaceful and inclusive societies.

Notwithstanding these positive developments, the progress has remained uneven. To date, controls over the production and sale of weapons are much more stringent than those over ammunitions. One of the regions disproportionately affected by this is Latin America and the Caribbean, which suffers from alarmingly high levels of armed violence and firearms-related homicides. One obvious root-cause for this is the constant and still relatively uncontrolled supply and availability of ammunition in society.

The present study presents the reader with a unique compilation of regional best practices in ammunition control. As such, it contributes towards the ever-expanding literature seeking to bridge the gap between weapons and ammunition controls and, in effect, contributes towards reduced levels of armed violence at the regional level. The implementation of standardized measures will further facilitate cooperation and coordination, paving the way for strengthened security frameworks in the Latin American and Caribbean region.

On a policy level, the study underscores the urgent need for a new and targeted international instrument for more rigorous ammunition controls. It is also imperative that the international community fully implements its obligations and commitments vis-à-vis ammunition under the Treaties and instruments already in force. This represents the most effective means of curbing the adverse effects that ammunition proliferation exerts not only on human security, but also on economic and social development around the world.

The United Nations Regional Centre for Peace, Disarmament and Development in Latin America and the Caribbean (UNLIREC) has been working towards achieving and maintaining peace and security in the region for over three decades. Ammunition Control Practices in Latin America and the Caribbean is its most recent contribution towards supporting States in the region in their disarmament and arms control efforts. It is envisioned that this study will encourage States and other relevant actors in the region to pave the way for enhanced ammunition controls both regionally and internationally.

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Preface/Executive Summary

Firearms or ammunition: Which one is more consequential to systemic levels of armed violence in Latin America and the Caribbean? One doesn’t work without the other and as such, ammunition plays an essential role in exacerbating conflicts and increasing levels of armed violence in the region and across the globe. Yet the controls over the production and sale of ammunition are less stringent than those over firearms. Bullets tend to be less well marked, registered, kept, monitored, and regulated than firearms, making diversion easier and tracing more difficult.

In Latin America and the Caribbean, the constant supply, availability, and proliferation of ammunition to all potential actors of violence – either through use in criminal activity, misuse by State forces, interpersonal violence between civilians, or incidents with private security forces – are a sine qua non to producing the region’s macabre armed violence records. Not only are firearms more frequently used in homicides in Latin America and the Caribbean than elsewhere in the world, the same can be said of bullets. Semantics, perhaps, but these daily human tragedies are not only firearm-related homicides, but also, essentially, ammunition-related homicides and must be treated as such if policies seek to diminish the body count.

The purpose of Ammunition Control Practices in Latin America and the Caribbean is to underscore the importance of ammunition controls and to explore the various international instruments, standards, guidelines, and practices by comparing them to current ammunition control practices in the region. This study intends to analyze ammunition control practices from a practical perspective by answering two basic questions: What is being done to improve ammunition control practices in the region, and How is it being done?

To answer these questions, the study is divided into three parts. The first part will introduce the importance of ammunition controls, international and regional instruments, and other guidelines and initiatives. The second will navigate through the current ammunition control practices in Latin America and the Caribbean and explore its three key aspects in depth: diversion prevention through marking and tracing; physical security and destruction of stockpiles; and forensic ballistics. Finally, the third part will outline a way forward by providing specific recommendations for Latin American and Caribbean governments, regional and sub-regional bodies, the United Nations system, donor countries, and civil society.

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PART I

Introduction
The Importance of Ammunition Controls

“What is a gun without any bullets?”1 “Stop a bullet, stop a war.”2 “The indispensable complement to any weapon”3 “the fuel of conflict”,4 “the oxygen of armed violence”. “People don’t die of gun wounds, they die of bullet wounds.”5 “Ammunition transforms [Small Arms and Light Weapons] from inoperative objects into lethal weapons that can be used to take away human lives and devastate communities.”6 “Once they enter the body, they fragment and explode, pulverizing bones, tearing blood vessels and liquefying organs.”7

Much has been rightfully written about the essential role ammunition plays in “escalating, prolonging, and intensifying armed conflict and crime,”8 not the least because “weapons often last for decades, but ammunition can only be used once.”9 In some regions, a lack of ammunition supply “has brought about the near-disappearance of certain types of weapon”, such as the case of the G3 assault rifle in East Africa.10 Once diverted from the legal market, “it is arguably more important to understand trafficking in small arms ammunition than it is trafficking in small arms and light weapons, because maintaining a regular supply of ammunition is crucial to sustaining conflict and armed criminal activity.”11

In Latin America and the Caribbean, constant supply, availability and proliferation of ammunition to all potential actors of violence – either through use in criminal activity, misuse by State forces, interpersonal violence between civilians, or incidents with private security forces – are a sine qua non to producing the region’s macabre armed violence records. If indeed “firearms are more frequently used in homicides in Latin America and the Caribbean than elsewhere in the world,”12 the same can be said of bullets. Semantics, perhaps, but these daily human tragedies are not only “firearm-related homicides” but also, essentially, “ammunition-related homicides” and must be treated as such if seeking policies to diminish the body count.

Indeed, ammunition “arguably constitutes the most lethal part of any weapon system”.13 In isolation, ammunition is certainly more dangerous than the firearms it renders lethal, given the risks of explosive accidents, the so-called unplanned explosions at munitions sites (UEMS), even if these are most likely in depots with ammunition for light weapons or military-grade explosives, than when storing small arms ammunition – the focus of this report – alone.
In the last 15 years, at least 22 UEMS incidents have been reported in the following countries in Latin America and the Caribbean: Ecuador (5 incidents), Brazil (3), Colombia (3), Mexico (2), Peru (2), Venezuela (2), Cuba (1), Guatemala (1), El Salvador (1), Nicaragua (1) and Paraguay (1). In total, these have resulted in at least 34 deaths and over 750 injuries — though almost a third of the deaths and the vast majority of the injuries occurred in a single accident, in Riobamba, Ecuador in November 2002. Of the incidents with determined causes, almost 70% reportedly occurred, because of “inappropriate storage systems and infrastructure” and “handling errors and inappropriate working practices”.

Which is more consequential to systemic levels of armed violence in Latin America and the Caribbean: firearms or ammunition? That discussion may devolve into philosophical or semantic jostling, but regardless “guns and bullets have a symbiotic relationship—neither can fulfil their lethal mission without the other. Like the syringes and substances used for lethal injections, they are physically distinct components of a unitary and interdependent system developed to inflict damage to humans.”

Yet, more often than not, controls on the production and sale of ammunition are less stringent than those of firearms. Bullets tend to be less well marked, registered, kept, monitored and regulated than firearms, making diversion and misuse easier to conduct and more difficult to trace.

This is only partially explained by the massive volume of the ammunition business. The scale of production, trade, and use of small arms ammunition worldwide is almost unfathomable, with a yearly production of over 12 billion units — almost two bullets per living human — and, for example, a single facility producing over 1.5 billion cartridges in a year for the US military, which still needed to import millions of bullets to cover its use patterns. In Brazil, the company CBC (Companhia Brasileira de Cartuchos) — which deems itself “one of the three largest ammunition producers in the world” — produces ammunition virtually non-stop, in three daily eight-hour shifts.

Usage levels are, accordingly, astonishing. Often a military secret, some estimates of the so-called Daily Ammunition Expenditure Rate (DAER) by armed forces suggest that 600 soldiers with assault rifles could use over 2 million rounds in warfare over a month. Levels of consumption in military training, by police forces and by civilians worldwide additionally help to explain the volume of production. While most ammunition is consumed domestically — particularly in countries where government-owned or -affiliated factories provide most of the ammunition for its armed forces and police — the international trade in ammunition is a significant business.

Between 2004 and 2009, the average annual international trade in small arms ammunition was at least USD1.8 billion. In 2014, “ammunition accounted for 38 percent of global transfers” in the USD 6 billion international small arms trade — or almost USD 2.3 billion. According to data from UN COMTRADE, in 2016 exports of ammunition worldwide reached almost USD6.9 billion. Market projections for the next decade forecast continued growth.
In Latin America and the Caribbean, at least eight countries currently produce small arms cartridge-based ammunition\(^{25}\) though most industries in the region provide ammunition solely to their domestic armed and security forces, and thus usually only produce one to four different calibers. Examples of such government-owned and military-gearied enterprises are Compañía Anónima Venezolana de Industrias Militares-CAVIM (Venezuela) (www.cavim.com.ve/) Fábrica de Armas y Municiones del Ejército-FAME (Peru) (www.famesac.com/) Fábricas y Maestranzas del Ejército-FAMAE (Chile) (www.famae.cl/ and www.famae.cl/municion-menor/), INDUMIL (Colombia) (www.indumil.gov.co/categoria-producto/productos-civiles/municiones-indumil/), Fabricaciones Militares (Argentina)\(^{26}\), and Industrias Militares de Guatemala (which may currently be dormant).\(^{27}\) In other Caribbean and Central American nations, the manufacturing of firearms and ammunition is either prohibited, or is ‘permitted only if the maker holds a valid licence, but is not conducted in practice’.\(^{28}\)

In terms of large (private sector) actors in international markets, Latin America has only two: Águila (Mexico) (www.aguilaammo.com.mx/), which is mostly geared towards the US civilian market, but also has a respectable market share in Latin America and the Caribbean, and the region’s behemoth, Companhia Brasileira de Cartuchos-CBC (Brazil) (www.cbc.com.br/) a true global player, both in the military and civilian ammunition markets. As such, the Latin American and Caribbean region has both sides of the usual dichotomy between “modern manufacturers competing in markets for high-quality ammunition for sale to state actors in NATO member states” and “at the other end of the spectrum small-scale, state-owned production facilities that are exclusively operated to meet, at least partially, the domestic demand of state actors” and “are not necessarily profit-oriented or profitable enterprises [that] may rely on outdated machinery and remain idle between order for ammunition from domestic actors”.\(^{29}\)
In all countries, levels of production and internal consumption are mostly unknown due to national security concerns. One Geneva-based expert interviewed noted that “many countries consider their ammunition reserves to be more sensitive than their weapons, as ammo is more linked to their capabilities. Many states are willing to share information about their weapons stockpile, but not their ammunition.”

Levels of export are likewise difficult to pinpoint, given the sector’s lack of transparency and reporting obligations. For example, the most comprehensive database on international transfers of small arms (and its ammunition), NISAT-PRIO, has no data for small arms ammunition exports from Mexico between 2010 and 2015, and exports from Brazil in the period only show up, because of national import reports from Belgium, of a few million Euros between 2010-2012.

Yet, it is known that Mexican ammunition is widely available in the US and Latin American markets and Brazil’s current production levels of ammunition, coupled with an 85% share towards exports, suggest that hundreds of millions of rounds of ammunition are exported per year. In fact, searching the UN database COMTRADE through export and import influx to countries around the world, a fuller picture emerges. For example, Brazil reported USD320 million in exports in 2017 alone. Likewise, in 2016, Argentina exported ammunition worth over USD2 million, Mexico almost USD36 million, and Peru over USD8.2 million.
As per imports, UNCOMTRADE shows that between 2014 and 2016 almost all countries in Latin America and the Caribbean (27 nations) imported some ammunition, though many did so at small levels. Nonetheless, the following countries imported (and reported) at least USD1 million in ammunition during the period: Argentina (MUSD 9.5), Brazil (MUSD21.3), Chile (MUSD10), Colombia (MUSD8.4), Costa Rica (MUSD2.8), the Dominican Republic (MUSD1.36), Ecuador (MUSD1.1), El Salvador (MUSD 2), Guatemala (MUSD 74), Mexico (MUSD 39.4), Peru (MUSD 4.9), and Uruguay (MUSD 1.36). Here too, the discrepancies between reported imports and numbers arrived at from export reports from all other countries is often considerable. For example, in the same period, Venezuela did not report any imports, but export reports from third countries show that Venezuela received at least USD 4 million in ammunition.

Worldwide, the dizzying plethora of types of ammunition,43 it could be argued, does not make it easier to control, monitor, and preclude diversion and misuse. However, while enormous and widespread, the ammunition trade is significantly clustered, facilitating both the full implementation and universalization of existing controls and standards, and the potential creation of new norms. For example, while over 100 countries produce small arms ammunition, about 90% of exports in 2011 originated in only 15 countries.35

Moreover, the traditional lack of transparency surrounding the trade in ammunition, considered very much a strategic good even compared to that for small arms (“because of its critical role in sustaining combat, armed forces have been particularly concerned to keep information about stock secret”)36 also does not alone explain the relative neglect.

Lack of recognition of the problem has likewise not been the issue; almost twenty years ago, a UN Group of Experts noted that “attempts to address small arms and light weapons would be incomplete if they did not include due regard for ammunition and explosives”.37 While at that point the experts already lamented the dearth of information available – a liability that has not been entirely addressed – in the many years since, the international community learned much, but did less than necessary. The thread has been pulled to today by a 2008 Group of Experts (and resulting report)38 on “the issue of conventional ammunition stockpiles in surplus”, and more recently by its “revival” in the December 2015 Resolution 70/35, which “reiterates its decision to address the issue of conventional ammunition stockpiles in surplus in a comprehensive manner.”39

Notwithstanding, to date, ammunition has been missing in most global normative developments, such as its exclusion from the United Nations Programme of Action on Small Arms and Light Weapons (UN PoA)40 and its treatment as a lesser category under the scope of the Arms Trade Treaty (ATT). While the quid pro quo that kept ammunition outside of the scope of the International Tracing Instrument (ITI) may have sparked the process that culminated in the important International Ammunition Technical Guidelines (IATG) (see below),41 the promise in 2005 that ammunition would “be addressed in a comprehensive manner as part of a separate process conducted within the framework of the United Nations” has not yet been fulfilled.42 If anything, “international efforts to control the damaging effects of trafficking, proliferation,
and misuse of small arms and light weapons have generally sidestepped the issue of ammunition. Firearms have essentially been dissociated from their ammunition on the international agenda.\textsuperscript{43} This neglect, in turn, has unfortunately “overshadowed the distinctive characteristics that justify addressing ammunition in its own right”.\textsuperscript{44}

Ammunition controls have thus been “relatively immune to influence of research”\textsuperscript{46} as gains in knowledge and technology have not been translated into multilateral political action. Considering the scope, breadth and impact of the ammunition trade, the level of diplomatic, political and operational attention to ammunition controls internationally has been underwhelming, but intentional. In other words, the theme was deemed “too sensitive” or “too complex” to tackle, but this remains a political decision. Ultimately, the culprit is lack of international political will; “politics have trumped sensible policy.”\textsuperscript{46}

However, the Latin American and Caribbean nations have been among the least responsible for these omissions in the global arena, perennially being at the forefront of UN discussions calling for greater attention to ammunition controls. For example, during United Nations General Assembly First Committee in 2012, Peru’s Ambassador forcefully posited that it was “undelayable” that the international community tackles the problems posed by ammunition in an “individual manner”.\textsuperscript{47} Conversely, as Part II discusses, domestically there is still much to be done in the region, particularly considering the overwhelming human toll of “ammunition-related” homicides and injuries in Latin America and Caribbean.

International and Regional Instruments and Guidelines

INTERNATIONAL INSTRUMENTS

Despite these loopholes, governments are nonetheless bound by a series of international obligations and commitments.\textsuperscript{48} There are also several standards and guidelines on ammunition controls that should be followed even if they are not obligatory. As mentioned, though the politically-binding, and universal, UN PoA\textsuperscript{49} and its complement, the International Tracing Instrument (ITI)\textsuperscript{50} excluded ammunition from operational provisions, many governments and civil society groups continue to advocate for its inclusion,\textsuperscript{51} while some governments have noted that, in their national interpretation and implementation, the instrument in practice includes ammunition.

Regardless, a majority of countries in the region are legally-bound by the Protocol against the Illicit Manufacturing of and Trafficking in Firearms, Their Parts and Components and Ammunition, supplementing the United Nations Convention against Transnational Organized Crime (Firearms Protocol), “the only legally binding instrument on small arms at the global level”, which requires State parties to criminalize the illicit manufacturing and trafficking of ammunition.\textsuperscript{52} In Latin America and the Caribbean, a total of 28 countries are therein also obligated to adopt effective control and security measures in order to prevent diversion (including confiscation, seizure and disposal); to establish a system of authorizations or licensing to ensure legitimate manufacturing, export, import, transit and transport; to ensure adequate record-keeping and tracing methods; and to exchange information on illicit manufacturing and trafficking dynamics.\textsuperscript{53}

A majority of governments, international and civil society organizations. Argued for full inclusion of ammunition negotiating the ATT,\textsuperscript{54} though the debate proved quite contentious.\textsuperscript{55} That instrument’s Article 3 determines that State Parties “shall establish and maintain a national control system to regulate the export of ammunition/munitions fired, launched or delivered by the conventional arms covered under Article 2 (1), and shall apply the provisions of Article 6 and Article 7 prior to authorizing the export of such ammunition/munitions”.

