Please note: This is a DRAFT version of this methodological annexe.

Methodological Annexe

Annexe of the *Global Burden of Armed Violence 2015: Every Body Counts*

Introduction

This methodological annexe describes the data and methods used in the published report, *Global Burden of Armed Violence 2015* (hereafter 'GBAV 2015'). It provides an overview of the process, from the data collection to the production of the estimates on lethal violence and the subset of data at the core of the analysis presented in Chapter Two ('Lethal Violence Update') and Chapter Three ('Lethal Violence against Women and Girls'). It also provides details on the statistical analysis on the economic cost of violence discussed in Chapter Five ('The Economic Cost of Violence').

The content in Chapter One ('Violence, Security, and the New Global Development Agenda') and Chapter Four ('Unpacking Lethal Violence') is based on data that did not undergo a selection or production process within the scope of this report. These chapters cite directly from sources, studies, and reports in their respective bibliographies.

For more details about the databases, datasets, sources, and procedures used in the GBAV 2015, please contact sas@smallarmssurvey.org.

Sources and methods

The GBAV 2015 follows the consolidated methodology based on the unified approach of violence as documented in the methodology Annexe for the previous edition of the report (Geneva Declaration Secretariat, 2012). This approach claims that the monitoring and measuring of lethal violence should go beyond distinctions between conflict and non-conflict settings; all violent deaths should be counted, regardless of their circumstances.

In principle, all types of violent deaths should be counted, so as to inform data on the levels of lethal violence across countries and territories, irrespective of their legal status (including, for example, justifiable homicides and deaths in war zones). Every killing of a person, inflicted violently by another, contributes to the total human toll of violence, irrespective of circumstances or motives. Therefore the measuring of violent deaths needs to be inclusive to ensure that no form of violence is omitted. Such an approach serves to guarantee that victims are acknowledged as such and that people may ultimately be protected better by tailored interventions and programmes.

The ongoing discussion regarding the post-2015 agenda and the Sustainable Development Goals provide important insights. At the time of writing, world leaders were examining the proposal elaborated by the Open Working Group on Sustainable Development Goals (UNGA, 2013). The proposal includes 17 goals, each one accompanied by a set of measurable targets to measure the implementation of the given goal. Goal 16 focuses on peace and inclusive societies, access to justice, and accountable institutions.[1] The first target under Goal 6 reads: 'Significantly reduce all forms of violence and related death rates'. This wording implies that the measuring of lethal violence should not be limited to a single dimension, such as homicide. On the contrary, it calls for a more comprehensive indicator to be established.

The main challenge inherent to this theoretical approach is that not all forms of violence are equally measurable, due to the lack of quality data. For example, although a wide range of institutions producing and disseminating homicide statistics at the international level have proven this data to be solid and highly comparable, the same does not apply to data on unintentional homicide.

Indeed in some countries, the number of unintentional homicides is included in the total homicides, while in other countries it is excluded. The same holds true for data on killings due to legal intervention. Statistics on legal intervention, or justifiable homicides, can also differ with regard to the inclusion or exclusion of killings of police offers and by-standers during a legal action.

Accordingly, homicide and conflict-related deaths can be considered the two main measurable forms of lethal violence due to the multitude of data providers at the national and international level. Altogether homicide and conflict data are far from providing an exhaustive assessment of the magnitude and distribution of violent deaths. Nevertheless they represent the best approximation to date, also considering that any collection of statistics on solely one or the other would bear significant omissions. Indeed a comprehensive composite indicator would yield statistics that are comparable across settings, thereby providing evidence to support the formulation of policies for the prevention and reduction of violence and to monitor their implementation.

The focus on these two indicators, however, is not without problems. It is a challenge to grasp the wide range of differences and specificities regarding the statistical processes adopted by the sources. Each data collection carries its own scope and focus. One will record homicides to monitor the efficiency of the police, whereas another will count the frequency of access to hospital following a lethal firearm injury. Again, sources documenting conflict can only cover civilian victims or specific forms of conflict-related violence, such as with non-state or one-sided violence.

[1] Goal 16: 'Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels' (UNDESA, 2014).

Beside the discrepancies inherent to the scope of data collection on violent deaths, these can also apply methodologies and statistical rules to develop count and rates on other forms of violent deaths. When statistics on violent deaths are disseminated, they are rarely accompanied by complete information as to the rules applied to the given data collection. Such an omission represents an obstacle to accurate monitoring and measuring, because it limits the understanding of what a given number really means.

The development of a methodology for the monitoring and measuring of violent deaths, therefore, needs to factor in flaws such as overlapping and double counting, for example, when homicide figures already include conflict-related deaths.

GBAV 2015 estimates on violent deaths

The GBAV 2015 estimates a global total of 508,000 annual violent deaths in the period 2007–12 (Figure 1.1 The distribution of the global burden of violence). This figure portrays an estimate of the total number of human beings killed in violent circumstances. They are victims of homicide (377,000 victims) and armed conflict (77,000), of unintentional homicide (42,000) (such as manslaughter), and of legal intervention (19,000).

