



Department
for International
Development



Tools for measurement, monitoring and evaluation

Making conflict, crime and
violence data usable

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Practice Products for the CCVRI

Improving Measurement in DFID Crime, Conflict & Violence Programming

This document is one of a series of Practice Products developed under the *Conflict, Crime, and Violence Results Initiative (CCVRI)*. The full set of products is intended to support DFID country offices and their partners to develop better measures of programme results in difficult conflict and fragile environments.

DFID recognises the need to focus on the *results* of its work in developing countries. To this end, DFID strives to account better for our efforts on behalf of UK taxpayers, offering clarity regarding the value and impact of our work. The Results Initiative operates under the assumption that we will achieve our development objectives with our national partners more effectively if we generate—collectively—a clear picture of the progress being made.

Within DFID, the Conflict Humanitarian and Security Department has established a partnership with a consortium of leading organisations in the fields of conflict, security and justice to develop more effective approaches to the use of data in the design, implementation and evaluation of programmes that contribute to reducing conflict, crime and violence. In addition to producing these Practice Products, the consortium has established a Help Desk function to provide direct and customized support to country offices as they endeavour to improve measurement of results in local contexts.

The Help Desk can be accessed by contacting helpdesk@smallarmssurvey.org.

The views expressed in this Practice Product are the sole opinions of the authors and do not necessarily reflect the opinions of all consortia partners. This Practice Product does not reflect an official DFID position.

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Document Summary

Title: Tools for measurement, monitoring and evaluation. MAKING CONFLICT, CRIME AND VIOLENCE DATA USABLE

Purpose and intended use of this document: This document has a focus on the use of conflict, crime and violence data. In particular, the document highlights how raw data and statistics can be transformed into information, and helps understand trends, patterns and dynamics of conflict, crime and violence around the globe. This tool will help users to build meaningful analysis based on the sources of conflict crime and violence data discussed in the document SOURCES OF CONFLICT, CRIME AND VIOLENCE DATA.

Key questions this document addresses:

- How can the information power of CCV data be enhanced?
- What elements need to be considered to render data useful?
- What examples exist that have used CCV data for programing purposes?
- What is metadata?
- What is an indicator?

Key messages/essential “take aways”:

- Raw data can be transformed into meaningful information with a minimum of additional efforts.
- Monitoring trends (over time) and disaggregating data (e.g. by gender, use of weapons) increases the analytical capacity of CCV data
- A clear definition of concepts and indicators is necessary for making data useful
- The pooling of indicators is essential for monitoring a complex phenomenon (such as conflict, crime and violence).

Intended audience of this document (including assumed skill level): DFID Country Officers, who need to collect, assess, and use conflict, crime and violence data for programmatic purposes. No prior knowledge or experience with statistics or data collection is required.

Key topics/tags:

CONFLICT, CRIME AND VIOLENCE DATA, DATA CONTENTS, DATA USE ADVICE

Authors and their organizations:

This paper was authored by the Small Arms Survey - Anna Alvazzi del Frate, Natalie Jaynes, Ryan Murray, Matthias Nowak and Irene Pavesi.

Cross-references to other documents in the series:

Tools for measurement, monitoring and evaluation. IN-DEPTH FOCUS ON SURVEYS

Tools for measurement, monitoring and evaluation. SOURCES OF CONFLICT, CRIME AND VIOLENCE DATA

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Introduction

The focus of this document is to provide practical input in terms of how to utilize Conflict, Crime and Violence (CCV) data, and to illustrate how this data can be useful for DFID country offices.

This document discusses the process of transforming raw data into meaningful information to support evidence-based programming. This paper is closely related to another Guidance Product entitled, 'Tools for measurement, monitoring and evaluation' (SOURCES OF CONFLICT, CRIME AND VIOLENCE DATA).

The first section provides an overview of what the basic steps are to **transform data into meaningful information**. This section explores in particular how data should be disaggregated, how timelines provide an important part of the 'story', and what metadata (data about data) is needed for analysis. The second section discusses some of the basic elements and steps to **develop indicators**. It then explores how indicators can and should be used and provides two policy-relevant examples.

This document is based on the experience of the Small Arms Survey in carrying out comprehensive assessments in conflict and post conflict areas, based on existing data (such as official statistics) as well as data specifically collected at the local level.

From numbers to information

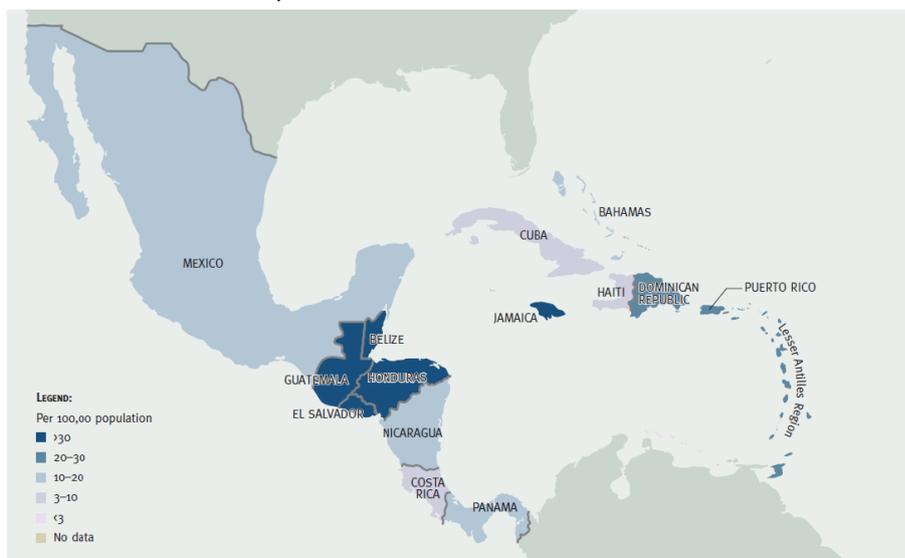
Data needs to be analysed and then transformed into information that is relevant and usable as a base for decision-making either at programme level or at policy –level. This section will present several elements that allow for transforming numbers into more usable information.

A central task of the data is to be able to monitor trends and patterns of conflict, crime and violence, inform decisions and evaluate if policies, programmes and measures are achieving their intended outcomes. Therefore, collected data and the indicators chosen should comprehensively engage the distribution of conflict, crime and violence across space and time and the patterns with other variables. The following sections will address these aspects in detail.

Geographical distribution

The distribution of conflict, crime and violence can often be assessed by plotting information on maps. This can be a simple and effective analytical tool to identify critical areas and targets for programmes and policies. The use of maps can help in understanding the distribution of events at all levels of territorial disaggregation, depending on the availability of data, providing different types of information for analytical purposes. Below are three different examples illustrating how maps can be used to enhance knowledge on the distribution of conflict, crime and violence.

Map 1 - Average annual rates of violent deaths per 100,000 in Central Americas and the Caribbean, 2004 -2009

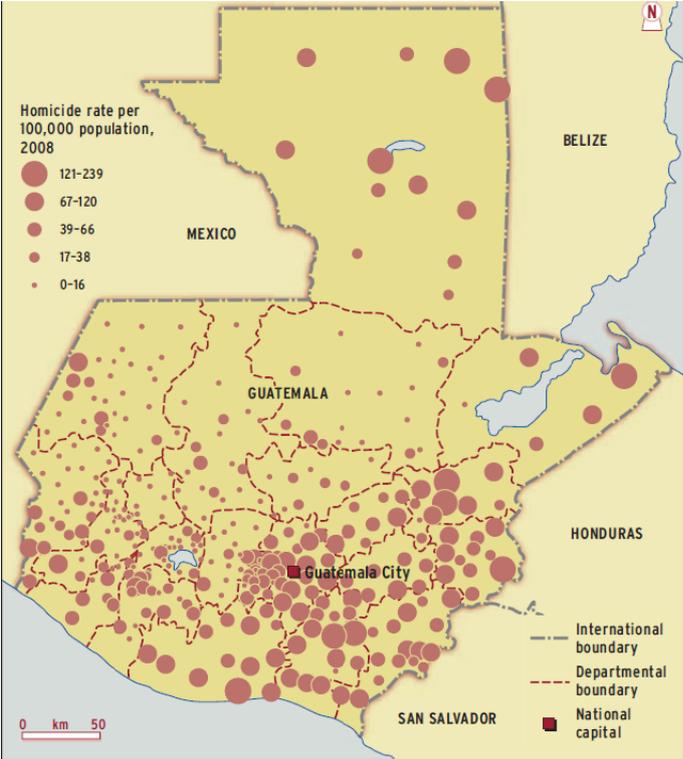


Source: Geneva Declaration Secretariat, 2011, p. 62

Map 1 shows violent death rates in Central Americas and the Caribbean. Data are organized in ranges and a colour is assigned to each range. The countries represented in the map then assume the colour of the relevant homicide rates. The advantage to using a