Therefore, 23 countries from Latin America and the Caribbean\textsuperscript{56} are already legally-obligated to conduct risk assessment processes for any export of ammunition, and “apply the provisions relating to prohibited transfers and denial of authorization of proposed exports in the same way that it would with respect to other conventional arms within the scope of the ATT”.\textsuperscript{57} This means those countries are prohibited from transfers of ammunition that would violate a UNSC arms embargo, other binding UN agreements, or that would be used for genocide, crimes against humanity, or war crimes. Moreover, said governments must deny transfers that “would contribute to or undermine peace and security”, or could be used to commit or facilitate a serious violation of international humanitarian law; a serious violation of international human rights law; an act constituting an offence under international conventions or protocols relating to terrorism or transnational organized crime.\textsuperscript{56} Nonetheless, some deem coverage of ammunition in the ATT partial, as States are not explicitly obligated to consider ammunition under the articles covering Import, Transit/Transport, Brokering, Diversion, Record Keeping, and Reporting, all of which refer only to “conventional arms covered under Article 2(1)” – particularly unfortunate in terms of transparency. However, initial ATT implementation indicates that states in Latin
America and the Caribbean have been willing to deem ammunition as included under all these categories, excluding Reporting.

In addition to the obligations derived from the ATT, and although not germane to most countries in the region. The Wassenaar Arrangement On Export Controls for Conventional Arms and Dual-Use Goods and Technologies (Wassenaar Arrangement) binds member states Argentina and Mexico to “promote transparency and greater responsibility in transfers of conventional arms and dual-use goods and technologies, thus preventing destabilizing accumulations”.

Moreover, Chile is undergoing the membership process, while Colombia is currently in an exploratory phase. The Wassenenar countries follow a detailed munitions list, and have committed to implement nationally the guidelines on, inter alia, effective export control enforcement, national reporting requirements, re-export controls, brokering, transit/transshipment, disposal of surplus or demilitarized military equipment, and end-user controls.

The entire set of guidelines could be helpful to other Latin American and Caribbean nations; indeed, some countries in the region, including Costa Rica and the Dominican Republic, are already considering the Wassenaar munitions list as a basis for their national control lists in order to comply with ATT implementation.

REGIONAL INSTRUMENTS

Among regional commitments, the Organization of American States’ Inter-American Convention against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives and Other Related Materials (CIFTA), was adopted in 1997 as the first legally-binding international norm explicitly covering ammunition (and explosives), and was a major inspiration for both the Firearms Protocol and the UN PoA.

The 31 member states to CIFTA in Latin America and the Caribbean, as regards ammunition controls, are obligated to harmonise their national legislations; to criminalize illicit manufacturing and trafficking; to take security measures (“undertake to adopt the necessary measures to ensure the security of firearms, ammunition, explosives, and other related materials imported into, exported from, or in transit through their respective territories”); to strengthen national controls (“establish or maintain an effective system of export, import, and international transit licenses or authorizations”); to exchange information, experience, and training; and engage in cooperation, technical, law enforcement, and legal assistance.

Particularly helpfully, CIFTA was complemented by a series of Model Legislation recommendations, developed by the Inter-American Drug Abuse Control Commission (CICAD), which inasmuch as ammunition is concerned, includes detailed prescriptions for the “control of international movement” (its detailed Chapter II is devoted to ammunition specifically), “strengthening controls at export points”, establishing criminal offenses, and confiscation. Unfortunately, the political process surrounding CIFTA has remained relatively dormant in recent years.

On a sub-regional level, the Americas have several other normative efforts germane to the control of ammunition, though almost all have, like CIFTA, lost steam in recent years. These include efforts under the Central American Integration System, (such as the Tratado Marco de Seguridad Democrática en Centroamérica) and the

In over 60 countries during the last decade, poorly-stored ammunition stockpiles have inadvertently exploded. In the ten-year period from 2000 to 2009, there were at least 189 explosions in ammunition depots resulting in 3,486 fatalities and 4,427 significant injuries. This averages out to an annual rate of 19 explosions, 349 fatalities and 443 injuries. This fatality rate is 21% of the fatality rate suffered from landmines and unexploded ordnance annually. Thousands of people have died, and the livelihoods of entire communities were disrupted. Unsecured or poorly-monitored national ammunition stockpiles also lead to massive diversion into illicit markets. Diverted conventional ammunition is increasingly used to make improvised explosive devices (IEDs).

The General Assembly requested the United Nations to develop guidelines for adequate ammunition management. In response, the UN SaferGuard Programme was established. It oversees the dissemination of International Ammunition Technical Guidelines (IATG): detailed standards for voluntary use by countries that wish to improve the safety and security of their ammunition storage sites.

The International Ammunition Technical Guidelines (IATG) are designed to establish standardised management processes and security procedures for conventional ammunition storage and processing facilities. Inadequately managed ammunition stockpiles threaten public safety and pose a risk to the security of States. While it is the prerogative of each State to determine the system of stockpile management that is most suited for its national defence and security purposes, the issue has been of growing concern to the international community because of:

1. the impact on social and economic development within developing nations due to undesirable explosions of ammunition depots; and
2. the cross-border consequences due to the diversion of poorly managed stockpiles.

Source: https://www.un.org/disarmament/un-saferguard/faq/
unfortunately discontinued CASAC-Programa Centroamericano para el Control de Armas Pequeñas y Ligeras (CASAC), the Andean Community’s Decision 552: The Andean Plan to Prevent, Fight and Eradicate Illicit Trafficking in Small Arms and Light Weapons in all Its Aspects, Mercosur’s Presidential Declaration on Combating the Illicit Manufacture and Trafficking in Firearms, Ammunition and Related Materials, and potential future attention by UNASUR.59

Exceptions in terms of recent activity and continued relevance come from the operational front, such as Mercosur’s ongoing Working Group on Firearms and Ammunition (GTAFM) – which has been meeting since 2001 to discuss the harmonization of operational aspects of arms and ammunition control, most recently in December 2017 in Brasília59 –, and efforts by CARICOM, which has put forth important political and operational endeavours. Though full implementation remains elusive.

In the Declaration on Small Arms and Light Weapons (2011), the Caribbean governments “solemnly commit to implement all necessary actions at the national and regional level to fully combat the illicit trade in small arms and light weapons and their ammunition”, as well as to fully implement the PoA and the ATT, to strengthen national capacities, policies, and legislation, to harmonize sub-regional laws, to enhance the security of stockpiles (“including the identification and destruction of surplus”), and to “continue to accord the highest national and regional priority to matters related to combating and eradicating the illicit trade in small arms and light weapons and their ammunition”.70

These objectives have had follow-through in practical terms as well, with the creation of model legislation for UN PoA and ATT implementation, and trainings for national points of contact, on marking, border security, stockpile management, and end-user control systems.71

Operationally, the Implementation Agency for Crime and Security (CARICOM IMPACS) was created in 2006 and is headquartered in Port of Spain, Trinidad and Tobago, with a reported staff of 70 full-time employees (www.caricomimpacs.org/aboutus). Arm-regist projects, the Regional Integrated Ballistic Information Network (RIBIN; see more below), and Regional Intelligence Fusion Centre (RIFC) are noteworthy in their intention of enabling national governments to gain, process, and analyze information to trace firearms and ammunition used in criminal activities,72 even if their real-world realisation is still lagging.

GUIDELINES AND OTHER INITIATIVES

In addition to normative instruments – whether ‘hard’ or ‘soft’ law, global, regional, or sub-regional in scope – several international standards and guidelines on ammunition controls are not only widely available, but essential to follow for governments concerned with optimum levels of human security and compliance with best practices. It should be noted, however, that some of the following instruments cover all forms of ammunition (such as the International Ammunition Technical Guidelines) while others are specific to small arms ammunition.

Foremost among these are the IATG, which as aforementioned stemmed from the “punting” of the ammunition issue during the negotiations of the PoA and the ITI. These voluntary ‘technical guidelines for the stockpile management of conventional ammunition’ are both highly detailed and relevant to national authorities seeking state-of-the-art practices to implement.73 Importantly, the IATGs have “three levels of ascending comprehensiveness”, thereby offering immediate solutions to governments regardless of how effective their baseline may be, with Level 1 constituting “a basic minimum to reduce risk” and Level 3 an optimum scenario.74

The IATGs are accompanied by a web-based implementation support tool known as UN Safeguard, which boasts of an extensive array of training courses and an accompanying roster of experts qualified to administer them.75 The web-based implementation support toolkit includes several risk management resources (such as an assessment risk reduction checklist76 and the Explosive Consequence Analysis77) and technical calculators.78

The guidelines are further supported by UN-ASAP (Ammunition Safety Assistance Program), a “clearing-house to support States in assessing their needs to improve the safety and security of ammunition storage facilities, as well as to undertake the destruction of surplus ammunition”.79 Safeguard has also established a “quick-response mechanism, which allows ammunition experts to be deployed rapidly to assist States, upon request, in the urgent management of ammunition stockpiles, including in the aftermath of unintended explosions of ammunition”.80

The IATGs are reportedly currently “being used to support ammunition stockpile management efforts” by 86 countries, though it is impossible to independently ascertain to what extent and how well the guidelines are being implemented in each.81 Technical and financial support to the endeavour has come from diverse quarters: the governments of Bangladesh, Brazil, Cameroun, the Czech Republic, Germany, Japan, Serbia, Singapore, Switzerland, the USA and the EU. However, it should be noted in the context of the Americas that while all IATG modules are available in English and Portuguese82 (presumably given Brazil’s involvement), and some can be read in French, none of them are available in Spanish, a liability which should urgently be addressed to render these highly technical documents more accessible to operators in many countries in Latin America.

While not intended to comport a global purview like the IATGs, the OSCE Handbook of Best Practices on Conventional Ammunition – ‘a compilation of the currently available best practice’ guides’ of techniques and procedures for the destruction of conventional ammunition, explosive material and detonation devices and the management and control of stockpiles of ammunition’ – also includes a plethora of practical information that can be used by governments in Latin America and the Caribbean (and is available in Spanish).83 Divided into five guides – Marking, registration, and record keeping; Stockpile management; Physical security of stockpiles; Transportation; and Destruction – the OSCE Handbook reflects the best available knowledge and experience from not only the group, but also the special expertise of the governments that drafted them, respectively, Germany, the Netherlands, the United States and Sweden.84 At least 14 OSCE members have also benefited from missions by the organization for practical assistance in stockpile management, security, and surplus destruction.85
However, as the Handbook was developed within a European context, it should be pointed out that the “full implementation”87 of these international guidelines “has significant cost implications”. Moreover, though experiences, practices and research from different regions may offer important lessons learned, the discrepancies between countries in the Americas and some European countries may make them unfeasible. As such, lessons learned from other developing regions may be especially helpful. For example, island nations in the Caribbean may have more similarities with Pacific nations,88 or others may see similarities with challenges on the African continent.89

Eastern Europe and the Balkans may be of particular interest, as these regions have similar average socio-economic levels as parts of Latin America and the Caribbean thus presumably having similar financial and technological constraints.90 Moreover, this region has produced a large amount of excellent reference guides and analysis on arms and ammunition control issues, especially through The South Eastern and Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC) and the Regional Approach to Stockpile Reduction (RASR). SEESAC, based in Belgrade and supported by UNDP, has several publications on ammunition controls and it monitors the current trends in the area.91

RASR, in turn, is a “regional approach to address the threats posed by excess, unstable, loosely secured or otherwise at-risk stockpiles of conventional weapons and munitions in South East Europe”, composed of Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Montenegro, Romania, Serbia and Slovenia, “working to prevent disastrous explosions and destabilizing diversions of stockpiled conventional weapons and ammunition”.92 Resources from their last workshop (October 2017)93 include detailed presentations on surplus ammunition management from Albania, Bosnia-Herzegovina, Montenegro, and Serbia, among other materials of potential interest to governments in the Americas.94

Finally, existing civil society guidelines on ammunition controls may also provide important lessons for governments in the regions. One example is the Geneva International Centre for Humanitarian Demining (GICHD) Ammunition Safety Management app, which can be downloaded for free by ammunition safety and PSSM practitioners, project managers, advisers, and experts.95 The user-friendly operations guide and training aid can also provide local capacity building, “ensuring that the ammunition stocks can be successfully managed in accordance with IATGs when the international expertise has left”. Highly relevant to the Americas, the app “is designed to make the maximum safety improvements in the shortest, simplest steps at low cost and with limited resources”.96 Guidelines on specific sub-themes within the broader area of ammunition controls, particularly as regards physical security and stockpile management, are also available from civil society organizations and should be consulted by the region’s governments.97 Importantly, many germane guidelines follow the notion of “good” rather than necessarily “best practices” in recognition that resource scarcity may impede some countries in achieving the highest known levels of practice, but must not preclude achieving – with targeted assistance – better and basic standards.
NOTES


17. Ammunition Stocks: Promoting Safe and Secure Storage and Disposal. Biting the Bullet Briefing 18 (Greene, Holt, and Wilkinson, 2005, p. 13) [Small Arms Survey, 2005, p. 20]. Available from http://www.smallarmssurvey.org/fileadmin/docs/D-Book-series/book-03-targeting-ammunition/SAS-Targeting-Ammunition-04-Introduction.pdf. More recently, the company in charge of the facility, Orbital ATK noted that “during the last five years, the company manufactured more than 8 billion rounds of small-caliber ammunition for the U.S. military and other customers”, so around 1.6 billion per year, or an average of 22 million round per day.

18. Author’s visit to CBC, Ribeirão Pires, São Paulo in December 2017.

27. The factory only produces 5.56 mm ammunition for the armed forces (www.minfed.mil.gt/mdn/industria/misionvision.html).

59. www.wassenaar.org/about-us/
62. Available from http://www.oas.org/juridico/english/sigs/a-63.html. The U.S. under President Obama briefly considered ratification, to no avail; one of the reported obstacles was the argument that manual loading of ammunition would be criminalized. Mary Beth Sheridan, “Despite Obama pledge, Democrats show little
PART II

Good Practices and Current Scenario in Latin America and the Caribbean

LEGISLATION

In addition to complying with international norms and standards, an obvious first step for ammunition controls anywhere is to have proper national legislation in place. While detailed analysis of laws on ammunition control in Latin America and the Caribbean is beyond the scope of this report, it is fair to note that the global finding of the aforementioned UN report still holds today in the region: “in some countries existing legislation can be considered comprehensive and effective, in others legislation is inadequate or even lacking altogether.”

Basic components of a proper normative framework would include, at a minimum, the classification and definition of ammunition, licensing requirements for production, transfers (import, export, transit, transshipment, etc.), rules for purchase, possession, and sale (including maximum quantities for individuals and private security agents), national registers, identification and marking, possible stockpiling standards, and penalties for disrespect of any of these regulations, among others.

In some cases, model legislation has been developed for particular thematic priorities, such as that of marking and tracing by the OAS, or to domesticate international obligations, such as CARICOM’s model legislation for ATT and UN PoA implementation; “Member States are now required to enact legislation according to the Model to give effect to their national obligation under the Treaty.” For nations with less robust norms, a good basis for strengthening laws on firearms and ammunition is the “LEY MARCO DE ARMAS DE FUEGO, MUNICIÓN Y MATERIALES RELACIONADOS”, offered by Parlatino, CLAVE, and the Parliamentary Forum on SALW.

Several countries in the Americas have good general firearms laws; these include Barbados, Brazil, Costa Rica, Cuba, Dominican Republic, Paraguay, Peru, and Trinidad and Tobago, to name a few. However, even some nations that have good basic firearms norms may lack the same level of specific controls on ammunition. Indeed, in several countries in Latin America and the Caribbean, restriction levels on firearms are significantly higher than those on ammunition, which is often less covered.
in both laws and administrative norms. For example, Peru has virtually no limit on the number of rounds a civilian can purchase and does not restrict access to hollow point ammunition by individuals. According to a Central American expert consulted, “for those working on reforming legislation, it is easier to suggest limitations or restrictions to firearms than ammunition”, partially because a dearth of “research and analysis has limited public conscience of ammunition”, its limitations in national laws and, ultimately, “its non-inclusion in instruments like the PoA”. The same holds for issues, such as stockpiling, apprehension, and diversion (and statistics thereof): attention is disproportionately paid to firearms.

Another interviewed expert from the Caribbean concurred, noting that “because firearms are always seen as the main tool of choice for criminal gangs, they are often seen as a greater political showpiece for the public to feel as if politicians are taking action. As a result ammunition is overlooked and is not seen as having equal importance to the equation”. In that sub-region, the expert continued, “most countries in the region have a very outdated firearms act, which does not adequately deal with the realities of the 21st century and needs to be significantly strengthened”, though even some laws recently amended fall short “because technical persons are often not consulted”.