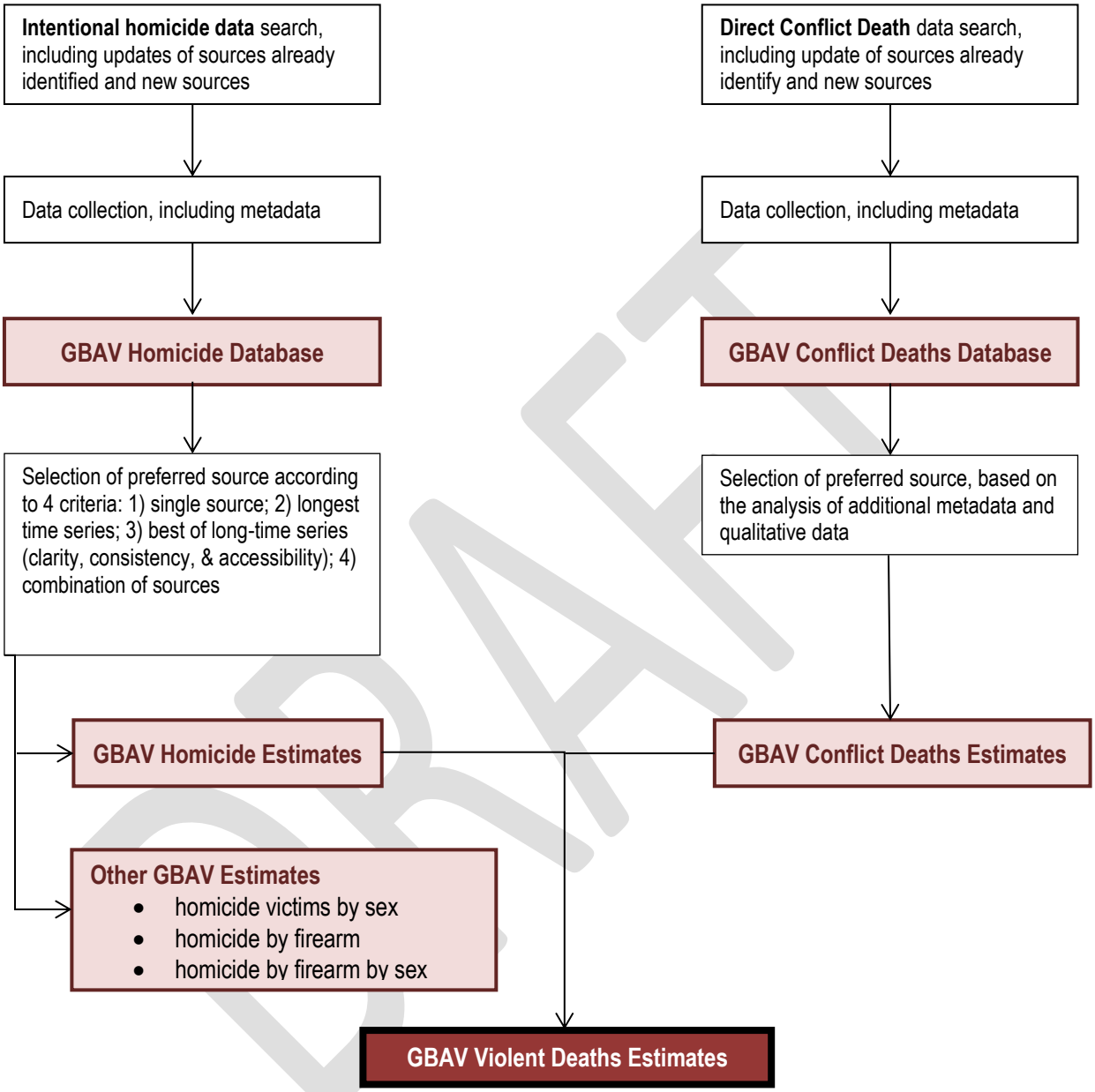
Estimates of intentional homicide and direct conflict deaths are calculated from an extensive and systematic collection of national data and cross-national specialized datasets, which constitute the basis for the lethal violence estimates presented in the GBAV 2015. Both datasets on intentional homicide and direct conflict deaths are based on the data collated from a wide range of sources and rely on data that stems from so-called 'incident reporting mechanisms'.[2] In comparison with the GBAV 2011, the current edition benefits from a broader scope of data collection on intentional homicide, which now includes also disaggregation by sex of victims and the use of firearms to commit homicide.

Global totals on legal intervention killings and unintentional homicides are based on two samples of countries for which the information is available and which specify whether these numbers are included or excluded in the total number of homicides.

The data collection and elaboration process behind the GBAV violence deaths estimates is illustrated in Figure 1.

[2] For a detailed explanation of the incident reporting mechanisms and methodology, see Figure 2.2 'Explaining the data sources' (Geneva Declaration Secretariat, 2011, pp. 48–51).

Figure 1. The GBAV violent deaths estimates process



The core of the GBAV database is represented by estimates of violent deaths at the national level. These estimates combine homicide and conflict-related deaths, according to an established methodology. The GBAV data collection also supports further separated databases on a range of aspects of lethal violence. In particular, the GBAV data process involves the production of the following sets of data:

- homicide victims by sex;

- homicide by firearm, including by sex; and
- homicide at the sub-national-level.

The following sections describe the sources used in the GBAV database as well as the methods applied to develop the estimates of violent deaths.

Homicide

Data on intentional homicide typically is produced by the criminal justice and public health systems and disseminated by a range of governmental agencies, e.g. the National Statistical Office. Other national institutions and international organizations also disseminate secondary data on homicide. At the regional level, for example, the Organization of American States (OAS Hemispheric Citizen Security Observatory) and Eurostat provide statistics on homicide. At the international level, the United Nations Office on Drugs and Crime (UNODC), the Organization of American States (OAS Hemispheric Citizen Security Observatory), and the World Health Organization (WHO) are examples of organizations that collate and publish national level data on homicide.

