

Briefing Paper

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ESTIMATING GLOBAL MILITARY-OWNED FIREARMS NUMBERS

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Front cover photo

Military personnel on parade in Hargeisa, Somaliland,
May 2016. Source: Mohamed Abdiwahab/AFP Photo



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Overview

The Small Arms Survey estimates that at the end of 2017 the total global holdings of the armed forces in 177 countries included at least 133 million firearms. More are believed to exist. Military firearms holdings are the least public of all major small arms categories. Of more than 100 governments polled by the Small Arms Survey to date, only eight reported their total military firearms inventories. Another 20 countries supplied data independently, or to other projects or researchers. Secrecy and the Small Arms Survey's uncertainty about the disposition of older weaponry mean that it is only possible to estimate most countries' military firearms inventories. Military holdings also have been affected by some of the largest disarmament projects focused on destruction of military surpluses, not all of which have been made public. Global military small arms data seems certain to remain less accurate than data on worldwide civilian and law enforcement holdings, a nagging source of ambiguity in global small arms totals.

Key findings

- At the end of 2017 the total holdings of armed forces in 177 countries included approximately 133 million firearms. Many more are believed to exist.
- Military firearms are highly concentrated. Over 43 per cent of the global total belongs to just two countries.
- Ten countries have approximately 93.3 million military firearms, comprising 70 per cent of the world total identified here.
- Global military small arms data seems certain to remain less accurate than data on worldwide civilian and law enforcement holdings.

Introduction

Military-owned firearms are a leading factor in conflict and violence, and the focus of much international small arms diplomacy (Small Arms Survey, 2006, pp. 37–38). They also constitute the world's largest centrally controlled weapons stockpiles and the largest stockpiles that can be rapidly transferred or lost, raising vital control issues (Small Arms Survey, 2004, p. 54). However, civilian-owned firearms appear to outnumber their military counterparts worldwide by over six to one (see Box 1).

The Small Arms Survey estimates that at the end of 2017 the total global holdings of armed forces in 177 countries—that is, all countries known to have military forces—included approximately 133 million firearms.¹ Many more are believed to exist.² As this Briefing Paper shows, lack of official transparency, typically due to national security concerns, is a serious challenge for estimating military-owned firearms. This Briefing Paper draws on official information on firearms holdings for armed forces from 28 countries. It relies on estimations of military-owned firearms totals for other countries.

This research shows that military firearms arsenals are highly concentrated. Over 43 per cent of the estimated global military total belongs to just 2 countries, while 10 countries account for 70 per cent of global holdings.

The armed forces covered here are state military services, typically under the control of ministries of defence.³ They currently have approximately 22.1 million active military personnel, 60.9 million reservists, and 12 million paramilitary personnel. The latter do not include paramilitaries under police or interior ministry authority, who fall instead under law enforcement totals. The global military firearms average is roughly 1.4 firearms per individual armed forces member worldwide for 177 countries, including countries for which military firearms totals have been estimated.

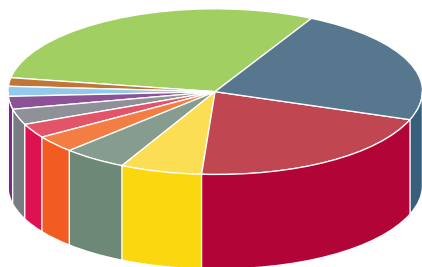
The global total of 133 million military-owned firearms identified here is significantly lower than the previous Small Arms Survey global estimate of 200 million military-owned firearms. The change is due mainly to three factors: the use of more conservative estimating methods for reserve forces, the use of more recent military personnel data, and the inclusion of some paramilitary force holdings under law enforcement rather than military firearms holdings. Official paramilitary organizations under the control of interior or home affairs ministries or associated mostly with law enforcement have generally been excluded here.

