



Examination of Firearms and Forensics in Europe and aCross Territories



Final Report

Professor Erica Bowen

Dr Helen Poole

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Contents

Contents.....	3
1. INTRODUCTION TO THE PROJECT	6
1.1 The European context concerning the illegal use of firearms	6
1.2 Objectives and scope of the project	7
1.3 Methods.....	8
1.3.1 Selection of countries and participants	9
2. THE NATURE, PREVALENCE, AND IMPACT OF GUN CRIME	11
2.1 Introduction	11
2.1.1 Official definitions and associated terminology	11
2.2 The prevalence of gun crime	16
2.2.1 Available data sources	16
2.3 Method of data collection	19
2.4 Results.....	20
2.4.1 Gun crime defined by police data.....	20
2.4.2 Criminal justice data	22
2.4.3 Morbidity data	26
2.4.4 Emergency room data.....	27
2.4.5 Crime victimisation surveys	28
2.4.6 Participant perspectives on the nature of gun enabled crime	29
2.4.7 Participant perspectives on gun crime data	31
2.5 Impact of gun crime	32
2.6 Summary	34
3. LEGISLATION AND GUN CRIME	35
3.1 Introduction	35
3.2 Policy context.....	35
3.3 Study rationale and aims	38
3.4 Method	38
3.5 Findings.....	38
3.5.1 What influences the development and implementation of changes to legislation?	38
3.5.2 How adequate is current legislation?	41
3.5.3 What is the impact of legislation?	45
3.5.4 What are the challenges to implementing legislation?	46
3.5.5 Required improvements to legislation.....	48

3.6 Summary	49
4. POLICING GUN CRIME	51
4.1 Introduction	51
4.2 Causes of gun crime	51
4.3 Policy context	51
4.4 Policing gun crime	53
4.5 Method	55
4.6 Results	55
4.6.1 Disparity in Priorities	55
4.6.2 Disparity in resources and investigations	56
4.6.3 Interventions	58
4.7 Summary	59
5. THE ROLE OF BALLISTICS INTELLIGENCE IN PREVENTING THE ILLEGAL USE OF FIREARMS	61
5.1 Introduction	61
5.2 Nature of ballistics intelligence processing	61
5.3 Method	62
5.4 Results	62
5.4.1 Ballistics Comparison Services: structure, training, staffing and accreditation	63
5.4.2 Choice of automated ballistics comparison systems	66
5.4.3 Processes and methods of ballistic comparison	69
5.4.4 Service Level Agreements and timeliness	75
5.4.5 International Comparisons	76
5.4.6 Knowledge exchange and networks	79
5.5 Summary	79
6. AN EXPERIMENTAL INVESTIGATION OF CROSS BORDER BALLISTICS INTELLIGENCE SHARING	80
6.1 Introduction	80
6.2 The Western Balkan Context	80
6.3 Intelligence Sharing	81
6.4 Methodology	81
6.4.1 Data Protection	81
6.4.2 Acquisition and correlation of ballistic material	82
6.5 Findings	83
6.6 Summary	86
7. FINDINGS AND RECOMMENDATIONS	87

7.1 The Nature and Prevalence of Gun Crime	87
7.2 The Development and Implementation of Legislation:	89
7.3 The Detection and Policing Of Gun Crime	90
7.4 The Use of Ballistics Intelligence.....	91
References	96
Appendix 1.1 Interview schedules and ballistics questionnaire	99
Appendix 1.2 Case study: Italy	107
Appendix 2.1 Complete data set of gun crimes obtained	125
Appendix 2.2 WHO Mortality data concerning firearms injury related deaths.....	130

Tables

Number	Title	Page
1.1	Summary of participants from each country	11
2.1	Summary of firearms categories, descriptions and associated levels of control	13
2.2	Dimensions on which countries deviated from the standard definition of firearm in 2011 (summarised from Aebi et al, 2014)	15
2.3	Summary of national crime victimisation survey data collection, frequency and nature (summarised from Aebi et al, 2014).	20
2.4	Criminal offence categories in which firearms are identified in each country for which data were obtained	22
2.5	Prevalence of homicide involving firearms by country	25
2.6	Prevalence of robbery involving a firearm by country	26
2.7	Summary of gun use within crimes of robbery sexual offences and assaults/threats taken from the 2004/5 ICVS	30
2.8	Estimated social and economic costs of gun crimes in England and Wales based on 2010 cost data	34
2.9	Estimated social and economic costs of gun crimes in England and Wales based on 2012 cost data provided by the Institute of Economics and Peace (2013)	35
5.1	Use of automated ballistic systems across countries	68
5.2	Number of ballistic items that were submitted/acquired in the last 12 months	73
5.3	Correlations and hits	74
5.4	Double casting and use of IBIN	77
6.1	Summary of the number and nature of hits identified	83

Figures

Number	Title	Page
2.1	Summary of aggregate deaths by firearm (assault and undetermined) for each country	29

Boxes

Number	Title	Page
2.1	Key for table 2.3	23
2.2	Definitions of Static and Dynamic Peace Dividends (IEP, 2013)	34
6.1	Case Study	85

1. INTRODUCTION TO THE PROJECT

Helen Poole and Erica Bowen

1.1 The European context concerning the illegal use of firearms

This report presents the final results of the EFFECT project funded by Directorate General Home Affairs (ISEC) with the aim of assessing the nature and prevalence of gun-enabled crime (GEC) across select EU and candidate countries, the nature and role of legislation within countries and at an EU level, and the challenges for policing gun crime. In addition, the potential role of ballistics intelligence gathering and cross-border sharing in the prevention of the illegal use of firearms was examined.

The criminal use of firearms is a major global issue (WHO, 2010), not least across the European Union. Official estimates indicate that in excess of 5,000 murders are committed with firearms annually (UNODC, 2013). Such is the importance of gun enabled crime (GEC) that in 2013 the EU specifically identified the reduction of the risk of firearms to citizens, including combating illicit trafficking in firearms, as one of the nine law enforcement priorities for 2014-2017. Despite the harm that gun crime can cause, little is known about gun crime in Europe, and this project aims to address this knowledge-gap.

In 1991 the European Firearms Directive was implemented to assist in the control of firearms for civilian use, the function of which was to document the minimum requirements that member states should adhere to regarding the acquisition and possession of different firearms categories in order to both facilitate the commercial exchange of firearms across member states, whilst safeguarding the EU population against criminal acts facilitated by firearms. It is widely acknowledged that the majority of legally owned firearms are owned, used and stored by civilians that meet the criteria of legitimate users. However, firearms can pose a risk to civilian security when used in the commission of crimes such as homicide, robbery, abduction, threats to kill, coercion and also through their illicit manufacture and trafficking (EC, 2014). Consequently, as this project focused on what we are referring to as 'gun enabled crime' (GEC) (for a discussion of definitions please see section 2.1): issues concerning self-harm and suicide are not considered here.

During the course of this project, a number of high profile incidents involving firearms have focused attention on the transit of firearms between EU member states and bordering countries. Of particular note has been the flow of easily available and low cost weapons from post-conflict regions such as the Western Balkans (although this is not the only region from which firearms emanate), through Schengen agreement states, for use in the commission of terrorist attacks in Western Europe. Whilst the most high profile of these have been in Paris in January 2015 and November 2015, and Brussels in March 2016, there have also been seemingly politically motivated shootings in Porte de Vincennes, Copenhagen, Zvornik, Thalys and Sarajevo.

Following the November Paris attacks, the EC proposed amendments to the 1991 Firearms Directive, including measures such as: a five year ceiling on firearms certificate life; medical tests for applicants for gun licenses; bringing more forms of firearms within the scope of the directive (such as collectors' items and acoustic weapons); regulating blank-firing and replica weapons; tighter controls on deactivation including a ban on the ownership of deactivated category A firearms; tighter controls on dealers; and stricter rules around deactivation standards inter alia. Many of these issues are also explored in this report, and in many ways, our findings support those of the proposed amendments (European Commission 2015b).

Furthermore, an EU action plan aimed at tackling the trafficking of firearms was also published (European Commission 2015a), recommending that: all Member States set up inter-connected

national focal points on firearms to develop expertise and improve analysis and strategic reporting on illicit trafficking in firearms; closer working with the United Nations Office on Drugs and Crime (UNODC), to regularly map out global firearms trafficking routes to the EU; Europol to reinforce its actions regarding online trafficking and the diversion of legal trade and to continue to improve the collection of information and intelligence related to firearms; and The Commission continue to provide financial assistance, with a focus on projects with a comprehensive scope and a strong data collection impact. Again, many of these recommendations are reinforced by the findings from this study and are further explored below.

In the latter paper the EC directly invites ‘all Member States to set up inter-connected national focal points on firearms to develop expertise and improve analysis and strategic reporting on illicit trafficking in firearms notably through the combined use of both ballistic and criminal intelligence’. The importance of ballistics intelligence mentioned here, is another area that has not been fully researched and this is the focus of Chapters 5 and 6. It is recognized that ballistics information can help in the detection of crimes within countries, but it also increasingly recognized that cross-border sharing of information can help detect crimes where guns have crossed borders, and provide a better intelligence picture on the movement and flow of firearms between states. For this study, Serbia was chosen as the focus point for examining cross-border movement of firearms because of its political history meaning that there are a large number of post-conflict weapons in circulation. This has led to a widely held belief that the cheaply available firearms for the region are moving across Europe, and being used in gun crimes (this is further explored in Chapter 6).

It should be noted that, by the time of the latest attacks in Brussels and Paris, all interviews had been concluded. Thus, although trafficking was not a major focus of this project, it seems fair to assume that issues regarding the movement of firearms through Europe may have been more pronounced had the interviews been undertaken more recently.

1.2 Objectives and scope of the project

As stated above, the purpose of this project was to assess the nature and prevalence of GEC across Europe, and to examine the potential for reduction through policing, legislation, and the use of ballistic information sharing. More specifically, the questions addressed by this project are:

- 1) What is the nature, prevalence and impact of gun crime in Europe?
- 2) What are the challenges of implementing policies to prevent and mitigate the impact of gun crime?
- 3) What are the emerging threats to current and future gun crime policy?
- 4) How can gun crime be effectively policed, and what are the challenges for police organisations?
- 5) How is ballistics intelligence currently used in Baltic and EU countries?
- 6) Does ballistic intelligence provide evidence, beyond that provided by the INTERPOL Ballistic Information Network (IBIN) that crime guns do travel across EU borders?
- 7) Can ballistic intelligence facilitate cross-border co-operation and communication about GEC and lead to greater crime linkage detection and solution?

For the purposes of this report, these objectives are broken down into 5 key chapters focusing on: the nature, prevalence and impact of gun crime; legislation and gun crime; policing gun crime; the

role of ballistics intelligence in preventing the illegal use of firearms; and a presentation of the findings of the experimental study on the use of cross border ballistics intelligence sharing.

1.3 Methods

In order to address each of the objectives, the project draws together desk based research, interviews with key policy, law enforcement, ballistics, statistician and NGO stakeholders, and quantitative data on the use of automated ballistics correlation systems. In addition to this, a unique experimental approach was taken to examine whether ballistics intelligence facilitates cross border co-operation and communication about the illegal use of firearms, and results in greater crime linkage. Whilst thematic sections are presented, all draw on the same interview data drawing out the relevant themes from individual interviews. The interview schedules can be found at Appendix 1.1 below.

It should also be noted that an in depth study was also undertaken in Italy and, whilst some of the data are incorporated into the main findings, a full account of the Italian research can be found at Appendix 1.2. The Italian study reveals a number of issues that are not as pronounced in the main study, particularly in relation to the role of organised crime. The same data collection methods, interview schedules and so forth were used by the Italian partners as the main study, however, integration of all the Italian data would have led to an over-representation of one state.

Within each of the individual chapters an account of the research methods employed is provided, however, in broad terms the following methods were used. All EU and candidate countries were examined in terms of the nature and prevalence of GEC, which involved both a review of the existing literature and publically available data, but also by approaching states where there was no publically available data to provide statistical information. As is examined in Chapter 2, the results of this data gathering exercise were variable across states, which results in some limitations in terms of establishing a complete picture across the EU. A similar desk-based approach was taken to the examination of legislation across the EU, but this issue was also a feature of the various face-to-face semi-structured interviews with individuals and groups. This is further explored in Chapter 3. In terms of policing, desk based research was supplemented by interviews with stakeholders from policing and related organisations as identified below, and reported in section 4.

Chapter 5 examines the use of automated ballistics intelligence systems that is, systems used for comparing ballistics material such as cartridge cases and bullets retrieved from crime scenes, and compared with pieces found at other scenes through automated comparison systems such as IBIS and Evofinder. Again, relevant available literature related to ballistics systems was reviewed. However, there were two other specific methods employed to investigate this. Firstly, participant countries were invited to complete a questionnaire regarding information concerning the use of automated systems and correlation and hit rates achieved. The following nine countries completed the questionnaire: Belgium, France, Netherlands, Germany, Spain, Portugal, FYR of Macedonia, Denmark and Sweden. Secondly, interviews were conducted with relevant personnel from ballistic institutes regarding the issues and challenges related to automated systems and cross-border intelligence sharing.

Finally, the experimental study into the use of automated intelligence systems to identify cross-border hits is fully examined in section 6. In brief however, 1,000 cartridge cases from Serbian crime scenes were acquired onto IBIS and compared with the databases of the following countries: Sweden, FYR Macedonia, Kosovo*, Italy, Denmark and Norway. The correlations were then examined by a ballistics expert and probable hits identified and reported accordingly to the participating countries.

1.3.1 Selection of countries and participants

An *a priori* decision was taken to focus on a selective number of EU MS and neighbouring countries for the purpose of the project, and through the course of the project the number of participating countries was reduced due to budgetary cuts and the inability of some countries approached to provide data. In total 14 countries participated and were selected in order to provide a diverse range of data from countries that had varying levels of identified gun enabled crime and different automated ballistics systems.

Participants were invited to take part in individual interviews to discuss issues concerning gun crime in their country. Recruitment was conducted by contacting the organisation directly, either through the generic contact details that were publicly available, or direct contact was made with a named person provided through a project partner. In all instances, institutional approval was sought for the research to take place. Participants represented senior figures relating to policy development, policing, crime statistics, forensic (ballistics) analysis and also included representatives from non-governmental organisations which focused on the prevention of gun enabled crime. Due to the voluntary nature of the research there was some variation in the range of perspectives that informed the study, and the number of informants from each country. In total 42 individuals participated in the interviews, of these 35 were men, seven were women. The nature of participants from each country is summarised below in table 1.1 below.

In total, 24 interviews were undertaken in Italy, however, a subset of these interviews have been selected for inclusion in order to avoid Italian data having a disproportionate impact on the findings. A report on the results from the Italian study can be found in Appendix 1.2.