Data producers and providers

Depending on the criminal justice system, details of intentional homicide data can be produced by the police bodies recording administrative data on the homicides made known to them. Morgues and forensic institutes document detailed information, about the causes and characteristics of deaths associated to alleged homicides, data which feeds into criminal prosecution. The judiciary also records the number of suspected parties brought to court and sentenced with the charge of intentional homicide. Such statistics are usually disseminated by the agencies that produce them, but may also be issued by the given Ministry of Interior or Ministry of Justice.

Public health institutions produce and disseminate data on the mortality of national populations. In particular, hospitals, health clinics, emergency rooms, mortuaries, and vital registration systems record details on the number and causes of deaths according to the International Classification of Diseases (ICD). The ICD, a standard tool used for collecting and reporting diagnostic information, was adopted by WHO Member States and is currently in its tenth revision (WHO, n.d.a). The ICD classifies intentional homicide by 'external causes of deaths' and codes it as 'assault' (X85-Y09). Intentional homicide statistics produced by the public health sector are frequently disseminated by the Ministry of Health. Finally, in many

countries, the National Statistical Office disseminates national data on intentional homicide, which is produced by the criminal justice or the public health systems, or both parties.

Observatories on violence, crime, and conflict gather and disseminate data on intentional homicide at the national and local level. These institutions can have different governance structures. These include research institutions led or supported by governmental agencies. Examples include: the Australian Institute of Criminology (AIC), the Observatoire national de la délinquance et des réponses pénales (ONDRP) in France, and the National Violence Monitoring System (SNPK) in Indonesia.

A further typology of observatories includes departments of or projects led by academic institutions, for example the Instituto Cisalva within the Universidad del Valle or the Conflict Analysis Resource Centre (CERAC) in Colombia, the Observatory on Violence from the Democracy, Peace and Security Institute (IUDPAS) in Honduras, and the Observatorio Venezolano de Violencia (OVV) within the Central University of Venezuela. Regardless from their formal status, these observatories have in common a mandate to collect and disseminate data on lethal violence so as to inform evidence-based policing and programming.

The quality, coverage, and completeness of both criminal justice and public health recording systems vary widely across the world. Sophisticated and comprehensive data recording systems are available in all high-income regions and several low- and middle-income regions; yet in several parts of world, including many countries in Sub-Saharan Africa, primary source data may not exist at all.

At the international level, various institutions are involved in the analysis of regional and international patterns of violence. For example, the United Nations Office on Drugs and Crime (UNODC) has published two issues of the *Global Study on Homicide* (2011 and 2013) which provide analysis based on cross-national and time series of homicide data sourced from more than 200 countries and territories, including criminal justice and public health sources. Table 1 presents a selection of regional and international sources dealing with statistical data on homicide.

Table 1. Overview of selected secondary and international sources for data on intentional homicide

Source	Description
Global Burden of Disease (GBD) by the Institute for Health Metrics and Evaluation (IHME)	Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Global Burden of Disease (GBD) provides a tool to quantify health loss from hundreds of diseases, injuries, and

	risk factors, so that health systems can be improved and disparities can be eliminated. For more information, see http://www.healthdata.org/gbd
Eurostat	Eurostat is the statistical office of the European Union situated in Luxemburg. Its task is to provide the European Union with statistics at European level that enable comparisons between countries and regions. Providing data on crime in the EU is complicated by considerable differences in the methods and definitions used in the member states. This should be taken into account when using statistical figures. While the need for factual statistics has long been recognized by the member states and the European Commission, there is still a lack of reliable and comparable statistical information. For more information, see http://ec.europa.eu/eurostat/web/crime/overview
The Global Burden of Diseases Injury Expert Group	Reliable estimates of the incidence and burden of injuries constitute data that is essential for prioritizing national safety strategies. On 14 July 2007, the core team of the Global Burden of Disease (GBD) project issued an open call for expert participation in The Lancet. Approximately 37 expert groups have been clustered together in five larger groups studying related diseases, injuries, and risk factors. For more information, see https://sites.google.com/site/gbdinjuryexpertgroup/about-the-expert-group.
World Health Organization (WHO)	WHO statistics on violence are available in a number of formats for the world, for WHO regional groupings of countries and for individual countries. All data is sex- and age-specific. WHO Headquarters Statistical Information System (WHOSIS) provides region- and country-specific numbers and rates for deaths and disabilities due to violence-related deaths in all countries of the world that return such information to WHO. Mortality data by country, year, cause of death, age and sex are transmitted regularly to WHO. They are therefore considered as official national statistics as reported by the competent authorities of the countries concerned. At the country level, information on causes of death is compiled from individual death certificates as recorded in civil registries. For Global and regional WHO data and more information, see http://www.who.int/violence_injury_prevention/surveillance/databases/en/
European Sourcebook of Crime and Criminal Justice Statistics	The sourcebook is published by the European Institute for Crime Prevention and Control, affiliated with the United Nations (HEUNI). The Sourcebook provides accurate and validated national data, but most of all helps in understanding how the European criminal justice systems work. The data are supplemented by extensive notes that explain differences in the definition of offences and of penal measures, as well as differences in recording practice. These notes help the reader to understand the possible limitations to the comparability of the data. For more information, see http://www.heuni.fi/en/index/tiedotteet/2014/09/europeansourcebookofcrimeandcriminaljusticestatistics2014published.html
United Nations Children's Fund	The TransMONEE database is a compilation of data on the situation and wellbeing of children, young people, and women in Central Eastern Europe