visual tool like this is that it provides immediate information on the distribution of violence and allows for easy cross-national comparison. The map helps in identifying Belize, Honduras, Guatemala, El Salvador and Jamaica, coloured in dark blue, as the most violent cluster in the region, with violent death rates higher than 30 per 100.000 population. However this type of representation comes with some limitations in terms of analysis. The rates are presented at the national level and the level of violence is shown as homogenous within the national borders. Clearly, the distribution follows further sub-national patterns that can be discovered only by looking at data at a different level of territorial aggregation.

Map 2 – Homicide rates per 100.000 in Guatemala by municipalities, 2008



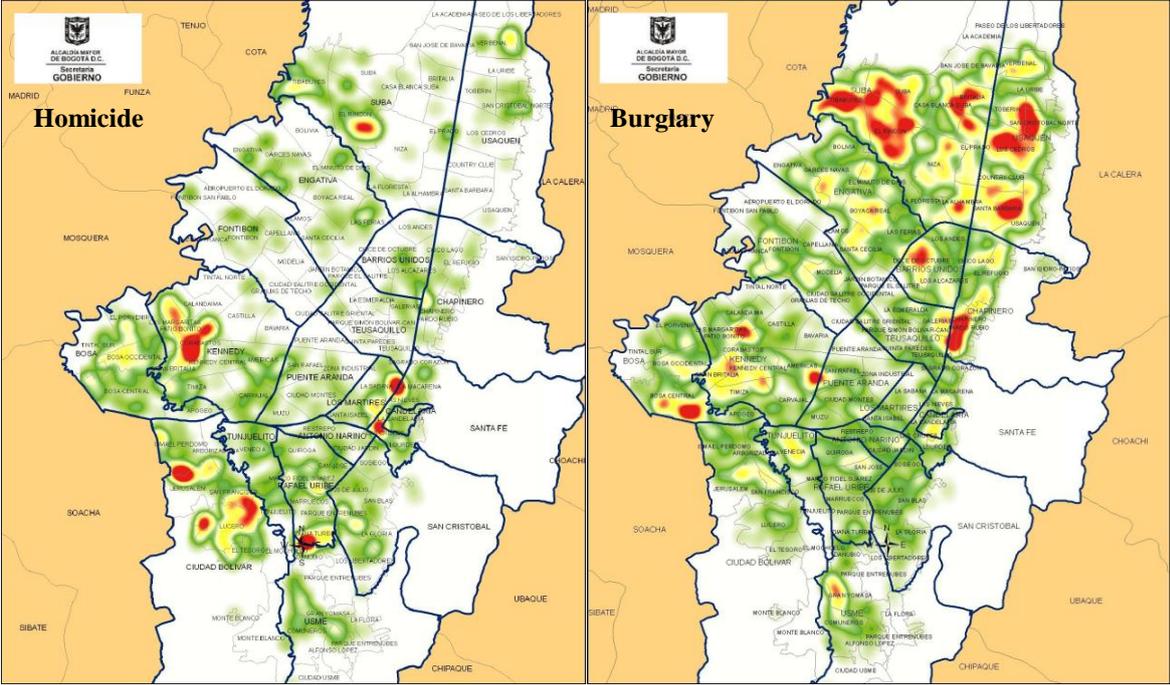
Source: Nowak, 2012

Map 2 shows how violence, in terms of homicide rates, is distributed across municipalities in Guatemala. The size of the dots plotted on the map is proportioned to the level of homicide rates by municipality. Again, the visualization of data conveys that violence is neither randomly distributed nor homogeneous but rather that it clusters around major urban areas, in particular Guatemala City. It also shows that border areas are critical, suggesting the impact of organized crime activities in these areas (Nowak, 2012).

More detailed analysis on the patterns of violence is also very useful at a lower territorial aggregation, in particular when other information is also available. Map 3 shows an example of hot spot analysis in Bogota, Colombia. Two different sets of information are compared by plotting them on the map: on the left, homicide cases and,

on the right, burglary cases. Red areas correspond to higher concentrations of incidents. The two maps show that violent crimes (homicide) and property crime (burglary) follow different patterns to the extent that they concentrate on different areas, calling for specific interventions. Information on both homicide and burglary is associated with particular (social, economic) characteristics of the city areas affected. Homicides thus concentrate in poorer, peripheral areas of the city (South, East), whereas burglaries typically concentrate in the rich neighbourhoods of the Northern parts of the city. This has important impacts on policing strategies, how authorities should deal with specific risk factors, and what measures can be recommended to reduce the impact of these two specific forms of crime and violence.

Map 3- Distribution of homicide and burglary cases in Bogota, 2011



Source: CEACS, 2012

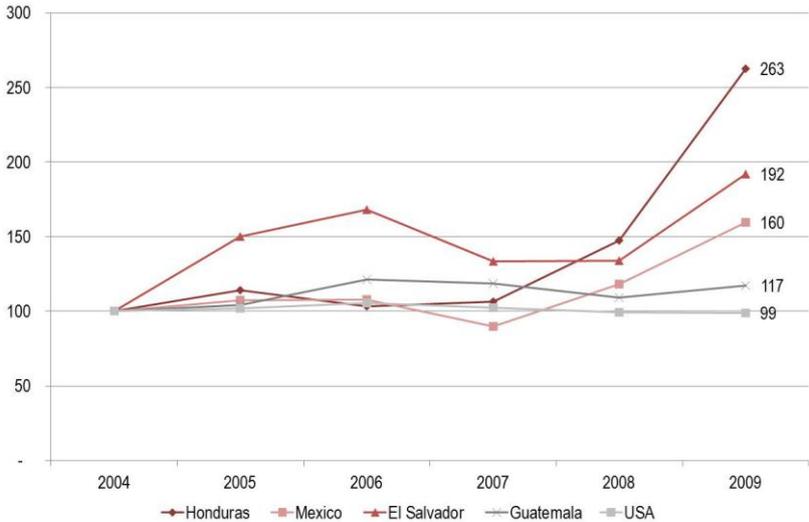
The examples proposed in this section show how the visualization of data, through the use of maps, informs the reader about the spatial distribution of phenomena. The understanding of geographic patterns of conflict, crime and violence is crucial to identify critical areas and suitable targets for programmes and interventions. However, the information provided by maps refers to snapshots in time and do not provide insights on how violence has changed over time. Thus, trend analysis is important to understand how events are distributed across time.

Evolution over time

Trends in conflict, crime and violence provide important information about how particular elements of violence evolve. In particular, comparing the evolution of a phenomenon to a baseline (the first time a measurement of the phenomenon has been made) is critical for evaluating the impacts of measures and programs on a particular

element (for example crime). Two examples of trend analysis are presented below. Figure 1 shows how the killing of female victims has changed over time in five selected countries in the Americas. Data are represented as indexes, meaning that the number of femicides by year is shown as percentage variation from the first year of the temporal series. Therefore, the number of female victims in 2004 is set as the benchmark, with value 100, and the data for the following years are put in relation to it. This representation facilitates the trend analysis and makes clearer to the user that the number of female victims is increasing to different extents in all countries but the United States; in particular, in Honduras, femicides have increased by 263% compared to 2004.