Table 1.1 Summary of participants from each country

Country	Gender	Stakeholder	Interview type (group vs individual)	Participant code
FYR of Macedonia	M x 2	Policy	Group	1MMKP
	F x 2	Forensics		2FMKB
		Police		3MMKLE
		Statistics		4FMKSTAT
FYR of Macedonia	M	NGO	Individual	5MMKNGO
Croatia	M	NGO	Individual	1MHRNGO
Portugal	M	Forensics	Individual	1MPTB
Spain	M	Forensics	Individual	1MESB
UK	M	Police	Individual	1MUKLE
UK	F	NGO	Individual	2FUKNGO
UK	M	Forensic	Individual	3MUKB
UK	M	Police	Individual	4MUKLE
UK	M	Statistics	Individual	5MUKSTAT
UK	F	Policy	Individual	6FUKP
UK	F	Police	Individual	7FUKLE
Holland	M	Police	Individual	1MNLE
Holland	M	Forensic	Individual	2MNLB
Holland	M	Policy	Individual	3MNLB
Denmark	M x 3	2 forensic	Group	1MDKB
		1 Police		2MDKB
				3MDKLE
Germany	M x 2	1 Police	Group	1MFDLE
		1 Forensic		2MFDB
Belgium	M	Research/NGO	Individual	1MBER
Belgium	F	Police	Individual	2FBELE
Belgium	M	Policy	Individual	3MBEP
Belgium	M	Forensic	Individual	4MBEB
Belgium	M	Research/NGO	Individual	5MBER
Belgium	M	Police	Individual	6MBELE
France	M	Forensic	Individual	1MFRB
Kosovo*	M	Policy	Individual	1MXKP
Serbia	M	Policy	Individual	1MRSP
Sweden	M	Research/NGO	Individual	1MSER
Sweden	M	Police	Individual	2MSELE
Sweden	M	Forensic	Individual	3MSEB
Italy	M	Police	Individual	1MITLE
Italy	M	Forensic	Individual	2MITB
Italy	M	Policy	Individual	3MITP
Italy	M	NGO	Individual	4MITNGO
Italy	F x 1	Statistics	Group	5FITSTAT
	M x 2			6MITSTAT
				7MITSTAT

*All references to Kosovo are without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

2. THE NATURE, PREVALENCE, AND IMPACT OF GUN CRIME

Erica Bowen

2.1 Introduction

As identified in the introduction, gun crime has gained increasing policy attention across Europe during the last ten years. In order to be able to understand how such policy changes impact rates of gun crime, there is a need to understand how gun crime is currently conceptualized and counted across Europe. These data can then be used to determine not only the impact of policy change, but also the impact of gun crime on regional economies. The purpose of this section is to examine these issues in depth. We start by examining relevant definitions and terminology before critically examining the data sources that are available from which to determine the prevalence of gun crime. Estimates of gun crime are then presented based on available criminal justice, mortality, and crime victim data, before an examination of the views of stakeholders concerning the nature and availability of gun crime data is presented. This section ends with an appraisal of the economic impact of gun crime, drawing upon data from the UK as a case study.

2.1.1 Official definitions and associated terminology

The focus of legislation across EU MS reflects the original 1991 EU Firearms Directive and the subsequent 2005 United Nations Firearms Protocol (UNFP), and 2008 revised EU Directive. These tools themselves do not define the illegal *use* of firearms, nor do they define ‘gun enabled crime’ *per se* but instead focus on defining the mechanisms of controlling the legal acquisition and possession of firearms. The issue of determining appropriate penalties for contravening the conditions specified by the Directorate was devolved down to each country’s judiciary, with the result that each country could determine appropriate penalties in line with their individual legal frameworks. The UN Protocol however required that countries develop criminal offences specific to the illicit trafficking of firearms, their manufacture and the falsifying or removing of marks on firearms. The extent to which firearms are identified within other crime types is, however, a matter of considerable variation across MS with no legal requirement for MS to record such crimes.

Definitions of ‘firearm’

Despite a developing legislative framework, ambiguity continues to surround the definition of ‘firearm’. Firearms were defined, According to Annex I of the 1991 EU Directive, within four categories depending on their lethality (see table 2.1, page 11). According to annex II there were three conditions under which firearms may not be defined as such. These include instances where:

- They have been rendered permanently unfit for use by the application of technical procedures which are guaranteed by an official body or recognized by such a body i.e. they have been deactivated;
- are designed for alarm, signalling, life-saving, animal slaughter or harpoon fishing or for industrial or technical purposes provided that they can be used for the stated purpose only; and
- are regarded as antique weapons or reproductions of such where these have not been included in the previous categories and are subject to national laws.

The 2005 UNFP defined a firearm as ‘any portable barrelled weapon that expels, is designed to expel or may be readily converted to expel a shot, bullet or projectile by the action of an explosive, excluding antique firearms or their replicas’, and the 2008 Amendments to the EU Directive adopted

this definition, and maintained the exception clauses identified previously. The 2005 UNFP identified that antique firearms and their replicas should be defined in accordance with domestic laws, but that any weapon manufactured in 1899 or earlier shall be identified as an antique and therefore not as a firearm.

Table 2.1. Summary of firearms categories, descriptions and associated levels of control

Category	Description	Control
A	<ul style="list-style-type: none"> Fully automatic weapons and military weapons; explosive military missiles and launchers; firearms disguised as other objects; ammunition with penetrating, explosive or incendiary projectiles, and the projectiles for such ammunition 	Prohibited
B	<ul style="list-style-type: none"> Firearms used by marksmen and hunters; semi-automatic or repeating short firearms; single-shot firearms with centre-fire percussion; single shot short firearms with rimfire percussion whose overall length is less than 28cm; Semi-automatic long firearms whose magazine and chamber can together hold more than three Rounds; Semi-automatic long firearms whose magazine and chamber cannot together hold more than three rounds, where the loading device is removable or where it is not certain that the weapon cannot be converted, with ordinary tools, into a weapon whose magazine and chamber can together hold more than three rounds; Repeating and semi-automatic long firearms with smooth-bore barrels not exceeding 60 cm in length; Semi-automatic firearms for civilian use which resemble' weapons with automatic mechanisms. 	Subject to authorisation
C	<ul style="list-style-type: none"> Firearms used by hunters; Repeating long firearms other than those listed in category B, point 6. Long firearms with single-shot rifled barrels. Semi-automatic long firearms other than those in category B, points 4 to 7. Single-shot short firearms with rim fire percussion whose overall length is not less than 28 cm 	Subject to declaration
D	<ul style="list-style-type: none"> Other firearms; Single-shot long firearms with smooth-bore barrels. Any essential component of such firearms : The breach-closing mechanism, the chamber and the barrel of a firearm which, being separate objects, are included in the category of the firearms on which they are or are intended to be mounted. 	None

Despite these formal definitions of firearms, their application within legislation is not always consistent (see section 3), and this impacts on how crimes are recorded and reported. The European Sourcebook of Crime and Criminal Justice Statistics (Aebi et al., 2014), adopted 'standard definitions' of 'firearm involved' and 'firearm' to facilitate the collation of police data relating to gun enabled robbery and homicide. These definitions were devised and adopted in order to facilitate data collection from as many countries as possible in a manner that was as inclusive of local definitions as possible. The term 'firearm involved' was used to refer to a firearm that has been involved in committing a crime, regardless of whether the firearm has been discharged, used as a blunt weapon, or just carried by a criminal assailant. The standard definition of 'firearm' adopted with the European Sourcebook is 'a weapon that launches a bullet or other projectile (or several at a time), making use of an explosive charge as a propellant, and that can be carried and used by a single person' (pg 401). Included within this definition are pistols, revolvers, rifles, shotguns, sub-machine guns, light and medium machine guns, improvised and special firearms (e.g. pen guns), unloaded firearms carried with ammunition at hand and legally owned firearms. It is noted that all countries included these weapons as a *minimum* within their 2011 police data collection. Specifically excluded were heavy machine guns, hand grenades, Molotov cocktails, air guns, gas pistols, paintball rifles, crossbows, bows and arrows, replica and other fake firearms, and unloaded firearms carried without ammunition at hand. However, the authors noted that there were important deviations from the standard definition of firearm by some of the countries (see table 2.2 below).

Table 2.2 shows that a number of countries including Croatia and Germany (of most relevance to the current research) have rules concerning the inclusion of different forms of 'firearms' that are different from the standard definition adopted. Consequently, these variations within the definition are likely to impact on rates of crime in which firearms are identified as being involved, with broader definitions leading to a potential over-estimation of gun crime. These variations clearly will impact the comparability of available statistics. In addition to these variations with regards to the definition of firearm, according to the European Sourcebook, Hungary and Germany do not identify homicides in which firearms are used as a blunt instrument or used as a threat, and also do not include firearms that are carried or ready to hand within any offence category.

Table 2.2 Dimensions on which countries deviated from the standard definition of firearm in 2011 (summarised from Aebi et al, 2014)

Country	Heavy machine guns included	Hand grenade included	Air guns, gas pistols and/or paintball rifles included	Crossbow or bow and arrow included	Replica firearms included	Firearm shot included	Firearm as blunt weapon excluded	Firearm as threat excluded	Unloaded firearms carried without ammunition included	Firearm carried excluded	Firearm ready to hand included
Albania [#]	X	X	X	X	X	✓	X	X	X	X	X
Austria	✓	X	X	X	X	✓	X	X	✓	X	✓
Belgium	X	X	X	X	X	✓	X	X	X	X	X
Bulgaria	X	X	X	X	X	✓	✓	✓	X	✓	✓
Croatia	X	✓	✓	X	✓	✓	X	X	✓	X	X
Cyprus	✓	X	✓	X	X	✓	X	X	✓	X	X
Czech Republic	X	X	X	X	X	✓	X	X	X	X	X
Denmark	X	X	X	X	X	✓	X	X	X	X	X
Estonia	X	X	X	X	X	✓	X	X	X	X	X
Finland ²	X	X	X	X	X	✓	X	X	X	X	X
France	X	X	X	X	X	✓	X	X	X	X	X
Georgia	✓	X	X	X	X	✓	X	X	✓	X	X
Germany ¹	X	X	✓	X	X	✓	✓	✓	✓	X	X
Greece	X	X	X	X	X	✓	X	X	X	X	X
Hungary	✓	✓	X	X	X	✓	X	X	✓	X	X
Iceland	X	X	X	X	X	✓	X	X	X	X	X
Ireland	✓	X	X	X	X	✓	✓	✓	✓	✓	✓
Italy	X	X	X	X	X	✓	X	X	X	X	X
Kosovo ^{###}	X	X	X	X	X	✓	X	X	X	X	X
Latvia	NO DATA										
Lithuania	X	X	X	X	X	✓	X	X	✓	✓	X
Luxembourg	NO DATA										
Malta	X	X	X	X	X	✓	X	X	X	X	X

FYR Macedonia [#]	NO DATA										
Montenegro [#]	NO DATA										
Netherlands	X	X	X	X	X	✓	X	X	X	X	X
Norway	X	X	X	X	X	✓	X	X	X	X	X
Poland	✓	X	X	X	X	✓	X	X	✓	✓	✓
Portugal	X	X	X	X	X	✓	X	X	X	X	X
Romania	NO DATA										
Serbia [#]	X	X	X	X	X	✓	X	X	X	X	X
Slovakia	✓		✓	✓	✓	✓	X	X	✓	X	X
Slovenia	X	X	X	X	X	✓	X	X	X	X	X
Spain	X	X	X	X	X	✓	X	X	X	X	X
Sweden	X	X	X	X	X	✓	X	X	X	X	X
Switzerland	X	X	X	X	X	✓	X	X	X	X	X
Turkey [#]	X	X	X	X	X	✓	X	X	X	X	X
Ukraine	X	X	X	X	X	✓	X	X	X	X	X
UK: England & Wales	X	X	X	X	X	✓	X	X	X	X	X
UK: Scotland	X	X	X	X	X	✓	X	X	X	X	X
UK: Northern Ireland	✓	X	✓	X	✓	✓	X	X	✓	X	X

¹For robbery offences only; [#]Candidate countries; ^{##}Potential candidate country; all other countries are existing member states (MS); ²Cross bow is included in more recent Finnish definitions of firearms;

2.2 The prevalence of gun crime

Currently there is no administrative definition of either 'gun crime' or 'gun enabled crime' and consequently no agreed upon metric for reporting the prevalence of these forms of criminal behaviour. Consequently, indicators of gun crime from which to determine its incidence and prevalence arise from several possible sources: criminal justice agencies, health care agencies, victimisation and crime surveys (Gilgen, Krause & Muggah, 2010). However, each of these have limitations which need to be understood before data obtained through them are examined.

2.2.1 Available data sources

Criminal justice data

Administrative data on recorded crime are the most readily available data source (del Frate, 2014). Statistics on crime and criminal justice are invaluable tools for informing the development of evidence-based policy. Such data enable the evaluation of the implementation of legislation, and the effectiveness of new laws. In relation to gun enabled crime and the implementation of the EU Directives, such data are fundamental to understanding the extent to which European countries and MS are implementing new laws, and the impact that such laws may be having on gun enabled crime. At a European and International level two platforms exist through which crime data are compiled for comparative purposes. Since 2007 Eurostat has collated and published data concerning total crime, homicides, violent crime, robbery, domestic burglary, theft of a motor vehicle, drug trafficking, prison population and the number of prison officers. The United Nations Surveys on Crime Trends and the Operations Criminal Justice Systems (UN-CTS) collates basic information regarding police recorded crime and criminal justice system resource across EU Member states as well as non-EU countries (see <https://www.unodc.org/unodc/en/data-and-analysis/statistics/crime/cts-data-collection.html> for details). The UN-CTS instrument focuses on a restricted range of criminal acts, including homicide, rape, robbery, kidnap, theft and burglary. Neither of these data sources enable analysis of gun crime trends however due to the exclusion of questions concerning the involvement of firearms within the offence categories examined.

There are many factors that degrade the quality of crime data. First, across the EU at least 128 national authorities are responsible for the collation and production of statistics relating to crime, and at least 52 distinct offence classification systems exist (European Commission, 2011). Moreover, different countries apply different counting rules to measure crime, which has been noted to often lead to double counting. Additional obstacles include the fact that offence data are recorded at different times relative to an offence being reported. Malby (2010) notes, that even the most effectively recorded crime category of intentional homicide suffers from clear variations between countries which make comparisons challenging. These variations include different thresholds for categorising a death as intentional homicide. It is possible that a death that occurs in the act or attempted act of an alternative serious crime may also be counted as intentional homicide or murder. Moreover, variations exist in the extent to which infanticide, assault leading to death, and killings by law enforcement officers acting in the line of duty are included within police recorded crime statistics. Further, more generic variations may also exist in relation to the unit of measurement; whether, for example, offences, suspects or cases are counted. Additional ambiguity surrounds the extent to which attempted homicide or non-intentional homicides are included in published figures, and also the point at which a suspicious death is classified as homicide.

Further conceptual ambiguity arises as there is not a perfect match between the incidence of crime and the number of perpetrators, or the number of victims. For example, it is common for more than one crime to be recorded from one incident (e.g. assault and kidnap) and therefore one individual perpetrator to be identified in more than one recorded crime type within a single criminal investigation.