(UNICEF) – TransMonEE	and Commonwealth of independent States (CEECIS). Data is based on official registers, administrative records, national accounts and surveys. Most of the data are collected directly from national statistical offices using a standardized template. For more information, see http://www.nsd.uib.no/macrodataguide/set.html?id=42&sub=2
Organization of American States (OAS) – The OAS Hemispheric Observatory Reports 'AlertAmerica'	Alertamerica.org: The OAS Hemispheric Citizen Security Observatory is constantly updating and publishing information for all the countries in the hemisphere. The Observatory presents official information disclosed by the States, assembled into indicators that cover all social phenomena of crime and violence, as well as the initiatives developed to control and penalize them. For more, see http://www.oas.org/dsp/english/cpo_observatorio.asp
The United Nations Economic Commission for Europe (UNECE)	UNECE promotes, jointly with the United Nations Office on Drugs and Crime (UNODC), the development of an international crime classification system for statistical use, to improve consistency and international comparability of crime statistics. It produces the Crime and violence statistics in the UNECE Statistical Database. For more, see http://www.unece.org/stats/crime.html

The GBAV Homicide Database

The GBAV Homicide Database builds on the data collection that was initiated in 2010, in preparation for the GBAV 2011 report. Overall it contains a total of 7,686 data points, including 4,168 homicide figures for 203 countries and territories[3] from 2004 to 2012. Furthermore, the GBAV Homicide Database also includes disaggregated data on the gender of homicide victims as well as on the use of firearms. Table 2 lists the sources on intentional homicide and provides information on the availability of disaggregated data.

Table 2. Homicide data points in the GBAV Homicide Database by source, 2004-12

National sources	Total Homicide	Homicide by sex	Homicide by firearm	Homicide by firearm by sex
National Statistical Institution	748	216	104	72
National Police	224	41	88	25
Ministry of Interior	60	23	36	8
Ministry of Health	32	34	38	24
Forensic Institute	32	27	17	15
Ministry of Justice	23	12	13	6

[3] Fifteen countries have been combined into two macro regions: Lesser Antilles and the Micronesia Region. See 'Lethal violence estimates'.

National sources	**Total Homicide**	**Homicide by sex**	**Homicide by firearm**	**Homicide by firearm by sex**
National Observatories	17	7	16	2
Attorney General	5	4	5	-
Regional - International sources				
UNODC	816	7	321	-
WHO – Global Burden of Disease	337	317	-	-
Eurostat	452	206	-	
IHME – Global Burden of Disease (2010)	188	188	188	188
European Sourcebook of Crime and Criminal Justice Statistics	165	-	68	-
WHO - European Mortality Detailed Database	242	242	232	232
WHO - Health for All Database	177	125	-	-
WHO - PAHO	86	81	-	-
UNICEF - TransMonEE	157	-	-	
OAS	137	4	43	-
The Global Burden of Diseases Injury Expert Group	23	72	63	-
UNECE	86	79	-	-
WHO - Mortality Database (2004 and 2008)	23	22	-	-
World Bank	65	11	25	9
Other sources				
Non-governmental organizations	42		14	-
Media reports	16	-	-	-
Other observatories	15	8	8	-
Total sources	**4,168**	**1,726**	**1,211**	**581**
Grand total sources				**7,686**

Data has been entered in the database in form of absolute values.[4]

In addition to what Table 2 depicts, the GBAV Database includes data on homicide at the subnational level from the abovementioned sources of homicide data. This includes data from province, municipal, and city level, depending on the country, and contains around 92,000 data points on homicides from 18 countries spanning over the years 2001–13.

Methodology to establish a time series for intentional homicide for each country

The GBAV Database contains time series on intentional homicide for a total of 201 countries or territories. In order to select the source for building the time series, the following process was followed:

For 51 countries (25 per cent), only a single source on homicide was identified. For 126 countries (63 per cent), more than one source provided a time series on intentional homicide. The best source was selected according to the following criteria:

- **length of time series**: the source provides the longest time series;
- **clarity**: the source provides relevant metadata, including a clear definition of homicide;
- **consistency**: the source provides data reported regularly and timely, with a consistent methodology; and
- **accessibility**: the source is transparent and data is publicly available.

For 26 countries (13 per cent), no time series was available, but multiple sources provided data for different years. In these cases, available sources were combined to establish the time series.

In the case of an incomplete data series, the most recent previous year with available information is kept constant for missing years and considered with the relevant population data.

Conflict deaths

The dataset on Conflict Deaths (DCDs) in this, the third volume of the *Global Burden of Armed Violence,* has undergone a twofold update and enhancement.

First, certain countries afflicted by ongoing conflict and which have been taken over from the 2011 report have been updated for their figures for the years 2009 to 2012. Second, although a number of situations of

[4] When sources provided both rates and absolute values, the latter were selected and entered in the database. When sources provided only rates, absolute values were derived by using population data provided by the same source, if available, or otherwise by using statistics from the UN World Population Prospects (UN, n.d.).

widespread violence do not fit the definition of 'armed conflict', they deserve attention and inclusion into the lethal violence combined estimates, since these deaths are counted neither in homicide data, nor in 'traditional' armed conflict databases.