Destruction and other forms of disposal, including transfers of military weapons to civilian owners, also contribute to a reduction in military firearms holdings, especially of older military firearms. Yet there is still reason to believe that the estimate presented here is an underestimate. Military procurement of newly manufactured weapons has tended to outstrip surplus destruction in countries with the largest military firearms stockpiles (Karp, 2010, p. 4). The documented production of at least 175 million modern military service rifles, made for state military customers as of 2015, not to mention handguns, other types of firearms, and stockpiles of older weapons, suggests that tens of millions more military firearms exist than those documented in this Briefing Paper (Jenzen-Jones, 2017, p. 30). But these additional firearms cannot be sufficiently accounted for country by country to be included here. Consequently, the totals given in this Briefing Paper should be used with caution and updated where possible.

Figure 1 shows the countries with the ten largest known or estimated military firearms holdings. Of these ten countries, only Ukraine and the United States provided comprehensive (although not recent) data. The holdings of the rest are estimated using their largest contemporary troop numbers and a combination of doctrinal estimation for ground forces and empirically derived ratios for other military components. Collectively, these 10 countries are believed to hold

Figure 1 The largest reported and estimated military-owned firearms holdings

- Russian Federation (30.3 million)
- China (27.5 million)
- North Korea (8.4 million)
- Ukraine (6.6 million)
- United States (4.5 million)
- India (3.9 million)
- Vietnam (3.8 million)
- Iran (3.3 million)
- South Korea (2.7 million)
- Pakistan (2.3 million)
- Other countries (39.7 million)



Note: Totals may not agree due to rounding.

Source: Small Arms Survey (2018)

Box 1 Global breakdown of firearms numbers

At the end of 2017 there were approximately 1,013 million firearms in the 230 countries and autonomous territories of the world, 84.6 per cent of which were held by civilians, 13.1 per cent by state militaries, and 2.2 per cent by law enforcement agencies (see Figure 2).

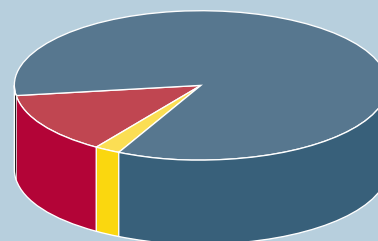
The 2017 combined global total of 1,013 million firearms is higher than the previously published Small Arms Survey global total of 875 million firearms in 2006, an increase of 15.7 per cent for all identified firearms. Much of this change is due to an increase of 32 per cent in the estimated civilian-held firearms total. Reported global totals for the law enforcement and military categories show net decreases, mostly due to changes in estimating procedures.

While the global total for 2017 is significantly higher than that in 2006, not all changes at the country level are due to a growth of civilian firearms holdings. Some variations since 2006 are also affected by the availability of more complete reporting or more comprehensive estimates.

Every effort has been made to ensure the reliability of Small Arms Survey data, but not all entries are equally complete. In some areas—especially law enforcement and the military—some government agencies and stockpiles may have been missed. The Survey methodology counts all firearms equally, although they can vary greatly in capability, reliability, and durability.

Figure 2 Global firearms ownership estimates, 2017

- Civilians (857 million)
- Law enforcement (22.7 million)
- Military (133 million)



approximately 93.3 million, or 70 per cent, of the world's estimated 133 million military-owned firearms identified here.

Sources and methods for estimating military-owned firearms holdings

This study uses two main approaches for calculating military firearms holdings of armed forces: official data on military firearms holdings and estimates based on the use of a doctrinal category multiplier applied to the number of military personnel in a country. Unfortunately, reference works like *The Military Balance* report only major weapons systems (ISS, 2018), while others like *Jane's Weapons: Infantry* list countries believed to possess particular military firearms types, but do not usually give quantities (Jones and Ness, 2013).