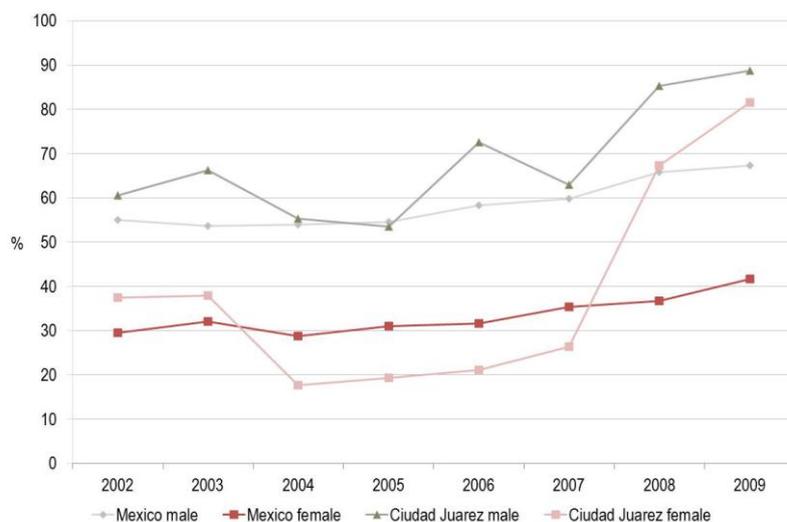
Figure 1 - Femicide trends in five selected countries, 2004-09 (basis 2004=100)



Source: Geneva Declaration Secretariat, 2011

Another example, presented in Figure 2, shows the evolution of firearms related deaths in Mexico and Ciudad Juárez, before and after the initiation of the drug wars in 2006. Data are presented as the percentages of firearm homicide by male and female victims. This shows that the use of firearms in homicides affects males and females differently. Firearms are used, on average, in 60% of homicide with male victims and in less than 40% with female victims. Since 2005, there is an increasing trend of the proportion of homicide for both males and females, with the latter by a greater extent.

Figure 2 - Percentages of firearm homicide victims by sex in Mexico and Ciudad Juarez, 2002–2009



Source: INEGI (2009)

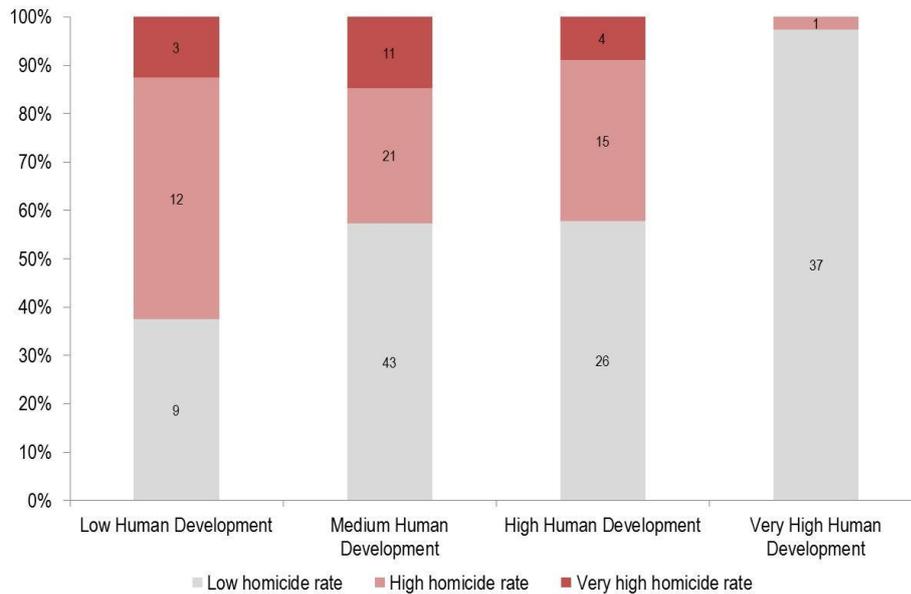
This type of analysis includes both the spatial and the temporal aspects of violence, as it looks at both national and local level, but it gives more emphasis to the distribution of violence across time. It allows a better understanding of how the phenomenon has evolved and facilitates the identification of a problematic pattern (the peak of female victims by firearms in Ciudad Juárez) that would have been hidden by looking at only one point in time.

Patterns of conflict, crime and violence

Data can also be used to gain an understanding about the relationship of conflict, crime and violence to other variables. The analysis of the distribution in space and/or time of violence in relation to economic and social variables allows for the identification of those factors that are likely to cause or facilitate higher levels of violence or the exacerbation of conflict. Clearly this type of analysis is crucial for policy and programming because it helps gain an understanding of what factors are worth tackling to impact on violence levels and enhance the wellbeing of vulnerable groups.

The example below shows homicide data compared to Human Development Index for 182 countries. The HDI represents a statistic covering life expectancy, income and education variables, to rank countries according to their level of development. Figure 3 shows a relationship between the level of violence and the level of development. Indeed high and very high homicide rates are concentrated in countries with low to medium human development achievement.

Figure 3 - Homicide Rates and Human Development Index, 1986-2009



Source: Geneva Declaration Secretariat, 2011

The identification of this pattern allows the reader to make speculations about the relationship between violence and development: “In other words, lethal violence appears to constrain development progress. Classifying countries as either ‘improving’ or ‘deteriorating’ across homicide and development indicators reveals how countries that register a crude improvement in their HDI are also most likely to exhibit lower levels of violence. That is, homicide rates determine negatively and significantly the presence of any improvement of a country’s HDI rating. As such, the statistical assessment confirms that higher homicide rates are associated with lower HDI rankings” (GBAV, 2011, p.152).

Kisielewski, Rosa and Asher (2010) have compiled a list of phenomena that are highly correlated with armed violence, under the hypothesis that they have a causal relationship or at least anticipate armed violence. These factors are organized into *predictors*, meaning factors causing or anticipating armed violence, and *sustainers*, meaning factors reinforcing violence, once started.

Predictors

- Arms transfers (+)
- Discrimination against ethnic groups (+)
- Economic inequality/poverty (+)
- Forced evictions/displacement (+)
- Freedom of movement (-)
- Freedom of press (-)
- Gross domestic product (+)
- Illegal trade (+)
- Illicit drug trade/prevalence of drug trafficking (+)
- Inflation rates (+)
- International sanctions (+)
- Level of democratization (-)
- Literacy and education level (-)

- Military expenditure (+)
- Military personnel (+)
- Police (per capita) (+)
- Political corruption (+)
- Political stability (-)
- Political violence (+)
- Presence of armed militias/factions (+)
- Prevalence of religious extremist/extremist groups (+)
- Prison population (+)
- Religious persecution (+)
- Rule of law (-)
- Water and food scarcity (+)
- Youth unemployment (+)

Sustainers

- Disarmament, demobilization and reintegration (-)
- Duration of past conflict (+)
- Economic validity (-)
- Outcome of previous conflict (+)
- Police and military capacity (-)
- Political legitimacy (-)

In addition to understanding patterns and drivers of violence, data can be further disaggregated to help gain an even more refined and nuanced understanding of violence. This is discussed in the next section.

Disaggregating Data – explaining complex phenomena

Disaggregation is crucial for optimizing the usefulness of data because it reveals patterns that would not be detectable from overall figures. For example, homicide as an indicator will show how many persons per 100,000 inhabitants have died violently over a period of time. However, this indicator does not provide the full picture of such an event because the label “homicide” includes a wide range of acts.

Table 1 shows examples of types of data series that may be found in many countries. Each of these different elements are characteristics and circumstances of homicides that are necessary to understand its urban/rural dimensions, the participation of organized crime or gangs in the commitment of the homicide, the use of weapons, the day, time, and location (at home or in the street) of the event, the gender and age of the victim, etc. Only with such detailed information can policy-making and programs be informed about at-risk populations and locations, and if the measures proposed are actually yielding results in the targeted areas or for the targeted populations.