The database has been expanded to better reflect the complex reality of contemporary violence. In some cases, violence erupts and quickly devolves into some form of war. Violently repressed mass uprisings may result in hundreds of victims. In other cases, long-lasting violence among gangs, organized criminal groups, and state security forces, has taken on the characteristics of an armed conflict. Examples of such situations—in which no conflict is declared, yet high numbers of violent deaths occur and are unlikely to be labelled as homicides—include the uprising in Egypt, the early stages of the conflicts in Libya and Syria, or the killings that occurred in Kiev before the outbreak of the conflict in Ukraine.

These deaths are typically documented by civil society and academic organizations, or groups or individuals who keep records of casualties, including a wide range of details on conflict events, such as: characteristics (and identity) of the victim, location, and date of the event (see See Box 1.4, Geneva Declaration Secretariat, 2015).The GBAV Database includes datasets from countries suffering conflict and from a group of 'focus countries' afflicted by violence and insecurity. This methodology is based on the GBAV unified approach to lethal violence (Geneva Declaration Secretariat, 2011, pp. 11-42) and the belief that prevention of all forms of violence and violent deaths is necessary to achieve 'peaceful and inclusive societies', as indicated within the post-2015 Sustainable Development Goals framework, and to ensure that everybody targeted by any form violence is accounted for, or, in other words, that 'nobody is left behind' (UNDESA, 2014 para. 17; Alvazzi and De Martino, 2015).

The selection of countries for the collection of conflict deaths data is based on three main criteria:

- an average intensity of conflict/crisis is measured through a conflict death rate that is equal to or greater than 1 per 100,000 *or* 70 deaths per year on average for the period 2004–12;
- the appearance of the country and fatalities linked to instability, crises or armed conflict in at least 7 of the 24 datasets or reports on armed conflicts and instability. (See Annex I); and
- conflict death figures are not included in the homicide statistics computed and disseminated by other national sources, such as the national statistical office or national police.

Based on these three criteria, the database includes killings in war zones and during intense crises in the following 35 countries:

1. Afghanistan
2. Algeria
3. Burundi
4. Central African Republic
5. Chad
6. Colombia
7. Côte d'Ivoire
8. Democratic Republic of Congo
9. Egypt
10. Ethiopia
11. Georgia
12. India
13. Indonesia
14. Iran
15. Iraq
16. Kenya
17. Lebanon
18. Libya
19. Mali
20. Myanmar
21. Nepal
22. Nigeria
23. Palestinian Territories
24. Pakistan
25. Philippines
26. Russia
27. Somalia
28. South Sudan
29. Sri Lanka
30. Sudan
31. Syria
32. Thailand
33. Turkey
34. Uganda
35. Yemen

For each of these countries, data on conflict has been compiled from multiple available sources, including international and specific casualty recorders. Given the mandate of casualty recorders—to document conflict events where few or no other impartial source is available—statistics on conflict-related fatalities are often accompanied by detailed descriptions of the events, including the dynamics and the actors involved. When available, these descriptions are collected to grasp better the nature of the data and to guide the selection of the main source for the GBAV conflict estimates.

Overall, the GBAV estimates a global average of 70,000 conflict deaths. This would translate as a total of 420,000 victims of conflict and instability, if this figure was multiplied times six years, to cover the 2007–12 period observed by the GBAV 2015. But conflicts and crises endure a high level of volatility, can erupt and escalate quickly and then suddenly cease. For example, the conflict in Sri Lanka had an intensity peak with more than 15,500 deaths in 2009, but no conflict-related fatality has been recorded since the end of that year. Libya brings another example of sudden changes in levels of conflict violence. The crisis in the country begun with the Arab Spring protests in 2011, and quickly escalated, reaching approximately 17,000 deaths the following year, a rate of 274 violent deaths per 100,000 population.

Violent deaths estimates

The elaboration of lethal violence estimates aims to provide figures on the total human toll of violence across conflict and non-conflict settings. In practical terms, these estimates combine the number of violent

deaths recorded as intentional homicides by a multitude of national and international actors and those deaths excluded by the homicides count, but classified as conflict-related and documented by casualty recording systems.

The GBAV 2015 focuses on estimates on the average number of violence deaths per year, between 2007 and 2012. The process to produce these estimates is presented in Figure 1. This process is based on the compilation of the GBAV Homicide Database and the GBAV Conflict Database through the consultation of multiple sources. For each country, a single source is identified for homicide data as well as for conflict data, where it applies. Table 3 provides an example of this calculation, based on the case of Pakistan.

Table 3. Violent deaths estimation, Pakistan, 2007–12

Indicator	**Source**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Intentional Homicide	NSO	10,556	12,059	12,491	13,208	13,860	13,846
Direct Conflict Deaths	SATP - PIPS	3,599	6,715	12,109	8,719	6,705	5,629
Violent Deaths Count		14,155	18,774	24,600	21,927	20,565	19,475
UN Population		163,928,329	167,008,083	170,093,999	173,149,306	176,166,'353	179,160,111
Violent Deaths Rate		8.6	11.2	14.5	12.7	11.7	10.9
GBAV 2015 lethal violence estimate 2007-12		**11.6**					

In total, the GBAV 2015 database includes lethal violence rates for 201 countries and territories. It includes 191 of the 193 United Nations member states. It excludes San Marino and Tuvalu, due to the lack of data.

The database includes Anguilla, Bermuda, Guam, Hong Kong, Palestine, Puerto Rico, Taiwan, and the three UK territories: England and Wales, Northern Ireland, and Scotland.[5]

[5] The United Kingdom is not included as a single country, but rather as three territories.