Morbidity data

Given the considerable challenges of using police recorded crime data to determine the prevalence of gun crime, it is not surprising that morbidity data are most often reported as a proxy measure. In the health arena, definitions of illnesses and lists of acceptable treatments are relatively standardised internationally (National Audit Office, 2012). Unlike the ambiguity of crime rates, death rates are better defined due to each death representing one individual from a given population. Although data are available concerning deaths by firearms for most countries, these data are often not complete, and when considered longitudinally data points are not always present (Duquet & van Alstein, 2015). The World Health Organisation compiles mortality data (WHO, 2014) and details the methods through which death and injury has arisen using the International Classification of Diseases and Related Health Problems (ICD-10). There are four firearms categories, each of which comprises three individual codes which identify the type of firearm involved as well as the intention behind the event (Langley & Chalmers, 1999):

Firearm injury – Undetermined intent (unknown cause, fatal or non-fatal):

- Y22: Handgun discharge undetermined intent (firearm only)
- Y23: Rifle shotgun and larger firearm discharge undetermined intent (firearm only)
- Y24: Other and unspecified firearm discharge undetermined intent (includes airguns, BB guns and flare guns)

Firearm injury - Unintentional (unintentional shooting, fatal or non-fatal):

- W32: Handgun discharge (firearm only)
- W33: Rifle, shotgun and larger firearm discharge (firearm only)
- W34: Discharge from other and unspecified firearms (includes airguns, BB guns and flare guns)

Firearm injury – Assault (gun homicide, attempted or completed):

- X93: Assault by handgun discharge (firearm only)
- X94: Assault by rifle, shotgun and larger firearm discharge (firearm only)
- X95: Assault by other and unspecified firearm discharge (includes airguns, BB guns and flare guns)

Firearm Injury: Self-harm (Gun Suicide, attempted or completed)

- X72: Intentional self-harm by handgun discharge (firearm only)
- X73: Intentional self-harm by rifle, shotgun and larger firearm discharge (firearm only)
- X74: Intentional self-harm by other and unspecified firearm discharge (includes airguns, BB guns and flare guns)

For the purpose of this report, due to the focus on gun crime, only death by firearm (undetermined intent) and through firearm assault (homicide) will be analysed. The unintentional (accidental) death category and self-harm category are not analysed.

There is some controversy regarding the firearms categorisation within the ICD-10 which has a bearing on the data provided. From a public policy perspective it is important to be able to differentiate between handguns, long guns, military style semiautomatic firearms, and air guns/rifles. Although the previous ICD-9 coding system enabled the identification of handgun, shotgun (automatic), and military firearms, as well as unspecified and 'other' firearms, The ICD-10 codes combine rifle, shotgun and larger firearm discharge into one code. The consequence of this is that there is a loss of specificity concerning the origin of lethal injury which then hampers the ability to develop appropriate public health and legislative responses (Langley & Chalmers, 1999). Similarly, the inclusion of injuries from airguns within the 'other and unspecified' category is also problematic when trying to understand the nature of death and injury caused by firearms. In addition to individual firearm categories, the data have been aggregated by category of intention to provide estimated death rates as a result of an undetermined firearm injury, or an assault with firearm.

In addition to the cautions raised previously about the categorisation of firearms linked to deaths in the ICD-10, it is also worth noting that although the deaths may originally identified as occurring for an undetermined or even accidental cause, categories are not updated after a police investigation is completed (Duquet & van Alstein, 2015). Therefore although these categories may be face valid at the time of recording (i.e. the details at the time lead medical practitioners to make the recorded classification), over time the actual categorisation may be incorrect should it be found that the death arose in the context of homicide.

Crime victim's surveys

As has been seen from the police recorded crime and the WHO mortality database, both sources of data regarding gun crime have their weaknesses, particularly when the purpose of review is to compare countries in their levels of gun crime, a task that is vital if effective pan-European legislation is being developed and implemented. Police crime data are contaminated by variations in recording practices and legal definitions of criminal act, variations in the point at which crimes are recorded and in the units of measurement. The WHO ICD-10 data as we have seen is contaminated by a lack of specificity of the firearms involved, and the burden of returning these data is known to increase reporting. In addition, both sources individually mask the true extent of gun crime. It is known that victims of gun crime who survive are in some cases fearful of reporting their experiences to any authority due to potential reprisals (Squires, 2015). In circumstances such as these, where under-reporting is known to occur, it is more appropriate to use crime victimisation survey data to capture data concerning gun crime (Aebi et al, 2014). Such data also enable a broader picture of the impact of gun crime to be determined based on the nature and impact of injury.

International crime victim's survey

The International Crime Victims Survey (ICVS) was developed as a longitudinal multi-wave crime survey, based on the British, Dutch and Swiss national surveys (van Kesteren, van Dijk and Mayhew, 2014) documenting a range of variables associated with the experience of crime, and attitudes towards crime. The survey was completed by more than 300,000 people across 78 countries between 1989 and 2005. That the survey was repeated in 1992, 1996, 2000, 2004-5 and 2010 enables cross country longitudinal comparisons of trends in victimisation and associated variables. The standardised methodology and adoption of samples representative of countries or cities makes this a high quality survey. Data concerning firearms were collected in the 2004-2005 survey, from participants in 24 countries, 21 of which were in Europe. Analyses of this module of data reported by Duquet and Van Alsten (2015) provide interesting contextual information regarding cultural variations in gun ownership. Main conclusions suggest that the countries with highest gun ownership are also those countries with the largest firearms production in Europe. Moreover, individuals who reported owning guns were most likely to report owning long guns e.g. shotguns. The survey included a number of direct questions concerning individual's experiences of crimes involving weapons over the course of the last five years. Specifically, when asked about their experiences of robbery, sexual offences, assaults and threats participants are asked whether a weapon was used by the assailant, what kind of weapon, and whether it was used. For the robbery question, if participants indicated that a gun was used, they were then asked whether the gun was a hand gun or a long gun. This follow up question concerning the type of gun used is not present in relation to sexual offences or assaults and threats.

Although the ICVS is a considerable resource there are also some clear limitations. First, assaults and threats are confounded by their combination into one offence category. It would be useful to know better whether firearms were more likely to be used to assault or threaten individuals. Second, it would also be useful to know for the categories of sexual offences and assault or threats what types of guns were involved. Third, the 2004/05 ICVS was the only survey to include the questions on firearms. Consequently, there is no internationally comparable data available to map trends in victimisation due to gun enabled crime. Finally, although data were obtained, no findings regarding

the reporting of crimes involving guns relative to crimes not involving guns have been published. In addition, data concerning victim’s perceptions of the police response to the reporting of such crimes also exists, but is yet to be examined in detail. It would therefore seem that more information can be obtained about the experience of a limited range of gun crimes, reporting patterns and perceptions of the police response than is currently publicly available.

National surveys

According to Aebi et al (2014), when countries were approached in 2010 to determine whether a victimisation survey of any kind had been completed, Austria, Cyprus, Germany, Greece, Kosovo, Malta, Serbia and Slovakia had never implemented a crime victimisation survey, although table 2.6 shows that Austria, Germany and Greece did participate in the 2004/05 ICVS. In addition, Denmark, Germany, Luxembourg, the Netherlands, Sweden and the UK participated in the 2010 ICVS (see <http://wp.unil.ch/icvs/sources-for-the-icvs> for details). However, Aebi et al (2014) also noted that 11 additional European countries conduct their own crime victimisation surveys, although the periodicity varies considerably. Table 2.3 summarises data from the European Sourcebook illustrating the frequency with which other countries have implemented such surveys.

Table 2.3 Summary of national crime victimisation survey data collection, frequency and nature (summarised from Aebi et al, 2014).

Country	Frequency
Belgium	Normally every two years
Bulgaria	Annual
Denmark	Annual
France	Annual
Iceland	Annual for the capital, every two years for whole country
Ireland	Every 3 – 6 years
Italy	Every 5 years
Netherlands	Annual
Sweden	Annual
Turkey	Annual
UK	Continuous (annual results)

It has been challenging to obtain details of the surveys conducted in each of these countries, as many are not publicly available. However in England and Wales, Sweden, Italy and Bulgaria respondents are not asked questions about their experience of crimes involving firearms. It therefore seems that opportunities are being missed to develop a better understanding of non-lethal gun crimes through omitting such questions. It would be of benefit for questions on this topic to be included routinely in future iterations of these national surveys.

2.3 Method of data collection

For the purpose of this part of the project three approaches to acquiring prevalence data were taken. First a review of published academic literature was undertaken to identify any academic studies from researchers in the countries of interest that identified the source of or reported prevalence data since 2010. Second, a review of grey literature was undertaken to identify relevant unpublished reports from academic and other organisations within the countries of interest that might cite prevalence data. Third, direct contact was made with representatives’ of the Ministries of Interior and Justice and national statistical authorities to request prevalence data. This section adopts a ‘latest available year’ data in order to ensure that as wide a geographical spread within the EU is maintained as well as ensuring that the data presented are timely (c.f. Malby, 2010).

From the research undertaken three main potential sources of data were identified. First, police recorded crime data were obtained for 22 countries. Second, World Health Organisation mortality data were obtained for 34 countries. Third, results from the ICVS were available for 21 countries. These data are presented and discussed in turn.

2.4 Results

2.4.1 Gun crime defined by police data

In order to try and determine the prevalence of gun crime (see section 2.2), police recorded crime data were sought from the national police, statistical authorities and ministries of interior and defence for all European countries when published data were not available. This exercise yielded a large and complex dataset (see table A2.1 in appendix 2 for incidence and prevalence details).

The data that were found and/or returned to the research team indicated that 'gun crime' is conceptualised as an extremely diverse category of crime. Table 2.4 (page 21) summarises the range of criminal offences for which data were found and/or returned when requests for the data were made. Perhaps unsurprisingly given the observations from the European Sourcebook noted previously, the most consistently identified recorded crime categories involving firearms were those of homicide and robbery, although homicide data were only available for 19 countries, and robbery data were available for 10 countries. It has been observed that due to its severity, homicide – the intentional killing of a person by another is recorded more effectively than other crimes (Malby, 2010). The data presented in table 2.4 however illustrate the variability in how firearms are included within crime definitions. Countries such as Croatia, Germany and FYR Macedonia provided data that is both specific to an offence (e.g. murder), as well as data that are generic infringements of a particular act (e.g. Offences against the Firearms Act). Whereas Denmark only returned data relating to Offences against the Firearms Act, and no data specifically referring to other criminal offences in which a firearm was identified as present or used. When questioned directly about these data our interview respondents from Denmark confirmed that these were the only available data.

Further variations existed concerning the association between firearms and crimes that were identified. For example in the UK England and Wales, although comprehensive firearms or gun crime data are collated, they are reported in relation to how the firearm featured in crime (e.g. was discharged, used as a blunt weapon), as well as the broad categories of offences in which it was used (e.g. violence, criminal damage), but the links to specific criminal acts (e.g. homicide) are not provided. Moreover, crimes relating to firearms trafficking and other infringements of firearms regulations were not returned in relation to our request for gun crime data. This was also the case for the majority of the countries who provided data.

Table 2.4. Criminal offence categories in which firearms are identified in each country for which data were obtained

Country	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Albania	✓			✓																						
Austria	✓	✓																	✓	✓	✓	✓				
Belgium	✓			✓											✓											
Croatia	✓													✓												
Cyprus						✓								✓												
Denmark														✓												
Estonia																	✓									
Finland	✓																									
France				✓																						
Germany	✓		✓	✓	✓	✓				✓	✓		✓	✓	✓	✓										
Greece														✓												
Iceland	✓																									
Ireland	✓		✓	✓														✓								
Italy	✓																									
FYR Macedonia	✓	✓					✓		✓					✓												
Malta	✓			✓																			✓			
Netherlands	✓																									
Norway	✓																									
Poland	✓		✓	✓																			✓	✓		
Portugal	✓																									
Spain	✓																									
Sweden	✓	✓		✓											✓											
UK: England & Wales	✓	✓		✓	✓			✓		✓		✓	✓			✓	✓								✓	✓

Box 2.1: Key for table 2.3

- 1 = Homicide/murder
- 2 = Attempted homicide/murder
- 3 = Assault
- 4 = Robbery
- 5 = Threats
- 6 = Theft
- 7 = Causing danger
- 8 = Criminal damage
- 9 = Celebration shootings
- 10 = Unlawful discharge
- 11 = Holding someone against their will
- 12 = Firearm as a blunt weapon
- 13 = Violence
- 14 = Unspecified 'Firearms Act' or equivalent offences
- 15 = Illegal possession
- 16 = Crimes involving guns
- 17 = Unlawful handling of firearm, components or ammunition
- 18 = Burglary / Aggravated burglary
- 19 = Manslaughter
- 20 = Aggravated manslaughter
- 21 = Intentional aggravated assault
- 22 = Other unintentional assault
- 23 = Damage to health
- 24 = Rape
- 25 = Possession of weapons
- 26 = Public fear, alarm or distress

2.4.2 Criminal justice data

Table A2.1 in appendix 2 presents the data obtained for the most recent year where available for each of the European countries. There are several issues to note. First, there is a substantial proportion of missing data, despite adopting three different strategies for obtaining police recorded crime involving firearms data were obtained for 23 countries within the timeframe of the project. This resulted from a combination of data requests not being responded to, data not being available and in one cases (Denmark) the project team were informed that data concerning the role of firearms in specific crimes were collected but were not publicly available for data protection reasons. This undoubtedly limits the ability to calculate pan-EU gun crime prevalence rates. However, this is not the only factor that makes this task exceptionally difficult as the variations in crime data returned, and variations in the years for which they are available also seriously compromise this task.

When considering the prevalence of gun crime, thought also needs to be given to the most appropriate indicator to be used to represent the data. Incident data, which is the frequency of offences recorded, provide a non-standardised estimate of crime. Crime is acknowledged to be influenced at least in part by the size of the population. Consequently a standardised indicator which

accounts for this influence is required. Gilgen et al (2010) argue in their paper on measuring and monitoring armed violence, that when indicators are developed they need to:

- Provide relevant and robust measures of progress towards established targets;
- Be clear and straightforward to interpret and provide a basis for comparison;
- Be broadly consistent with other key priorities and avoid imposing a disproportionately high burden on governments and other partners;
- Be based on existing international standards, recommendations and best practice; and
- Be assembled from well-established data sources, quantifiable and consistent in order to enable measurement over time (pg 13).

Most often, crime rates are represented as the incidence of crime per 100,000 of the population, which serves on some levels as a standardised indicator. It is an established indicator that is familiar to policy makers and therefore conforms to some of Gilgen et al's requirements. Consequently, we calculated the rate per 100,000 of the population for each of the gun crime types for which data were provided. However it must be noted that there is an age bias relating to the recording of criminal behaviour, in that each country has a different age of criminal responsibility. Consequently, the likelihood of being identified as a perpetrator, and therefore of a crime or crimes being recorded, is directly influenced by the age of criminal responsibility and the age of the alleged perpetrator. An improved metric would therefore constitute the rate of incidents per 100,000 of the criminally responsible population. That is, rates should be calculated based on the population that are over the age of criminal responsibility.