Reported armed forces' firearms holdings

United Nations (UN) member states can report their official military firearms holdings through the UN Register of Conventional Arms (UNROCA), even though there is no request or invitation to do so



(Holtom, 2010; UNODA, 2009, pp. 22–23). Several countries have provided information through UNROCA on national holdings of some light weapons, especially man-portable air defence systems (UNGA, 2013). Argentina, Trinidad and Tobago, and Togo have provided information on military firearms holdings at least once in a UNROCA report (Small Arms Survey, 2006, p. 44; UNGA, 2011, pp. 43, 69).

Governments sometimes supply data on their military small arms inventories when asked to do so. Of more than 100 governments polled by the Small Arms Survey to date, eight reported their total military firearms inventories (Small Arms Survey, 2018). Another 20 countries supplied data independently or to other projects or researchers, although some of these cases were purely of historical interest, such as totals for the former East Germany or Yugoslavia. These and other reports confirm the current existence of 17.5 million military firearms (Small Arms Survey, 2018). Most governments still do not share such data. Whether they are prevented by security prohibitions, lack of centralized accounting, or bureaucratic inertia is hard to say.

Estimating military firearms inventories

Systematic estimation is used only when reliable firearms statistics are unavailable. The estimation of the number of military firearms in a particular country begins with the number of military personnel; this number can usually be found in reference works, such as the *The Military Balance* (IISS, 2018). Box 2 describes the approach taken for determining the number of military personnel to be used in the calculation of military firearms holdings. Box 3 provides a comparison of official data and a military-owned firearms holdings figure based on the estimation approach described below.

The ratio of military firearms to active military personnel varies greatly among countries and services, making a single ratio too crude a measure. Therefore, four distinct multipliers have been developed, based on different types of military doctrine. Each country's national military doctrine provides a guide to the kinds of conflicts its military is armed to fight and how it tends to equip itself. The method follows the work of Barry Posen

on national military doctrine, generally using categories developed subsequently for firearms specifically (Posen, 1984, p. 13; Small Arms Survey, 2006, pp. 36–63). Each country's military is assessed and identified with one of the four categories of operational doctrine listed below, and the appropriate multiplier is then applied to the available data on military personnel. The four doctrinal categories most relevant for estimating military firearms inventories are as follows:

- *People's war militaries* use mass infantry forces and large reserves whose personnel are chosen for their political reliability. China was long the classic example, while the former Yugoslavia was another.
- *Trinitarian militaries*, so named because of the integration of the state, citizens, and the military, stress heavily armed active-duty forces reinforced by reserves. Examples include Australia, Canada, Germany, and Japan.
- *Constabulary militaries*, organized primarily to maintain domestic order, are characterized by low ratios of weapons per armed forces personnel. India and Nigeria are prominent examples.



Armed soldiers guard a US F-35A Lightning II aircraft at Amari Air Base, Estonia, April 2017. Source: Raigo Pajula/AFP Photo

Table 1 Estimated ratio of firearms per person for each category of armed forces

People's war militaries	Trinitarian militaries	Constabulary militaries	Reserve militaries
4.8	2.6	1.9	1.8

Source: Small Arms Survey (2006, pp. 46–52)

- *Reserve militaries* rely on the rapid mobilization of reserves for territorial defence. They feature small full-time armed forces and large reserve components. Examples include Finland and Switzerland.

Ratios of firearms per total military personnel (air force personnel, sailors, soldiers, and reservists) are averaged from empirical examples for each category (Small Arms Survey, 2006, pp. 46–52). Table 1 provides the ratio of firearms per person for each category of armed forces.

Two other multipliers are used to estimate the firearms holdings of armed forces. Firstly, a shortcoming of current data collection procedures is the over-representation of European, Latin American, and North American examples. This appears to skew the averages for the four categories upwards, because

it seems unlikely that less developed countries consistently arm themselves at levels comparable with wealthier states. With this problem in mind, a multiplier of 1.2 firearms per active military personnel member is used for some less developed countries. This rule has been applied to many sub-Saharan African countries.