Table 1 - Homicide: Data types, sources, and contextual information

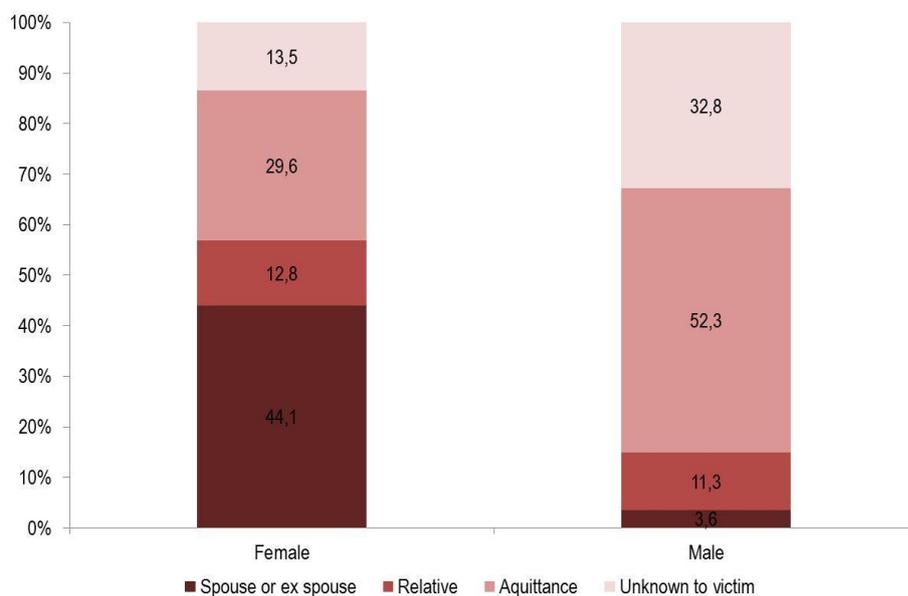
Type of data	Source(s)	Counting unit	Contextual information
Number of homicides	<ul style="list-style-type: none"> • Police • Prosecution • Courts • Mortuaries • Hospitals 	<ul style="list-style-type: none"> • Number of cases • Number of perpetrator • Number of victims 	<p>Mechanism (use of weapon)</p> <ul style="list-style-type: none"> • Firearm • Knife • Blunt object, etc. <p>Victim and perpetrator</p> <ul style="list-style-type: none"> • Victim (sex, age, ethnic group, etc.) • Perpetrator (sex, age, ethnic group, etc.) • Drug and alcohol use

			<ul style="list-style-type: none"> • Victim/Perpetrator Relationships Geographical distribution/location • Urban/rural • Private residence • Commercial property • Street • Other public place, etc. Circumstances • Organized crime related • Gang related • Robbery/theft related • Intimate partner/family related, etc.
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Source: Small Arms Survey 2012 (unpublished) (elaboration of UNODC, 2012, p. 89)

An example of the informative value of having disaggregated data is presented in Figure 4. When homicide statistics are analysed by disaggregating the information by sex and relationship between victims and offenders, important patterns emerge. Indeed, male and female homicides are driven by different factors, with roughly 85% of males killed by acquaintances or unknown individuals while more than 55% of females die by the hand of intimate partners of family members. It is clear that this type of analysis adds notable value to the simple observation of homicide distribution in space and time. Furthermore, it provides important information for policy and programmes designers as it suggests that domestic violence is the principal cause of women’s violent death.

Figure 4 - Victims of homicide by relationship of perpetrator to victim and sex. Selected European Countries, 2011 or latest available year



Source: UNECE Statistical division database

The disaggregation of information available on violent events is not only present (and used) in homicide analysis and/or crime statistics. Conflict information can also be disaggregated, for example by group(s) involved in violence, as well as trends and patterns of victimization. Datasets such as the Iraq Body Count project – that can be

grouped together more broadly under the label of casualty recorders – provide a wealth of information on gender, age, status (civilian or combatant) and circumstances of violence in conflict settings.¹

Metadata or what's in a number

Raw data are merely numbers and lack informative value for users. In order to transform numbers into information that can be used, it is necessary to supply sets of data with additional technical information. This type of information is known as metadata (data on data). Metadata can be understood as the set of documentation indicating how, where, when data are collected. This includes information about the data collection form, questionnaire, sampling methods. In other words, metadata helps users understanding what is measured and how, in order to enhance their interpretation of data. The collection of metadata allows the reader to:

- Identify discrepancies in trends due to changes in collecting methods
- Understand the nature of data and relevant implications on interpretations
- Use data as baseline
- Minimize the misuse of data
- Facilitate comparisons across space and time

Furthermore, the systematic collection of metadata helps in identifying the sources of data allowing for an efficient plan for the updating and maintenance of databases. The proper and systematic collection of metadata is crucial especially when data are collected from multiple sources. For example, it is crucial to know at least the following:

- Definitions used
- Coverage (city, county/district/province, national, regional...)
- Counting unit (victim, perpetrators, case, incident, file, etc.)
- Period of reference
- Source
- Any additional information available on the process

The European Sourcebook of Crime and Criminal Justice Statistics collects and publishes information on police, prosecution, conviction and correctional statistics for European countries. Data are collected together with a set of technical information on the statistical rules for counting applied by countries. For example, countries are asked about the counting unit they use (offence, case, etc.) whether statistics are collected at the time of reporting or after investigation. They are also asked whether they apply a

¹ See for example the Iraq Body Count website, and for casualty recording the Oxford Research Group website www.iraqbodycount.org/ and <http://www.oxfordresearchgroup.org.uk/>.

principle rule offence, meaning whether, in cases of concurrent offences, only the most serious is counted for statistical purposes (see Figure 5).

Figure 5- Metadata collected by the European Sourcebook of Crime and Criminal Justice Statistics

	Are there written rules regulating the way in which data is recorded?	When is the data collected for the statistics?	What is the counting unit used in this table?	Is a principal offence rule applied?	How are multiple offences counted?	How is an offence committed by more than one person counted?	Have the data recording methods described above been substantially modified between 2003 and 2007?
	1: Yes 2: No	1: When offence is reported to the police 2: Subseq. 3: After investigation	1: Offence 2: Case 3: Decision 4: Other	1: Yes 2: No	1: As one offence 2: As two or more offences 3: Uncertain	1: As one offence 2: As two or more offences	1: Yes 2: No
Albania	1	2	1	1	1	1	1
Armenia	1	1	1	2	3	1	2
Austria	1	3	1	2	2	1	2
Belgium	1	2	1	2	2	1	2
Bosnia-Herzegovina	1	1 & 3	...	1	2	1	1
Bulgaria	1	1	...	2	2	1	2
Croatia	1	3	1	2	1	1	2
Cyprus	1	1	1	1	1	1	2
Czech Republic	1	1	1	1	1	2	2

Source: ESB, 2010, p. 116

It is clear that this information has an important impact on data because the statistics reported under the label “homicide” include slightly different information from country to country. For this reason, the collection of metadata is crucial for the proper use of data. For the same reason, it is also important that data are presented together with a minimum standard of information to allow users to understand the nature and the limitation of statistics.

As an example, Figure 6 shows the way the Statistical Office of the European Commission presents data in a neutral table, with extensive definitions and graphically highlighting changes in data counting methods (break in series). Note that these simple representations often hide complex double-checking and calculations before being presented as such, and it is important to read any footnote, caveat, methodological note or small print available.

Figure 6 - Homicides recorded by police (2003-2009)

Table 3: Crimes recorded by the police: Homicide, 2003-2009

This is defined as intentional killing of a person, including murder, manslaughter, euthanasia and infanticide. Attempted (uncompleted) homicide is excluded. Causing death by dangerous driving, abortion and help with suicide are also excluded. The counting unit for homicide is normally the victim (rather than the case). For exceptions to the standard definition, see the metadata files on the Eurostat website.