As observed, gun crime is exceptionally diverse in nature when the role of firearms in standard notifiable offences as well as criminal acts concerning the possession of firearms are considered together. There are several patterns worth observing, based on the standardised indicator provided. First, the rates of gun crime vary considerably depending on how it is defined. So, for example, when rates are based on aggregate crimes against a specific Act, they are generally higher than when rates are reported in relation to a specific criminal offence. For example, Denmark has the highest rate of firearms crime (130 incidents per 100,000 of the population) based on the data provided which reflects contraventions of the national Firearms Act. In Croatia, the rate of crime when defined as offences against the national Firearms Act is high (52.71 incidents per 100,000 of the population) and yet when offences involving illicit firing are considered the rates are considerably lower (1.03 per 100,000).

In order to facilitate more direct comparisons, tables 2.5 and 2.6 present the data for homicide and robbery. If we focus on the homicide data in table 2.5 as that is the most consistently identified crime (Malby, 2010), and also the crime for which we have data from a majority of countries it is evident that rates vary between countries from 0 per 100,000 of the population in Iceland, to 2.2 per 100,000 of the population in Albania. The majority of countries for which there is data have homicide rates between 0.10 and 0.50 homicides per 100,000 of the population. Albania, FYR Macedonia and Sweden have rates higher, and Poland, Iceland, and Croatia have rates lower than this. Rates of robbery are higher than those for murder ranging from 1.30 (Portugal) to 86.02 (Sweden) incidents per 100,000 of the population.

Table 2.5 Prevalence of homicide involving firearms by country

Country	Source of information	Year	Offence	Incidence	Population	Rate
Albania	INSTAT	2014	Intentional homicide with a firearm	67	3,020,209	2.22
Austria	National Police	2014	Murder	14	8,223,062	0.17
Belgium	Federal police	2010	Homicide with a firearm	36	10,895,568	0.33
Croatia	European Sourcebook	2011	Intentional Homicide	1	4,302,000	0.02
Finland	Finnish Homicide Monitor	2014	Victims killed by firearm	11	5,268,799	0.21
Germany	Ministry of Interior	2013	Murder/homicide	142	80,620,000	0.18
Iceland	Office of the police	2014	Homicide	0	329,100	0.00
Ireland	Crime and criminal justice statistics office	2014	Murder/manslaughter	14	4,712,695	0.30
Italy	Ministry of Interior	2010	Homicides	209	59,280,000	0.35
FYR Macedonia	UNPoA report	2013	Homicides	25	2,107,000	1.20
Malta	National Police	2014	Homicides of women	14		0.67
			Wilful homicide	3	412,655	0.73
			Armed Robbery	6		1.45
Norway		2014	Homicide	4	5,109,059	0.08
Poland	Police headquarters	2014	Homicide (including attempted)	32	30,820,000	0.10
Spain	National Statistics Institute	2013	Homicides by firearms	95	47,130,000	0.20
Sweden	Swedish national council for crime prevention	2014	Murder	74	9,723,809	0.76
			Attempted murder/manslaughter	210		2.16
UK: England & Wales	Home Office Police recorded crime	2013/14	Homicide	28	64,596,800	0.04
			Homicide (including air weapons)	30		0.05

In relation to the robbery data, table 2.6 shows that this crime category is recorded in a range of ways, often reflecting the different targets of the robbery or the location of the robbery. Such variations again make comparisons between countries difficult, as for countries with only one category of armed robbery it is unclear whether all of the separate targets are represented within this single category. Moreover, some countries disaggregate their robbery data by the type of firearm involved (e.g Portugal), thereby adding another layer of complexity to the data. However, when the data are examined it is evident that the highest rates of robbery per 100,000 of the population are reported by Sweden with more than 86 incidents. The second highest rates were reported by Belgium with more than 39 incidents per 100,000. The lowest rates were reported by Portugal.

Table 2.6 Prevalence of robbery involving a firearm by country

Country	Source of information	Year	Offence	Incidence	Population	Rate	
Albania	INSTAT	2014	Robbery with a firearm	44	3,020,209	1.46	
Belgium	Federal police	2013	Armed robbery	4,401	11,136,147	39.52	
		2013	Armed robbery on public transport	143	11,136,147	1.28	
		2013	Armed robbery on the street	17	11,136,147	0.15	
		2013	Armed robbery in a public place	131	11,136,147	1.17	
France	French National Police	2013	Armed Robbery	4,033	65,800,000	6.13	
			Armed robbery against a financial institution	116		0.18	
			Armed robbery against industrial establishment	2,450		3.72	
			Armed robbery against cash in transit	24		0.04	
			Armed robbery of individuals	468		0.71	
			Other armed robberies	975		1.48	
			French Gendarmerie	2013		Armed robbery	1,201
	Armed robbery against a financial institution	39	0.06				
	Armed robbery against industrial establishment	671	1.02				
	Armed robbery against cash in transit	2	0.003				
	Armed robbery of individuals	257	0.39				
	Other armed robberies	232	0.35				
	Germany	Police crime statistics	2013		Thefts with firearms	615	80,620,000
				Robberies involving guns	2,467	3.06	
Ministry of Interior		2013	Robbery of shops	1,403	1.74		
			Robbery of petrol station	266	0.33		
Ireland	Crime and criminal justice statistics office	2014	Aggravated burglary	41	4,712,695	0.87	
			Robbery of establishment	204		4.33	
			Robbery of goods/cash in transit	15		0.32	
			Robbery from person	44		0.93	
Malta	National Police	2014	Armed Robbery	6	412,655	1.45	
			Portugal	Robbery		99 (gun)	10,813,834
				35 (gas)		0.32	
				6 (air)		0.06	
Sweden	Swedish national council for crime prevention	2014	Robbery with firearm	8,364	9,723,809	86.02	
UK: England &	Office for National Statistics	2014	Total robbery involving a firearm	1,972	64,596,800	3.05	
Wales	Home Office Police recorded crime	2013/14	Robbery (non air weapons)	1,946		3.01	
			Robbery (including air weapons)	1,971		3.05	

The basic requests made by the project team, and the interpretation of these by the respondents which led to the considerable diversity of data provided, illustrates the fact that gun crime is a poorly defined and operationalised category. Data illustrate a need for a comprehensive definition of gun crime to be developed in order that the statistical authorities within each country, and the associated criminal justice and governmental departments understand what constitutes gun crime, and the impact that legislation may have on rates of crimes involving firearms.

2.4.3 Morbidity data

Table A2.2 (appendix 2) illustrates that again, despite mortality data being more consistently defined and collected there were inconsistencies in the availability of ICD-10 data provided by each country with data only available for the year 2009 for two countries (Iceland, Montenegro), 2010 for two countries (Slovenia, FYR Macedonia), 2011 for two countries (France, Bosnia and Herzegovina), 2012 for nine countries, 2013 for 16 countries, and 2014 for the remaining three countries (Slovakia, Malta, Austria). Data were not provided from Albania or Kosovo*. It has been noted that the process of coding deaths through this classification is overly burdensome which leads to some countries not routinely completing this data collection exercise (Aebi et al, 2014).

Previously, Duquet and van Alstein (2015a) estimated that approximately 6,700 persons die each year as a result of gunshot wounds within EU member states. However, approximately 75% of these deaths are self-inflicted; suggesting that 1,675 people are killed by wounds inflicted by someone else using a firearm each year in EU member states, and which would constitute a form of gun crime. Approximately fifteen percent of firearms related deaths in EU member states were homicide, with the remaining deaths by firearms being either accidental, or of undetermined cause.

According to table A2.2, in total 3,475 deaths by firearms were identified through the ICD-10 mechanism across European countries based on the data for the most recent year. Of these, 12.4% were of undetermined firearm discharge, 40% were from unintentional firearm discharge, and the remaining 47.6% were from homicide. The figure of 1,665 homicides is congruent with the estimate of Duquet and van Alstein (2015a) that 1,675 deaths from gun shots are at the hands of other people. This is likely to be an underestimation of the true extent however given the category of 'undetermined' firearms deaths which suggests that an unspecified proportion of those deaths are likely to be from homicide.

Based on the data presented in table A2.2 it is evident that mortality rates due to undetermined firearm discharge ranges from 0 (Turkey, Norway, Netherlands, Montenegro, Malta, FYRO Macedonia, Luxembourg, Iceland, Cyprus, Croatia, Bosnia and Herzegovina) to 0.335 per 100,000 (Lithuania). Firearms deaths from undetermined causes represent 0 to 66.67% (Estonia) of all firearms related deaths with on average 22.50% of firearms deaths attributed to this cause across all countries. Of these, the majority (77.3%) were identified as 'other unspecified' firearms. A further 12.6% were identified as handguns and the remaining 10.1% were identified as 'rifles, shotguns or larger firearms'.

Assaults by firearms (homicides) range from 0 to 1.07 per 100,000 of the population (FYRO Macedonia), and represent between 0 (Iceland and Bosnia and Herzegovina) and 100% (Malta, Montenegro, Netherlands, Norway) of firearms related deaths. The average percentage of firearms deaths identified as homicide across the 33 countries in table A2.2 is 57.80%. In relation to the firearms involved, the majority (71.1%) were identified as 'other unspecified' firearms. In contrast 12.7% were identified as handguns, and the remaining 16.2% were identified as 'rifles, shotguns or larger firearms'.

Figure 2.1 (on page 17) summarises the aggregate morbidity rates for the most recent year combining deaths by firearms that were undetermined and caused by assault (homicide). Figure 2.1 shows that the aggregate prevalence rates of deaths by firearms ranges from 0 (Luxembourg, Iceland, Bosnia and

Herzegovina) to more than 1 per 100,000 (Cyprus (1.389), FYR Macedonia (1.0706), Serbia (1.2983) and Turkey (1.0056)). In addition to the variation in the years for which the data were collected, further difficulties arise in interpreting and comparing the data in figure 2.1 and table A2.2 due to the small numbers of gun deaths in some countries, as well as the high percentages of 'undetermined' firearms deaths in some countries.

2.4.4 Emergency room data

An alternative method of estimating civilian deaths and injuries from firearms involves examining data from emergency departments of hospitals. Only one such study in Europe could be found in which these data were reported. Davies et al (2011) analysed data obtained by the Trauma Audit and Research Network in England, which represents approximately 70% of the trauma receiving hospitals in England and Wales. Analysis of trauma cases between January 1998 and December 2007 found that 0.53% (487) of all cases were due to firearms injuries with between 40 and 50 patients identified per month, although there was an upward trend of reports throughout the 10 year observation window. The vast majority (90.4%) of injuries were due to assault in the 357 cases in which injury origin was documented. In total 7.0% of patients died from their injuries (7.4% men, 3.8% women). These findings broadly confirm that assault is the most frequent cause of death involving a firearm, as per the ICD-10 findings reported in table 2.5.

Summary

In summary, deaths by firearms homicide are the most frequent context of firearms deaths based on the data collated. In addition, firearms within the category of 'other unspecified' firearms are most often identified as the cause of deaths by firearms regardless of whether the deaths are categorised as of undetermined origin, accident or homicide. The fact that this ICD-10 category does not more clearly specify the firearms involved is problematic from a public policy perspective as it does not help the development of prevention policies or legislative responses. It also makes interpretation and comparison of data between countries challenging. Emergency room data provide additional evidence regarding the nature of firearms injuries and deaths.

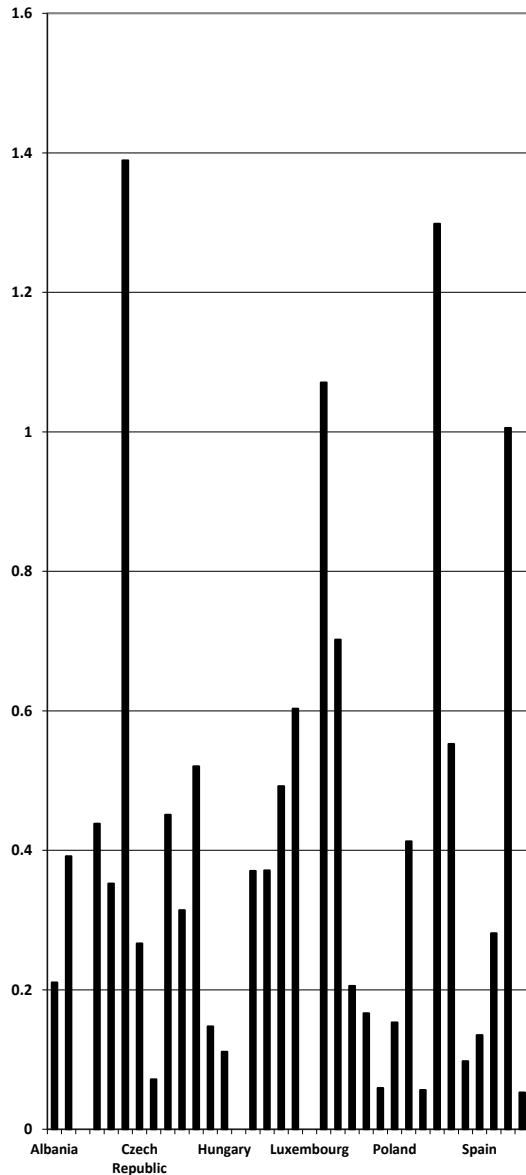


Figure 2.1 Summary of aggregate deaths by firearm (assault and undetermined) for each country

2.4.5 Crime victimisation surveys

This section therefore provides an overview of crime victim surveys reported within our 16 target countries since 2006, focusing on data concerning firearms where it is available and highlighting potentially missed opportunities for collecting these data.

Table 2.6 presents the data isolated for European countries. From these data it is evident that 3.5% of the population of respondents reported experiencing a robbery. On average a gun was used in 4% of robberies, ranging from being not present at all in robberies reported by participants in Bulgaria, Finland, Hungary and Iceland, to a maximum of 12% of robberies reported by participants in Italy.

In relation to sexual assaults, van Dijk et al (2007) reported that weapons were generally unlikely to be used, and typically a knife was used more often than a gun. A gun was present in on average 0.9% of incidents. According to the data in table 2.6, 3.1% of the respondents reported experiencing a sexual

assault. Table 2.6 shows that within European countries a gun was present in on average 0.72% of sexual offences reported. Participants from the majority of countries reported that guns were not used at all in the sexual offences committed. Only respondents from Denmark (7%), Portugal (4%) and Spain (5)% reported that a gun had been present.

Assaults and threats were more commonly reported than both robberies and sexual assaults, although robberies were most likely to involve guns than the other two categories. Van Dijk et al (2007) reported in the wider study that on average guns were present in 2.4% of assaults and threats. The data in table 2.7 show that 9.8% of respondents reported an assault or threat. The average rate for guns to be present in assaults and thefts is 1.5% across the European countries that participated. This ranged from guns being completely absent in all instances of threats and assault reported in Bulgaria, England and Wales, Estonia, Finland, Greece, Hungary and Ireland, to guns being present in a maximum of 4% of assaults and threats experienced by participants in France, Italy and the Netherlands. Together these data suggest that individual contact crimes involving firearms are a relatively rare occurrence across European countries, and that instances of robbery are more likely to involve firearms than are sexual offences and assaults or threats.