Smaller countries were aggregated into two regions. Specifically:

- the Lesser Antilles, which includes Anguilla, Antigua and Barbuda, Barbados, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago; and
- the Micronesia Region, which includes Guam, Kiribati, Marshall Islands, Federal States of Micronesia, Nauru, and Palau.

The composition of macro-geographical (continental) regions and geographical sub-regions is based on the categorization of the United Nations Statistics Division (UNSD, n.d.b). Intentional homicide rates per 100,000 population were calculated on the basis of the 2012 revision of the UN World Population Prospects (UN, n.d.).

'Estimating the Economic Cost of Homicides'[6]

Chapter Five of the GBAV 2015 presents research that considers the (direct) economic cost of homicide expressed in terms of reduced average life expectancy and the associated valuation of forgone economic income. Effectively, it calculates the opportunity cost of a life cut short by homicide. This provides a precise estimate of the costs associated with homicide and the potential gains in wellbeing, if such violence is reduced.

This study uses a counterfactual to estimate the cost of homicidal violence on life expectancy and per capita income on a global, regional and per-country basis for the years 2000, 2004, and 2010.

Using data on deaths from the World Health Organization, this paper calculated the counterfactual life expectancy of specific countries and regions (as defined by the World Bank, according to per capita income levels of each country) in the absence of excess deaths from homicide. That is, it calculated what the life expectancy would have been for each country and region in the absence of deaths exceeding a natural or 'normal rate' of homicide (see 'Natural rate of Homicide' below).

With the above data, this paper calculated the number of months of life that the population of a region or country lost to excess violent deaths. It estimates the monetary value of these months of life in terms of Gross Domestic Product (GDP) per capita, adjusted in terms of exchange (which facilitates comparing across regions). Another counterfactual is also calculated for the cost of deaths from firearms.

These calculations were made both for the total population and according to different age groups (of which there were 17 in total, each including a span of five years) and gender.

[6] Please note that the methodology explained here is a summary of the full methodological document provided by the Authors. For the sake of space and simplicity, the present annexe provides summary information. In case of specific questions and research-related queries, please write to sas@smallarmssurvey.org to access the full methodological document.

The biggest limitation for this study was the unavailability of data for a significant number of countries (See Annex IV). While many were excluded for this reason, for others a careful process of demographic data imputation had to be used.

Methodology

Division by region

To conduct this study, the 105 countries included were grouped into regional blocks. The regions used were established by the World Bank according to their gross national income (GNI), a measurement that refers to the GDP as adjusted for terms of trade, i.e. the difference between imports and exports valued at purchasing power. Table 1 lays out the regions.

Table 1. Regions of the World Bank Income

Region	**Per capita GNI (in USD)**	**Number of Countries**
Low income	USD 975 or less	2
Lower-middle income	USD 976–3,855	16
Upper-middle income	USD 3,856–11,905	37
High-income OECD members	USD 11,906 or higher	29

Having said that, this regional division was chosen because levels of national income reflect not only the economic conditions of individual countries, but also certain fundamental institutional characteristics related to a society's wealth that influence the relationships and behaviors that occur within it. This cannot be assumed in cases in which regional divisions come naturally by way of geography, given the heterogeneity between countries on the same continent.

To have consistency along regional lines throughout the study, it was necessary to assume that countries remain in the same region in 2004 and 2010, as they were in 2000—that is, that there were no economic shocks strong enough to move a country into a different income level in 2004 or 2010, as compared to the 2010 starting point. A region's per capita income is calculated as the average of the countries within this region.

Homicides by firearms are grouped under five different categories: self-injury, accident, assault, undetermined intent, and war operations and legal interventions. For the sake of this study, the focus was on assault only (homicide). Information was available for 86 countries only on homicide by firearms (see Annexe IV).

Natural rate of homicide

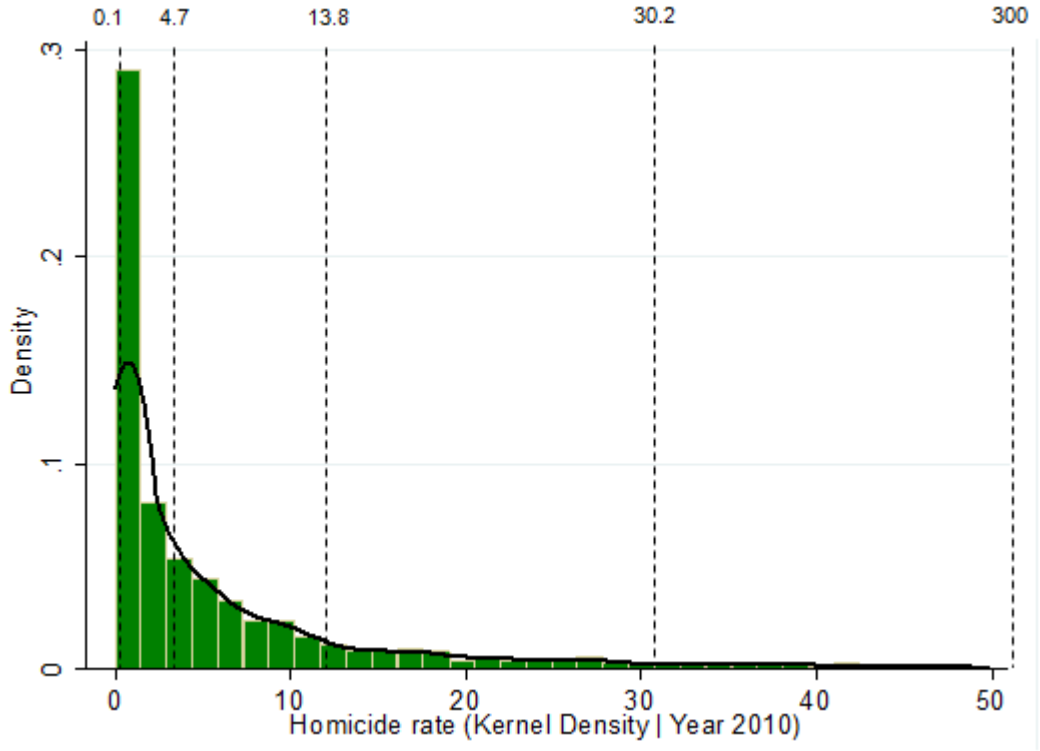
In order to measure the years of life lost to homicide and death from external causes, it is necessary to construct a counterfactual that can calculate the life expectancy of each region, regardless of excess deaths from homicide—that is, what a country or region's life expectancy would be without violent deaths that exceed the threshold of what can be taken as the 'natural homicide rate' in the world.[7]