Secondly, while reserve-based militaries like those of Finland or Switzerland tend to be well armed and ready for rapid mobilization, many countries' reserves are not as well armed and appear to be generally unprepared for extended combat operations. Many countries—especially in Asia, but to a lesser extent in Europe and Latin America—have large reserve components, often numbering several million personnel, far surpassing the numerical strength of their active forces. For example, Iran's Basij currently has a 'claimed membership' of 12.6 million

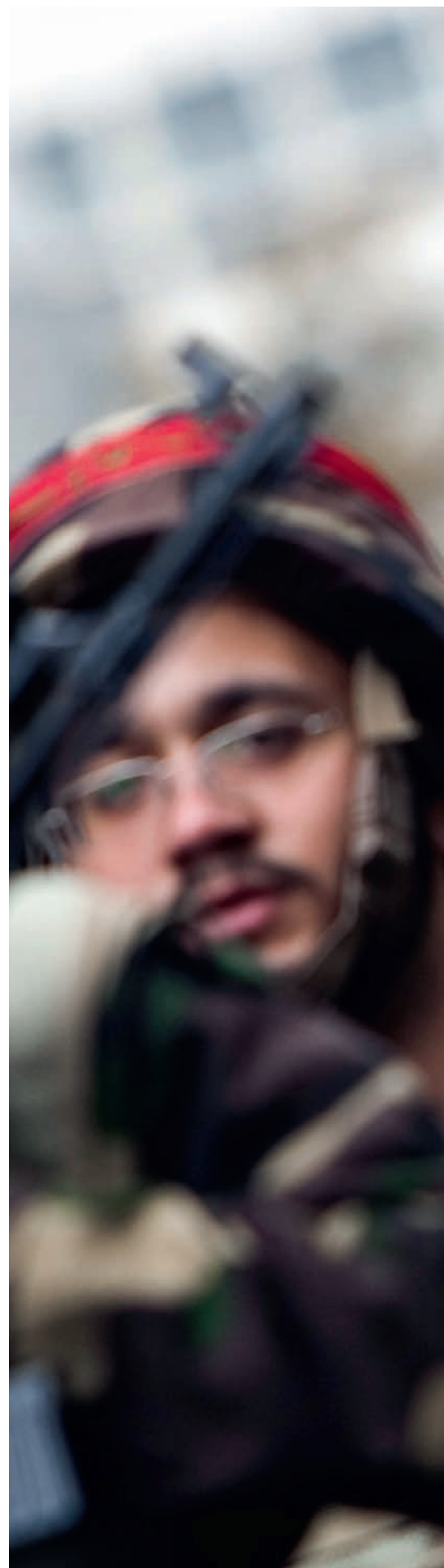
Box 2 Legacy versus new equipment

The personnel data used for calculating the military-owned firearms holdings of 116 of the 177 countries included in the Small Arms Survey military-owned firearm data set comes from the publication *The Military Balance 2018* (IISS, 2018).

This is a change from previous Survey practice, where estimates generally used data for the highest number of armed forces personnel since the period when a particular country transitioned to modern semi-automatic or fully automatic military firearms, usually in the 1960–70s (Small Arms Survey, 2006, p. 61, note 6). For other countries, higher personnel totals from the cold war era remain relevant, since much of their equipment still appears to remain in storage. This approach takes into account the fact that many countries reduced their military personnel dramatically after the cold war, resulting in the creation of significant weapons surpluses (van Creveld, 2006, p. 197). Some countries have disposed of surplus military firearms through destruction, formal transfers, or illicit diversion, while a few have experienced catastrophic losses. For all of these countries, personnel data from more recent years is utilized.