Table 2.7 Summary of gun use within crimes of robbery sexual offences and assaults/threats taken from the 2004/5 ICVS

Country	Sample size	Robbery		Sexual offences		Assault & threat	
		N	% Gun	N	% Gun	N	% Gun
Austria	2004	45	6	127	0	172	3
Belgium	2014	89	7	41	0	187	1
Bulgaria	1100	30	0	5	0	57	0
Denmark	1984	59	7	67	7	191	3
England & Wales	1775	110	10	53	0	245	0
Estonia	1678	126	2	37	0	146	0
Finland	2500	47	0	65	0	259	0
France	2016	52	5	28	0	179	4
Germany	2025	36	6	117	0	246	3
Greece	2020	94	3	99	0	136	0
Hungary	2103	60	0	23	0	132	0
Iceland	1909	39	0	85	0	308	1
Ireland	2003	104	3	84	0	281	0
Italy	2023	53	12	30	0	83	4
Luxembourg	800	47	3	31	0	79	2
Netherlands	2010	69	1	89	0	280	4
Norway	3996	96	9	190	0	428	2
Poland	5013	253	1	90	0	439	2
Portugal	2011	103	8	26	4	111	1
Spain	2034	119	6	20	5	196	1
Sweden	2012	55	1	111	0	251	2
Average	(sum)	(sum)	4.29	(sum)	0.72	(sum)	1.5
	45,030	1,590		1,418		4,406	

2.4.6 Participant perspectives on the nature of gun enabled crime

Details of the qualitative methodology are presented in section 1.XX. The data presented here were obtained through these interviews (see Appendix 1 for the interview schedules used). Within the interviews participants were asked how gun enabled crime was defined in each of their countries. As might be expected given the range of offence categories that were identified relating to this class of

criminal activity in the previous section, there was little unity on how gun enabled crime was defined. The qualitative data were represented by three themes.

Gun enabled crimes are defined by diverse legislation

Participants in four countries reported on the diversity of offences that are considered within their penal codes as constituting gun crime. These include infringements of gun control legislation as well as criminal acts of violence in which firearms are present:

"Then of course there's everything which is contrary to the arms law itself. Possessing a gun without a permit, walking around in the streets without a permit, gun in your pocket. Shooting in your garden with a gun. Hunting when you're not allowed to hunt. Not taking security measures when you must" (3MBEP)

"in Denmark we mean gun crime is both, what you call the violent acts part of it, that you have some gun incidents when somebody has firing at each other; but also the illicit trafficking and the illicit dealing with firearms, and we also define that as gun crime" (1MDKLE)

"The Criminal legislative covers the following areas on Law on Weapons, Law on Production and Trade with Military Equipment, Law on International Restrictive Measures. These are the main laws in this area. The first criminal act that is stipulated in the Criminal Code is criminalizing production and purchase of weapons, [inaudible] for perpetration of criminal acts. The second Criminal Act is illegal production, hold and trade in weapons and explosive materials. The third Act is classification of fire weapons, covers classification for the trade marks" (1MMKP)

However, whilst the range of relevant individual offences and penal codes were mentioned by some participants, others highlighted that actually gun crime was a simple crime category of illegal possession:

"It's that you were stopped by the police or your house is searched and the police finds a weapon in your apartment or in your car or on you, so you have illegal possession. Or you walk around with a weapon, in Sweden you're not allowed to have a weapon in a public place or even outside of your storage, so that can be illegal possession or unlawful use of a weapon and that is a gun crime by definition. So gun crime is actually just unlawful possession" (1MSER)

Gun enabled crimes are not differentiated from notifiable offences

Despite gun crimes being defined by legislation, in several cases it was reported that gun crimes were simply standard list notifiable offences in which a firearm was used. It was acknowledge that gun crimes were not a unique class of crime at the point of detection or at the point at which an individual was charged with committing an offence:

"..and firearm offences are a subset of that where a notifiable offences has been committed and recorded by the police and a firearm has been involved by either being fired, used as a threat or used as a blunt instrument" (5MUKSTAT)

"You wouldn't be charged with "murder with a gun" or "robbery with a gun." So this is an interesting question, what's the total universal things that we should call gun crime? I don't have a very good answer. Your project maybe will produce a good answer" (1MSER)

In actuality, the presence of a firearm within a notifiable offence was viewed as an aggravating factor which may lead to harsher punishment if convicted:

"violence, theft, menacing people. When you use a gun at that moment, we call it an aggravating circumstance..... you add something to that punishment" (3MBEP)

Participants referred to the Serious and Organised Crime Threat Assessment (SOCTA, 2015) when framing their appraisal of the role of firearms in crime which led to the perception that firearms were accessories to other crimes rather than the main factor in crimes.

“firearms are generally just a, how you call it, an accessory to other crimes, so they’re used to commit other crimes, that was at least what threat assessment said. So we focus mostly on the basic crime” (3MNLMIN)

Not all gun enabled crimes are equal

Although participants acknowledged the complex diversity of technical gun crimes; that is, all forms of infringement of legislation and regulations concerning the use of firearms in crime, and the contravention of firearms licensing and ownership regulations, it was clear that not all forms of gun crime were perceived in the same way:

“Because if you have a gun at home with a license then you’re not storing it properly, is that a gun crime? No.” (1MBELE)

“The real gun crime, now I’m not talking about impulsive things. I’m talking about real criminals” (IMBEP)

“But of course, when the police are thinking about these issues they don’t care so much about the illegal possession, they care about weapons being used in robberies or in attempted homicides or assaults, etc.” (1MSER)

It is evident from these excerpts that participant attitudes toward gun crime suggested that acts of violence in which firearms are used are viewed more legitimately as gun crime by law enforcement personnel than is the contravention of firearms licensing and ownership regulations. It is possible that these attitudes influenced decisions to provide the project team with data concerning gun crime, and the selection of the data that were provided, given the focus on crimes relating to acts of violence involving a firearm, rather than crimes concerning licensing and possession or trafficking.

2.4.7 Participant perspectives on gun crime data

The need for good quality, and ‘better’ data was identified by a minority of participants, particularly in relation to developing appropriate policy responses to the issue of gun crime:

“after Charlie Hebdo, after Amrani started shooting in Liege, we said look, we have done a lot of progress on the legal framework, it’s time to make progress on the other two main issues right now, with first of all get a better image of the illegal firearms market because we don’t have good data and if you don’t have good data and a good image, it’s very difficult to develop good policy.” (1MBER)

In addition, reflecting the broader EU legislative context, participants from Sweden noted that without good data concerning the prevention of gun crime it is not possible to develop a coherent justification as to why one approach should be adopted over and above alternatives:

“So I think it’s also a problem to use one or few countries as the golden standard and to force everyone else to change that, also because there’s not enough data to support that those countries are having a more secure approach.” (1MSER)

Moreover, participants spoke of having faith that legislation had had an impact in place of having data to support this:

“And so there’s a lot of magicians trying to juggle the figures but the honest thing is, we don’t know. There’s too many precautions we have to take before we can say something. But we assume that there is an impact.” (1MBER)

However, it was clear that obtaining and reporting such data may not always have a positive impact. Specifically, it was acknowledged that data may not actually provide an accurate picture of the issues, due to data protection restrictions in the case of Denmark: and more worryingly, in Serbia may actually lead to civil unrest:

“Police year statistics maybe you can see some of it there but I don’t actually know why you have to find that, and I don’t know if that would be the right picture you’re getting, because they of course have some, what do you call it, restriction about what information they send out and what (inaudible). So I don’t think that will give the right picture” (1DKLE)

“That’s also a double edged sword because sometimes that could only feed the frenzy that this is a very unstable environment or it could feed the paranoia or it could just send the wrong message that there is actually no problem where there is a problem.” (1MRSP)

It is clear from this last quote that should gun crime data be more systematically collected there would need to be an attempt to appropriately contextualise the meaning of the data in appropriate way in order to manage public expectations and interpretations in order to maintain security at a local level. The Serbian participant continues:

“So it’s not just about collecting the numbers but also thinking about what those numbers means. And helping sort of spread that information to the rest of the country. Otherwise, we might have a very good understanding over your city or your region without really knowing how this links to other parts of the country.” (1MRSP)

This suggestion supports the need for standardised indicators that reflect and account for potential confounding factors such as population size and age of criminal responsibility. It also illustrates that there is a need for data sharing outside of regions or cities in order for policy makers to be able to contextualise their local needs within the broader national context, and by extension to a European and/or international context.

2.5 Impact of gun crime

Globally, firearms have been used in more than 245,000 homicides worldwide (Interpol Firearm program, 2012), and it is estimated that the illegal firearms trade generates between €125 million and €236 million per year worldwide. Further, according to Duquet and Van Alstein (2015) death caused by gunshot wounds account for around 6,700 deaths (75% suicide, 15% homicides, 10% of accident or unspecified deaths) each year in the EU. The illicit firearms trade is closely linked with other serious crimes such as drug trafficking, human trafficking, corruption and terrorism. These crime guns can also be seen to travel; firearms that have been used in a shooting in one city have sometimes been located in another city, country, or continent (Gagliardi, 2010). Salfi et al (2006) note that for every violent death in the EU region, there are 20 – 40 hospital treatments for non-fatal injury (of which it must be acknowledged a proportion will be from accidental injury, and others ‘undetermined’). Moreover, for deaths from injury in general there are a further 300 people seeking outpatient treatment per death. If we extrapolate this to the identified firearms-related death rate identified in table A2.2 this means that the number of non-fatal injury-related hospital visits ranges from between 33,300 (1,665 x 20) and 83,720 (2,093 x 40). The number of outpatient visits ranges between 499,500 and 627,900 per year.

The economic costs of violence are difficult to calculate on a pan-EU basis, as the data required to do so are scarce. However, in the UK it has been estimated that the combined economic cost of all forms of violence is €34 billion per year (Salfi et al, 2006). This includes the direct costs of police, criminal justice and healthcare sectors, as well as the indirect costs in terms of lost productivity. In 2008 it was reported that the total social and economic cost of a murder in England and Wales was £1,662,500 (Golding & McClory, 2008). Therefore not accounting for inflation, if the same metric is applied to the police reported homicide figures in 2013/14 from table 2.4, the economic and social cost of the 30 firearms-

related homicides amounts to a minimum of £49,875,000. In 2011, the Home Office of England and Wales updated the scale of social and economic costs for a number of crimes. Table 2.8 summarises these for the crimes identified in gun crime data in table 2.4.

Table 2.8 Estimated social and economic costs of gun crimes in England and Wales based on 2010 cost data

Crime type[#]	2013-14 Incidence	Cost per incident € (£1 = €1.46)	Total cost for crime type € (£1 = €1.46)
Homicide	30	2,591,034	77,731,020
Attempted murder, assault with intent*	483	37,591	18,156,453
Other violence against the person**	1,337	8,424	11,262,888
Robbery	1,971	12,862	25,351,002
Burglary	114	5,731	653,334
Criminal damage***	2,439	2,111	5,148,729
Total	6,374	(av) 21,726	138,483,462

[#]home office figures for the social and economic cost of public fear, alarm or distress, possession of weapons or other firearms offences (from table 2.5) are not available.

*Home office figures are provided for 'serious wounding' and these are used here although it is acknowledged that there is some conceptual ambiguity between this and the crime category of 'attempted murder, assault with intent'.

** Home office figures identify a category of 'Other wounding (£9,790) and 'common assault (£1,750). The figure provided is the average of these two.

***Home office figures are identified separately for criminal damage (personal; £1,053) and criminal damage (commercial; £1,838). This estimate is based on the mid-point between these two values as the crime data do not specify the target.

Based on the financial estimates derived in 2010 it is estimated that the economic and social cost of gun crime for offences where data were available in the UK (in 2013/14) amounted to nearly €140 million. More recent calculations by the Institute for Economics and Peace (2013) calculated the cost and impact of violence on the UK economy using data adjusted for what are termed 'static' and 'dynamic' peace dividends (see box 2):

Box 2.2	
Definitions of Static and Dynamic Peace Dividends (IEP, 2013)	
Static Peace Dividend (costs to society and government)	
<ul style="list-style-type: none"> • Direct costs to the victim (security, loss of property) • Direct costs to the state for victim support (health, victims services) • Costs of police and the judicial system • Prison service costs 	
Dynamic Peace Dividend (costs that affect economic activity)	
<ul style="list-style-type: none"> • Productivity loss from homicide • Productivity loss from violent crime • Productivity loss from public disorder • Productivity loss from weapons crime • Productivity loss from burglary and theft • Productivity loss of individuals in jail 	

Table 2.9 presents revised estimates of gun crime based on the IEP (2013) data. These data show an 82% increase in the estimated cost and impact of gun crimes.

Table 2.9 Estimated social and economic costs of gun crimes in England and Wales based on 2012 cost data provided by the Institute of Economics and Peace (2013)

Crime type[#]	2013-14 Incidence	Cost per incident € (£1 = €1.46)	Total cost for crime type € (£1 = €1.46)
Homicide	30	5,258,342.57	157,750,277
Attempted murder, assault with intent*	483	51,514.64	24,881,571.10
Other violence against the person**	1,337	15,443.08	20,647,389.0
Robbery	1,971	21,525.22	42,426,208.60
Burglary	114	7,548.20	860,494.80
Criminal damage***	2,439	2,552.81	6,226,303.59
Total	6,374	(av) 39,659.91	252,792,244

[#]home office figures for the social and economic cost of public fear, alarm or distress, possession of weapons or other firearms offences (from table 2.5) are not available.

*Home office figures are provided for 'serious wounding' and these are used here although it is acknowledged that there is some conceptual ambiguity between this and the crime category of 'attempted murder, assault with intent'.

** Home office figures identify a category of 'Other wounding (€26,144.95) and 'common assault €4,741.20). The figure provided is the average of these two.

***The figures here are not specified regarding what was the target of criminal damage.

In 2013 the Institute for Economics and Peace (IEP, 2013) calculated that the total cost and impact of crime against households and individuals was €181 billion. Consequently, the total cost and impact of the gun crimes calculated in table 2.9 represent 14% of the cost of all violence to the UK economy. Moreover, it has been estimated that the UK spends 5.8% of GDP on violence containment (IEP, 2014). Consequently, from this illustration even though gun crime constitutes approximately 0.2% of recorded crime in England and Wales, the economic burden is not insubstantial, and the figures presented in table 2.9 do not include the costs of general weapons offences which as we have seen in table 2.4 are included within gun crime figures. Therefore the actual economic burden of all crimes involving firearms is likely to be considerably higher. It therefore also follows that in countries that have higher rates of firearms related crimes, the relative economic burden will also be substantially higher. Effective prevention of gun crime is therefore needed in order to reduce its economic and social impact. This is particularly pressing given the current climate of financial austerity affecting many European countries.