This natural rate of homicide is defined as the number of homicides per 100,000 inhabitants that is natural or normal, defined as the average homicide rate of the second quintile in the distribution of global homicide rates for all cohorts.

To do so, data on the homicide rates of each country were taken and ordered from the least to the greatest. Subsequently, the sample was divided into five equal quintiles, where the first quintile corresponds to the lowest rate of homicide in the world and the fifth to the highest. After dividing them into quintiles, as shown in Figure 1, the average rate of the second quintile (greater than 0.1 and less than 4.7 per 100,000) was taken to be the natural rate of homicide.

[7] For an explanation of 'natural' and 'excess' homicide, see GBAV 2015 (Geneva Declaration Secretariat, 2015, p. 161).

Figure 1. Division of homicide rates in the world by quintiles, 2010



This procedure was then repeated to disaggregate by age group for each year under study.

It is important to consider the size of the population and the disproportionate weight of countries such as China, India, the Russian Federation, and the United States and not to impose a counterfactual rate of homicide as low as 1 person per 100,000 people, which would buck the trend in each of these countries. Hence the natural rate used has taken these two factors into account.

That said, in addition to calculating the average aggregate homicide rate, the breakdown by age and gender is calculated because the data on homicides shows that young men are considerably more likely to be victims of homicidal violence than women. As such, it is considered important to study the changes and losses of years of life expectancy among certain population groups in order to highlight the characteristics (in terms of age and gender) that make them more likely to be a victim of homicide.

Cost of living in years because of excess deaths from homicides[8]

Following the methodology proposed by Becker, Philipson, and Soares (2005), this study calculates changes to life expectancy in a given country from different causes of death, in addition to the estimated

[8] This brief summary is based on the complete methodological document provided by the authors. In case of specific questions and research-related queries, please write to sas@smallarmssurvey.org to access the full methodological document.

cost of excess deaths from external causes, measured in years of life and GDP. These calculations are based on a survival function and on the infra-marginal changes it has on these costs. To do this, the authors calculate wealth as a function of each country's per capita income and life expectancy at a given moment. In this case, the life expectancy was taken from life tables calculated above, the entry was taken from per capita income tables adjusted for 2005 prices from the Penn World Tables.[9] Moreover, this study used the methodology proposed by Soares (2006) to calculate the willingness to pay for additional years of life.

[9] These data is available online at: https://pwt.sas.upenn.edu/php_site/pwt71/pwt71_form_test.php

Annex I. List of datasets or reports on armed conflicts and country instability

International Dataset	Source
Arbeitsgemeinschaft Kriegsursachenforschung Report	Schreiber, 2012, 2011, 2010
Armed Conflict Location and Event Data Project	ACLED, n.d.
Armed Conflicts Report	Project Ploughshares, n.d.
High Casualty Terrorist Bombings	CSP, 2014a
Major Episodes of Political Violence 1946-2013 database	CSP, 2014b
State Failure Problem Set: Internal Wars and Failures of Governance, 1955-2013	CSP, 2014c
State Fragility Index 2012	CSP, 2014d
CIRI Human Rights Dataset 2014	Cingarelli et al., 2014
Conflict Barometer 2011-2012	HIIK, 2013, 2012
CrisisWatch N°121	ICG, 2013
Freedom in the World Index	Freedomhouse, n.d.
Global Terrorism Database	START, n.d.
Human Rights and Democracy Report	FCO, 2013
IISS Armed Conflict Database	IISS, n.d.
International Country Risk Guide	PRS, n.d.
Peace and Conflict report	Hewitt, Wilkenfeld, and Gurr, 2012
Political Terror Scale	PTS, n.d.
SIPRI Yearbook 2012 Chapter	SIPRI, 2012
Social Conflict in Africa Database	SCAD, n.d.
UCDP Battle-Related Deaths Dataset	UCDP, n.d.a
UCDP Battle-Related Deaths Dataset	UCDP, n.d.b
UCDP Battle-Related Deaths Dataset	UVCDP, n.d.c
The UCDP/PRIO Armed Conflict Dataset	UCDP/PRIO, n.d.

National Datasets	**Source**
Afghanistan and Iraq	iCasualties, n.d.a; n.d.b
Colombia	CERAC,2014
Iraq	Iraq Body Count, 2013, 2012, n.d.
Nepal	INSEC, n.d.
Palestine	B'Tselem, n.d.
Somalia	Elman Peace, n.d.
India, Nepal, Pakistan, and Sri Lanka	SATP, n.d.a; n.d.b; n.d.c; n.d.d
Syria	SNHR, 2013; 2012
Libya	Djukic, 2014

Please note: This is a DRAFT version of this methodological annexe.