Country	2003	2004	2005	2006	2007	2008	2009	Rate per 100 000 population, average per year, 2007-2009		
								Country	City	
Belgium	230	268	224	226	213	199	185	1.87	Brussels	3.09
Bulgaria	247	240	196	183	169	172	150	2.14	Sofia	2.06
Czech Republic	:	:	:	:	:	:	105	1.00	Prague	2.74
Denmark	82	60	70	45	76	79	79	1.42	Copenhagen	1.81
Germany	859	868	869	808	757	722	706	0.89	Berlin	1.93
Estonia	147	91	113	91	93	84	70	5.74	Tallinn	6.03
Ireland	52	46	65	68	85	89	92	2.02	Dublin	2.33
Greece	116	111	132	110	128	139	144	1.22	Athens	1.98
Spain	587	520	518	476	482	408	412	0.96	Madrid	1.14
France	987	990	976	879	826	839	699	1.27	Paris	1.40
Italy	765	767	648	663	685	654	626	1.10	Rome	1.20
Cyprus	15	15	15	12	11	9	16	1.52	Lefkosia	0.86
Latvia	220	199	127	148	117	119	109	:	Riga	:
Lithuania	385	356	404	302	284	304	252	8.31	Vilnius	7.90
Luxembourg	3	2	4	9	7	7	5	1.31	Luxembourg	4.24
Hungary	228	209	164	175	137	147	139	1.40	Budapest	1.55

Source: Eurostat, Statistics in Focus. Crime and Criminal Justice 2006-09.

http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-12-006/EN/KS-SF-12-006-EN.PDF

The next sections will explore and discuss in more depth how data can be rendered useful and usable for more complete and comprehensive analysis of trends, patterns, and dynamics of conflict crime and violence.

Developing indicators

A next important step in 'transforming' data into information is **the development of indicators**. Many sources of data that can be used for developing indicators of armed violence exist. However, the use of the data for that purpose is complicated, requires significant planning and needs to relate the limitations of the data to the eventual users of the indicators for policy purposes.

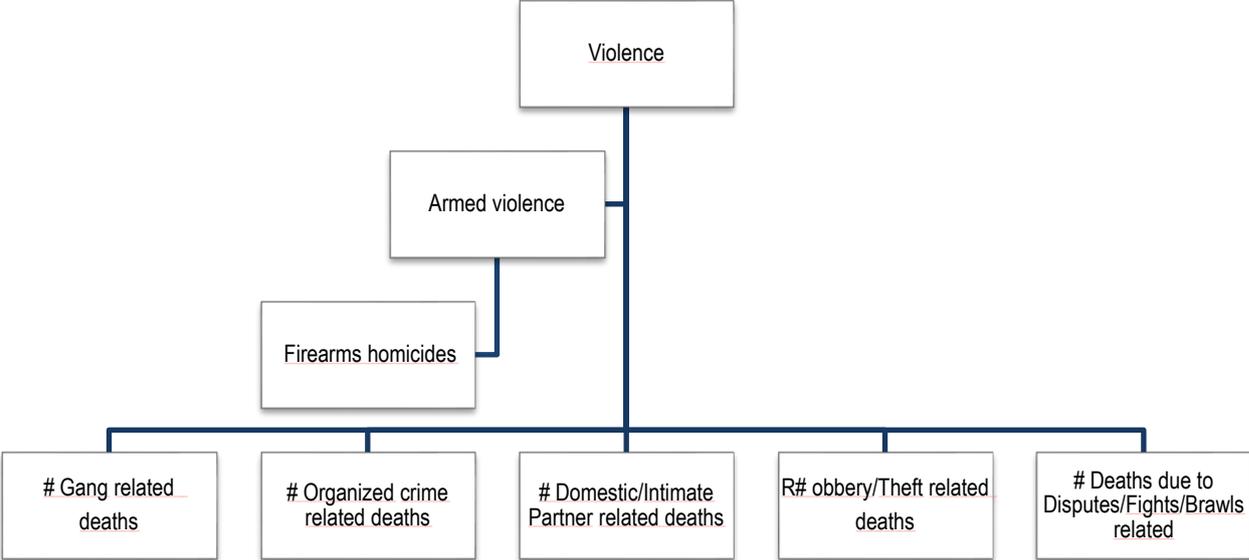
From concepts to indicators

According to the World Bank, an 'indicator is an observation used to measure the presence of or changes in some larger, more abstract concept ... An indicator does not need to be quantitative, but it should be measurable in some way... At the same time, not all quantitative measures (i.e. statistics) are indicators - a number is just a number until it is assessed in the context of the larger concept' (World Bank, 2010).

Indicators thus respond to the measurement needs of abstract concepts. For example, in this paper, conflict, crime and violence would correspond to these 'abstract concepts' and indicators for CCV are the objectively observable and measurable dimensions of these. Indicators need to be able to capture different specific dimensions of the concept

that is to be monitored. Mapping the dimensions of the concept (therefore disaggregating all relevant aspects and define measurable elements of the concept) is a helpful step towards the development of indicators.

Figure 7 – From concept to indicators: Defining measurable dimensions



Source: Author’s own elaboration

Indicators need to be reliable, representative, comparable and based on available data. In order to allow for monitoring and cross-national comparisons, indicators need to be collected at regular intervals and with consistent methods over time. Only when indicators are collected in a systematic manner, can they provide information on whether a situation has changed and how. The list below provides some simple considerations for the construction and use of indicators:²

- **Relevant**– the indicator helps measuring progress toward a goal, raise awareness about a critical issue, or help local decision-making.
- **Reliable** – the information provided by an indicator must be trustworthy.
- Provides **timely information** – indicators must be able to deliver information in a relevant timeframe for the operations and measurements needed.
- **Clear and easy to measure**– having available data is very important for indicators to be used. However, it is important to go beyond measuring things for which data is available. In many cases, research and/or surveys to collect the data necessary rather than being confined to what is available.

² See De Vaus, 2002 and <http://www.communitiescommittee.org/fsitool/>

Conclusions and interpretations on crime and violence can be developed when data is collected and presented in a coherent and consistent manner, according to transparent definitions and reliable methodologies.³

The development of indicators requires a clear selection of the key elements which are intended to be measured. Kisielewski, Rosa and Ascher, (2010, p. 3) propose the following elements to be taken into consideration when developing such indicators:

- Data from surveys, censuses, administrative sources, and surveillance systems will need to be combined in a rigorous and defensible manner.
- Data storage and distribution should occur on the most widespread and simple platform possible. Indicators should be distributed with information related to the source of the data and a quality index that indicates an overall measure of the completeness of data documentation, quality of data collection and recording methods, possibility of data misrepresentation by informants, and closeness of concept measured to the concept represented by the indicator.
- Indicators of armed violence can be analysed both through time series methods and also linear regression methods to explore the relationships between measures of phenomena that either predict or sustain armed violence, and the armed violence itself.
- Once the indicators described above are developed and made available, experimental and quasi-experimental techniques can be used to test the relationships between armed violence and development, as well as the effectiveness of interventions intended to reduce or end armed violence.

Another crucial point for the selection of indicators is that they should be based on international standards, recommendations and best practices in order to produce meaningful and comparable information (Geneva Declaration, 2010). The development of indicators needs to plan for data collection to be carried out in a systematic, ethical and sustainable manner. In developing countries this often entails the need to build local capacity to collect relevant data.

Pooling Indicators

The mere representation of data points or trends by itself is not sufficient however, to facilitate analysis and actually inform policy-making, programmatic decisions, or even monitoring and evaluation efforts. One single indicator on its own cannot represent a reliable indicator of a complex phenomenon. For this reason, sets of indicators can be developed to monitor the different dimensions of violence.

³ See 'metadata' section above and also the methodological annex in Geneva Declaration Secretariat, 2012.

Table 2 shows a set of crime and violence indicators which are considered key for the observatory established by OAS for the Americas for measuring the situation of citizens' security. This set of indicators is used as a general measure of the safety and security situation in a location, including interpersonal violence, self-directed violence (suicide), and crimes such as theft and kidnapping and police coverage. The data for these indicators can stem from official crime statistics recorded by the police, health statistics gathered by hospitals/morgues, or can also be survey based. The choice of sources and methods is dependent upon each country's context, existing infrastructure, and capacities.