Moreover, it should be noted, however, that simply passing relatively strong legislation is necessary, but insufficient, as it is only the first step towards a robust ammunition control system. The actual implementation of the law depends on the operational aspects of governance, law enforcement, and criminal justice, which, in turn, are contingent on proper political prioritization, budgeting, resource allocation, etc. It is here that many nations in Latin America and the Caribbean are often lacking. For example, though rightfully lauded as one of the continent’s most comprehensive controls, the “ballistics database” determined by Article 2, item X, has simply never been implemented. Costa Rica reportedly is also encountering similar obstacles, not simply not worth the cost to secure it or worth the risk posed by an accident or its aftermath. According to a Central American expert consulted, “for those working on reforming legislation, it is easier to suggest limitations or restrictions to firearms than ammunition”, partially because a dearth of “research and analysis has limited public conscience of ammunition”, its limitations in national laws and, ultimately, “its non-inclusion in instruments like the PoA”. The same holds for issues, such as stockpiling, apprehension, and diversion (and statistics thereof): attention is disproportionately paid to firearms.

CURRENT SCENARIO
Always keeping in mind the importance of restraint and robust controls, we now turn towards a view of the current scenario. As noted above, in general, Latin America and the Caribbean have demonstrated political leadership, but still suffer from procedural gaps in the practical implementation of some aspects of ammunition control. As such, this section will offer a brief assessment of the current practices and a few examples of what is being done, what works (impact/effectiveness), and what does not, in contrast with international best practices. As the full life-cycle of ammunition and the ensuing fundamental controls are not necessarily germane to all countries, this section will focus on three main areas, all extremely relevant to the vast majority of nations in the region: (I) Marking, tracing, and diversion prevention; (II) Physical security and destruction of stockpiles; and (III) Forensic ballistics.

Chapter 1
Diversion Prevention Through Marking and Tracing

MARKING
Marking ammunition – in order to preclude theft, diversion, and illicit trafficking, or to understand how it happened after the fact in order to prevent future incidents – has long been recognized as absolutely essential, a corollary to the responsibility of producing or importing ammunition. Moreover, recoverable markings, combined with proper record keeping, can prove instrumental in helping solve firearm crimes, particularly homicides. Markings must be made both to the cartridge itself, and to all packaging that accompanies ammunition in transport, sale, and stockpiling. Markings must generally follow two principles: clarity (identifications should be easy to read) and uniformity (style and position of identifications should follow the same patterns). On packaging, for ammunition intended for the armed forces or other security agencies, it is most common best practice to mark a manufacturer identification, type and/or caliber, quantity in package, year of production, and the lot code. For military ammunition, a so-called NATO STANAG (standardization agreement) is the closest standard to a global norm: the document guiding these requirements is STANAG 2953, or AOP-2(c) (Allied Ordnance Publication), The Identification of Ammunition. This standard, for calibers up to 20mm, requires packages including: the symbol for the nature of the projectile (tracer, ball, armor piercing, etc.); quantity of ammunition; caliber; packed configuration; lot number; and the NATO design mark (a cross within a circle).

This is required across NATO membership, but also in countries like Brazil, Colombia, Russia, and South Africa, for their security forces, and also for “non-state actor markets in CIP states and a number of states that are not CIP members such as Brazil”. In the Americas, only Chile is a member of the CIP – the legally-binding Permanent International Commission for the Proof of Small Arms – though...
individual manufacturers have received homologation in their high standards\textsuperscript{24} to market their ammunition in CIP members, including CBC-Brazil, for eight different types of ammunitions.\textsuperscript{25}

In terms of cartridge cases, the most common combination of markings is only manufacturer information plus year of production (military ammunition) or caliber (civilian ammunition).\textsuperscript{26} However, the Americas already have an excellent standard, as put forth by the aforementioned OAS Model Legislation for Marking and Tracing.\textsuperscript{27} Its Chapter III (Marking of Ammunition) establishes that manufacturers shall ensure that "each cartridge is marked at the time of manufacture"; "each box of ammunition is marked at the time of manufacture"; and that importers must mark both cartridges and boxes accordingly (Article 4).

Moreover, Article 5 determines the "manner of marking": "Each cartridge shall be permanently marked by a headstamp impressed, stamped or embossed that identifies the manufacturer, the country and year of manufacture, and a unique batch or lot number"; headstamp markings on cartridges shall "consist of simple geometric symbols in combination with a numeric and/or alphanumeric code; be of a size that is readily legible to the naked eye; and be of a quality and/or depth such that the markings cannot be readily tampered with or removed" and "each box of ammunition shall be marked with the same identification as on the headstamp marking" and "the unique batch or lot number of the ammunition". Boxes of "imported ammunition shall contain, in addition to the marking referred to in paragraph 3, information that identifies the country of import, the year of import and the importer". In other words, nations in Latin America and the Caribbean are already bound by a detailed rendition of best practices in ammunition marking; it is just a matter of implementing them.

Detailed, traceable information on packaging and lot numbering for cartridges are the best practices to strive for. In current general practice, the omission of lot number information on cartridges has been blamed on "the general absence of a stipulation by customers that these marks should be applied"\textsuperscript{28} or, more bluntly, "producers mark only what clients ask and pay for".\textsuperscript{29} However, in looking at ammunition controls mostly from an economic and industry perspective, the role of governmental regulation, legal prescriptions, and private sector innovation can be overlooked.

\textbf{Best practices} in Latin America and the Caribbean regarding ammunition marking come from different sub-regions. In the Dominican Republic, compulsory marking, including for the civilian market, was regulated in 2007 so that imported ammunition receives a country code, code identifying the importing company, import year, caliber and lot number marking.\textsuperscript{30} As such, importers request the marking at the production point, and have even joined with competitors to ensure reaching the minimum quantity a given exporter would ship.\textsuperscript{31} Ammunition for police or security forces receives, sometimes, a distinct code for the procuring agency instead of for the importing company. Conversely, Argentina has received recommendations to mark the ammunition it produces in this mold, which may also be similar to the standards used in Venezuela.\textsuperscript{32} In addition to requesting consideration of taking up laser-marking for secondary marking and additional information, the proposal suggested...
codes for security forces: AR PFA (Policía Federal), AR GNA (Gendarmería Nacional Argentina), AR PNA (Prefectura Naval Argentina), and AR PSA (Policía de Seguridad Aeroportuaria), but may not have been implemented yet.

In Colombia – which years ago deemed itself a “pioneering country in marking firearms, ammunition and explosives”, a moniker currently less adept for its ammunition – markings for military and civilian market ammunition are distinct. INDUMIL’s 5.56 x 45mm ammunition includes codes for producer (“IM”), year of production (4 digits) and lot (4 digits), while its ammunition for “self-defense” in various calibers includes the caliber specification (38, 32 or 7.65mm) and producer (“INDUMIL”). As the military calibers are marked in lots of 25,000 cartridges, tracing is optimized for ammunition from the security forces; civilian ammunition, however, only has lot markings on packages, not cartridges. Over a decade ago, these markings allowed for a very high solution rate on tracing requests (98%, though this also included firearms and explosives) and were deemed innovative and “high standards”. The same analysis noted the lack of markings on civilian ammunition was due to the “high costs they would represent to buyers” and “a difficult policy decision”, a stance that as argued herein is probably obsolete today.

The case of Brazil is instructive in the feasibility and importance of rendering marks as detailed as possible in order to ensure greater success for tracing attempts. On marking, Brazil’s firearms and ammunition legislation (Disarmament Statute, 2003) basically foreshadowed the OAS’s recommendations, eventually combining with private sector innovation to create a clear case of best practice, not only for the Americas, but worldwide. The law’s determination was not easy to come by, with much discussion and jostling by all interested stakeholders in the months prior. The new legislation stipulated what needed to be done (marking cartridges for security forces with lot and purchaser information), but not “how”. As such, it was contingent on industrial ingenuity and innovation to find a solution, which CBC did by globally pioneering the use of laser-marking ammunition cartridges.
Shortly after the law came into effect, in addition to noting the discouraging effects on potential transgressors, experts “expected that lot numbers will help the police to identify patterns of ammunition leakages from the police or the military to organized crime”, and that marking cartridges would “provide the federal police and the justice system with a powerful tool to enable them quickly to identify and punish those state agents responsible for diverting ammunition to criminal outlaws, or for not taking the necessary security measures to prevent the theft and diversion of ammunition. It (was) also expected that ammunition marking will provoke a ‘virtuous circle’ by strengthening the control and security of military and police stockpiles.”

While it took a few years to fully implement the measure (for different calibers, entry into force was between January and July 2005, but most police forces only confirmed consistently receiving duly marked ammunition in 2008), current reports note that growing pains have subsided. Proper implementation was also contingent on the creation of detailed technical and administrative prescriptions, such as the size of the lot (10,000) and the information that needed to be part of the database for tracing: name of buyer, governmental sale authorization, product code, ammunition description, delivery lot number, invoice information, and transit authorization.

**TRACING**

Together with proper record-keeping (accessible, online ‘live’ databases constantly updated with correct, disaggregated data, kept for long – 10 years as per Brazil’s regulations), detailed marking (‘one lot, one client’) allows for tracing of ammunition diverted, trafficked, or used in firearm-related violence. Tracing best practice would follow a three-fold process: identification, mapping, and verification. To wit, identification is “the collection of information on the physical characteristics of the ammunition, in order to determine the identity of the manufacturer, the date of manufacture, the country of origin and the calibre of the ammunition”; mapping, the “recording of ammunition samples drawn from different localities or groups, so that this information can be used to build up a detailed ‘photograph’ of the transfer methods for this ammunition”; and verification, the “cross-checking the information by means of additional research”, including through enquiries with experts and governmental authorities.

It has been well pointed out that marking and tracing is not a ‘silver bullet’ in resolving these challenges: “While lot numbers can certainly help, they are not the turn-key solution to the ammunition-tracing problem. A realistic contribution that ammunition marking could bring to an investigation would be to provide a ‘shortlist’ of possible sources of diversion.” But they can indeed help.

In the case of Brazil, which has been called an ‘explosive cocktail: a prosperous and inadequately regulated ammunition industry in a violent country,” such help is most needed. Small arms ammunition is big business in Brazil, with the quasi-monopolistic CBC producing, selling and exporting exhorbitant amounts, as virtually the sole provider to police forces, civilians and exports. Today, CBC exports roughly 85% of its production, with an emphasis on ‘premium’ small caliber military ammunition for NATO militaries, having received multiple homologations in said highly-sought standard since its first, in 2007. CBC’s annual production may surpass 1.5 billion rounds, rendering it one of the world’s top three ammunition producers, and includes production in acquired factories in Germany (MEN) and the Czech Republic (Sellier & Bellot).

Brazil’s use and stockpiling of small arms ammunition is high. For example, since 1989, private security companies in Brazil have reportedly gone through over 122 million rounds of ammunition; almost 46.7 million between January 2010 and May 2015, a month which saw over 1 million rounds destined to private security. While sales to, and use by, police forces and civilians are most often not informed, the Ministry of Defense reported that between 1995 and 2002, CBC sold 320.9 million rounds to “gun shops and ammunition distribution depots”. High levels of ammunition usage is also evident, not only in the country’s leading total numbers of firearm-related homicides, but also of ‘stray-bullet incidents’; according to a UNLIREC study, between 2014 and 2015, a total of 197 cases (with 98 deaths) occurred in Brazil, over 26% of all cases in Latin America and the Caribbean.

In a recent study, Instituto Sou da Paz analyzed the ammunition apprehended in the state of Rio de Janeiro between January 2014 and June 2017. The findings were staggering: over a half million rounds of ammunition were apprehended by Rio’s police forces – a monthly average of around 13,000 rounds – which, if used, would allow 430 shots per day. For the only year (2014) that proper information regarding the producers was made available, 42% of the apprehended ammunition – or almost 59 thousand rounds – were made by CBC. Interestingly, a full 28% of the ammunition was not identified (read: properly marked and/or registered) in terms of producers, 23% were “others”, while the Mexican manufacturer Aguila appeared with 5%.

Unfortunately, though “Brazilian ammunition should be the object of systematic tracing”, the study notes a lack of analysis, studies and tracing attempts in Brazil. In other words, though the aforementioned expectant experts were correct in noting the ameliorated marking requirements were a ‘powerful tool’ for Brazilian authorities, it appears the tool is going unused, even if large apprehensions are constantly made, particularly in Rio de Janeiro. The markings allow one to recognize the ammunition produced in Brazil, and gives much information for any ammunition diverted from the security forces, but the tracing apparently is not often conducted. The study notes the legal responsibility for monitoring ammunition production and sales lies with the Brazilian Army, which uses a monitoring system (SICOVEM) that was donated by CBC, which the study deems “clear evidence of a conflict of interest.” In conclusion, the analysis calls for lot marking on ammunition cartridges produced by CBC, but sold to the civilian market.
In terms of tracing, in all fairness, the regulated company has provided to the regulator the necessary tools to properly implement the controls. In addition to the marking and record-keeping, which automatically couples the information laser-marked on the cartridges with the packaging details and inserts the data into an online database, access is given to the DFPC and state police units, which can log-in, input the information found on a cartridge or box, and immediately receive information on first buyer, authorization, product’s code, lot number, and invoice. More often than not, the security forces either do not take this step, or do not follow-up on the information obtained.

More recently, UNLIREC conducted a study in Dominican Republic creating a profile of ammunition seized at border controls and recovered from crime scenes. Preliminary findings show that 26% of ammunition recovered from crime scenes had import markings and Águila and CBC accounted for at least 17% and 8% of the evidence recovered. In the graphic below, most common calibers found are shown.

**GUIDELINES AND STANDARDS**

When considering the closest possible approximation between the ideal and the feasible, it should be recalled that “a fully comprehensive approach to tracing illicit ammunition would require that every single ammunition package and round of ammunition be reliably traceable through its chain of transfer. It should not be forgotten, however, that there is significant scope for more limited standards that, while not necessarily allowing for the reliable tracing of all ammunition in every situation, would make a substantial contribution to combating illicit ammunition trafficking by limiting the leakage of ammunition from state actor markets.” Moreover, the “major differences” in tracing shipments of illicit ammunition to conflicts, for example, and “tracing a single ammunition cartridge stolen from a sport shooter and used in an armed robbery in the United States” must be considered. That said, some existing guidelines and standards are quite helpful.

The OAS Model Legislation on Marking and Tracing also duly covers the issues of record-keeping (Article 6) and tracing (Articles 7, 8 and 9). The norm determines a national registry, which in the case of ammunition shall include (and keep for 30 years): “the identifying marking of a cartridge and ammunition box”, the name and location of the owner, and of “authorized producers, dealers, brokers, importers and exporters”, the date of entry of information to registry, and information concerning each ammunition import, export and in-transit transaction. As per tracing, minimum requirements are the determination of the national authority “responsible for responding to and making tracing requests” (which should ensure confidentiality), the information to be provided in said requests (markings, type, caliber, other characteristics), its legal justification (describing the illicit nature of the ammunition, and circumstances in which it was found), and the “intended use of the information being sought”. In its tracing response, a government shall provide “a timely and accurate response” and, “to the extent possible”, confirmation that the ammunition was manufactured or imported by the State; information on manufacturer and importer; the date of manufacture or import; and whether it was exported legally.

### Table: Grading of ammunition seized between JAN / 2014 and JUN / 2017

<table>
<thead>
<tr>
<th>Caliber</th>
<th>Number</th>
<th>% of Cartridges</th>
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<tbody>
<tr>
<td>9mm</td>
<td>150,593</td>
<td>27.44%</td>
</tr>
<tr>
<td>7.62 mm / .308</td>
<td>77,232</td>
<td>14.07%</td>
</tr>
<tr>
<td>.38</td>
<td>57,103</td>
<td>10.41%</td>
</tr>
<tr>
<td>40</td>
<td>55,818</td>
<td>10.17%</td>
</tr>
<tr>
<td>5.56 mm / .223</td>
<td>46,432</td>
<td>8.46%</td>
</tr>
<tr>
<td>Undetermined</td>
<td>12,013</td>
<td>2.19%</td>
</tr>
<tr>
<td>Total</td>
<td>548,777</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Figure 10:** Apprehension by Caliber in Rio de Janeiro 2014-1017

The three calibers that appear in larger volumes in the seizures are: 9mm (restricted gauge present in pistols and submachine guns), 7.62mm (restricted gauge found mainly in rifles), and .38 caliber, predominant in revolvers.