Information is not so readily available on the disposal since the end of the cold war of surplus military-owned firearms for 40 countries listed in the database. In 13 cases the baseline data for military personnel used in firearms estimates are from the 1980s or 1990s. In 27 cases data from different years is used for active military personnel, on the one hand, and reserve or paramilitary forces, on the other. Countries like China and the Russian Federation, for example, are believed to possess large stockpiles of surplus military firearms.⁴ Smaller but still significant surplus stockpiles left over from militaries of the 1980s and earlier appear to be a feature in much of the world (Karp, 2009).

Countries continue to create surpluses of small arms today, even if their levels cannot be compared to those of the post-cold war era. For example, while the United States has arranged one-for-one replacement of 462,000 military pistols (South, 2018), many countries are buying much smaller numbers of new military rifles and other firearms than previously, sometimes designating new equipment exclusively for their special forces, or only buying enough for their downsized forces. In France, for example, 400,000 FAMAS rifles, dating back to the 1970s, are being replaced by 102,000 HK416F rifles and carbines (Wilk, 2017). In Portugal, a cold war legacy estimated at roughly 376,000 military firearms is being replaced with a total of 10,225 firearms for the country's active-duty personnel (Small Arms Survey, 2018; Barreira, 2017).





Armed members of the Basij militia on parade in Tehran, Iran, November 2011. Source: Raheb Homavandi/Reuters

Box 3 Comparing reports and estimates

Reported data offers a chance to verify the accuracy of the estimation method by comparing the calculated total with reported figures. For example, for several countries estimates using the method described above give results close to officially reported totals: 1,316,300 military firearms reported for Brazil, as opposed to approximately 1,460,000 estimated; for Germany, 483,016 reported versus 493,000 estimated; or for Malta 5,547 reported versus some 5,300 estimated (Small Arms Survey, 2018).

Estimated figures also can be markedly lower than reported data. For example, the actual reported military firearms totals for the Czech Republic, Serbia, and Slovenia are over double the amount estimated using the approach outlined in this Briefing Paper. At least one case of a much higher estimate can also be found. The firearms estimate for the armed forces of Colombia in 2017 is double the total reported back in 2005 (Small Arms Survey, 2018). This may be explained by reliance on an old reported total, followed by expansion of the armed forces in the subsequent 12 years, which pushes the estimated total up sharply. Whether lower or higher than reported data, estimates require careful checking and cautious use.



reserve personnel, North Korea's Red Guard has some 5.7 million assigned personnel, South Korea's Mobilization Reserve and Homeland Defence Forces number 4.5 million, and Taiwan has 1,657,000 men and women with emergency service obligations (IISS, 2017, pp. 306, 331, 379).

It is unclear if these secondary, support-only reserve forces exist only on paper, if there is equipment for all reported personnel or just for some, or even if no weapons are held in storage for such reserves (IISS, 2018). In the past the Small Arms Survey estimated the military firearms holdings of these reserves at the same ratio as for active reserve militaries: 1.8 firearms per person. In acknowledgement of this uncertainty, however, a new multiplier of 1.2 firearms per reservist is used—enough to arm all personnel with a rifle and officers with sidearms—but secondary, supporting reserves are presumed to be armed at a rate of 0.5 firearms per reservist, or even 0.2 when evidence is lacking.

Estimating types of military firearms

An important refinement is the breakdown of small arms types in each country's total military arsenal. Empirical examples are few, but show some variation in the share of modern self-loading service rifles, pistols, machine guns, and other firearms types (Table 2). These ratios support the conclusion that, in lieu of officially reported data, a hypothetical country with 1 million military firearms can be expected to have some 720,000 modern self-loading service rifles and 130,000 side arms, for example.

Issues affecting the process of estimating military-owned firearms

Variation among countries and services

Each service usually sets its own military firearms requirements, resulting in distinct inventories. The country reports given in Table 3 illustrate the great diversity in military firearms holdings among different military services, with national military weapons ratios (for all services combined) ranging from 1.1 to 7.4 firearms

Table 2 Typical proportions of military small arms categories

Modern self-loading service rifles	Pistols	Machine guns	Other
72%	13%	6%	9%

Source: Small Arms Survey (2006, p. 56)



A Brazilian sailor with an assault rifle during the Latin America Aero and Defence (LADD) exhibition in Rio de Janeiro, Brazil, April 2013. Source: Vanderlei Almeida/AFP Photo

per person. Ground forces tend to have higher ratios of firearms, but in some countries air forces and navies appear to be better equipped per person.