Table 2 - Set of indicators of crime and violence adopted by Alertamerica, Organization of American States

Crime and Violence	
Intentional homicide (total)	Rape cases resulting in a sentence (rate per 100,000 inhabitants)
Intentional homicide (rate per 100,000 inhabitants)	Sexual violence (total)
Intentional homicide male (rate per 100,000 men)	Sexual offences against children (total)
Intentional homicide female (rate per 100,000 women)	Assault (total)
Intentional homicide young adults (rate per 100,000 young adults)	Assault (rate per 100,000 inhabitants)
Intentional homicide committed with firearms (rate per 100,000 inhabitants)	Robbery (total)
Civilian firearms legally registered (total)	Robbery (rate per 100,000 inhabitants)
Suicide (total)	Kidnapping (total)
Suicide (rate per 100,000 inhabitants)	Kidnapping (rate per 100,000 inhabitants)
Suicide female (rate per 100,000 women)	Theft (total)
Suicide male (rate per 100,000 men)	Theft (rate per 100,000 inhabitants)
Traffic and transport fatalities (total)	Motor vehicle theft (rate per 100,000 inhabitants)
Traffic and transport fatalities (rate per 100,000 inhabitants)	Burglary
Rape (total)	Domestic burglary
Rape (rate per 100.000 inhabitants)	Persons in formal contact with Police

Source: <http://www.oas.org/dsp/observatorio/database/indicators.aspx?lang=en>

Organized by country, each indicator is presented with a graph, including rates or absolute values and information on the sources of data.

To increase the informing power of data, it is recommended to **combine simple data series to produce more elaborate information**. For example, in the area of policing, data might be available on a number of different parameters. Context-related data on policing can be used to detect overloaded police stations or lack of investment in

equipment. This kind of information is used for comparing regions within a country, or across nations. Table 3 is an example of indicators that provide this information:

Table 3 - Example of combined policing indicators

Indicator	Data requirement
Number of police officers per 100,000 population	Requires availability of population data and “Number of police officers”
Recorded crimes per police officer	Needs two policing indicators “Number of recorded crimes” and “Number of police officers”
Percentage of crimes reported to the police	Requires availability of victimization survey data on crimes reported to the police by respondents and “Number of recorded crimes”
Clearing rates	Crosses two policing indicators “Number of recorded crimes” and “Number of cases cleared”
Arrests per police officer	Requires two policing indicators “Number of arrested persons” and “Number of police officers”
Police costs related to GDP	Requires availability of policing indicator on “Expenditures” and GDP data
Police costs per police officer	Uses two policing indicators “Expenditures” and “Number of police officers”

Source: Small Arms Survey 2012 (unpublished)

In order to respond to more sophisticated questions or to produce specific / contextualized indicators, it may be necessary to undertake a further step: **analyse the simple data contextually or to add information from external sources / databases.** Sets (or baskets) of indicators are becoming quite popular for monitoring trends in crime and justice. Sets of indicators are likely to complement each other, highlighting different aspects of trends (for example mixing quantitative and qualitative aspects) and suggesting possible external aspects which may be influencing the trends.

An example of a set of indicators is represented by the Fifteen Juvenile Justice Indicators, developed by UNODC and UNECE, which include both diagnostics of the extent of the problem (quantitative indicators) as well as policy indicators. The purpose of this set of indicators is to monitor the functioning of the juvenile justice system with reference to children’s rights standards. The fifteen Juvenile justice indicators include a set of 11 Quantitative indicators and 4 Policy indicators to collect numerical information on children in conflict with the law and descriptive information on policies. These aim at providing a basic and standardized tool to measure and monitor the situation of children in conflict with the law to promote the assessment and development of policies.

Table 4 - The fifteen juvenile justice indicators

Indicator	Definition
Quantitative Indicators	
1. Children in conflict with the law	Number of children arrested during a 12 month period per 100,000 child population
2. Children in detention (CORE)	Number of children in detention per 100,000 child population
3. Children in pre-sentence detention (CORE)	Number of children in pre-sentence detention per 100,000 child population
4. Duration of pre-sentence detention	Time spent in detention by children before sentencing
5. Duration of sentenced detention	Time spent in detention by children after sentencing
6. Child deaths in detention	Number of child deaths in detention during a 12 month period, per 1,000 children detained
7. Separation from adults	Percentage of children in detention not wholly separated from adults
8. Contact with parents and family	Percentage of children in detention who have been visited by, or visited, parents, guardian or an adult family member in the last 3 months
9. Custodial sentencing (CORE)	Percentage of children sentenced receiving a custodial sentence
10. Pre-sentence diversion (CORE)	Percentage of children diverted or sentenced who enter a pre-sentence diversion scheme
11. Aftercare	Percentage of children released from detention receiving aftercare
Policy Indicators	
12. Regular independent inspections	Existence of a system guaranteeing regular independent inspection of places of detention
	Percentage of places of detention that have received an independent inspection visit in the last 12 months
13. Complaints mechanism	Existence of a complaints system for children in detention
	Percentage of places of detention operating a complaints system
14. Specialised juvenile justice system (CORE)	Existence of a specialised juvenile justice system
15. Prevention	Existence of a national plan for the prevention of child involvement in crime

Source: UNODC and UNICEF, 2006.

The presentation of these indicators also includes criteria to prioritize the collection of information. Out of the fifteen indicators, five are recognized as core indicators, to be prioritized when the measurement of the whole set is not feasible. Each indicator is proposed together with a set of technical information on what is intended to measure and how as well as indications on disaggregation categories to maximize the usefulness of juvenile justice indicators (see Appendix 1).

Table 5 summarizes another example of combined indicators to monitor armed violence developed by the Geneva Declaration Secretariat, with regard to three goals and eight targets to prevent and reduce armed violence.

Table 5 – Indicators to measure and monitor armed violence

Targets	Indicators
Goal 1: Reduce the number of people physically harmed from armed violence	
1.a Reduce the number of conflict deaths	1.1 Number of direct conflict deaths 1.2 Number of indirect conflict deaths
1.b Reduce the number of non-conflict violent deaths	1.3 Rates of intentional homicides per 100,000 population 1.4 Rate of extrajudicial killing per 100,000 population
1.c Reduce the number of people with non-fatal injuries caused by armed violence	1.5 Emergency room visits due to violence-related injuries per 100,000 population 1.6 Rate of victimization caused by armed violence per 100,000 population
1.d Reduce sexual and intimate partner violence	1.7 Rate of women subjected to sexual violence 1.8 Rate of women subjected to sexual or physical violence by current or former intimate partner
Goal 2: Reduce the number of people in groups affected by armed violence	
2.a Reduce the number of children associated with armed violence	2.1 Number of children recruited by military forces 2.2 Number of children associated with non-state armed groups 2.3 Number of children associated with gangs
2.b Reduce the number of violence-related refugees and IDPs	2.4 Number of violence-related refugees in a foreign territory 2.5 Number of violence-related IDPs 2.6 Number of violence-related returnees/resettlers
Goal 3: Strengthen institutional responses to prevent and reduce armed violence	
3.a Increase the effectiveness and accountability of justice and security systems	3.1 Percentage change in willingness of persons to report incidents of armed violence (reporting rate) 3.2 Percentage change in public confidence in the ability of justice and security providers to contribute to security and safety affectively and fairly 3.3 Percentage change in real/ perceived judicial/criminal impunity (unresolved violent crimes)
3.b Increase national investments in armed violence prevention and reduction programmes and related official development assistance (ODA)	3.4 Formation of national and local strategies for armed violence prevention and reduction 3.5 Creation or strengthening of routine monitoring and surveillance of armed violence in all its forms 3.6 Percentage change in bilateral ODA devoted to direct and indirect armed violence prevention and reduction programmes

Source: Geneva Declaration Secretariat (2010), p. 10

Two examples are presented below in order to highlight the types of indicators defined, combined, and applied in practical cases.