**Top 5**

<table>
<thead>
<tr>
<th>Caliber</th>
<th>Number</th>
<th>% of Cartridges</th>
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<tbody>
<tr>
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</table>

**Graphic: Instituto Sou da Paz**

**Figure 11:** Dominican Republic. Crime Scenes 2017

- **9mm (9x19)**: 85.94%
- **.38**: 4.45%
- **.380 (9x17)**: 4.45%
- **12GA +16GA +20GA**: 1.96%
- **.32**: 1.84%
- **5.56 mm**: 2.45%
- **Other handgun calibres**: 3.45%
- **Undetermined**: 2.45%
- **Total**: 100%

Source: UNLIREC: PROFILING AMMUNITION SEIZED AT BORDER CONTROLS AND RECOVERED FROM CRIME SCENES ACROSS LATIN AMERICA AND THE CARIBBEAN Briefing Paper I: The Dominican Republic Case Study and Methodology
In addition to the OAS prescriptions, the OSCE Best Practice Guide on Ammunition Marking, Registration and Record-Keeping is the international yardstick in this area, recalling that “all ammunition should be marked appropriately and accurately [...]. Appropriate markings provide a major contribution to safety, security and the administrative management of the ammunition stockpile”.28 This document is particularly helpful in the theme of registration and record-keeping, which “should span the entire life cycle of ammunition, from its production to its consumption or disposal/destruction” and “are the keys to controlling legal stocks of ammunition and preventing them from becoming illicit”.29 These activities should be conducted at manufacture, testing, time of shipment and receipt, storage and possession, in case of loss or theft, at consumption/use or disposal/destruction, and at any transport and handling.30

TECHNOLOGICAL INNOVATIONS AND COSTS
The use of other technological innovations can be most helpful in precluding diversion and assuring ammunition security. Of course, technology in itself is no panacea for ammunition controls, and depends on having the physical, human, and IT resources in place to take advantage of the tools. As such, it is essential to “walk before you run”: basic controls should be in place before considering costly and high-tech systems. For example, “in poorer countries, meeting basic [Physical Security and Stockpile Management] requirements is likely to be prioritized over establishing digital inventory-management systems”.71 Nor are high-tech innovations always easy to introduce, as “barriers to the adoption of the new technologies... include the conservative nature of military and law-enforcement agencies and the historically slow pace of change in firearms technology”.72

That said, two especially interesting technologies are the use of Radio Frequency Identification (RFID) technology and ‘chip strips’ technology on ammunition packaging.73 RFID technology transfers data from a tag on the ammunition packaging “to a reader using radio waves for the purpose of identification and tracking... passive RFID tags can be read even inside a case, carton, box, or other contained, and from a distance of up to several meters”, as opposed to bar codes.74 Indeed, “by using readily available RFID systems, it is possible to undertake detailed checks on a weapon and its ammunition throughout the journey from manufacturer to final authorized user”.75 Once more, the region reportedly is at the forefront: “its application in the field of arms control is relatively recent and has also been pioneered by Brazil, followed by other Latin American countries”.76 With the cost of the technology decreasing – tags are currently available for between 10 and 50 cents of a dollar per unit77 – this trend should continue to grow until it is universal. Another technology also shows promise, particularly for the transport or international transfer of ammunition boxes: ‘chip strips’ “unique electronic identity” would allow “the capacity to scan ammunition boxes in a truck and given the fact that scanners feature GPS, the location and time of departure could be recorded, as well as the arrival at an intermediate or final destination”.78

Prior to CBC’s innovation on laser marking, a common argument against changes to the ammunition market was one of cost; compared to firearms, “ammunition marking can have a proportionally greater financial impact on projection costs. This can seriously affect a firm’s competitiveness in terms of a procurement opportunity”.79 While this was true for traditional techniques, it simply no longer holds. As previously noted, currently “UNLREC supports the use of laser technology to mark ammunition wherever access exists to the technology necessary for its implementation”.80

CBC currently uses the VideoJet laser marking equipment in its factory, which reportedly costs about USD100,000 per unit between equipment and technology.81 Maintenance costs are approximately USD9,300 for the production of 5 million cartridges.82 The company acknowledges not only that the initial costs were not prohibitive, but that they can be seen as an investment that led to reputational and quality gains, an additional factor in CBC being widely recognized as a high-tech, ‘premium’ ammunition producer.83 In terms of financial cost, the estimated additional 15% per unit is recovered by the market performance, due to its unique trustworthiness and control for use and stockpiling by security forces, in addition to the high quality levels of the product in terms of ballistic performance.84 Current production levels – including laser-marking – are between 100 and 120 cartridges per minute.85

To be clear, CBC did not necessarily want to mark its ammunition with laser – it was compelled to do so, because of a political decision and legal determination. Industrial, private sector innovation was sparked by an imposed governmental regulation. In response, in January 2005, CBC implemented what it called SIP (“Sistema de Identificação Personalizada de Munições”), “integrated into production, managed by an exclusive information technology system that offers online individual tracing possibility for all ammunition sold to Brazilian public agencies, allowing for the identification of the purchaser upon finding either the cartridge or packaging”.86

Other legal determinations and technological solutions can be found; for example, the technology of micro-stamping ammunition has also shown promise. This process – in which a “unique, traceable code is inscribed onto [...] the firearm and subsequently imprinted onto the weapon’s ammunition as it is fired” – at least in theory allows investigators to identify and trace ammunition components to guns that have been used in criminal activities even when the guns are not accessible, and also to identify the last retail purchaser of the firearms linked to the ammunition.

Assuming that reading the codes does not require specialized forensic equipment or expertise, the routine use of microstamping would also reduce the workloads of overstretched forensic examiners”.87 Further breakthroughs using laser-marking are fully feasible as well, and, if implemented, “the traceability of ammunition will reach a level never before achieved”.88

Broadly speaking, innovation in ammunition technology per se has been rather limited in the decades after the development of cartridge-based ammunition.89 While the potential for technological innovation to firearms that could limit their misuse and lethality is enormous (‘smart guns’), changes to ammunition have often focused
on making them lighter (‘caseless’ cartridges, use of polymers), or more powerful/
destructive, accurate, and long-range. While the hope of using technology to make
ammunition ‘safer’ is perhaps wishful thinking, technology can be used to great avail
for stronger ammunition controls.

While not currently done, laser marking technology would also allow for the post-
production marking of lot number information on all ammunition, also for the civilian
market, as rounds could be finalised in line with demand projections and marked
only when a buyer is determined. The first-buyer identification could arguably take
different forms under different systems, but could inform the distributor, store, or
geographical destination (such as a Brazilian or US state if divided over different
distributors/sellers). Regardless of the details,

‘a more comprehensive focus on tracing illicit ammunition would cover not only
ammunition on state actor markets, but also ammunition on non-state actor
markets. This would include the ability to trace a cartridge case recovered in
the context of a criminal act. Such comprehensive tracing would require all
ammunition to be reliably traceable throughout its legal supply chain. Specifically,
15 it would require even the smallest quantity of ammunition transferred to an
individual recipient to be marked with a unique code”.

There is a need to go further than the current status quo, as in addition to the
obsoleteness of the cost argument, “no technical or technological barrier can any
longer justify the absence or inadequacy of marking”. All cartridges manufactured
in Latin America and the Caribbean – and the entire world, for that matter – should
be marked with a lot number and an identification number of the ‘smallest packaging
unit’, regardless of whether it is intended for the military or the civilian market.

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Chapter 2:
Physical Security and Destruction of Stockpiles

STOCKPILE MANAGEMENT

According to the IATGs, “The term ‘stockpile management’ refers to those procedures
and activities regarding the safe and secure accounting, storage, transportation,
handling and disposal of conventional ammunition. The objective of conventional
ammunition stockpile management is to reduce the hazard to local communities
from unplanned explosive events and to negate the risks to wider communities posed
by the uncontrolled proliferation of ammunition. Conventional ammunition stockpile
management comprises six complementary groups of activities:

A. ammunition storage
B. ammunition processing, maintenance
   and repair
C. ammunition accounting
D. ammunition demilitarization
   or destruction
E. security of ammunition stockpiles
F. transport of ammunition

A number of other enabling activities are required to support these six components
of stockpile management, including: risk assessment and planning, allocation of
resources, information management, human skills development and management
training, quality management, and the selection and use of effective, appropriate
and safe equipment.” Another crucial aspect to ammunition controls is the Physical
Security and Stockpile Management (PSSM).

In decidedly simplistic terms, stockpile safety prevents ammunition from killing people
either by blowing up, by falling into the wrong hands, or by becoming dangerous even
in the ‘right hands’ if they become unstable or fail when needed. Though stockpile
management measures can be highly technical and use expensive technologies –
particularly for explosive munitions for light weapons or conventional arms – it is
not necessarily so, especially for small arms ammunition: “PSSM isn’t rocket science,
it’s creating simple measures that have a high impact.” In fact, “relatively low levels
of donor investment in tailored infrastructure, procedural developments, and staff
training can make a significant impact on risk reduction”. Ultimately, being able
to store ammunition safely is a precondition to produce, procure, use, and hold
ammunition responsibly in the first place. Yet, “if a state has the ability to procure and use ammunition, it is also able to manage the goods safely throughout their lifecycle.”

However, proper political prioritization and some investment are urgently needed. When asked about regional ‘worst practices’, an interviewed expert from the Caribbean highlighted that “diversion prevention, which is often due to an inefficient criminal justice system where from the point of confiscation to trial to destruction the period can be years or even a decade. Stockpile management and destruction are also serious problems where the systems that exist are for the most part inefficient for properly accounting for and monitoring all weapons/ammunition.” For countries with such a low level of current practice, much work and assistance are needed: “experience has shown that it is unlikely that many states could achieve international best practice (often equated with ‘NATO standards’) of ammunition storage infrastructure without significant capital investment. Donors have, to date, shown a reluctance to fund such projects.”

As such, it suits to remember that ammunition stockpiling, if anything, may be more urgent and is more complex than that for weapons: “Practices around the world saw stockpiled weapons and ammunition being dealt with in a similar fashion, often addressing the subject with security mindset before safety principles. Common approach has been in a secure storage and set of guard, whereas ammunition needs continuous and extensive care during storage, more so than most conventional weapons. Besides the lethality factor that involves unplanned explosions and numerous victims, poor ammunition stockpile management can also lead to diversion from stockpiles through theft and illicit trade.” Likewise, inventory ‘loss’ or ‘leakage’ involving internal actors and corruption is common in Latin America and the Caribbean, so both acts of commission and omission are essential to prevention.

According to an interviewed expert from North America, “Success only comes if there is an enabling environment, consisting of structural conditions that underpin national ownership of any effective system. Those conditions are: normative framework (legislation, regulations, governing documents, etc.); a structural framework for coordination, oversight, and implementation (establishment of organizations with defined roles, responsibilities, and that have the authority necessary and can be held accountable); physical capacity to implement the process (facilities, equipment); and financial and human resources for implementing and maintaining related processes and activities. For years, nations addressed stockpile management and physical security from the ground up, at the storage level, and that approach has not work as a sustainable model. Effective ammunition stockpile and life-cycle management must be a top-down approach, to ensure it becomes institutionalized and sustainable.”

Unfortunately – as with marking, record-keeping, and tracing – there are no international binding regulations or standards, though best practice guides are likewise widely available for the physical security of ammunition stockpiles. These include the UN SaferGuard initiative and the UN IATGs, the OSCE’s ‘Best Practice Guide on Procedures for Management of Stockpiles of Conventional Ammunition’ and the ‘Best Practice Guide on Physical Security of Stockpiles of Conventional Ammunition’, and the SEESAC Ammunition and Explosives Stockpile Management, which, as mentioned, may, in some ways, be particularly germane to the Latin American and Caribbean nations. All in all, States “have access to a set of excellent standards and best practices concerning stockpile management. The key task is effective implementation, and that is to a great extent a political task. Effort toward implementation needs to be tailored to each State (and often to individual ministries and agencies within that State). Stockpile management is politically sensitive, especially when it concerns explosions and diversion of State stockpiles.”

The OSCE management document “contains information useful for those individuals currently working in ammunition storage locations and those managers involved in the chain of command over these facilities that are working to establish national policy and procedures.” More than only managing physical ammunition (including a full
physical inventory of stock annually), these guidelines also focus on the importance of managing the information relevant to the stocks, particularly regarding records and reports of loss/theft/diversion, in addition to use, particularly for security forces and private security, as false and unverified reports of use can be a smokescreen for diversion. Vetting, training, and keeping staff up-to-date, as well as accountable, for any deviation from optimal norms is also emphasized. On technical practices for stockpiling, the following items are discussed in detail: safety and storage (robustness and capacity of stockpile facilities), facility standard operating procedures, quality (condition of ammunition), and supply management (organisation of stockpiles).

As per physical security best practices, the OSCE document begins by recalling that “every holder of ammunition has a legal and moral duty of care to those it employs in the management of the ammunition and the general public that may be affected by the theft and potential use of ammunition stolen from ammunition storage facilities and from an explosive event within an ammunition storage site”. Its technical recommendations cover protection modes (ingress/egress of unauthorized persons), integrated security systems, intrusion detection systems and considerations on fencing, lighting, locks, and response to security breaches. The best practices document goes on to cover the "implementation of the stockholders duty of care", a set of requirements designed to manage risks and hazards associated with the storage and handling of ammunition and explosives by providing protection criteria to minimize loss of life, serious injury and damage to property", as follows: UN Classification of Dangerous Goods, Explosion Effects, Hazard and Risk Analysis, Hazard Mitigation, Explosives Quantity Distances, Safe Guarding of Explosive Sites, and Waivers and Exemptions.

Even more detailed are arguably the NATO ‘Allied Ammunition Storage and Transportation Publications 1 and 2’ (AASSTP-1 and 2), which are “generally regarded by technical specialists as one of the most comprehensive documents covering the principles of safe storage and transport of ammunition” and deemed “international best practice”. Likewise, the IATGs offer detailed technical knowledge over twelve series, to wit: (1) Introduction and Principles of Ammunition Management, (2) Risk Management, (3) Ammunition Accounting, (4) Explosive Facilities Storage (Field and Temporary Conditions), (5) Explosives Facilities Storage (Infrastructure and Equipment), (6) Explosive Facilities Storage (Operations), (7) Ammunition Processing, (8) Transport of Ammunition, (9) Security of Ammunition, (10) Ammunition Demilitarization and Destruction, (11) Ammunition Accidents, Reporting and Investigation, and (12) Ammunition Operational Support.

It should be once more noted, however, that the NATO standards are available in English and French (and usually are not publically available or must be purchased) and IATGs are in English and Portuguese and sometimes French; neither set of technical standards is thus accessible in Spanish. In some cases, resources from civil society organizations have attempted to fill this gap; of particular note – in addition to the aforementioned GICHD Ammunition Safety Management app – are the PSSM Best Practice Cards, developed by the Small Arms Survey, which portray essential information on playing cards available also in Portuguese, Spanish, and French.
Finally, UNLIREC can also provide technical briefing notes on ammunition controls and stockpile management, including ‘Small Arms Ammunition - Loss of Batch Key Identity’ (Note 2011/02) and ‘Surplus Ammunition’ (Note 2011/05). A constant schedule of capacity building and training activities also aims to assist the region’s governments on PSSM. Moreover, UNLIREC has “generic Standard Operating Procedures (SOPs) for stockpile management and destruction of small arms and light weapons”, including on Ammunition Storage, with several guidelines germane to ammunition stockpile management, including on Risk Management, Ammunition Storage, Security, and Transport. Tailor-made assistance in the implementation for these guidelines has so far been offered to 18 countries in the region and remains available upon request to interested states (for a compendium of UNLIREC Stockpile Management and Destruction Tools please see Annex 4).

So which of the Latin American and Caribbean nations are fully and flawlessly implementing the UN IATGs, NATO and OSCE standards? In all honesty, probably none. However, there are vastly discrepant levels of compliance with stockpile management best practices, with some countries performing much better than others. While detailed operational information is most often not made available, a potential proxy to the quality of PSSM may be the periodicity and volume of accidents and diversion. This counterfactual exercise – “no news is good news” – must be taken with a grain of salt: the lack of explosions or widely reported diversion from stocks does not necessarily indicate good PSSM, as other factors (such as sheer luck, low levels of crime, or weak press and criminal justice systems) could play a role. Conversely, however, a tendency for UEMS incidents and common ‘leaking’ from government stocks definitely indicates poor stockpile management.

In terms of UEMS incidents, as noted in the introduction, over a period of 15 years about 1.5 annual incidents occurred in Latin America and the Caribbean, though only 11 countries experienced them. Between 1979 and 2013, only three incidents were reported in the Caribbean (Cuba, the Dominican Republic, and Trinidad and Tobago), while Central America had eight (though none in Belize, Costa Rica, or Panama), and South America, a total of 23 (though none in Bolivia, Suriname, or Uruguay). In the same period, only one incident occurred at a production plant in the region, the January 2011 incident in Maracay, Venezuela, at CAVIM. In comparison with regions such as Asia, Eastern Europe, and parts of Africa, these numbers are relatively low.

Conversely, the levels of diversion (theft, criminal sale, and corruption leading to the illicit proliferation of ammunition) in the region is quite high. The possibilities for ammunition entering the illicit market can be summarized by “internal” and “external” flows. In the first case, diversion (via theft or corruption) from military and police inventories; diversion from private security companies and gun shops; purchase in gun shops by taking advantage of weak or non-existent controls (particularly for small calibre ammunition); illicit sales from ammunition factories and shops; ammunition stolen from individuals in burglaries (particularly for small calibre ammunition). For “external flows”: international trafficking networks; smuggling of ammunition purchased in neighbouring countries due to legal loopholes, as well as weak law enforcement and border controls; or international movements of ammunition after they have been diverted internally in one of the above scenarios.
In Latin America and the Caribbean, more often than not, diversion is caused by ‘weak lawmakers’ rather than ‘strong lawbreakers’.119 Relatedly, of the four usual types of ammunition trafficking (therefore across borders) in the typology put forth by Bourne and Berkol – ‘ant trade’, diversion from authorized transfers and sources, covert sponsorship by foreign governments, and large-scale black-market transfers120 – the region suffers primordially from the first two modalities. Especially relevant within both the ‘weak lawmaker’ and the predominance of theft of government stocks, liabilities surrounding stockpile management are a major source of ammunition ‘leakage’.