2.6 Summary

This section has provided evidence that currently no formal definition of gun crime exists. Indeed, some have challenged the appropriateness of trying to define 'gun crime' due to the erroneous impression this label gives of a single coherent entity that can be understood as such (Squires, Grimshaw & Solomon, 2008). Attempts at defining it through legislation are complicated by variations in how firearms are defined. The crime data obtained vary between countries due to differences in the extent to which firearms are identified as present and relevant to standard notifiable offences, with 26 different firearms crime categories identified. Consequently, it is not possible to calculate genuine prevalence rates on the police data obtained. Mortality data are somewhat more consistent but not available for the same year for all countries. These data do not provide sufficient detail concerning the type of firearm involved in the injuries that led to death to guide public policy response. Crime victim survey data is exceptionally limited in Europe, and more concerted efforts to collect data concerning the experience of crimes involving firearms is needed. Only then can the true economic and social impact of firearms crime be determined, and the impact of interventions and policy decisions be evaluated. The remaining sections of this report critically examine how legislation, policing and the use of ballistics data sharing may contribute to preventing gun crime.

3. LEGISLATION AND GUN CRIME

Thanos Stamos and Erica Bowen

3.1 Introduction

As noted in Section 2, gun crime is a broad category of activities which involve either the use of firearms within the course of notifiable violent offences, acts which contravene the regulation of legally owned firearms, and criminal acts specified by the 2005 UNFP in relation to the illicit trafficking of firearms, their manufacture and the falsifying or removing of marks on firearms. Indeed Squires et al (2008) noted that in the UK alone there were 55 offences that it was possible to commit with a firearm prior to the trigger being pulled. The typical legislative response to crimes involving firearms has been to tighten controls over the legal acquisition and ownership of firearms, rather than to modify existing criminal laws or develop firearms violence-specific offences, although one strategy adopted has been to increase the duration of prison sentences for perpetrators of gun crimes (e.g. mandatory 5 years imprisonment for possession in the UK).

3.2 Policy context

The logic behind tightening ownership regulations is that it is assumed that the risk of violence and violent deaths will be reduced through reducing the availability of firearms (Duquet & van Alstein, 2015a), the theory being that gun crime, violence and deaths is a function of the availability of firearms (Golding & McClory, 2008b). This assumption is very difficult to test empirically due to the poor quality of gun ownership data, as well as the poor quality of gun violence data that we examined in Section 2. The best quality international comparative study of this topic (van Kesteren, 2014) drew upon data from the NCVS (see section 2.2 for details) and examined the association between firearm availability, ownership and victimization of contact crimes including threats and assault across 50 countries. At a country level it was found that there was a significant positive association between handgun ownership and rates of victimization by gun related contact crimes, gun related threats or assaults and homicides (gun related or otherwise). At the individual level handgun owners were significantly more likely to be victims of contact crimes, even after controlling for demographic and other risk factors. In a combined country and individual-level analyses these results remained, and in addition it was observed that the high availability of firearms was associated with lower levels of victimization by contact crime in general, suggesting a potential deterrent effect of availability. In countries where firearms were more available, non-owners were more likely to be victims of gun related violence and homicide, suggesting that gun ownership may increase the likelihood of violence escalation. These data suggest that the relationship between firearm ownership and risk of violent victimization is less straightforward than the basic assumption suggests. However further research is required to more fully understand these associations, and in particular the association between availability, ownership and perpetration of violence, about which very little is known.

The 1991 EU Firearms Directive (Directive 91/477/EEC) provided minimum requirements that member states (MS) should impose regarding the acquisition and possession of firearms in accordance with the four categories identified in section 2.1, in order to facilitate commercial exchange across MS whilst guaranteeing the security of EU citizens (European Commission, 2014). At the time border controls in Europe were being disbanded, and consequently the Directive led to a legislative framework that set out provisions for the control of weapons for civilian use within the EU MS. The Directive introduced firearms categories which reflected the potential dangerousness of firearms, and which made more dangerous weapons subject to tighter controls and authorisation, whereas less dangerous weapons are not subject to licensing requirements.

This was superseded by the 2008 amendments to the EU Firearms Directive which reflect the requirements of the earlier 2005 United Nations Firearms Protocol (UNFP). The UNFP focuses on preventing the illegal manufacturing and trafficking of firearms, their components and ammunition, and

is interpreted alongside the United Nations Convention against Transnational Organised Crime. With this in mind, the UNFP was developed to improve cooperation between countries in order to prevent, combat and eradicate the trafficking of firearms, their components and ammunition. Consequently, the UNFP places a requirement for countries to share relevant information and intelligence on a case by case basis.

Although significant changes in European legislation have occurred during the last 25 years, little in the way of empirical research has been undertaken to evaluate the changes at an EU or national level (Squires et al, 2008). Such a task is however fraught with difficulty as it is understood that there exist many confounding variables that need to be accounted for. These variables include those highlighted in section 2 of this report – that is, crime counting procedures, crime reporting rates, legislation, policing, and the availability of intelligence data to determine which illegal firearms are used and how often any given firearm is used (Hales, Lewis and Silverstone, 2006). Three notable reports have been published recently that have relevance to this section: an evaluation of the implementation of the 2008 EU firearms directive (European Commission, 2014), and two reports from the Flemish Peace Institute concerning the potential impact of legislative change on gun deaths (Duquet & van Alstein 2015a, 2015b).

Evaluation of the EU Directive implementation

The evaluation study (European Commission, 2014) adopted a multi-method approach including online survey, interview and case study approaches. The online survey was used to collate information on the implementation of the directive as well as opinions on current and foreseen challenges. Respondents represented the competent authority responsible for implementing the Directive, representatives from industry, dealers and brokers, firearms users and international bodies, associations, research institutes and other experts (pg 21).

The findings from this evaluation highlighted considerable variation across MS regarding how key terms within the Directive were interpreted and implemented, specifically in relation to the classification of firearms. These variations were in turn identified as relevant to the security of the EU. Each MS reached its own opinion concerning how firearms were classified relative to the four categories specified in the 1991 Directive. This resulted in the same weapon being classified differently in different MS. The factors that contributed to this inconsistency were: different interpretations of how certain characteristics are a function of the firearm's lethality (e.g. telescopic features); incorporating the identity of end users (e.g. members of the home guard) and the end use of the firearm (e.g. sport). In addition, tensions were identified regarding the categorization of firearms between those categories in the Directive, and categories of firearms specified in national laws such that even when firearms are appropriately categorized, their regulation may not fit with the Directive's framework leading to situations where firearms that under the Directive would not be required to be licensed, being licensed due to the interpretation of national law. Furthermore, substantial variation was found in the number of categories specified within national legislation, with 15 MS adopting a two category approach (those prohibited and those under authorization; six MS adopted a three category approach and only seven MS adopted the complete four category specification detailed in the Directive. In relation to the 11 EU MS countries represented by our stakeholders, five (ES, HR, NL, UK, SE) adopted two categories, three (BE, IT, PT) adopted three categories and two (FR, DK) adopted four categories. Only Germany is not detailed in the evaluation document. Consequently, in our sample, eight countries adopted more stringent criteria than those specified by the Directive, and it is evident that differences in regulation regime mean that the same firearm may be classified differently across MSs. The consequence of this is that a weapon deemed to be legally possessed in one country may be deemed illegal in another due to variations in category criteria.

Further categorization inconsistencies were identified across MS. These related to the status of deactivated weapons, alarm weapons and antique weapons, all of which fall outside of the Directive. However, deactivated weapons were sometimes treated as firearms as no EU harmonized criteria for

deactivation standards exist. The lack of clear definition of 'convertible' in relation to alarm weapons also means that each individual MS had to determine whether an alarm weapon was readily convertible, and the standards used to test this vary between MS. Alarm weapons originating in Turkey were also identified as being of particular interest given that the Turkish weapons are more easily convertible than those originating from within the EU. National legislation also varies with regards to the definition of 'antique' weapons again as no definition was provided within the terms of the Directive.

Overall variations in the operationalization of key terms such as essential components, brokers, alarm weapons, and antiques weapons were the most controversial. The inconsistencies between EU and UNFP definitions of these terms led to a reliance on national approaches which resulted in increased security threats. Specifically, variations in deactivation standards lead to the circulation of deactivated firearms and their components with varying levels of security, which can be exploited by criminals who purchase, reassemble and reactivate them, and they pose a challenge to law enforcement efforts to trace them. Similarly, the variation in definition of 'readily convertible' weapons offers criminals an opportunity to convert blank firing or acoustic weapons into potentially lethal firearms, particularly weapons from Turkey which seem to be easier to convert. The lack of definition of 'antique' weapon meant that criminals could potentially legitimately purchase old firearms with a view to fabricating seemingly obscure ammunition, and then using them in crime.

The variations in categorization had greater implications for the functioning of the internal market, rather than security per se. Differences in marking standards had implications for security as it was deemed that inconsistencies increased the difficulty for law enforcement to trace firearms or fight illicit trafficking. Deactivation procedures were found to be 'remarkably' different between MS which raise concerns for security.

The adequacy of the Directive varied depending on the origin of the problem but was viewed as being relevant to most current security risks. However, issues such as conversion of alarm weapons, reactivation and deactivation of firearms, the existence of illegal inherited weapons and cases of altered or erased marks, fall outside of the Directive's reach. 3D printing and the use of the internet for licit and illicit firearms trade were identified as emerging threats.

3.2.1 Studies on the impact of legislation

Duquet and van Alstein (2015a, 2015b) compiled the results of three time-series studies conducted in Europe with a view to determining the impact of gun legislation on violent death (homicide and suicide). The three case studies focused on the impact of the 1997 firearms legislation in Austria; the impact of the 2006 weapons act in Belgium and the impact of military service reforms in Switzerland in 2003. However the last study only examined the impact of legislation on suicide and so will not be reviewed here.

In 1997 in Austria, more restrictive legislation was introduced in response to European Directive 91/477/EEC. Principally, this change introduced the principle of a 'good reason' for the legal possession of firearms, and also introduced background checks, age requirements, psychological testing, safe storage regulations and a cooling-off waiting period. An evaluation of the impact of this change on violent death rates and firearms availability found significant reductions over time in suicide and homicide after controlling for alcohol consumption and unemployment rates per capita between 1998 and 2005 but not before (Kapusta et al, 2007). Indeed, after the advent of the new law, suicide by firearm reduced annually by 4.7%, and homicide by firearm reduced annually by 2.3% per year.

Duquet and van Alstein (2015b) examined the impact of Belgium's 2006 weapons law on firearm suicide and homicide. The new law clarified the licensing requirements for firearms and prescribed that all firearms should be licensed unless they were either prohibited (category A) or 'freely obtainable' (category D). In addition the principle of 'good reason' was introduced, long with a range of licensing conditions linked to personal circumstances (e.g. prior criminal convictions, medical fitness etc).

Licenses were also issued after the police had assessed the application, and those adults living with the applicant had to be happy with having a licensed firearm in their home. Additional provisions were made regarding rules for sale and purchase, marking and registering weapons, and the safe storage and transportation of firearms. Using the WHO mortality database, Duquet and van Alstein (2015b) found that there was a considerable decrease in the number of firearms injury related deaths reported between 2007-2010, than had been reported between 2003-2005, representing a 35% decrease. This was disaggregated to a 39% decrease in firearms homicides and a 34% decrease in firearms suicides. Although these data suggest that legislation had an impact, important confounding variables were not controlled for which limits the validity of the findings.

Taken together these two studies provide some evidence suggesting a link between increased control of the legal acquisition and ownership of firearms and deaths by firearms, including homicide. However, in both studies the full range of socioeconomic characteristics that might also contribute to the use of firearms in suicide and homicide were not accounted for. In addition, neither of the studies attempted to examine the impact of legislation on other non-fatal outcomes and therefore the impact of firearms legislation on the broader categories of gun crime identified in Section 2 remain unknown.

3.3 Study rationale and aims

It has been acknowledged that very little academic research has been conducted on the topic of gun crime in general, and legislation specifically. In addition, to our knowledge only the evaluation of the implementation of the Directive has drawn upon qualitative data provided by key stakeholders. Such data are vital if legislation is to be further developed as they will provide insight into the extant challenges faced by the very individuals who work within the legal frameworks developed. The stakeholder groups included within the present study differ from those in the Directive evaluation as they include representatives of competent authorities, law enforcement, forensic labs, statisticians and NGOs, thereby adding complimentary perspectives to the knowledge base. Moreover, the inclusion of non-EU MS and candidate countries provides a broader cross-border perspective on the issue of gun crime legislation in Europe. The aim of this section of the project was therefore to understand from the stakeholders their perceptions of following issues concerning existing legislation and its role in combating gun crime:

- What influences the development and implementation of changes to legislation?
- How adequate is current legislation?
- What is the impact of legislation?
- What are the challenges to implementing legislation?
- How should legislation be changed in the future?

3.4 Method

Informants to this section of the report comprised 24 individuals (4 women) from 13 European countries. Participants represented all stakeholder groups. The data presented in this section were extracted from transcripts of the interviews that were conducted (see appendix 1.2 for the interview schedules). The results are presented thematically with illustrative verbatim quotes provided to substantiate the claims made. However, due to the volume of data not all quotes relating to each theme are presented. A decision was made to present the themes for which the most substantial evidence existed across participants from more than one country. It must be noted however that given the cultural variations evident in previous research across EU member states, considerable variations in opinion and experience were expressed by the participants.

3.5 Findings

3.5.1 What influences the development and implementation of changes to legislation?

Discussions concerning the factors that exert push or pull influences on the development and/or modification of firearms legislation identified four main factors: Visibility, Major events, Politics and Lobby groups.

Firearms crimes are not visible and therefore not a priority

Participants from four countries (NL, HRN, MKN, SE) suggested that gun crime lacks visibility as a social issue requiring a formal legislative response, and consequently is perceived as a lower priority than other more directly observable issues such as the refugee crisis:

“Ministry of interior should continue it. But it’s not their top priority. It’s very seldom that it’s their top priority. Right now their top priority is the refugee crisis. Nobody is talking about gun problems and there are still illegal gun problems, there are cases of illegal, if somebody being killed or wounded by the illegal weapons. But this is not a top priority” (1MHRNGO).

This was perceived to be the case even in the face of evidence that firearms were actually more important than competing priorities. Moreover participants suggested that it was difficult to increase the priority given to gun crime, suggesting that tackling firearms crimes is an unpopular issue:

“Oil, weapons and man trafficking are much more important but we don’t, we focus on the drugs..So that’s something I think well it’s a problem in getting the topic sold, to people the policy makers” (1MNLLE).

It was also evident that the priority given to the issue of gun crime varied between member states and it was suggested that the perceived extent of the problem was inverse to the actual size of the problem faced:

“There’s a difference in priority and importance across different member states, we’ve talked about that haven’t we? So we’re very exercised about it constantly, but we’re probably in the best place of anybody, some countries have higher problems but it’s not seen as particularly abnormal or threat in their country” (4MUKLE)

Participants agreed that there was a need for the issue to be prioritized, and that through this process additional focus and resources would be made available to combat gun crime.