Example 1. Early warning Systems

Early warning systems represent an example of the process from data to information. The concept underpinning these systems is that the monitoring of a core set of indicators can forecast events. Early warning systems have been implemented in many fields, to predict natural disasters, spread of diseases, humanitarian crisis etc. In the last thirty years, these types of analyses have also been applied to the realm of conflict. From their initial conceptualization in the 70's, early warning systems emerged in the

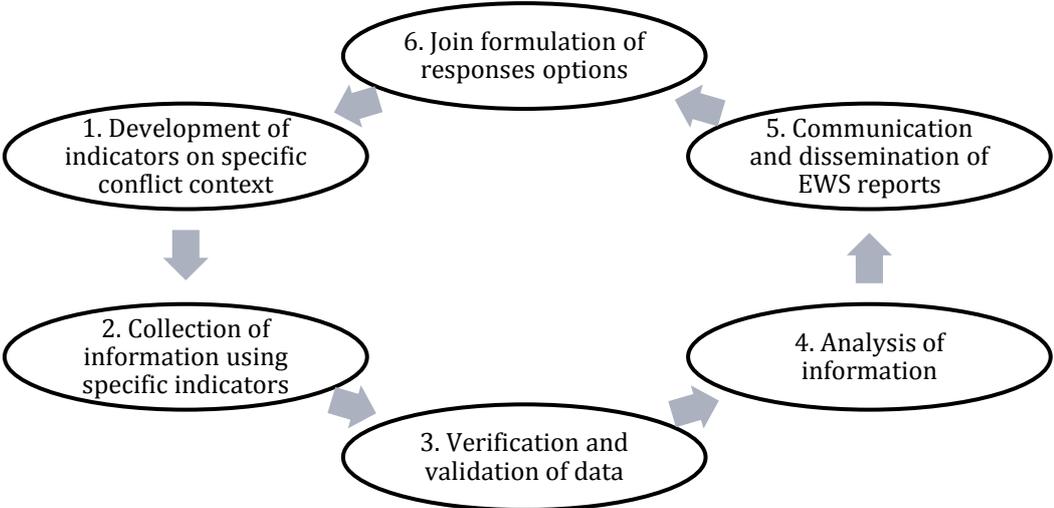
international agenda after the Cold War and following the failures faced in responding to the Rwanda genocide and the conflicts in the Balkans, in the early '90s. With conflict early warning systems the focus is on the real-time assessment of events that are likely to accelerate the rapid escalation of conflict in a high-risk environment. The purpose of such systems is to assist in preparing for danger and provide insights on how to mitigate it.

The selection of indicators is based on theoretical assumptions and evidence on the patterns of conflict. This means that monitoring activities need to focus on those factors that cause, anticipate or facilitate the spread of violence. "Warning is a hypothesis that is informed by reasoning, knowledge and, critically, by piecing together and analysing the indications of a potential threat" (CISC, 2007). The conflict analysis should identify the structural causes of tension, such as high levels of inequality or corruption, incidental facilitators such as the prevalence of weapons, and trigger events that stress the system leading to the insurgence of conflict.

The OECD (2009, p. 22) defines the following concepts:

- **Early warning** is a process that (a) alerts decision makers to the potential outbreak, escalation and resurgence of violence conflict; and (b) promotes an understanding among decision makers of the nature and impacts of violent conflict;
- **Early warning systems** involve regular and organized collection and analysis of information on violent conflict situations. They deliver a set of early warning products (based on qualitative and/or quantitative conflict analysis methods) that are linked to response instruments/mechanisms;

Figure 8 – Early Warning Systems



Source: OESCE, 2009

Although there are a growing number of different definitions and methodologies of early warning systems, they all include the following elements:

- **System of monitoring**, that is a systematic and near real-time collection of information to estimate the magnitude and timing of relative risks of emerging threats; (data collection)
- **Analysis** of the nature, trends and patterns of threats and describing plausible scenarios; (data analysis, an assessment for warning or identification of different scenarios)
- **Communication of recommendations** to policy makers on responses and interventions to prevent or mitigate the conflict; (formulation of an action proposal, transmission recommendations, assessment of early responses, which feeds back into the formulation of action).

Qualitative early warning systems are characterized by the presence of a “watch group” (for example, Human Rights Watch, Amnesty International and the International Crisis Group). They employ field-based analysts or special envoys, often posted within the region, to monitor and conduct specific research. The resulting recommendations are then lobbied with key decision makers and policymakers. Quantitative early warning systems are event data-coding. The methodology employed is based on the systematic collection and processing of empirical information. Table 6 provides an example of a set of variables collected by FAST⁴ for the purpose of early warning. These include information on the event, the actors involved and the source of data.

Table 6- Variables collected by in the FAST Database

Event attributes	Description (in parentheses the number of possible parameter values)
Reporter	Name of the person who reports an event
Event date	Date when the event took place
Reporting date	Date when the event was reported
Event location	State, province and district level; (ca 11'000)
Event type	Type of event that took place. The coding is based on the IDEA event form typology (208)
Initiator	The agent who did something. 1. Location: Describes where an agent comes from; (ca 11'000) 2. Sector: Defines from which sector of society an agent comes from; (46) 3. Level: Refers to the organizational or geographic structure of an agent; (14)

⁴ FAST is an event-based early warning system. This means that the system is based on the codification of events considered as relevant to peace or conflict. Events are reported by a Local Information Network and then coded according to the Kansas Event Data System (KEDS). Each event is then attributed a specific weight in the range from conflictual to cooperative, according to the Goldstein scale (Goldstein, 2002). The system has been in place in the decade between 1998-2008.

	4. Literal Name: Exact name of an agent
Recipient	The agent to whom something was done 1. Location: Describes where an agent comes from; (ca 11'000) 2. Sector: Defines from which sector of society an agent comes from; (46) 3. Level: Refers to the organizational or geographic structure of an agent; (14) 4. Literal Name: Exact name of an agent
Information Source	Source of information; (4)
Information Credibility	Refers to the credibility of an information; (3)
Geographic Scope	Geographic area in which an event took place; (3)
Event Salienc	Political significance of an event; (3)
Injuries	Number of injured people
Death	Number of dead people
Damage	Material damage
Issues	Issue or topic of an event; (30)
Description	Literal description of an event

Source. OSCE (2011, p.5)

Example 2. Evidence-based Programming in Colombia

Colombia experienced severe levels of armed violence linked to crime and conflict during the 1990s. In order to understand patterns of armed violence better, and design more coherent response, municipalities such as Bogota, Cali, and Medellín started to systematically collect data on the different forms of violence affecting their territory. Together with civil society, the 'CISALVA institute and the IADB developed a so-called 'regional system of standardised indicators of coexistence and citizen security' (Sistema regional de indicadores estandarizados de Convivencia y Seguridad Ciudadana)' (Gilgen and Tracey, 2011, p. 38).

Under the umbrella of such systematic data collection efforts, the municipality of Cali introduced the DESEPAZ (Desarrollo, Seguridad, Paz) program. Among others, the program included an integrated violent deaths monitoring system. As such, 'information on reported homicides from the police, forensic medicine, the attorney general's office, and the department of transportation are integrated into a single database on a weekly basis. On the basis of this data, programmatic responses are developed' (Gilgen and Tracey, 2011, p 38). Based on such data (which showed an increased risk of violent events during holidays, weekends, and elections), the city of Cali introduced a civilian gun-carrying ban during the high-risk periods identified by its monitoring efforts. Villaveces et al. (2000) observe that the enforced ban on carrying firearms on weekends after paydays, on holidays, and on election days in Colombian cities (Cali -1993-94- and Bogotá -1995-97) contributed to a significant drop in homicide rates in both cities.

Synthesis and Conclusions

Stand-alone data, for example the mere tracking of the homicide rate in one city, region, or country, does not provide sufficient information to provide informed recommendations to evidence-based policy-making or programmatic decision, monitoring, and evaluation. The main elements to keep in mind are:

- Knowledge of how events/casualties are measured is central to understand the values and pitfalls of a particular set of data (definitions, periodicity of measurement, coverage, and methodology).
- Data intended to monitor trends and patterns needs to be carefully assessed and examined to ensure no methodological or definitional changes occur over the period under observation.
- Pooling data from different sources can help identify such changes.
- Data on conflict, crime and violence measures complex social phenomena. Information and analysis can be further enhanced by considering different aspects that play a role in the evolution of data. For example, the number of police officers assigned to an area, workload, and perceptions/trust in police in this same area is important.
- Similarly, defining sets of indicators helps to understand all aspects of a particular type of conflict, crime, or violence. The example of an early warning system above shows that different forms of violence combined with different types of social, political and economic background information provide a better base upon which trends and risk of high-intensity violence can be assessed.