Perhaps most common in the region is the leaking from state ammunition holdings that dovetails the characteristics of what, for international trafficking, facilitates the ‘ant trade’ and the diversion of authorised sources. In other words, diversion from state stockpiles that tends to be more of a trickle than a river; in the case of Brazil, for example, “the modus operandi is different when it comes to diversion from the armed forces or the police. In these cases it is a network of corrupt officials that diverts boxes of ammunition little by little (three to five boxes containing 20 to 50 rounds each time). Other officials, usually retired, collect and stockpile the diverted ammunition and then distribute it to purchasers in criminal organizations.”121

Another common phenomenon stems from the lack of protocols for apprehended ammunition, which may follow several paths (police depots, judicial agencies, forensic ballistic laboratories) or be informally incorporated into police stocks, all of which makes ammunition vulnerable to diversion, misuse, or accidents. Undoubtedly, and also for ammunition,

“law enforcement has vulnerabilities that are not present in armed forces operating outside war zones. First, firearms are routinely removed from safe storage and taken out on patrol on the streets; and storage in police stations and similar establishments is dispersed and often small scale. This creates numerous difficulties for effective stockpile management and opportunities for unscrupulous people to divert guns and ammunition. Second, law enforcement is often responsible for firearms that have been seized from criminals and held as evidence. Such stocks of firearms have a high turnover which makes inventory management difficult, and are therefore vulnerable to loss, theft or corrupt sale.”122

Regardless of the magnitude, modus operandi or the illegal end-user of the diverted ammunition – which usually is domestic rather than international –, it is undeniable that “enhanced stockpile management and security is the key to ensuring that small and large leakages from state stocks do not feed illicit trafficking”.123

Such improvements, however, need not be highly expensive or complex; in the words of one interviewee expert from the Caribbean, “Without the use of high-tech stockpile management/inventory systems, the use of simple, specific and practical databases that can be used to log and retrieve information about inventory as opposed to paper-based solutions would make a significant difference. Additionally, strong leadership and supervision around all systems is necessary to ensure that the policies are enforced and procedures followed every time.”124 Another expert noted that “there are simple measures in terms of safety, security and stockpile management that could be taken into use from the IATG in most situations, e.g. simple accounting methods, small-unit storage guidelines, and temporary storage guidelines.”125

The dynamics fleshed out above suggest that many countries in Latin America and the Caribbean must urgently address both the physical security aspects of PSSM and the management measures; those that depend on staff, training, procedures, and stamping out corruption and opportunities for diversion. Even fairly safe buildings and depots can become vulnerable when the processes and openings involving (possibly criminal) human behavior are less robust. Ultimately, “more so than anything else, safe management of ammunition is about the people carrying it out, their knowledge, attitudes and skills”.126 As an expert consulted put it, “Military personnel working with ammunition in small countries can usually be counted in one hand, which is not sufficient to follow the IATGs and implement them in practice. Generally, there is goodwill to follow the IATGs, but not enough manpower to do so.”127 Indeed, as another expert noted, “There is great potential in training, targeting the lower level of storekeepers and depot managers, which could also be done by taking advantage on new forms of training delivery which scale well, especially in a linguistically homogenous environment (e.g. by providing good traditional course material, or engaging in blended or online training).”128

Despite these gaps and vulnerabilities, best practices exist in the region, particularly with external donor and technical support. Argentina, for example, in 2007, “enacted a legal requirement that the armed forces and police should report weapons found to be missing from their inventories”, an important “improvement in accountability” that was pressed for by civil society and led to a 2012 audit that found thousands of rounds of ammunition – including 1,300 from the air force – were missing.129 Indeed, this excellent example “should be considered by other States that have not yet done so. Transparency can highlight the existence of a problem and is often a first step to solving it.”130

Another marked improvement in stockpile management practices comes from the Dominican Republic, which together with UNLIREC, developed a National Action Plan for Stockpile Management and Firearms and Ammunition Destruction that included enhancing the “security of 40 weapons and ammunition stockpile facilities belonging to the Dominican Army, Navy and Air Force” and training over 50 officials in stockpile management standards and operations, making for a more sustainable PSSM programme.131 A similar project was also implemented by UNLIREC in most of the CARICOM countries, a first for ammunition PSSM efforts in the sub-region, with very good results.

Another example of productive external assistance in stockpile management comes from El Salvador, which in March 2013, partnered with Mines Advisory Group (MAG) for a project that identified ten weapons/munitions “storage facilities across the country where stockpiles are extremely vulnerable to theft” and implemented a three-month long project with El Salvador’s Armed Forces to provide “new fencing, gates, cameras, high security locks and lighting” to “reduce the likelihood of weapons and
ammunition falling into the wrong hands’. While the Salvadoran military was aware of the risks posed by poor PSSM infrastructure, their lack of resources and technical knowledge had precluded action, for which MAG provided specialist knowledge and oversight, ‘ensuring compliance with international standards’.

In Honduras, between 2013 and 2014, the US Office of Weapons Removal and Abatement allocated US$500,000 to MAG to “support physical security and stockpile management (PSSM) and SALW and munitions destruction programs”, supporting security upgrades at storage sites, destruction activities and training on both themes. The programme included a visit by the US Defense Threat Reduction Agency, which assessed the “PSSM practices and procedures at storage sites used by the national police, Ministerio Público (Public Ministry), and military”, providing recommendations on safe storage. Also in 2013, the DTRA conducted a PSSM seminar in Suriname to orient ‘28 low- to mid-level military, law enforcement, and security personnel with direct stockpile management responsibilities to international PSSM best practices’.

**DISPOSAL AND DESTRUCTION**

Keeping ammunition over time (and changing circumstances) is a continuously growing liability. Ammunition shelf life is less than that of weapons, as explosives and chemicals may degrade, becoming unsafe or unstable, eventually exploding or becoming errant or useless. Often, disposal of ammunition is a direct consequence of miscalculations made vis-à-vis other aspects of stockpile management, including determining the required levels of ammunition production or procurement. Lack of foresight and planning can become a costly miscalculation: ‘In the process of acquiring a stockpile, its future is often left unplanned. Stockpile destruction is an integral part of ammunition safety management. Fewer obsolete and expired munitions in stock means less stock and less to worry about in terms of theft, acts of sabotage or terrorism, fire in the store, or accidents to one’s own troops attempting to fire dangerous ammunition.’

Among the many ways governments dispose of their unwanted stockpiles (whether seized, surplus, obsolete, or aging), preferred methods exist. For example, some countries still choose to sell (export or re-export) or gift surplus ammunition. However, “the sale or gift of surplus ammunition is strongly discouraged by much of the international community because, in effect, it only transfers the problem elsewhere.” Others may still engage in disposal practices that are either unacceptable or less than ideal from an environmental or human security perspective, such as deep-sea dumping, landfill disposal (burying), or increased training use. Ultimately, while there are in theory and in historic practice many possibilities of disposal — or getting rid of — unwanted ammunition, the only methods that should be contemplated are indeed destruction or demilitarization.

Of all the possibilities, undoubtedly, “international security concerns, international legislation, and practical considerations, however, indicate that the most effective option remains the physical destruction of ammunition”. How to physically ‘destroy’

**DISPOSAL AND DESTRUCTION**

In terms of guidelines, arguably the best resource is IATG 10.10, ‘Demilitarization and destruction of conventional ammunition’, which as other modules runs through three levels of increasingly secure measures, and notes the importance of transparency in carrying out destruction activities. The module covers aspects, such as needed staff competencies, levels of priority for destroying different types of ammunition, and the technical aspects of different technologies, including open burning, open detonation, and industrial demilitarization (see below), in addition to topics on the management of these processes, including quality and environmental management. The technical annexes are particularly noteworthy, offering detailed guidelines on procedures and principles for Open Burning and Open Detonation (OBOD) operations, schematic layouts for disposal sites, and management blueprints.

UNLIREC has been particularly active in supporting the destruction of surplus ammunition in the region, particularly using a self-designed, UNLIREC-patented (and then donated) Small Arms Ammunition Burning Tank (SAABT), in addition to building local capacity through trainings and technical support to ensure sustainable destruction capacity.
the ammunition remains a question, as a few different methods and approaches (including ‘demilitarisation’) exist. Importantly, given its explosive components, ammunition is more difficult to destroy than firearms, and must be subject to specific methods of destruction, which depend on the amount to be disposed of and its condition. Of course, for most countries in Latin America and the Caribbean, cost considerations are important and may vary widely. According to one source, variation goes from 90 to 800 US dollars per ton for small arms ammunition and from 540 to 1,000 US dollars for medium calibre rounds.

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The OSCE’s Best Practice Guide on the Destruction of Conventional Ammunition, developed by the Netherlands, likewise offers comprehensive advice, including “arguments in favour and against each process” for destruction, and attention to the environmental repercussions of any such activity. These guidelines are particularly helpful in their didactic explanation of closed burning methods (See Annex 2 for pictures of ammunition destruction methods), such as rotary kiln furnaces (including mobile variants), fluidized bed incinerator, car bottom furnace, hot gas decontamination facility, and contained (or controlled) detonation chamber. A list of criteria is also suggested to assist in the evaluation of the best techniques to use.

Another helpful document is the UN’s Report of the Secretary-General on ‘Methods of Destruction of Small Arms, Light Weapons, Ammunition and Explosives’ from 2000. Though not as up-to-date as the standards above (given that more modern techniques have been published over the past 15 years), the report reminds to “ensure that safety takes priority over speed and short cuts” and describes most destruction methods – including open-pit and contained detonation, burning (open-pit and contained/incineration), chemical neutralization, burial on land, and firing – but importantly already jettisons deep sea-dumping as an acceptable method.

The Secretary General’s report spawned the UNODA Destruction Handbook, which though more basic than the guidelines above, usefully summarizes methods of destruction that may still be in use in some settings with limited resources (firing, burning in improvised incinerator, large-scale burning with improvised means, burning using a mobile incinerator, burning with fixed incinerator, and rotary kiln incineration). For each method, the Handbook defines desirable destruction methods for different situations, and identifies advantages and disadvantages of each one, as well as needed equipment, personnel, infrastructure, methods (‘how to’) and environmental impact.

Some of these guidelines have been operationalized into best practices in the Americas. For example, the OAS’ mobile destruction unit SEMAFORO (Sistema para la Eliminación de Municiones y Armas de Fuego – Regional) could process more than 100,000 cartridges of ammunition (up to 12.5 mm) a day using propane gas, and between 2007 and 2011 reportedly disposed of over 1,700 tons of ammunition in Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua, with financial assistance from Canada, Italy, Spain, and the USA. In Nicaragua, efforts included the destruction of more than 900 tons of surplus ammunition from the armed forces, in addition to clearance efforts around an abandoned military base, securing over 44 hectares of munitions and unexploded ordnance in December 2010. In the case of Guatemala, programmes assisted by the OAS and the Golden West Foundation destroyed over 633 tons of ammunition between 2010 and 2011; perhaps most importantly - training and capacity building assisted in making the process sustainable with a new agency for ammunition controls within the Inspectoría General.

UNLIREC has been particularly active in supporting the destruction of surplus ammunition in the region, particularly using a self-designed, UNLIREC-patented (and then donated. Small Arms Ammunition Burning Tank (SAABT), in addition to building local capacity with trainings and technical support to make destruction capability sustainable. The aforementioned SOPs contain a series on SALW Destruction that details the ‘how to’ of SAABT (03.60) and Open Burning and Open Detonation (03.80) Operations for ammunition. Destroyed small arms ammunition amounts include 2.2 tons in Guyana, 0.2 tons in Suriname (October 2013), 2.3 tons in the Bahamas (November 2012), 0.1 tons in Antigua and Barbuda (April 2013), 0.6 tons in St. Kitts and Nevis (May 2013), 1.9 tons in Barbados (May 2013) and 30 tons in the Dominican Republic. In total, over 70 tons of ammunition have reportedly been destroyed in UNLIREC-assisted efforts since 2010, which have also included Ecuador, Jamaica, Trinidad and Tobago, St. Lucia, St. Vincent & Grenadines and Grenada.

The series of destruction initiatives in the Dominican Republic between 2010 and 2013 can be particularly highlighted as an instance of best practice, given its collaborative nature (with the Ministry of Defense) and its following the jointly-developed National Action Plan for Stockpile Management and Firearms and Ammunition Destruction (part of a sub-regional effort that included 13 Caribbean nations). The UNLIREC programme – made possible by a grant from the US State Department Office for Weapons Removal and Abatement – provided both “permanent technical and human resource capacity as well as infrastructure”, enabling, like its stockpile management component, the possibility of long-term locally-driven successful implementation of international standards.
Finally, the disarmament components of the ongoing peace process in Colombia are worth monitoring and analyzing for their ammunition disposal efforts, which have reportedly already included the destruction of 1.76 million rounds.\textsuperscript{164} Given the circumstances, the UN Mission in Colombia and partners, including UNLIREC, have been destroying ammunition mostly in incinerators.\textsuperscript{165} strict safety guidelines and operational technical procedures are being implemented.\textsuperscript{165}

DEMILITARIZATION

Though at times treated as ‘state-of-the-art’, the demilitarization of small arms ammunition by now – like some of the ‘innovative’ marking techniques discussed – is quite a mature, well-known, and widely-used method. As described by the aforementioned UN Secretary General report in 2000, demilitarization

\[\text{“is a process whereby ammunition is stripped down to its component parts and recycled, using as much of the material obtained as is economically feasible. Ammunition factories are increasingly turning to demilitarization as a paying service to customers for whom other methods are not practicable. Demilitarization is a rapid method for disposing of large volumes of surplus ammunition. It is environmentally friendly, provided that the plant is equipped with the elaborate filters and scrubbers required to prevent the escape of toxic fumes. Metals are reused as scrap and high explosive ammunition fillings can be converted into explosives for industrial use. Propellants can be reused if chemically stable.”}\textsuperscript{167}

All things equal, demilitarization is generally the best option for ammunition disposal whenever economies of scale justify the capital investment. The advantages relative to other methods are manifold, including mechanical disassembly with machines (“increasing operational efficiency and also reducing risk to personnel”), incineration in environmentally controlled systems, and the “ability to operate 24 hours a day, up to 365 days a year”.\textsuperscript{168} Perceived disadvantages are “the high costs of design, project management, construction and commissioning”.\textsuperscript{169} Moreover, in terms of timing, “the development of OBOD processes will take weeks to months, whilst the development of industrial demilitarization processes can take months to years”, though this may not need be a decisive factor for the long-term.\textsuperscript{170}

The OBOD vs. demilitarization debate, however, is by no means resolved, and generally revolves around environmental vis-à-vis operational and cost issues. In some regions, some forms of destruction are prohibited on environmental grounds; for example, due to “uncontrolled pollution” the “open detonation of large stocks of ammunition is prohibited in most Western European countries”, while the “open burning of ammunition containing smoke, flare, and dye or irritating agents is forbidden in the USA and many other countries, because of the high concentrations of hazardous products that are formed during the open burning”.\textsuperscript{171} Indeed, several countries (such as Germany, the Netherlands, and Sweden have banned OBOD if alternative processes are available.\textsuperscript{172} Recently, OBOD “has fallen out of favour with many demilitarization practitioners who consider it a source of uncontrolled soil, groundwater, and air pollution. The public also views OB/OD in a negative light, citing noise and vibrations, and claiming health risks as a result of the dispersion of
in itself can be a profit-generating activity, with some specialists in the area being once amortized, are more effective and less costly”.181 Moreover, demilitarization environments often requires the building of industrial demilitarization facilities, which, be lessened: “the destruction of large stockpiles of ammunition in non-conflict However, for medium to large nations in the region, the long-term costs may only pragmatic and feasible option”.179 Moreover, there is a known “global shortage of ammunition stockpile levels, cost, location and safety may mean that OBOD is the available resources and therefore may not be a practical option. Factors such as lowmunitions that are not safe to move or safe to process industrially; surplus propellant and explosive materials that cannot easily be recycled or reused; munitions in countries where logistics are poor and the shipping of large equipment is not cost-effective; and stockpiled munitions in-theatre following a conflict”.175 As such, the decision to use these methods in the ammunition destruction efforts following Colombia’s peace agreement – or in smaller countries in the Caribbean – is entirely sensible.

The most detailed recent study of the ammunition demilitarization sector found that the industry has roughly 30 major contractors highly-concentrated in Europe and North America, especially in Germany and the US, and is therefore “generally lacking in countries that need it most”.276 Nonetheless, at least one major example of best practice comes from Latin America: CBC in Brazil conducts its own ‘in-house’ process, with machinery developed internally that automatically sort, disassemble, and separate all the components (cartridge, projectile, powder, etc.), which are then either destroyed or recycled (metals, for instance, are melted and sold back in bulk).