Major events lead to tighter firearms controls

It was clear from participants in six out of 13 countries (BE, FD, UK, NL, DK, SE), that national firearms legislation evolved in an iterative way, most often in response to large scale national or international violent or terrorist events in which firearms are implicated. Interestingly, these changes were never based on empirical research or statistical analyses (Squires, 2015). Even though stakeholders perceived that gun crime was not considered a priority, the issue of firearms was brought to the center of attention by political demand after gun-related tragic incidents occurred. After these events participants perceived that politicians take measures to strengthen and tighten the legislation concerning legal gun ownership to protect the safety and security of the people.

“We did have a few amok shootings in Germany and after each one the legislation has become more restrictive” (1MFDLE).

“We have had several very highly-profiled public shootings over the last four or five years. So DG Home was basically giving an instruction to review the policy framework” (1MSER).

“The legislation was tightened at as a result of the Hungerford massacre and the Dunblane massacre” (3MUKB).

It was acknowledged however that although major events draw attention from the public and policy makers, this effect is short lived, but repeated each time a major event happened:

“There was actually a lull in the attention for this area for a couple of years, now after the incidents taking place and of course the terrorist attacks it comes much more in focus. I mean you can see for example that the terrorist attacks in Paris, also because they come in the European agenda, also the liquidation (targeted shootings), rise of liquidations taking place, in Amsterdam especially within organised crime, this you can see that the focus now gone more towards illegal arms too.” (3MNLP)

A minority view however was that policy makers wait for major events to happen as they facilitate the ability of new legislation or changes to legislation to be accepted by the general population:

“So it’s always difficult to change something even if everybody knows that it is necessary. So we always wait for an incident, like now. Generally we use the incident, we exaggerate the importance of the incident to sell what we find necessary to the politicians” (1MBEP).

“We always have to look from the facts of course if they say ‘well we find nothing o there’s no real reason to prioritise this even more’ of course then there’s , we have to see from that. But you can see that, let’s say, the incidents in Paris and of course in Amsterdam that helps I mean that helps to have discussion at least about it” (3MNLP).

Firearms control a political issue

It was evident that the stakeholders perceived that development of firearms legislation emerged from and was influenced by the dominant political climate and agenda (UK, BE, NL):

“And at that moment it was the more, the principle country I looked for was the Netherlands. They had the most interesting text at that time. I say around 98/99, but politically it was too hard to make it exact so it didn't pass, but when the time we have lost, the text was updated because everyday you hear about something and you say oh yes, we didn't think about that, let's put it in.” (3MBEP)

“Well it used to make a difference, I think, but I don’t think..it made a difference in the last government, I think..I think before that there was the perception is that there would be tougher controls with a labour government and weaker controls with the conservative government. But I think, ...that probably hasn’t been the case. I has been like steady, steady reacting to...external issues with kind of the things that have happened in, in Europe” (6FUKP).

It was also suggested that the direction taken by policy makers was influenced by lobbying groups who were successful in obtaining time with their parliamentary candidates:

“..yeah part of it may also be the political background, let’s say how majorities are in parliament for example. The Netherlands being a small country so, it’s very easy for people to get access and to have also to talk to parliamentarians for example and say ‘ok this is our interest, and its’ not being looked after by the ministry and would you please make a case for this.” (3MNLP)

However, it was acknowledged that the political will was not always available, illustrating again the variability in prioritizing the issue of gun crime:

“at the same time through the MSOC we interface with the political strategy that occasionally exists to support it with Home Office” (4MUKLE).

The role and influence of firearms owners groups

It was evident that organisations representing legitimate gun owners were consulted throughout the process of legislation development and implementation (UK, BE, NL). At times this consultation was formal, whilst at others the consultation was deemed to be informal driven by their links to politicians.

“And domestically, obviously we have got quite a vocal stakeholder community who are quite... they’re powerful actually, quite influential. So that obviously, when you are doing policies, compared to other jobs, there is quite a lot of engagement and consultation that we need to do....So they have got, you know, strong political allies in, you know like parliament and good representation there. And so we get quite, they get quite a lot of kind of parliamentary time actually. Yeah, and then just the one kind of anti-gun lobby, who are quite small actually. But ..both groups are kind of like on the advisory group.” (6FUKP)

Engaging with these organisations was viewed as necessary due to their representation of legitimate gun owners and also expert knowledge which is not necessarily shared by those who are responsible for policy in this area:

“Well no, they, lobbies of course are necessary because they at least show you, I mean they also give you knowledge that you don’t have, the perspective. And also they have interests which may be an interest that is also justifiable” (3MNLP)

However, engagement with these groups was not always perceived positively, due to the sense that this often slows down the process of changing legislation, and that at times these groups may challenge legislation on points that are perceived as technical, and not substantive:

“And sometimes for purely formal reasons, the- I don't know if it exists in England- but we have what is called the States Council. There you can attack, as a citizen, not the law but all the execution texts and sometimes our texts that we had to make in a hurry had to be re-written because of formal errors” (3MBeMIN).

3.5.2 How adequate is current legislation?

Participants were divided in their opinions concerning the adequacy of national legislation in relation to combating gun crime.

Legislation is adequate and complete

Participants from eight out of 13 countries (UK, NL, DK, BE, IT, SE, FR, PT, MKN) viewed their national legislation in a positive light suggesting that the legislation covered all aspects, was complete, and robust enough to combat gun enabled crime.

“So they got all the investigative tools to do that, so the powers are there. So we hardly ever get any, I mean I never see any request from the police or public prosecutor in that direction - we need more powers, for example, not for this.” (3MNLP)

“You know, if you look into the legal system from outside you can see that it is more or less all right “(1MMKNGO).

“So it's, you know we have a very good legislative position in the UK, it's more draconian than anywhere else in Europe.” (7UKFLE)

Legislation is inadequate and out of date

However, participants from five countries (PT, UK, MKN, BE, HRN,) viewed their national legislation as outdated and in need of improvement:

“So I think in the general, the law is good of course, and we can work with this law but I think it can be better” (1MPTB).

“Then, at legal level, there should be strengthening of the legal framework that is related to all aspects of the gun control, including the one which is related to the education and awareness raising” (1MMKNGO).

“I guess that, we have got the legislation, it’s not perfect but we have one.” (5MBER)

It was also the case that opposing views were held by participants within the same country, representing different stakeholder groups. For example, in both the UK and Belgium policy representatives held positive views concerning legislation, whereas law enforcement (UK) and research (Belgium) representatives expressed less positive views:

“We have got these tough, you know, pretty robust laws and checks that people have to have” (6FUKP)

“Yeah, I do. I think the whole, I think the Firearms Act, 1968 is completely and utterly out of date” (1MUKLE)

“So everything is covered. It’s not that we have open spaces in our legislation that attract criminal to abuse from, no no the legislation is quite complete” (3MBEP)

“I guess that, we have got the legislation, it’s not perfect but we have one” (5MBER)

These opposing views highlight the complexities of understanding the legislative context, and illustrate that views may be influenced by participant’s roles in relation to the development and implementation of legislation.

When participants described the problems with legislation the main issue identified concerned the implementation of legislation. Participants from most countries reported that their national legislation was sufficient, but weaknesses emerged through the process of implementing the legislation by prosecutors and police officers. This view was expressed by participants in five out of 13 countries (NL, BE, SE, RS, MNK):

“So a number of countries, from which we can read the language, what does the law actually say in those countries with airguns, with regards to airguns and then you see of course, on a general level the rules are more or less comparable but then the details, but then on an operational level it’s free for all, I mean there’s no, I mean even throughout countries you can see differences, how they are executed” (3MNLP)

“One, I don’t think it’s necessary. I think everything is already in the law. Two, it’s the problem of knowhow at the police corpses and a problem of willing- a will to do something. Because not does only a lack of expertise as sometimes I sympathise, but what you also see on a local level is laziness” (3MBEP)

Some participants indicated that the inability to enforce laws was due to the complexities and ambiguities within the laws themselves, rather than the personal traits of those in enforcement roles:

“I think a lot is regulated, yet many details are unclear. And sometimes it is difficult to enforce the law due to these ambiguities” (1MFDLE).

"I mean, the way the Government handled the adoption of the new legislation was not perfect and it, there was a lot of confusion, and the communication was not perfect also. [1064.3] to the public also" (5MBER)

In addition, it was felt that the habit of making small, iterative changes to legislation led to increasing complexity (UK), and that pressures to make changes quickly increased the likelihood of errors in the text and in its implementation (BE).

Loopholes

Participants also identified a number of legislative loopholes which were particularly problematic within a European context. These were deactivation standards, component parts, criteria for convertible weapons, alarm weapons and antique weapons.

Deactivation standards

Participants from four countries (UK, FD, BE, NL) identified deactivation standards as an existing loophole that can facilitate the transfer of firearms from legal to illegal markets. Specific concerns included:

The lack of consistent standards between countries, and:

"Here it's considered as neutralising in a irreversible way. That's still a problem with some countries, even if they have a proofhouse, sometimes the rules are not as severe as here and then it's not completely irreversible" (3MBEP)

"There have been cases, probably isolated but nevertheless they exist, where weapons which are catalogued as having been destroyed have nevertheless re-entered the market. So what are the standards for destruction and who is authorised to carry that out and how?" (1MSweRes)

The smuggling of deactivated weapons facilitating gun crime:

"And the antiques and deactivations are the ones where they think there is more issues with the criminals getting hold of them because they can't get hold of normal guns. And deacts, is the problem we're seeing from other countries because of the weaker standards. So, that's the kind of like the piece of work at the moment" (6FUKP)

The main concern regarding gun crime and deactivated weapons was the relative ease with which many so-called 'deactivated' weapons could be 're-activated' and converted back into a lethal firearm, to be sold on the black market.

Acquisition of component parts

Participants from two countries (UK, SE) raised concerns with the purchase of component parts and the ability to use these to reactivate deactivated weapons:

"And so, but now I think, all these things have come to the, the things have, like component parts for example, even though we have a definition, our guidance it is not in the legislation. So police are saying it is then difficult to if people you know come, you know bring them in, it is difficult to kind of like definitely say, you will be able to arrest someone because there is no clarity. So that kind of thing" (6FUKP)

"They find ways and loopholes on which components and parts are legal in one country, illegal in another and they send it to each other and they then assemble the weapons or they receive the weapon mainly to instill their own interest, satisfy their own needs for having firearms and touching them and so forth" (2MSWELE)

Definition of 'convertible'

Participants from four countries (DR, FR, SE, UK) identified legislative loopholes concerning alarm weapons as posing a specific threat in relation to gun crime. The main issues were the inconsistencies between the legislations of different countries resulting in no consistent definition of 'convertible', the lack of process to determine whether an alarm weapon is convertible or not, and the ease with which such weapons can be modified into potentially lethal weapons and sold on the black market:

"It's the same problem that we have now because in Denmark here you're not allowed to have gas alarm weapons, even though it's only a gas alarm weapon. You can buy them in Germany but you can't take them to Denmark, so I don't think I can see that will be a problem, I don't think so" (1MDenLE)

"we have quite a few cinema arms because we see the legislation is quite weak. They just need to remove any blockage from the gun barrel to reactivate a firearm" (1MFRBALLIST)

"There is not a process for assessing whether an item is convertible or not. And this process needs to exist, of course, in order to implement the directive" (1MSweRes).

Specific concerns were raised about the discrepancies in legislation and definitions of convertible between Europe and America:

"If you look at America, for example, they were, they were selling forward venting gas-powered guns, the sell 'em as toys over there. Of course they bring them in here and it's an offence under that '82 act because they're readily convertible. So, you know, again NABIS and some work done within there, they got the American authorities to actually recognise that fact" (1MUKLE)

"When you look at a shotgun, if you take the firing pin out of a shotgun, it's not a firearm, because it's not a lethally barreled weapon. Some courts, and we're waiting for a precedent case, some courts have already accepted that it's not a firearm it's just a bag of metal. Some courts will say, "No, No, No, by putting a pin in there or even a nail, that's a firearm again" so it's readily convertible" (1MUKLE)

Antiques weapons

Participants from two countries (UK, BE) identified the legislation concerning antiques weapons as problematic, with implications for gun crime. Specific concerns included the lack of clear definition of antique, and the increasing trend for criminals to acquire these weapons, develop technologies for manufacturing obsolete ammunition, and then using them in crime:

"So, it's a strange anomaly that sitting on the desk there and it's, you know, my wall hanging pistol, that's an antique firearm. But as soon as I get some ammunition for it or as soon as I threaten someone with it then, no, it's a 51ABA prohibited weapon and I'm gonna spend 5 years in prison" (3MUKB).

"You know the antiques one; you don't have to have a certificate and there is not a definition of what you mean by antique. So people might think, oh something from, you know, World War One would be an antique but actually that can be used like a modern firearm" (6FUKMIN)

"And the anomaly in the legislation was that we have what's called prohibited persons. And as a prohibited person, so if you've been to prison sentenced to any prison term you've become prohibited. If you've been sentenced to a prison term over 3 years, you are prohibited for the rest of your life from owning any sort of firearm or ammunition. So, we're in the situation, firearms, as I say, include air weapons. So, if you are found in possession as a prohibited person in possession of an air pistol, you are breaking the law, you are going back to prison. However, because of this exemption for antiques, you could have an antique firearm" (3MUKB).

3.5.3 What is the impact of legislation?

A range of opinions and attitudes were expressed concerning the impact of firearms legislation on gun crime. It was acknowledged by some (UK, BE) that it was difficult to determine the true impact of firearms legislation on gun crime due to confounding factors, poor data and poor monitoring:

"I think there are all sorts of other socio-economic and other factors which are far more prevalent as to why we have low levels of gun crime" (3MUKB)

"And so there's a lot of magicians trying to juggle the figures but the honest thing is, we don't know. There's too many precautions we have to take before we can say something. But we assume that there is an impact" (1MBeR).

It was also suggested (UK) that a common perception was that if rates of gun crime were increasing or decreasing this was viewed as a function of legislation, although conversely this endorses the view that legislation is an effective mechanism through which gun crime is controlled:

"I expect that people, it's just kind of done on the probably impact on, you know, the stats like things are, that people saw an increase in gun violence, they would be saying, you know, is your legislation and that, is that trying to flag that up. But there is nothing formal, there is not a formal monitoring" (6FUKP)

Firearms legislation can't impact gun crime

Participants from three countries (NL, BE, UK) suggested that the current firearms legislation was missing its target due to the focus on legal ownership and acquisition, whereas gun crimes are illegal by definition and therefore not addressed directly by firearms legislation:

"With a firearm crime, that's very difficult. It's illegal, it's illegal so laws are actually not really helping you a lot there" (2NLMB).

"And isn't really, you know, I think legislation largely designed around people who comply. So you know, you look at the whole antique piece and, you know, it's great for people who collect and, you know, they're obsolete calibre and, you know, why wouldn't you, but actually what's going on with criminals is they're able to buy a bullet head, a casing, the gunpowder and an antique weapon, put it altogether and they've got a live firearm and if they haven't got any previous criminal convictions, up until the point the ammunition and the weapon come together, all of that's perfectly lawful" (4MUKLE).