Appendix 1. Indicators and metadata

Metadata of the Fifteen Juvenile Justice Indicators

Indicator 1: Name	
Definition	Definition of the indicator.
Priority	Normal or CORE There are five core indicators and ten normal priority indicators. It is the case that all fifteen juvenile justice indicators are important for the assessment of the situation of children in conflict with the law. However, in situations where a country is unable to measure all fifteen indicators, the core indicators are those that should be measured as a matter of priority. The core indicators are: Indicator 2 (Children in detention); Indicator 3 (Children in pre-sentence detention); Indicator 9 (Custodial sentencing); Indicator 10 (Pre-sentence diversion); and Indicator 14 (Specialised juvenile justice system).
Numerator Denominator	This box sets out the relevant calculation that should be carried out in order to measure each of the Quantitative Indicators.
What it measures	This box describes what the indicator measures.
Why it is helpful to measure	This box describes why it is helpful to measure the indicator.
Applicable International Standards	This box contains international standards that are relevant to the indicator. The international instruments cited are: <ul style="list-style-type: none"> ➤ The Convention on the Rights of the Child ("CRC") ➤ The United Nations Guidelines for the Prevention of Juvenile Delinquency ("PJD") ➤ United Nations Standard Minimum Rules for the Administration of Juvenile Justice ("Beijing Rules") ➤ The United Nations Rules for the Protection of Juveniles Deprived of their Liberty ("JDL") ➤ The United Nations Standard Minimum Rules for Non-custodial Measures ("RNCM") ➤ The United Nations Economic and Social Council Guidelines for Action on Children in the Criminal Justice System ("Guidelines for Action") ➤ The United Nations Basic Principles on the use of Restorative Justice Programmes in Criminal Matters ("RJP") ➤ The United Nations Guidelines in Matters involving Child Victims and Witnesses of Crime ("CVWC")
How to measure it	This box sets how to collect information for the indicator and how to use that information to produce the indicator measurement. After this basic guidance, two further important pieces of information are provided for each indicator. These are: (i) <i>where</i> information might be found for that indicator – ' information sources ', and (ii) <i>which</i> children the information will be about – the relevant ' child population '. Information sources are usually single institutions or individuals that form part of the juvenile justice or adult criminal justice system. They are usually responsible for taking key decisions that affect children in conflict with the law, and they often have direct contact with such children. Information sources may include, for instance, individual local or district police stations, places of detention such as individual prisons or remand homes, and competent authorities such as magistrate's courts or juvenile courts. Child populations are particular groups of children that must be counted in order to measure a particular indicator. These could be for instance: ' <i>all children in detention on a particular date</i> ', or ' <i>all children leaving detention during the course of 12 months</i> ', depending upon which indicator was being measured. Sometimes, it may not be possible to count a whole relevant child population. When this is the case, it may be possible to take a <i>sample</i> from the relevant child population.
Disaggregation	The indicators are most able to provide assistance to country officials where information is available in a disaggregated form. This box provides suggested categories of disaggregation.
Tools	Finally, the information boxes provide links to information collection tools, policy analysis tools and Excel tools for assistance in measuring the indicators. The information collection tools and policy analysis tools are contained in Appendices 3 and 4. The information collection tools are designed to assist the collection of information for the Quantitative Indicators (Indicators 1 to 11). The policy analysis tools are designed to assist the collection of information for the Policy Indicators (Indicators 12 to 15). These tools may be particularly helpful where no existing information is available, requiring information for the indicators to be collected by the use of sampling, or where existing information is required to be further organised before collection.

Source: UNODC and UNECE, 2007

Homicide as an indicator of sustainable development

As an example, see below the methodological sheet on the indicator “Number of recorded intentional homicides per 100,000 population”, which has been identified by the UN among the set of Indicators for Sustainable Development (see United Nations, 2007).

Table 7 – Methodological sheet: Number of recorded intentional homicides per 100,000

Indicator	Number of intentional homicides per 100,000 populations
Brief definition	Total number of intentional homicides completed per 100,000 population
Unit of measurement	Police recorded cases/100,000 population, per country and per year
Placement in the CSD indicator set	Governance/Crime
Policy Relevance	<p>(a) Purpose: The Economic and Social Council, in its resolution 1984/48 of 25 May 1984, requested the Secretary-General to maintain and develop a United Nations crime-related database by continuing to conduct surveys of crime trends and operations of criminal justice systems. The major goal of the United Nations Surveys on Crime and Trends and the Operations of Criminal Justice Systems is to collect data on the incidence of recorded crime and the operations of criminal justice systems with a view to improving the analysis and dissemination of that information globally.</p> <p>(b) Relevance to Sustainable/Unsustainable Development (theme/sub-theme). Crime prevention and criminal justice are an integral part of the development process. Upholding the rule of law and good governance and proper management of public affairs and public property at the local, national and international levels are prerequisites for creating and sustaining an environment for successfully preventing and combating crime. ⁵ Such a stable and secure climate is necessary to support the goals of poverty eradication, economic investment, environmental stewardship, gender equality, participation, and sustainable livelihoods. Crime represents a dimension of growing concern in the framework for CSD indicators. The Secretary-General report “In larger freedom: towards development, security and human rights for all” highlighted that although poverty and denial of human rights may not be the direct cause of civil war, terrorism or organized crime, they all greatly increase the risk of instability and violence.⁶ However, measurement of organized crime poses serious methodological limitations. Measurement is more feasible when dealing with “conventional” categories of crime, or “volume” crime, the most serious of which is intentional homicide. The number of intentional homicides per 100,000 population represents the most widely available and uncontroversial indicator and is included as a measure in the Common Country Assessment Guidelines. Taking into account the seriousness of the crime, thus the almost inevitable statistical recording, this indicator provides reliable information from a large number of countries. Intentional homicide rates were highest in Africa, followed by the Americas, while other regions showed much lower rates. The analysis of homicide trends in the period 1995-2004</p>

	<p>suggests that there is an overall decreasing trend.</p> <p>(c) International conventions and agreements: The United Nations Congresses on the Prevention of Crime and Treatment of Offenders, held every five years, formulated non-binding recommendations (The Caracas Declaration of 1980), plans of action (e.g., Milan Plan of Action of 1985) and declarations (e.g. the Bangkok Declaration on Synergies and Responses: Strategic Alliances in Crime Prevention and Criminal Justice of 2005) on the subject.</p> <p>(d) International Targets/Recommended Standards: None</p> <p>(e) Linkages to Other Indicators: As other crime indicators, this indicator is linked to indicators of poverty and income disparity (e.g., per cent of population living below poverty line, unemployment rate, Gini index of income inequality), population change, including urbanisation and rapid population growth, as well as those on economic performance. Violent crime and homicide are considered to be especially linked to alcohol consumption, drugs (abuse and trafficking), and proportion of youth in the population.</p>
Methodological description	<p>(a) Underlying Definition and Concepts. Intentional Homicide may be understood to mean death deliberately inflicted on a person by another person, including infanticide. This indicator refers only to police-recorded homicides.</p> <p>(b) Measurement methods: Questionnaire sent to responsible government agency / official statistical body in each country. The indicator is computed as the number of total homicides recorded by the police in a given year multiplied by 100,000 and divided by the total population of the country in the same year (based on UN Population Division data).</p> <p>(c) Limitations of the indicator: Efficiency of the police systems. Response rate to the questionnaire. Scope of the definition (inclusion or not of death caused by injuries, euthanasia, help with suicide...)</p> <p>(d) Status of the methodology. Widely used in developed and developing countries. The Tenth UN Survey on Crime Trends and the Operations of Criminal Justice Systems (2007) will collect metadata associated to this indicator from all member States.</p>
Alternative definitions	Number of recorded violent crimes per 100,000 population (including homicides).
Brief definition	<p>Homicides, Assault, Rape and Robbery crimes recorded in criminal police statistics.</p> <ol style="list-style-type: none"> i. Intentional Homicide: Death deliberately inflicted on a person by another person, including infanticide. ii. Assault. Physical attack against the body of another person, including battery but excluding indecent assault. It includes aggravated assault and simple assault as maybe classified in some criminal codes. iii. Rape. Sexual intercourse without valid consent. iv. Robbery. Theft of property from a person, overcoming resistance by force or threat of force.
Unit of measurement	Homicide, Assault, Rape and Robbery police recorded cases per 100,000 population per country per year.
Limitations	The disadvantage of such a composite indicator is that the capacity of member States to record statistics on all four categories of crime is uneven, therefore there may be cases of countries with high levels of violent crime that are unable to reflect such incidents into statistics. The potential problem would be that countries with good statistical systems would appear as more affected by violence than others.

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