The machinery can be used by external clients (such as the São Paulo Military Police, which reportedly sends roughly two truckloads of ammunition per month), and has a capacity to demilitarize 1.6 tons of cartridges (or 1.2 tons of projectiles) per day.274 CBC uses two distinct types of machines in the demilitarization process: four units that strip/separate the components, and one that triturates them. Each separating unit can process 125kg of cartridges per day, and weighs about 150kg, while the triturating machine weighs about 1785kg and can process daily 3 tons of cartridges or 4.2 tons of projectiles. The joint maintenance costs for the five units runs at about USD62,000 per year.279

Some have argued that such programmes cannot be replicated elsewhere in the Americas, particularly given the costs involved and the smaller volume of ammunition processed in smaller countries. Undoubtedly, for some countries developing “purpose-built demilitarization facilities” to destroy ammunition stockpiles “will be well beyond available resources and therefore may not be a practical option. Factors such as low ammunition stockpile levels, cost, location and safety may mean that OBOD is the only pragmatic and feasible option”.275 Moreover, there is a known “global shortage of qualified personnel experienced in developing ammunition demilitarization facilities and programmes”.180

However, for medium to large nations in the region, the long-term costs may be lessened: “the destruction of large stockpiles of ammunition in non-conflict environments often requires the building of industrial demilitarization facilities, which, once amortized, are more effective and less costly”.180 Moreover, demilitarization in itself can be a profit-generating activity, with some specialists in the area being former ammunition producers. R3 (‘recovery, recycling, and reuse’) may also “offset processing costs and thus reduce the overall cost of demilitarization” as reusing scrap metal from casings such as “iron, steel, copper, brass, tin, lead, and tungsten are valuable and can be recovered and recycled for commercial purposes”.183 Indeed, recycling scrap metal is most beneficial, and, for some larger calibre ammunition, the “returns from sales of scrap are reportedly similar to the total processing costs”; for smaller calibres, “demilitarization will not generate revenue overall, but the use of R3 can help reduce costs considerably”.185

In the IATGs, a measure of cost based on experiences in Western Europe suggests a range from 101 to 529 euros per ton of small arms ammunition, though it recalls that “costs for lesser developed countries will be significantly less due to lower labour charges”.180 Moreover, “the greater the amounts of ammunition to be destroyed, the larger are the economies of scale and therefore the wider range of affordable and efficient technologies”.185

Transportation of ammunition to be demilitarized (particularly cross-border) is complex and expensive, but successful best practices have included a major operation in 2010-2011 from an Asian country to Bulgaria, which followed all security requirements and transportation standards for a total of 12,000 tons of ammunition.186 Thus, it should be noted that while the sector in the US struggles to keep up with demand, “most NATO nations have underutilized industrial demilitarization capacity”260 and could potentially receive ammunition from Latin America and the Caribbean to be demilitarized, as could potentially CBC in Brazil.

Finally, sub-regions and political groupings in the hemisphere – such as CARICOM, SICA, Mercosur and UNASUR – could contemplate building and maintaining regional demilitarization centers to receive all ammunition in need of disposal from member states, utilizing existing, yet inactive/underutilized former ammunition production plants and jointly reaping the financial, environmental and human security gains. As one interviewed expert noted, however, it is essential to reinvest the financial proceedings from the process “to support the continuation of demilitarization actives instead of back into the general budget”.185
Chapter 3: Forensic Ballistics: How Generating Strategic and Tactical Intelligence can Assist Ammunition Control

In addition to marking/tracing of firearms and ammunition, together with stockpile management/destruction, the area of forensic ballistics is vital in establishing ammunition control protocols. The firearms forensic scientist is the last in the forensic supply chain to adduce evidence. Typically, this is done after trace evidence, such as DNA and fingerprint treatment and interpretation; it is the forensic firearms scientist who can spot and collate developing trends in submissions of firearms and ammunition and establish links between shooting scenes and identifications to the guns responsible.

Analysis of spent cartridges and fired bullets, and in certain cases unfired cartridges and discharged shotgun cartridge wads, can provide vital intelligence forming a bridge between firearm violence and the identification of the conviction of the culprit.

The same analysis can be performed in jurisdictions in which legally owned firearms are subject to registration with test fired cartridges and bullets harvested from the guns and held on a central database.\(^{189}\)

**Automated Ballistic Identification Systems**

In forensic ballistics, the early 1990s were a watershed, with ‘Drugfire’, a system developed in the US under FBI direction that resulted in “a forensic imaging system that allows investigators to compare ammunition markings from a specific shooting to databases of seemingly unrelated shootings”, through a “multimedia database imaging system that automates the comparison of images of bullet cartridge cases, shell casings and bullets”.\(^{190}\) Around the same time, a similar system was developed in Canada by Forensic Technology Inc. and acquired by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), the Integrated Ballistics Identification System (IBIS),\(^{191}\) which initially was not compatible with the Drugfire system but today has become the most widely used system. IBIS has been adopted by INTERPOL in their Ballistics Information Network (IBIN).\(^{192}\)

The traditional ‘manual’ process involves the forensic firearms scientist using a technique called comparison microscopy\(^{193}\) to screen test fired cartridge cases and bullets from recovered firearms and those from crime scenes through an Open Case file (OCF).\(^{194}\) Depending on the size of the OCF, this could be a lengthy process. The big leap forward with the development of automated comparison systems, such as IBIS, is that they can store high volumes of samples and carry out the correlation process rapidly. Searching of remote digital OCFs, such as those in different jurisdictions or other agency digital OCFs, can also be carried out rapidly.

The use of automated systems has reduced the time required to search OCFs and to establish links between shooting scenes and the identification of the responsible firearms. The automated aspect of the process is the correlation; the acquisition, filtering of possible hits, and confirmation of a link or identification still requires the manual input of trained personnel. The latter requiring the use of comparison microscopy by a competent forensic firearms scientist.\(^{195, 196}\)
The use of automated comparison technology, just as the use of manual comparison microscopy, should be embedded within a Quality Management System framework with audit and assurance metrics to minimise the risk of operator and equipment error.

In basic terms, an automated ballistic identification system works through three steps, Acquisition, Correlation and Assessment.

In the case of IBIS, the process is as follows:
1. the sample(s) are acquired, or loaded, onto the system by a competent person using the Data Acquisition Station (DAS), the technical and metadata of the case and the images of each of the marks on the selected bullet(s) and cartridge cases are uploaded;
2. a ‘correlation is performed by the system, which results in the display of an ordered ‘hit list’ of possible matches, the highest of which are then assessed with comparison microscopy by a competent firearms examiner;
3. a ‘hit’ occurs when the ballistic expert confirms a match, using comparison microscopy, recording it as such in the system and reporting ‘it’ to the appropriate authorities.

The success rate in finding hits is typically greater with cartridge cases than bullets, this is because bullets can be severely damaged when they strike hard objects. However, the technology is improving all the time to deal with this.

IBIS models currently available include so-called 3D imaging, and older systems referred to as 2D. According to a representative from Ultra Electronics Forensic Technology Inc. (the current manufacturer of IBIS), configurations are very flexible, including systems with acquisition capacity for only cartridge cases or only bullets – or both; some options include servers, others do not and some use the Interpol server. Depending on the configurations, an IBIS system currently may be purchased starting at US$150,000, while those with more complex capabilities may cost up to US$1 million, the former probably being a better fit for most countries in the Americas in terms of resources, needs, and priorities. It should be further noted, however, that in addition to the equipment itself, it is essential that countries prepare for long-term investment around them, not only in trained staff to operate them, but also ongoing budget allocations for maintenance, continued licenses, and other structural and IT needs to keep systems going and networked for optimal results. Investment is also needed for the development of a Quality Management System.

Indeed, one interviewed expert from Central America noted that while IBIS is widespread in the sub-region (reportedly only Nicaragua uses a different system), many systems were donated by external actors and “licenses for the software are very expensive for some governments, some of which have been forced to stop feeding the system because they were unable to purchase the licenses.” At least in the case of one agency in the Dominican Republic, reportedly using the ALIAS from Pyramidal Technologies, the system is operated using open (free) software, according to the manufacturer, because it “doesn’t require any licensing fees, over time ALIAS can end up costing a third as much as a similar system.” Moreover, Pyramidal argues the technology is supposedly superior, made to run faster (on Mac computers, UNIX) and offering better 3D resolution, rendering “the most advanced yet cost-effective ballistics analysis system on the market.”

Other automated systems are also available e.g. Evofinder manufactured by ScanBl Technology whose website states that it is installed in over 20 countries across the world. However, it is noteworthy that the existing different systems are currently not compatible, precluding law enforcement authorities from sharing information electronically with entities using the competitor’s equipment. For example, in the case of the aforementioned agency from the Dominican Republic, the Ballistics and Biometric Laboratory of the National Arms System (LABBS) has a different system than the Scientific Police, which uses IBIS, therefore necessitating the use of “double-casting” (see below) for ballistic comparison purposes.

Regardless of the brand, the technology as a whole has matured and become widespread in the hemisphere; by 2010, 63 IBIS labs already operated in Latin America and the Caribbean, in 14 countries or territories. Today, the majority of the countries in the hemisphere use at least one IBIS system, with several nations ‘joining the club’ in the last several years such as Peru (2012), Paraguay (2013), and Honduras (2015). As of 2012, 87 sites operated in 22 countries in the region; among them, Mexico was by far the largest user with 47 sites – more than all the other Latin American and Caribbean countries combined.

Already in mid-2014, Mexico had reportedly reached the mark of 3,000 ‘hits’ between ballistic evidence and criminal cases at the Procuraduría General de la República (PGR), which at the time was receiving between 1,500 and 2,000 ballistic requests per month, processed by its 19 in-house forensic experts or its 104 across American and Caribbean countries combined.

INTERNATIONAL GUIDELINES, STANDARDS, AND PRACTICES

In terms of international guidelines and standards, the most important efforts come from police organizations, particularly Interpol, which manages the IBIN. Of the current 28 IBIN members, almost half are from Latin America and the Caribbean: Barbados, Belize, Chile, Ecuador, Guatemala, Jamaica, Mexico, Paraguay, Peru, Honduras, Trinidad and Tobago, and Colombia. Other nations should continue this trend of the region’s prominence and consider joining as soon as possible.

IBIN is a public-private association between Interpol and the system manufacturer, with an IBIS Correlation Server located at Interpol’s headquarters in Lyon, France. IBIN is the “only large-scale international ballistic data sharing network in the world”, which can allow “police to develop new investigative leads based on ballistic cross-comparison and to find connections between separate crime scenes from different countries that could have otherwise remained undetected.” While IBIS “has enabled
IBIN allows police to detect these links in an international arena.215 However, in addition to its still fairly low participation among countries, IBIN’s parameters allow shared data for casings recovered in specific locations and circumstances (including ‘within 80 kilometers of international borders’, ‘from suspected traffickers’, ‘related to terrorist activities’ or ‘from persons with a residence in another country’).216 This searching protocol optimizes the chances of a positive correlation whilst not generating vast amounts of unnecessary work for the system operators and firearms forensic scientists.

IBIN’s accompanying Handbook on the Collection and Sharing of Ballistics Data217 - helpfully available in Arabic, English, French and Spanish – serves as an important international document for forensic ballistics. Indeed, the Handbook is not only ‘a guide to getting involved with the programme, providing information on how to join the network and maintain membership. Most importantly, this manual is a handbook on how to use IBIN, allowing users to operate the network at the highest level of potential’.218

It should be noted, however, that in addition to following a long list of requirements, responsibilities and agreements, countries must have IBIS equipment to join IBIN and up-to-date ‘Safeguard Extended Warranty and Protection Plan’ (i.e. license and maintenance fee) to continue to access the system, therefore creating a prerequisite that has significant costs, even if these are decreasing over the years.219 Still, “countries that do not use IBIS technology or have different ballistic technology, can equally benefit from the IBIN international ballistics data reserve by transmitting replica moulds of the ballistic tests”.220 This technique, known as ‘double-casting’ or ‘ballistic cloning’, renders “microscopic quality replica” from the ballistic evidence.221 ‘Double-casting’ is a two step-process that requires a silicone mould to be made with the recovered fired projectiles or cartridge cases, and then making a resin cast using said mould. The resulting microscopic quality resin replicas of projectiles and/or cartridge cases can be uploaded to a ballistics information network and/or shared with judicial proceedings across jurisdictions for comparison without affecting the chain of custody or jeopardizing original evidence and circumventing bureaucratic hurdles. As such, ‘double-casting’ increases law enforcement’s ability to make connections between crimes and crime scenes, nationally and internationally.

For example, since receiving training and equipment from UNLIREC, authorities from Belize have shared double casts with neighbouring Guatemala in a criminal proceeding where the recovered firearm was marked with ‘GUA’. This allowed authorities from Guatemala to upload the double cast to their automated ballistics network and run a correlation against ballistic fingerprints stored in their criminal records.

The US’ National Integrated Ballistic Information Network (NIBIN), is “the only interstate automated ballistic imaging network in operation in the United States and is available to most major population centers in the United States”.222 Since 1999, the NIBIN system has reportedly captured “approximately 2.8 million images of ballistic evidence and
confirmed more than 74,000 NIBIN hits, but the true performance metric of NIBIN is the successful arrest and prosecution of shooters”.223 Success stories in bridging forensic and the conviction of criminals are multiple across the US,224 and at least one study has found the use of IBIS to be “effective”.225 As a comparison, the US (including Puerto Rico) has almost half of all the IBIS sites in the entire world,226 in addition to mobile units, such as the ATF van recently brought to tackle a surge of firearm-related homicides in Baltimore.227 Despite this reported success,228 however, the US has seen many critiques regarding NIBIN, though most of them focus on the system being underutilized, particularly given lack of manpower and proper investment, as encapsulated in a recent headline: ‘This Machine Could Prevent Gun Violence - If Only Cops Used It”.229

The UK has a similar integrated national system operated by the National Ballistics Intelligence Service.230

REGIONAL AND SUB-REGIONAL PRACTICES

Best practices elsewhere in the Americas, the Caribbean, Central America and Mexico (as aforementioned) are in relative terms active hubs of ballistics efforts, “having given due importance to the theme of forensic ballistics and information”, in the words of one interviewed expert.231 An example of such prioritization was the establishment, in 2014, of RIBIN (Regional Integrated Ballistic Information Network) to, at least in theory, “enable CARICOM Member States to capture, analyse and share ballistic data and increase the efficiency of investigations and significantly improve the conviction rates of persons”.232 Reportedly, upon request, Caribbean nations may also “join parts of the NIBIN network”.233 Connected with Interpol’s IBIN servers initially through Barbados, Belize and Jamaica, RIBIN has also been relevant to CARICOM IMPACS (Implementation Agency for Crime and Security),234 which delivered has provided some capacity-building workshops on operational aspects, such as Quality Management Systems (QMS) for forensic laboratories.235

Sub-regional efforts have also been strengthened by UNLIREC’s Caribbean Operational Forensic Ballistics Assistance Package, a programme supported by Canada and the USA to provide a range of improvements, including infrastructure, technology, and knowledge to eight States in the region. Related efforts have the donation of an IBIS BulletTrax™ system for Jamaica and basic forensic ballistics equipment to all project beneficiary States, refurbishing an indoor shooting range at the Trinidad and Tobago Forensic Science Centre, designing two containerized shooting ranges for their consequent donation, and assisting other States with their own refurbishment efforts.236

In addition, UNLIREC has carried out baseline assessments and developed technical recommendations with expert advice for all participating States; donated nine sets of double-casting equipment and provided technical training on their use based on the Interpol-developed methodology; implemented two shooting incident reconstruction courses and five Firearms and Ammunition Evidence Management Courses, carried out competency testing activities and collaborative exercises with all eight States, organized several regional forensic ballistic encounters and seminars with representatives from across the Caribbean and Central America, created an online hub for information sharing in partnership with the Caribbean Basin Security Initiative (CBSI)-Connect and delivered nine webinars available to all participating States, developed 17 Standardized Operating Procedures (SOPs), and trained all participating States on their use to improve and establish an overarching QMS for forensic ballistics laboratories, including health and safety measures. In the next phase of the project, UNLIREC aims to help States to reduce backlogs in forensic ballistics, plan for succession planning, create OCFs where absent, develop better intelligence-generating mechanisms to fight impunity in firearms-related crimes, facilitate inter-institutional coordination to better prosecute offenders and carry out criminal proceedings, and continue to deliver training to strengthen forensic examiners competencies and institutional capacities.

One of the technical courses on forensic ballistics matters is the Firearms and Ammunition Evidence Management Course (EMC), which brings together national justice and law enforcement participants, including public prosecutors, firearms examiners, forensic laboratory personnel, evidence technicians, scenes of crimes and intelligence police officers and covers, for instance, ‘Examination and Analysis of Ballistic Evidence in the Laboratory’ (Module 5) and ‘Intelligence and Investigation Tools’ (Module 6). Module 5 provides detailed information on comparison microscopy, but also for what it calls Automated Ballistic Identification Systems, which - in addition to IBIS - include systems used in Russia, Eastern Europe, Turkey and the systems ‘Evofinder’ and ALIAS. Finally, the Module explains how to create an expert report in

SOURCE: UNLIREC
forensic ballistics, how to perform as a ballistics expert in court, and how to develop a Forensic Ballistics Strategy.