Currently there is no systematic rule for estimating the rate of disposal of surplus military firearms. The problem is complicated, because military small arms

can survive for decades, leaving great uncertainty about the number of older weapons still in storage (Chivers, 2010). Nor is there a standard mechanism for

Accounting for disposal and loss

Any comprehensive total of military inventories must not only include weapons acquisition, but also account for authorized disposal of surplus and losses. For countries whose forces have shrunk as a result of downsizing following the end of the cold war, much of their equipment is presumed to be surplus and in military storage, exported, or destroyed. This has implications for estimates of military firearms holdings based on estimates of military personnel numbers. It can also miss the procurement of new military firearms, the planning for and acquisition of which are not as widely reported as for heavy weapons.

Table 3 Ratio of firearms per person in selected countries, by military service

Country	Base year	Total force	Active air force	Active army	Active navy	Reserves
Brazil	2008	1.1	0.6	1.3	1.0	1.1
Colombia	2006	1.4	0.8	1.4	1.4	*
Czech Rep.	2012	7.4	0.3	11.1	None	None
Germany	2012	1.8	1.5	3.1	0.8	7.2
Montenegro	2012	2.6	1.4	2.9	2.2	None
Norway	2012	2.5	1.0	2.5	1.8	3.1
Average		2.8	0.9	3.7	1.4	3.8

* No reserves were reported for Colombia in Calvani, Dupuy, and Liller (2006). Reserves of 61,900 personnel were cited in IISS (2007, p. 67).

Source: Calvani, Dupuy, and Liller (2006); Czech Republic (2012); Dreyfus et al. (2010); Germany (2012); Montenegro (2012); Norway (2012). Personnel numbers are taken from the same source or the relevant volume of the IISS *Military Balance* reports.

“ Like data on civilian and law enforcement firearms holdings, the country totals and service breakdowns of military firearms need further improvement.”

reporting disposals of weapons. The best data on disposals often comes from national reports of exports of surplus military firearms and the destruction of surpluses. The least understood processes are losses through damage and theft. Even when reports are available, their meaning can be obscure: damaged weapons can often be repaired, while firearms diverted to unauthorized end users do not simply disappear.

The scale of the destruction of military surpluses can be large. Germany undertook the largest documented contemporary small arms destruction programme ever recorded when it eliminated 2,303,252 small arms between 1990 and 2009 (Germany, 2010, p. 19). The Russian Federation declared its intention to destroy more than 9 million military small arms in 2010, including 4 million Kalashnikov rifles (Russian Federation, 2010; Neef, 2012), but there has been no subsequent confirmation.

Perhaps the most dramatic form of military stockpile is *catastrophic loss*, usually through the collapse of state authority. Well-known examples include the looting of some 550,000 small arms from Albanian state arsenals in 1997, or the loss of an estimated 4 million small arms and light weapons following the 2003 invasion of Iraq (Gobinet, 2011, p. 32; Small Arms Survey, 2004, p. 46). Even when reports indicate that government stockpiles have been looted, data rarely reveals the actual number of firearms stolen. Poor record-keeping often makes it difficult to determine even the proportion of a state's military holdings that were lost.