Annex IV. Lists of countries included and excluded in the calculation of the economic costs of homicide

Table 1. Countries excluded from the study

Afghanistan	Djibouti	Marshall Islands	Sierra Leone
Albania	Dominica	Martinique	Singapore
Algeria	Dominican Republic	Mauritania	Solomon Islands
Andorra	Equatorial Guinea	Micronesia (Federated States of)	Somalia
Angola	Eritrea	Monaco	Sudan
Anguilla	Ethiopia	Mongolia	Swaziland
Bangladesh	Falkland Islands (Malvinas)	Montserrat	Syria
Benin	French Guiana	Mozambique	Tajikistan
Bermuda	Gabon	Myanmar	Togo
Bhutan	Gambia	Namibia	Tonga
Bolivia	Germany, Former Democratic Republic	Nauru	Tunisia
Bosnia and Herzegovina	Germany, Former Federal Republic	Nepal	Turkey
Botswana	Germany, former West Berlin	Netherlands Antilles	Turkmenistan
British Virgin Islands	Ghana	Niger	Turks and Caicos Islands
Burkina Faso	Greece	Nigeria	Tuvalu
Burundi	Guadeloupe	Niue	Uganda
Cambodia	Guinea	Palestinian Territories	United Arab Emirates
Cameroon	Guinea-Bissau	Pakistan	United Kingdom, England, and Wales
Cape Verde	Honduras	Palau	United Kingdom, Northern Ireland
Cayman Islands	Indonesia	Papua New Guinea	United Kingdom, Scotland
Central African Republic	Iran	Reunion	Tanzania

Chad	Kenya	Rodrigues	USSR, Former
China: Province of Taiwan only	Laos	Rwanda	Vanuatu
Comoros	Lebanon	Ryu Kyu Islands	Viet Nam
Congo	Lesotho	Saint Kitts and Nevis	Yemen
Cook Islands	Liberia	Saint Pierre and Miquelon	Yugoslavia, former
Côte d'Ivoire	Libya	Samoa	Zambia
Czechoslovakia, former	Macau	San Marino	Zimbabwe
North Korea	Madagascar	Sao Tome and Principe	
Democratic Republic of the Congo	Malawi	Senegal	
Denmark	Mali	Serbia and Montenegro, former	

Table 2. Countries excluded and included

Excluded				
Antigua and Barbuda	Costa Rica	Iceland	Malta	Saudi Arabia
Argentina	Croatia	India	Mauritius	Serbia
Armenia	Cuba	Indonesia	Mexico	Seychelles
Aruba	Cyprus	Iraq	Moldova	Slovak Republic
Australia	Denmark	Ireland	Montenegro	Slovenia
Austria	Dominican Republic	Israel	Morocco	South Africa
Azerbaijan	Ecuador	Italy	Netherlands	Spain
Bahamas, The	Egypt, Arab Rep.	Jamaica	New Zealand	Sri Lanka
Bahrain	El Salvador	Japan	Nicaragua	St. Lucia
Barbados	Estonia	Jordan	Norway	Vincent and the Grenadines
Belarus	Fiji	Kazakhstan	Oman	Suriname
Belgium	Finland	Kiribati	Panama	Sweden
Belize	France	Korea, Rep.	Paraguay	Switzerland
Brazil	Georgia	Kuwait	Peru	Thailand
British Virgin Islands	Germany	Kyrgyz Republic	Philippines	Trinidad and Tobago
Brunei	Grenada	Latvia	Poland	Ukraine
Bulgaria	Guatemala	Lithuania	Portugal	United Kingdom
Canada	Guyana	Luxembourg	Puerto Rico	United States
Chile	Haiti	Macedonia, FYR	Qatar	Uruguay
China	Hong Kong SAR, China	Malaysia	Romania	Uzbekistan
Colombia	Hungary	Maldives	Russian Federation	Venezuela, RB

Included				
Antigua and Barbuda	Croatia	Hungary	Mauritius	Saudi Arabia
Argentina	Cuba	Iceland	Mexico	Serbia
Aruba	Cyprus	Iraq	Moldova	Slovak Republic
Australia	Denmark	Ireland	Montenegro	Slovenia
Austria	Dominican Republic	Israel	Morocco	South Africa
Azerbaijan	Ecuador	Italy	Netherlands	Spain
Bahamas, The	Egypt, Arab Rep.	Jamaica	New Zealand	St. Lucia
Bahrain	El Salvador	Japan	Nicaragua	Vincent and the Grenadines
Barbados	Estonia	Jordan	Norway	Suriname
Belgium	Finland	Korea, Rep.	Panama	Sweden
Belize	France	Kuwait	Paraguay	Thailand
Brazil	Georgia	Kyrgyz Republic	Peru	Trinidad and Tobago
British Virgin Islands	Germany	Latvia	Philippines	United Kingdom
Bulgaria	Grenada	Lithuania	Poland	United States
Canada	Guatemala	Luxembourg	Portugal	Uruguay
Chile	Guyana	Macedonia, FYR	Puerto Rico	Uzbekistan
Colombia	Haiti	Malaysia	Qatar	Venezuela, RB
Costa Rica	Hong Kong SAR, China	Malta	Romania	

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