A particular interesting case refers to Barbados and other Eastern Caribbean nations based on field observations from UNLIREC in 2017. Barbados assists Eastern Caribbean States, on request, with ballistic evidence examination and analysis with its IBIS system, conducted by the Firearms Examiners Unit of the Royal Barbados Police Force (RBPF), though the “current relationship... appears ad hoc, with no fixed documented system in place”. The study found that assistance is often governed by financial cycles, as states send casework to Barbados “in bulk, towards the end of the financial year, when funds are available”. The case study concludes that “a formal memorandum of understanding is required between states that submit either physical evidence or double-casts and the uploading ABIS State [in this case, Barbados]. Where states have trained and competent firearms examiners and comparison microscopy facilities, but no ABIS, a physical OCF should be created to enable real time intelligence to be generated”.

The use of automated systems used by competent forensic firearms scientists coupled with mechanisms and protocols, which allow for the rapid dissemination of intelligence to relevant stakeholders can only improve a jurisdiction’s response in tackling firearm-related crime.

In addition to any automated system, physical well organized OCFs need to be in place to facilitate the rapid determination of crime scene links and the identification of the responsible firearm.

It is essential to acknowledge that the role of the firearms forensic scientist is not simply to produce evidence. The provision of intelligence is of equal importance, not only to inform investigators, but also to provide a strategic overview to policy makers. Forensic ballistics intelligence goes further than the simple ability to link firearms to shooting scenes, it can provide a pivotal role in the ability to spot and flag developing trends, such as the use of new types of firearms, ammunition and their modus operandi. All of this can provide insight into the use, distribution and prevalence of specific firearms and ammunition.

Single points of contact should be encouraged within forensic firearms facilities to collate information on links and developing trends. As well, protocols need to be in place for the sharing of this information.

Effective intelligence leads not only to convictions, but also creates broader intelligence for law enforcement and judicial authorities enabling pro-active and not reactive responses to be developed.

Left unanalyzed for patterns and trends, forensic ballistic data will not provide the broader picture of the criminal proliferation and trafficking of firearms and ammunition. This huge potential, will not be fully realized without the investment of political and financial capital into the necessary human and physical resources, which is yet to occur in many countries in the Americas.
1. A/54/155, p.10.
2. Ibid, pp.10-11.
5. Project%20Documents%20/Small%20Arms%20%26%20Light%20%26%20Weapons.pdf.
10. See also www.cartridgecollectors.org/headstampcodes.
12. See Arts. 25 and 27.
14. A next step is to set the detailed technical and administrative regulations that bridge the law and the real world. For the case of Brazil, see: www.dfpce.mil.br/index.php?limitas-noticias/10-menu-de-2-nivel/1470-municacao.
16. For an explanation of how the system was foreseen, see Associaçao Nacional dos Peritos Criminals Federais, Balistica Forense: Governo quer controlar as armas no Brasil, Persica Federal, No 1, September-October 2003. Available from www.amcp.org.br/Portais/0/revistaAPC/15.pdf.
17. See also the results of the obstacles that have precluded its realization, see Sou da Paz, Implementacao do estatuto do desarmamento, pp.135-136.
20. Employee’s visit to CBC, Ribeirão Pires, São Paulo, December 2017.
21. Ibid.
23. Of the large apprehension operations reported, the only one mentioning the manufacturer was a seizure of 3,462.9mm rounds also from CBC, while they were reportedly found with a trafficker and a military policeman, the ammunition did not have lot markings, suggesting it would not have come from CBC.
65. Ibid.
66. These include issuance and expiration date of licenses and authorizations, point of departure and arrival, identification of countries of import and transit, identification of final recipient and end user, delivery date, classification, description and quantity of the shipment and broker information. Available from www.oas.org/juridico/english/cits_mod_leg_markings.pdf.
67. Ibid.
70. Ibid.
72. Ibid., p.87.
73. For a detailed discussion, see Small Arms Survey, Ammunition Marking, p.10.
74. Ibid., p.10.
76. Small Arms Survey, Ammunition Marking, p.10.
79. Ibid., p.2.
81. Total CBC investment was USD1.5 million for 15 machines, which take about a month to install. Email communication with CBC officials, February 2018. At least in the European market, laser-marking equipment has been noted to cost as much as USD100,000, but as little as USD18,700 depending on the technical specifications. Schroeder, “New technologies and small arms control”, p.77.
82. In Brazilian reais, R$30,000.
83. Author’s visit to CBC, Ribeirão Pires, São Paulo, December 2017.
84. Author’s e-mail communication with CBC officials, February 2018.
85. Ibid.
86. Ibid.
88. Ibid., p.23.
89. Small Arms Survey. Targeting Ammunition, p.47.
90. Ibid., p.39. For ‘light’ weapons, or generally ‘weapons of war’, other developments are underway, including ‘airburst munitions’ and electronically-initiated fire.
92. Martind and Berko, The Traceability of Ammunition, p.5.
96. Paujila, “Good Practice in Physical Security and Stockpile Management”.
97. Author’s e-mail communication, December 2017.
104. Ibid., p.41.
105. Ibid., p.50.
113. Full test available from UNLIREC upon request.
117. Ibid., p.22.
120. Small Arms Survey, Targeting Ammunition, p.104.
122. Marsh & Dube, Preventing Diversion, p.6.
124. Author’s email communication, December 2017.
125. Ibid.
126. Ibid.
127. Author’s e-mail communication, December 2017.
128. Ibid.
129. The ‘national emergency’ Law 26.216; and Marsh & Dube, Preventing Diversion, pp.5-6.
130. Ibid., p.6.
133. Ibid. Interestingly, El Salvador is the only nation from the Americas mentioned among the 16 countries with recent MAG operations, while Colombia was the only among 25 countries that saw past operations, though focused exclusively on landmines. See, for example, http://archive.magenternational.org/where-we-work/.
135. Ibid.
136. Paujila, “Good Practice in Physical Security and Stockpile Management”.
138. For description and pros and cons of each method, see UN SafeGuard, Guide to the International
Ammunition Technical Guidelines (IATG), p.2. For the toxic environmental impacts of these methods, see OSCE, OSCE Handbook of Best Practices on Conventional Ammunition, p.148.

140. For a summary of ammunition destruction technologies, see Wilkinson, “The Three Ds”, pp. 278-282. For examples of ammunition destruction projects (with costs), see pp.284-286.

141. Ibid, p.262.


143. UN SaferGuard, International Ammunition Technical Guideline.

144. OSCE, OSCE Handbook of Best Practices on Conventional Ammunition, p.147.


146. Ibid, p.160.


154. UNLIREC Standard Operating Procedures (SOPs). The modules include, respectively: Terms and definitions/General/SABT design/Ammunition types authorized for burning/Safety/SAA destruction operations/Ammunition accounting guidance (loose rounds); and Terms and definitions/General/Priorities and principles/Authority for disposal/Persoons authorized to carry out disposal/Methods of local disposal – general/Siting of disposal sites/Approval of disposal sites and SOPs/Planning and preparation/Conduct of disposals. SOPs are available from UNLIREC upon request.


156. www.unlirec.org/noticias_det_eng.aspx?id=84


166. UN SaferGuard, International Ammunition Technical Guideline, p.9.

167. Ibid, p.15.


175. Ibid, p.199.

176. Author’s email communication, December 2017.

177. Author’s email communication, December 2017.

178. Ibid., p.187.

179. Author’s visit to CBC, Ribeirão Preto, São Paulo, December 2017.


182. Ibid, p.207.


186. Ibid, p.199.


188. Author’s email communication, December 2017.

189. It should be noted that the real world application of the creation of databases from legally held firearms has been criticized, in some cases even deemed a complete “failure”. Erin Cox, “Mary-land scraps gun “fingerprint” database after 15 failed years”, Baltimore Sun, 7 November 2015. Available from www.baltimoresun.com/news/maryland/bs-md-gun-fingerprint-20151107-story.html.


193. A companion microscope is essentially two microscopes connected to an optical bridge which allows the viewer to observe two objects simultaneously with the same degree of magnification. This instrument can have a monocular or binocular eyepiece. May also be referred to as a companion microscope.

194. An OCF consists of an organised collection of live cartridge cases, fired cartridge cases, fired bullets and shotgun wads, recovered from the scenes of firearms related crime that can be linked to other ammunition components or guns to determine a link or evidence of the previous use of a gun in crime. UNLIREC Evidence Management Course Module 5, p. 30. Full text available from UNLIREC upon request.

195. UNLIREC Evidence Management Course Module 6, p. 24. Full text available from UNLIREC upon request.


197. Author’s email communication with Regional Sales Director, Ultra Electronics Forensic Technology inc., 16 January 2018.

198. Ibid.

199. Author’s email communication, December 2017.


204. http://www.scm.oas.org/odps/2010/01/CIFTA/FORENSIC1.PPT. At the time, the following coun-tries had the technology (with the number of laboratories in brackets): Brazil (6), Colombia (6), Chile, Curacao, Ecuador (8), El Salvador (3), Honduras (2), Jamaica (5), Mexico (19), Puerto Rico (2), Dominican Republic (3), Trinidad and Tobago, and Venezuela (5).

205. See map at www.ultra-forensictech.com/about. Holdouts include Uruguay, Bolivia, Suriname, Guyana and Nicaragua. For a view of the equipment and processes used during an IBIS investigation, see: www.youtube.com/watch?v=e8HR5TxlPMc. For the corporate video, see: www.youtube.com/watch?v=EB9G4ae412w.


208. Ibid., p.199.


210. For some of the forensic ballistic efforts in Mexico, see XXIII Sesión Consejo de Seguridad


212. www.interpol.int/Crime-areas/Firearms-trafficking/INTERPOL-Balistic-Information-Network-NIBIN.

213. Though the last three countries are currently pending connection: www.interpol.int/Media/Files/Crime-areas/Firearms/IBIN-countries.

214. www.interpol.int/Crime-areas/Firearms-trafficking/INTERPOL-Balistic-Information-Network-NIBIN.


216. Ibid.

217. Ibid.


220. UNLIREC Evidence Management Course Module 5, p. 31. Full text available from UNLIREC upon request.

221. Ibid. UNLIREC has also developed, based on the Interpol methodology, a detailed Standardized Operating Procedure (SOP) on double casting, which is available as an Annex to EMC Module 6 and it is available upon request.


224. For examples, see: www.atf.gov/firearms/success-stories.


226. 128 (ATF) + 45 (local police forces) = 173 IBIS sites in the US, against a total of 364 world-wide. UNLIREC, Evidence Management Course Module 5, Table 2, pp. 55-56. Full text available from UNLIREC upon request.


231. Author’s email communication, December 2017

232. UNLIREC Evidence Management Course Module 6, p 8


234. One such workshop, hosted by UNLIREC, IMPACS and Trinidad and Tobago in December 2016 included participants from ‘Permanent Secretaries, Directors of Civilian Forensic Laboratory-ies, Heads of Police Crime Laboratories, Senior Firearms Examiners and other policy personnel from: Antigua and Barbuda, Bahamas, Barbados, Belize, Cayman Islands, Dominica, Domini-can-republic, Grenada, Guayana, Jamaica, Suriname, St Kitts and Nevis, St Lucia, St Vincent, and Trinidad and Tobago’. www.caricomimpacs.org/Portals/0/Project%20Documents/Regional%20Integrated%20Balistic%20Information%20Network%20RIBIN.pdf. See also www.unlirec.org/noticias_det_eng.aspx?id=203.


236. UNLIREC Evidence Management Course Module 6, pp. 30-32. Full text available from UNLIREC upon request.

237. UNLIREC Evidence Management Course Module 6, p. 31. Full text available from UNLIREC upon request.

238. Ibid.

239. Ibid.

240. For a cautionary tale from the US, see Beth Schwartzapel, “This Machine Could Prevent Gun Violence”. 

241. www.caricomimpacs.org/Portals/0/Project%20Documents/Regional%20Integrated%20Balistic%20Information%20Network%20RIBIN.pdf. For RIBIN’s Leadership Board, see http://caricom.org/
The Way Forward

Conducting a gap analysis on ammunition controls – sketching a contrast between current practices in Latin America and the Caribbean and international best practices – leads to the conclusion that the region has its work cut out for it, and still has a ways to go until reaching optimal levels on themes, such as marking, tracing, stockpile management, destruction, and forensic ballistics, to name a few covered by this paper. The gap, however, is less dramatic than it may appear, as a few feasible changes, from political attention to investment to policy choices in the said areas, could bridge these differences in relatively short order.

As discussed, these changes are not impossible neither from a technical nor a financial standpoint. While ideal best practices, as implemented in parts of North America or northern Europe, may still realistically be out of reach in terms of technology or costs, both the “how to” and the “how much” of most standards and innovations discussed herein are feasible and within reach for most countries in the region. Where the gap may be more of a chasm, focused support from the international community and foreign donors would - in all cases - allow for bringing practices and infrastructure up to basic international standards (think Level 1 of IATGs, for instance, if not Level 3).

As noted, what is often perceived as state-of-the-art innovations using complex, expensive technologies – such as cartridge laser-marking or demilitarization of ammunition – are actually quite mature, well-known, and widely-used methods that are common in other sectors. Accordingly, the costs of said innovations are often less than assumed, and have decreased in recent years, even if strictly on a financial basis. However, a proper calculation of all costs (and risks) involved, including not only financial aspects and not only on the short-term, makes innovative technologies probably cheaper than their traditional counterparts.

Economies of scale can be created by international cooperation as well; for example, a group of nations in a sub-region may collaborate and pool resources to develop a hub for ammunition demilitarization they can all benefit from but that none can afford or justify individually. Finally, as ultimately dealing with human lives and dangerous materials, saving pennies may result in losing millions. For example, an ammunition explosion in Bharatpur (India) in April 2000, “resulted in an estimated ammunition stock loss of USD 90 million”, in addition to its human and environmental impacts, which we would argue must also be included in the calculation. Amazingly, “the explosion was the result of a fire at the ammunition depot, which was exacerbated by excessive vegetation. Ironically, the grass had not been cut for two years as a cost-saving measure.”
In terms of policy prescriptions, a first important step is to disaggregate the commonly-used term "SALW and their ammunition"; in operational aspects, such a conflation absconds four different phenomena that — while full of similarities — are by no means exactly the same, and thus need specific policies to tackle them. In some ways, ammunition for light weapons shares more characteristics with munitions for conventional weapons and military explosives than with its smaller counterparts. The following recommendations, therefore, refer solely to the category small arms ammunition, and intend to be implementable and cost-effective to implement, often being political decisions or simple measures that do not require extensive financial investments.

Recommen\-\dions for Latin American and Caribbean Governments:

POLITICS AND DIPLOMACY
- Invest political capital in the creation of global political will for greater ammunition controls, in recognition that the Americas suffer disproportionate harm from lax international regulations and practices;
- Consider pushing for the creation of new international instruments — and/or plugging the holes in the ones that already exist, but have omitted ammunition controls:
  - In the buildup to, and during, the June 2018 PoA RevCon3, make a concerted effort to remedy the obvious anomaly of the instrument's omission of ammunition; you recall that the 2005 United Nations General Assembly's promise that ammunition would "be addressed in a comprehensive manner as part of a separate process conducted within the framework of the United Nations" has not yet been fulfilled;4
  - Consider the urgent need for a comprehensive and ambitious approach to ammunition controls, which could include an international, legally-binding instrument for the full life-cycle of ammunition (from production to destruction), including mandatory universal standards for marking, record-keeping, tracing, robust stockpile management, surplus definition, and destruction, inter alia; and
  - Support, while rendering more germane to Latin America and the Caribbean (and thus more comprehensive), diplomatic proposals attempting to pave new avenues in ammunition controls at the UN, such as Germany's proposal to convene a new Group of Governmental Experts (GGE) on ammunition in 2020.5
- Fully implement obligations and commitments regarding ammunition under existing international instruments, including the Firearms Protocol6 and the Arms Trade Treaty;7
- Ensure Whole-of-Government Approach to ammunition control discussions and decision-making, ending the separation between those who participate in international fora and those charged with implementing norms nationally as if two distinct worlds; as per one Caribbean expert interviewed: "we should begin to shift the way we discuss and identify solutions to a more inclusive approach instead of working in silos [...] Representatives not just from the political level but also technical (forensic experts, firearms experts), law enforcement and regulators all have a very important contribution to make in developing initiatives and recommending legislation and policies for better ammunition control based on their experience at different levels";
- "Continue to further political interest and promote the active implementation of regional and sub-regional agreements pertaining to ammunition, particularly CIFTA, in light of the "Declaration of Mexico" which commemorates the Twentieth Anniversary of the CIFTA and reaffirms the importance of the Convention and its implementation, as well as this year's IV Conference of State Parties and its resulting "Course of Action 2018-2022" for CIFTA's operation and implementation, which includes commitments and measures to strengthen marking, tracing and stockpile management, among others";8
- Ensure that a proper national normative framework for ammunition controls exists, reflects current best practices, and is duly implemented. In other words, States are encouraged not to limit their actions to having relevant legislation in place, but rather recognize ammunition controls an an ongoing, long-term and daily labour;
- Install a culture of restraint when it comes to all aspects of ammunition: whether for production, export, stockpiling or use, "as little as possible" should determine a nation's approach to small arms ammunition; avoiding particularly a situation where economic interests surpass and undermine human security imperatives;
- Tackle ammunition diversion from government stockpiles as an urgent priority, particularly the management measures that depend on staff, training, procedures and stamping out corruption and opportunities for diversion, duly investing in the training of ammunition control experts, national curricula, and certified experts on aspects, such as ammunition destruction; and
- Increase transparency in the sector, through practice and regulation, as it is not only the production and trade in ammunition that is particularly opaque worldwide, but also the availability and exchange of information vis-a-vis national ammunition controls, rules, and procedures.