For example, considerable quantities of arms and ammunition were looted from military stockpiles in Libya in 2011. Although analyses estimate the total lost was over 400,000 small arms, a UN study concludes that the total cannot be known with certainty (Robinson 2011; UNSC, 2014a, para. 46–47). Similarly, in June 2014 the non-state armed group Islamic State captured arms and ammunition

from Iraqi government stocks that were reportedly sufficient to equip more than three Iraqi army divisions (UNSC, 2014b, para. 39). Unlike the permanent disposal of firearms in organized disarmament programmes, catastrophic losses usually do not mean that weapons disappear. Such incidents, like much illegal diversion of military weapons, more often mean ownership changes, typically as military weapons end up in the hands of terrorists, non-state armed groups, or civilians.

Conclusion

The estimated global total of at least 133 million military-owned firearms among 177 countries is a starting point for comparing states' military arsenals. Like data on civilian and law enforcement firearms holdings, the country totals and service breakdowns of military firearms need further improvement. Countries individually make decisions to release this kind of data, for reasons and at a pace of their own choosing. For now, official reports and official responses to research questionnaires elicit the most comprehensive information on firearms inventories available, confirming the whereabouts of almost 17.5 million military small arms. Reporting on procurement, or disposal via export or destruction, is available, but intermittent and rarely comprehensive.

Because of chronic official secrecy and the Small Arms Survey's uncertainty about the disposition of older weaponry, the only option is to estimate most countries' total military firearms inventories. But estimation has its weaknesses. It is unable to account for the gap between the total number identified here—133 million firearms—and the significantly greater number believed to have been manufactured and thought to be mostly still in existence.

Better use of standardized international reporting through the UN would be a great advance for global transparency and policy-making. But systematic

improvement in data on military holdings seems unlikely in the short term. Global military small arms data seems certain to remain inferior to data on worldwide civilian and law enforcement holdings, remaining a nagging source of ambiguity in attempts to ascertain global small arms totals. ●

Notes

- 1 Each of the three Small Arms Survey firearms data sets covers a different number of states and territories, depending on the unit of analysis and data availability. Civilian data covers 230 states and autonomous territories. Law enforcement data was available for 230 states and autonomous territories. Military firearms are presented for 177 states with formal military forces. The states covered in this Briefing Paper include several whose political status is contested or not universally recognized, such as the Former Yugoslav Republic of Macedonia, Kosovo, Palestinian Territories, Somaliland, and Taiwan.
- 2 This Briefing Paper defines military firearms in accordance with the list of 'small arms' contained in the International Tracing Instrument (UNGA, 2005, para. 4(a)). Therefore, certain light weapons falling outside this definition of a firearm, such as heavy machine guns and grenade launchers, are not included systematically in the global or country totals for military firearms. However, due to idiosyncratic national reporting procedures and definitions, firearms that are classified as light weapons under the International Tracing Instrument might be included in some country totals. Better coverage of all types of military small arms and light weapons is extremely desirable but must await better reporting by states and improved estimating procedures.
- 3 Law enforcement agencies and some paramilitary agencies, mostly under the authority of ministries other than their countries' respective ministries of defence, are addressed in the Small Arms Survey Briefing Paper on law enforcement firearms holdings (Karp, 2018b). Also excluded from the totals in this Briefing Paper are military-style weapons owned by civilians, which are covered in the Small Arms Survey Briefing Paper on civilian firearms holdings (Karp, 2018a).
- 4 See, for example, Pyadushkin, Haug, and Matveeva (2003, p. 29).

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About the Small Arms Survey

The Small Arms Survey is a global centre of excellence whose mandate is to generate impartial, evidence-based, and policy-relevant knowledge on all aspects of small arms and armed violence. It is the principal international source of expertise, information, and analysis on small arms and armed violence issues, and acts as a resource for governments, policy-makers, researchers, and civil society. It is located in Geneva, Switzerland, and is a project of the Graduate Institute of International and Development Studies.

The Survey has an international staff with expertise in security studies, political science, law, economics, development studies, sociology, and criminology, and collaborates with a network of researchers, partner institutions, non-governmental organizations, and governments in more than 50 countries.

For more information, please visit: www.smallarmssurvey.org.

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