OPERATIONS
MARKING, TRACING AND DIVERSION PREVENTION
- Determine and ensure that all ammunition — both cartridges and packages — produced (particularly by State-owned factories), imported, and stockpiled, is duly marked and recorded;
- Determine and ensure lot marking on ammunition cartridges also for the civilian market, so that all cartridges manufactured in (or imported to) Latin America and
the Caribbean be marked with a lot number and an identification number on the smallest packaging unit, regardless if for the military or civilian market;

- Engage in systematic tracing efforts, nationally and internationally, both using available tools and innovations most helpful in precluding diversion and considering that "an international standard to improve the ability of states to trace the initial transfer of ammunition produced under contract with a state actor could make a considerable contribution to combating illicit ammunition flows";13

- For ammunition producing countries:
  - Strive to join international instances of quality control and proofing, such as the Permanent International Commission for Firearms Testing (CIP)2 or others, as appropriate; 12
  - Regardless of production volume, consider using laser-marking technology for cartridges, in order to ensure and gain the ability to carry out post-production lot marking in all cases; and
  - Strictly regulate and create norms for the use of new materials (particularly polymers) and technologies in ammunition development and production.

**PHYSICAL SECURITY AND DESTRUCTION OF STOCKPILES**

- Duly implement the IATGs seeking to reach Level 3 standards as feasible, but ensuring Level 1 compliance as a minimum requirement of basic governance and State responsibility;

- All states in the region that have not yet done so should conclude the online self-assessment to estimate risk of their stockpiles, the Risk Reduction Process Level (RRPL) from UN SafeGuard (https://www.un.org/disarmament/un-saferguard/risk-reduction-process-levels/) and take all resulting necessary measures;

- Commit - at the highest political and budgetary levels - never to cut corners on stockpile safety, earmarking proper infrastructure and personnel resources as an investment in human security with financial dividends, rather than simply as a sunk cost;

- Consider taking up and championing a proposal made by the Peace Research Institute Oslo (PRIO) to enhance the current "patchwork of existing agreements" with an "informal international process on stockpile management", designed "to better coordinate those governments and organizations interested in stockpile management, and to encourage greater participation among those that have not focused upon the issue already";15

- Urgently define, account and destroy all surplus ammunition stockpiles, recognizing that while "States procure more conventional ammunition than they use",14 once ammunition has been produced, imported, or confiscated, it is the State’s responsibility (particularly of the judicial system when ammunition is apprehended) to ensure it cannot harm its citizens in accidents or as a result of diversion. As such, the most dangerous or vulnerable stocks must be prioritized;

- Install normative and/or policy directives entirely banning the practices of re-export, gifting, or dumping of ammunition, on environmental and human security grounds. If a State produces or procures ammunition, it is ultimately responsible for its safe and sound destruction;20 and

- Demilitarize ammunition and recycle components whenever disposal options permit, rendering it obligatory for all countries that produce ammunition, particularly in State-owned factories.

**FORENSIC BALLISTICS**

- Aim to harmonise Automated Ballistic Identification System acquisition and searching protocols in the region, focusing on cooperation across jurisdictions. Setting up of sub-regional Centre of Excellence where evidence could be processed for multiple member states should be contemplated as a way forward;

- Nations that already have IBIS stations should continue the region’s prominence in the international IBIN (Interpol) network and join as soon as possible;

- Effective intelligence leads not only to convictions, but also creates broader intelligence for law enforcement and judicial authorities enabling pro-active and not reactive responses. Establishing and optimising the use of double-casting, the collation of small arms submission trends and developments and the effective searching of physical and digital Open Case Files will enhance the provision of both tactical and strategic intelligence; and

- This huge potential will not be fully realized without the investment of political and financial capital into the necessary human and physical resources.

**Recommendations for Sub-Regional and Regional Bodies:**

- Sub-regions and political groupings in the hemisphere – such as CARICOM, SICA, Mercosur, Andean Community, and UNASUR – should consider building and maintaining regional Centre of Excellence for aspects of ammunition controls, such as demilitarization, forensic ballistics and marking/tracing, in addition to instituting secretariats or coordinating instances for international cooperation, including annual regional conferences for ammunition control authorities and experts, which can "help develop and maintain contacts and foster relationships", as noted by one interviewed expert;

- Revitalize instruments, processes, and engagement in small arms ammunition controls, also as a potential spark for other aspects of SALW control that have remained relatively dormant in recent years (see CIFTA/OAS recommendation above); such re-engagement may include reviewing "long ago developed
best-practice guidelines […] in light of new international measures, such as the International Ammunition Technical Guidelines (IATG), in addition to ensuring that the best guidelines and standards worldwide are available in all languages germane to the hemisphere; and

- Consider that an aforementioned new global instrument “does not have to necessarily emerge – at least originally – from the UN. In fact, the avenue of a regional or sub-regional cornerstone, to be joined later by other regional ‘building blocks’ is also feasible.”

### Recommendations for the UN System and Donor Countries:

- Provide for the urgent translation of the IATGs into Spanish;
- Politically prioritise stockpile management and ammunition destruction in Latin America and the Caribbean;
- Drastically increase funding for ammunition controls in the region, duly demanding national ownership and commitment at the highest possible level to programme and policy sustainability as a quid pro quo;
- Significantly increase investment particularly in destruction programmes, recognizing that “there are currently insufficient donor resources to make more than a small dent in the global stockpile of ammunition that needs to be disposed of”, and
- Seek a low-cost technological solution to integrate laser-marking for cartridges in (State-owned) factories with a lesser level of production automatization.

### Recommendations for Civil Society:

- Fully re-engage and prioritise the issue of ammunition controls, independent of whether it is in a political or diplomatic forum, or low or high level of a governmental forum (local, national, regional, or global). In the absence of determined, knowledgeable, and strategic action by civil society organisations in the region, the recommendations above may face unsurmountable obstacles from economic and political pressures, or simply from the power of inertia and the status quo.
## ANNEX

### Annex 1

**IBIS Use Across the Americas**
(Adapted from Table 2, UNLIREC EMC Module 5)

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<td>Belize</td>
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<td>Brazil</td>
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Total Number of IBIS Sites – Latin America and the Caribbean: **87**
Annex 2

Ammunition Destruction Methods

Small Arms Ammunition ‘Burning Tank’ (SAABT)

Field Expedient Method

Source: UNLIREC
## Annex 3

**Legally Binding International Instruments on Conventional Weapons (ATT - CIFTA - PAF) Status of Ratification in Latin America and The Caribbean**

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Note: The International Tracing Instrument (ITI) is a politically binding instrument and an important reference for the effective implementation of the ATT. UNSCR 1540 is a legally binding instrument for all United Nations member states.

Annex 4

Compendium of UNLIREC Stockpile Management and Destruction Tools

Over the past decade UNLIREC has developed a series of practical tools to assist States to enhance the physical safety and security of their weapons, ammunition and explosive stockpiles, to carry out destruction processes, and undertake secondary marking, inventory management and maintenance of registers.

UNLIREC’s Standard Operating Procedures (SOPs) and technical briefing notes for stockpile management and destruction of small arms and light weapons (SALW), ammunition and explosives have been designed and developed to assist States in their compliance with international agreements and norms, while providing them with specific guidance that can be easily adapted to their own administrative and operational systems. These tools are based on and incorporate the International Small Arms Control Standards (ISACS) and UNSaferGuard Programme’s International Ammunition Technical Guidelines (IATGs). To date, UNLIREC’s technical assistance, accompaniment and training have been implemented and integrated in 18 countries in Latin America and the Caribbean. UNLIREC SOPs include:

**SERIES 01 – SALW INVENTORY MANAGEMENT**

- **01.10 Accounting** (Terms and definitions/General/Classification of weapons/National weapons register(s)/Unit weapons register/Daily issue and receipt of weapons/Loss or recovery of weapons/Destruction of weapons)
- **01.20 Surplus Weapons** (Terms and definitions/Identification of surplus weapons/Storage of surplus weapons/Accounting for surplus weapons)
- **01.30 Unique Secondary Marking** (Terms and definitions/Background/Technical Committee (weapon marking)/National marking authority/Marking requirements/Accounting)
- **01.40 Storage – Weapons** (Terms and definitions/General Basic storage requirements/Weapons storage locations/Weapon storage racks)
- **01.50 Storage – Small Arms Ammunition** (Terms and definitions/General/Basic storage requirements/Weapons storage locations/Small unit ammunition storage requirements/Magazine infrastructure/Recovered ammunition and explosives)
- **01.60 Inspection of SALW Facilities** (Terms and definitions/General/Stockpile management of weapons/Stockpile management of small arms ammunition (SAA)
01.70 Handling and Safety (Terms and definitions/General/General safety precautions (weapons)/ Normal safety precautions (NSP) (weapons)/ Actions on accidents or incidents)

01.80 Job Descriptions Summary (Terms and definitions/General/Key appointments/ Supplements to job descriptions)

01.90 Staff Training (Terms and definitions/General/Trained staff)

SERIES 02 – SALW STOCKPILE MANAGEMENT

02.10 Risk Management (Terms and definitions/General/Risk management responsibilities/Concept of risk and threat/Stockpile risk assessment/Risk analysis)

02.20 Security (Terms and definitions/General/Security responsibilities/ Security threat/Protective security measures/Physical security measures/Inventory security/ Security education/Security during destruction/Reporting of losses and investigations/ Action on activation of alarms)

02.25 Security – Small Arms Ammunition (Terms and definitions/General/ Security responsibilities/ Security threat/ Stockpile risk assessment/ Protective security measures/ Physical security measures/ Inventory security/ Security education/ Security during destruction/ Reporting of losses and investigations/ Action on activation of alarms)

02.30 Transport – Weapons (Terms and definitions/General security requirements/ Specific transport requirements/Documentation/Reporting of losses and investigations/ Instructions for drivers and security escorts)

02.40 Transport – Small Arms Ammunition (Terms and definitions/General security requirements/ Specific transport requirements/Documentation/Reporting of losses and investigations/ Instructions for drivers and security escorts)

SERIES 03 – SALW DESTRUCTION

03.10 Destruction Planning (Terms and definitions/General/Planning sequence/ Destruction planning activities)

03.20 Handling and Safety (Terms and definitions/General/ General safety precautions (weapons)/ Normal safety precautions (NSP) (weapons)/Safety precautions (destruction equipment)/Actions on accidents or incidents)

03.30 Actions on Accidents (Terms and definitions/General/ Accident procedures/ Investigation of accident/Classification of accident)

03.40A Destruction Operations - Chop Saw (Terms and definitions/General/ Physical destruction processes)

03.40B Destruction Operations – Industrial Rotary Kiln Furnace (Terms and definitions/General/ Physical destruction processes)

03.50 Disposal of Waste (Terms and definitions/General/Types of waste/Waste metals/Waste wood/Waste plastic/Emissions to air/Waste water/Prohibition of deep sea dumping)

03.60 Small Arms Ammunition Burning Tank (SAABT) Operations (Terms and definitions/General/SAABT design/ Ammunition types authorized for burning/Safety/ SAA destruction operations/Ammunition accounting guidance (loose rounds)

03.65 SALW Destruction (Field Expedient SAA and Pyrotechnic Destruction Techniques by Burning) (Terms and definitions/General/System design/ Ammunition and pyrotechnic types authorized for burning/Safety/Destruction operations/ Ammunition accounting guidance (loose rounds)

03.70 Pyrotechnic Burning Tank (PBT) Operations (Terms and definitions/ General/PBT design/Ammunition types authorized for burning/Safety/Pyrotechnic and propellant destruction operations)

03.75 Light Ammunition Burning Tank (LABT) Operations (Terms and definitions/ General/LABT design/Ammunition types authorized for burning/Safety/Destruction operations)

03.80A Open Burning and Open Detonation Operations (Ammunition) (Terms and definitions/General/Priorities and principles/Authority for disposal/Persons authorized to carry out disposals/Methods of local disposal – general/Siting of disposal sites/ Approval of disposals sites and SOPs/Planning and preparation/Conduct of disposals)

03.80B Ammunition Disposal Operations at Disposal Site (Purpose/Scope/Terms and definitions/ Regulatory references/ Responsibilities/Authorised methods of disposal/ Design and use of demolition pits/ Design and use of burning / Incineration areas and trenches/ Explosive limits at the site/ Misfire waiting times/ Communications requirements/ Medical arrangements/Firefighting arrangements/ Personnel limits/ Clothing and personal protective Equipment (PPE)/ Meteorological conditions/ Contraband/ Eating and drinking/ Vehicle routes/ Segregation of loads/ Unloading and parking/ Sentries/ Accident procedures/ Reporting and recording/ Free From Explosives (FFE)

03.90 Independent Monitoring and Verification (Terms and definitions/Scope/General/Authority/Monitoring/Verification)
03.95 Ammunition Disposal / Demolition Planning and Conduction OBOD Operations - Demolition Orders
(Conduct and planning of operations for OBOD on demolition and burning grounds/ Terms and definitions/ Regulatory references/ Authorised methods of disposal/ Warning of demolition or burning (warning order)/ Preparation & planning OBOD operations/ Specimen demolition order/ Orders for the OIC (demolitions/disposals)

UNLIREC TECHNICAL BRIEFING NOTES
UNLIREC TBN 2011/01: Determination of Surplus Weapon Stocks
UNLIREC TBN 2011/02: Small Arms Ammunition – Loss of Batch Key Identity
UNLIREC TBN 2011/03: National Explosives Inspectorate - Role and Responsibilities
UNLIREC TBN 2011/04: Civilian Storage of Fireworks/Pyrotechnics
UNLIREC TBN 2011/05: Surplus Ammunition
UNLIREC TBN 2011/06: Disposal of Irritants and Riot Control Agents (RCA)
UNLIREC TBN 2011/07: Operational and Confiscated Weapons Management
UNLIREC TBN 2012/08: Deactivation of Firearms

LIST OF ABBREVIATIONS AND ACRONYMS
AASTP Ammunition Storage and Transportation Publication
AOP Allied Ordnance Publication
ATT Aris Trade Treaty
CARICOM IMPACS CARICOM Implementation Agency for Crime and Security
CBSI Caribbean Basin Security Initiative
CICAD Inter-American Drug Abuse Control Commission
CIFTA Inter-American Convention against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives and Other Related Materials
CIP Permanent International Commission for Firearms Testing
DAER Daily Ammunition Expenditure Rate
DAS Data Acquisition Station
EMC Firearms and Ammunition Evidence Management Course
GGE Group of Governmental Experts
GICH London International Centre for Humanitarian Demining
GTAFM Working Group on Firearms and Ammunition
IATG International Ammunition Technical Guidelines
IBIN Interpol Ballistics Information Network
IBIS Integrated Ballistics Identification System
ITI International Tracing Instrument
LABBS Ballistics and Biometric Laboratory of the National Arm System
MAG Mines Advisory Group
NATO STANAG North Atlantic Treaty Alliance Standardization Agreement
NIBIN the United States’ National Integrated Ballistic Information Network
OAS Organization of American States
OBOD Open Burning and Open Detonation
OCF Open Case Files or Outstanding Crime File
PSSM Physical Security and Stockpile Management
QMS Quality Management System
RASR Regional Approach to Stockpile Reduction
RFID Radio Frequency Identification
RiBiN Regional Integrated Ballistic Information Network
RIFC Regional Intelligence Fusion Centre
RRPL Risk Reduction Process Level
SAABT Small Arms Ammunition ‘Burning Tank’
SEMAFORO Sistema para la Eliminación de Municiones y Armas de Fuego – Regional
SIP Sistema de Identificação Personalizada de Munições
SOP Standard Operating Procedures
UAM Unplanned Explosions at Munitions Sites
UN PoA United Nations Programme of Action on Small Arms and Light Weapons
UN-ASAP United Nations Ammunition Safety Assistance Program
UNLIREC United Nations Regional Centre for Peace, Disarmament and Development in Latin America and the Caribbean
UNODA United Nations Office for Disarmament Affairs
United Nations Regional Centre for Peace, Disarmament and Development in Latin America and the Caribbean

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