Where impacts were being identified, these often related to individuals who were not criminals, but legal firearms owners who may use their firearm within an impulsive act of violence:

"It's become more difficult not for the real criminals but for those who would do something rather impulsively, there we have created some kind of restrict" (3MBeMIN).

Firearms controls push people to illegal weapons

Participants from four countries (PT, FD, BE, UK) also cautioned that a potentially unwanted side-effect of increasing controls on the legal acquisition and ownership of firearms is that potentially legitimate owners will seek illegal weapons:

"Our law in the moment is very difficult for a civilian to have a gun. Okay. You must have this this this this this. A few weeks, okay. I don't want a gun. But you buy a gun illegally" (1MPTB).

In addition, it was suggested that by making particular types of firearms scarce, the demand for weapons would increase, and the market would change in order to meet the demand, potentially through the increased importation of more lethal weapons:

“And then there’s be careful what you wish for, ‘cause the more you suppress the market, the more you increase the demand. So actually if you suppress the market on all this antique stuff and you clear it all up, then will it generate actually the returning investment of importing a load of Glockes now becomes worthwhile” (4MUKLE).

Criminals will always find a way

A perception expressed by participants in two countries (BE, UK) was that regardless of how good legislation is, and the changes that might be made, criminal individuals and groups are always one step ahead and will always find a way to circumvent legislation:

“And the matter also- when you write something down in order to prevent an abuse in the arms legislation, when they read it, they will also start imagining immediately how can we get around it. They have lawyers for that. And it's a continuing battle and that makes our work a hundred times as difficult as it used to be when the first laws were written” (2MBEMIN)

“It’s a tricky one because whatever you do, someone will always find a way to get [39:57] around what you are doing, won’t they? Criminals are always, cleverer, they are always cleverer than you” (6FUKMIN)

3.5.4 What are the challenges to implementing legislation?

It was clear that the lack of visibility, and priority given to combating gun crime hampered attempts to develop and implement legislation. In addition, participants acknowledged that combating gun crime through legislation was challenging due to the complex individuals and contexts involved. There was a need identified to balance improving policy with the feasibility of implementing any modifications (NL), and the needs of legitimate gun users (UK) and also there was a suggestion that legislative change may actually not lead to drastic improvements in the situation (BE). The most substantively supported challenges to implementing legislation however were: the country’s relationship with the EU; the lack of harmonized legislation between European countries;

Relationship with Europe influences modification of national legislation

Participants from two non-EU countries (MAC, HRN) commented on the position of their country relative to the EU and the influence that EU legislation has on developing national legislation. Specifically, the future membership of the EU was identified as a driving force for changing legislation prior to achieving membership, so that national legislation would already be harmonized with the Directive upon membership being attained:

“Harmonization with the EU legislation. The Directive from 1991 was the main reason for adoption of this categorization and making new areas” (MACFG)

“But I’ll tell you actually all the other countries in the region, what actually happened is that all the other countries in the region, they want to become members of the EU. So actually it was this push that made and changed their legislation” (1MHRNGO).

Indeed, the costs of not harmonizing legislation would have been considerable for the country’s economic future, although the process of categorising weapons according to the Directive was problematic:

“If we don’t adopt it we will be isolated from the other regional countries and from the European Union and not be able to conduct any activities regarding the trade and purchase of weapons on the one hand. On the other hand we cannot intercept the weapons, we cannot categorise the weapons into the categories there are stipulated by this Law according to the EU legislation” (MACFG)

The growing size of EU membership was identified as a further challenge to the development and implementation of legislation:

“Everything has become complicated. You have to take into account that we are 28 member states in the Union now...the way of negotiating – it is not possible to sit around a table and discuss they are still around the table but it’s so big that you have to yell. You can’t negotiate properly” (3MBEP).

Lack of harmonised legislation

It was widely acknowledged (UK, XK, NL, FD, BE) that the European context itself brought many challenges to the development and implementation of legislation concerning gun crime. In particular, the issues previously suggested concerning the lack of harmonized legislation were particularly problematic. This lack of harmonization existed not only across European countries, but also between European and non-European countries:

“What’s definitely a problem are the different legislations in individual European countries” (1MFDLE)

“We are investigating them. We will try to see where they are converted, because Turkey sells them as blank fire and it’s completely legal. So there is a discrepancy between laws in Turkey and actually laws in Balkan because in Balkan you cannot possess these weapons without a license” (1MXKP)

“And member states they are classifying weapons differently among these four categories which is a problem if you can buy a weapon without a license in one state and take it to your home country where you need a license for it” (3MNLP).

It was also observed that even though the Directive specified minimum standards, the resulting variation in how the Directive was implemented has led to a very fragmented picture across Europe and a situation in which no single country has implemented the Directive as intended:

“All the national legislations look different from each other and also from the firearms Directive” (1MSER).

Although participants fully acknowledged the problems for combating gun crime due to the lack of harmonized legislation across countries, they were also quite clear on the challenges posed by trying to achieve harmonization. Specifically, the challenges were identified as reluctance on the part of individual countries to modify their standards under any circumstances, but specifically when it was perceived that the national legislation was more restrictive than the EU Directive minimum standards:

“And when we get to that standard that’s where the tension will start, won’t it? Because the UK standard’s up here, we’d probably be unhappy with dropping our standard and making it common down here, ‘cause that’s the problem with standardization isn’t it? You’ve all got to move” (4MUKLE)

“Should we have a common definition of a replica firearm?”[and straight away, exactly this problem came up. France would say ‘well this is our definition of a replica’, and the UK would say ‘well we have a different definition of a replica’, and the two are not possible to harmonise. So who’s going to give way? Or should we have a third definition? The discussion kind of gets stuck there” (1MSER).

“We feel that we do not want to adopt our legislation to more lax measures, and we’re hoping that we would be able to keep our stricter definition or non-definition of what a deactivated firearm is...that is perhaps the main discrepancy” (2MSELE).

Finally participants identified another challenge with implementing legislation that has developed due to external pressure, and that is the need for any changes in one domestic law, to be harmonized with other associated and relevant domestic laws:

"In 2008 they started drafting a new law which more or less was the same law from 2006 but they called it a new law,. They only amended it a bit...But it's selectively implemented and its' not harmonised with other laws that are needed to be harmonised to have some regulations some bylaws to connect all the things you know" (1MMKNGO).

"And then on the deactivations, we have standards for deactivation and quite high standards but there is nothing in the law that says you have to follow those standards. You know, so it's kind of, yeah I know, why don't anyone pick that up?" (6FUKMIN)

3.5.5 Required improvements to legislation

Participants identified several areas of improvement needed, which not surprisingly link to the previous issues and challenges identified in implementing legislation in response to gun crime. These included:

- The need to increase the priority given to gun crime as a policy issue (BE),
- The need to adopt a multi-disciplinary legislative framework for combating gun crime involving multiple ministries (e.g. Defense, Interior, Culture; MKN)
- The need to legislate against the preparation and planning of gun crime in a proactive rather than reactive way (SE)
- The need to facilitate the legal surrender of illegally owned (inherited) weapons (KX)
- The need to tighten borders to impact on firearms trafficking (BE)
- Tighter legislation in relation to handmade and convertible weapons (ES)

Need to register all firearms

Participants from three countries (SE, BE, DK) all recommended that all firearms should be registered, licensed and test fired at the point of manufacture, although the resourcing challenges of this were acknowledged. . This

"I think one important aspect that we haven't seen in so many other countries that I think could be exported elsewhere is to license everything and to register everything and to never take anything out of the national registry, which makes it a lot of easier to find if diversion does occur" (1MSERes).

"Everything that comes in should be controlled and registered, it should be but it... the control should be as thorough as necessary and not taking into account the capacity of the existing staff" (3MBEP).

"So we have said because we have the proofhouse and all weapons that come into the country or are fabricated in Belgium, they have to pass through the proofhouse because of the quality control. Let's use it for another purpose as well at the same time, and let's register all the weapons that pass through there. So that's also a role for the" (3MBEP)

"the big robbery down in the military base; if those firearms have been test fired then you could find out the first time you find any ammunition from them. So if you find some projectiles and some cartridges we can say that they originate from that robbery and that will lead us from the intelligence part, to make it more easy to say 'ok which direction do we have to look?' So that could be an idea" (1MDKLE).

3.6 Summary

Legislation controlling the legitimate acquisition and ownership of firearms is the most often adopted legislative response to gun crime. The assumption that levels of availability and ownership contribute to gun crimes in general is poorly evidenced, although there is tentative evidence that stronger firearms controls impact on homicides by firearms. More research is needed however to better understand the associations between ownership and perpetration of violence, as well as the role of other potential confounding socio-demographic and individual characteristics.

The qualitative study presented in this section identifies the complexities of developing and implementing firearms legislation with a specific focus on combating gun crime. Parker (2011) notes that the process of passing laws is complex, often involving a range of factors such as public advocacy, private interests, social mobilization, prevailing national priorities and interpersonal relationships between policy makers. Moreover, it is suggested that in relation to firearms law specifically, attitudes towards and the use of guns may also influence legislative developments. Certainly the findings presented herein support the role of many of these factors. The picture that emerged from the interviews was that legislating the control of civilian firearm ownership was a balancing act between trying to maintain the security of individuals, families and countries, whilst minimizing the economic costs associated with the legitimate manufacture and trade in weapons, and also whilst trying to maintain peaceful relations with legitimate firearms owners.

The interviews with stakeholders suggest that gun crime often lacks visibility and is therefore often perceived as a lower priority. The priority given to gun crime differed from country to country and it was sometimes suggested that the perceived extent of the problem was inverse to the actual size of the problem. The stakeholders therefore argued that there was a need for this issue to be prioritized. In addition, the stakeholders clearly stated that the development of firearms legislation is influenced by the political climate and agenda. In this respect it was observed that legislation often evolved in an iterative way, most often in response to high profile shooting incidents that led to increased public awareness of the issue of gun crime.

Stakeholders held mixed opinions about the adequacy of existing legislation with representatives of the majority of countries reporting that their national legislation was adequate. However, in a minority of cases there was disagreement between stakeholders within a single country, with ministerial representatives endorsing the adequacy of legislation, and law enforcement representatives challenging it. Three clear issues were identified as loopholes in legislation within the EU context: the lack of harmonized deactivation standards and acquisition of deactivated components, the lack of harmonized definition of 'readily convertible', and the lack of definition of 'antique' weapons. These findings reflect those reported within the evaluation of the implementation of the directive (European Commission, 2014), and illustrate that these issues are still identified as threats to EU security.

When asked about the impact of legislation, despite initial views that legislation was adequate and appropriate for combating gun crime, stakeholders questioned the ability to accurately determine the impact of legislation, identifying a number of social and economic factors that mediate the association between legislative change and changes in gun crime prevalence. Some stakeholders questioned whether existing legislation could actually impact gun crime, given its focus on the legal ownership and acquisition of firearms, whereas others suggested that if the wrong balance between firearms control and national security is struck, individuals will seek illegal rather than legal weapons. A minority view expressed was that regardless of the nature of legislation, criminals are always one step ahead of changes.

The pan-European context was identified as a key contributor to the challenges of developing and implementing legislation. Countries outside of the EU were motivated to harmonise legislation in order to facilitate the transition once membership was ratified. Countries within the EU identified the ever-expanding size of the EU as one of the major challenges to the successful negotiation of legislative

change. The lack of harmonization between the legislations of European countries and with the Directive itself was identified as the most serious challenge for the prevention of gun crime.

Stakeholders identified a number of improvements that should be made to legislation. These included increasing the priority given to gun crime, adopting a multi-disciplinary legislative framework, legislating against the preparation of gun crimes, not just their successful commission, facilitation of illegally owned but inherited weapons, the need to tighten borders, and tighter legislation in relation to handmade and convertible weapons. A more pronounced view expressed by stakeholders was that there was a need to register all firearms in order to facilitate their tracking into and out of legitimate and illegitimate markets.

4. POLICING GUN CRIME

Mike Hellenbach, Sue Elliott and Erica Bowen

4.1 Introduction

It was noted in Chapter 3 that although legislation has a role to play in combating gun crime, the accurate implementation of legislation by police was viewed as fundamental to its success. In three countries (SE, UK, BE) participants highlighted that in addition to increasing firearms controls, sentences for those caught in possession of an illegal weapon had been increased, there is limited evidence for the deterrent effect of increasing harsh punishment for offences. The Halliday review of sentencing in the UK (Halliday, French, & Goodwin, 2001) concluded that it was the perceived likelihood of being detected and punished which offered the greatest deterrent effect, over and above the duration of sentences. Consequently, the focus of this Section is on the policing of gun crime. This section comprises two halves, in the first we review the European policy context and limited literature regarding policing strategies aimed at reducing gun crime. In the second half we present a summary of the interview data obtained from our participants concerning the policing of gun crime

Before commencing the literature review there are a couple of observations that need to be made regarding the nature and quality of the literature. First, the available research is limited, and was authored by British researchers, and the majority of which include data restricted to the UK context. Second, the primary studies obtained are now somewhat dated having been published between 2006 and 2009. Moreover, they vary in terms of quality due to variations in the nature of publications obtained. It is notable that such a limited corpus of evidence exists in relation to the policing of gun crime, and somewhat ironic that the research available comes from a country with some of the internationally acknowledged most stringent firearms laws in Europe. There is consequently a clear need in the current climate, where firearms are higher on the agenda, to develop a better understanding about effective gun crime policing strategies through programmatic academic research in this area across all European and neighbouring countries.

4.2 Causes of gun crime

In order to effectively intervene at any level in gun crime, an understanding is needed of the causal factors and contexts involved. Academic research examining the factors leading to gun violence is limited in general and even more so in Europe. In their review of evidence and policy concerning gun crime, Squires, Grimshaw and Solomon (2008) identified three social contexts which drive gun crimes: illegal drugs, gangs and the 'gun culture'. Participants in our interviews were asked for their understanding of the causes of gun crime. Not surprisingly a range of perspectives were offered, which were influenced by the extent to which participants viewed gun crime as a 'special case' of crime, or as we saw in Section 2 just a standard notifiable offence committed with a firearm. However, gangs and gang-related issues were most consistently identified by participants in seven countries (BE, DK, NL, KX, SE, RS, UK) as the main causal context of gun crime. Associated issues related to: status within the gang or relative to another gang, personal protection due to gang affiliation, and gang 'territory'. The issue of gun crime in the context of organised crime involving gangs and drugs was also raised, and consequently the gang context seems to be particularly salient to gun crime across Europe.

4.3 Policy context

At an EU level, Europol priorities are set in relation to the Serious and Organised Crime Threat Assessment (SOCTA). The SOCTA enables the description and assessment of threats posed to the region from the range of organised criminal activities, and also enables the identification of gaps in knowledge and intelligence (UNODC, 2009). The SOCTA represents the first step in a four-step policy cycle through which an in depth analysis of threats facing the EU is provided, along with recommendations for dealing with the threat. Multi-annual strategic plans are then developed which detail strategic goals in relation to each threat area. The European Multidisciplinary Platform against Criminal Threats (EMPACT) sets

out the operational actions which are then evaluated in order to determine the impact on the identified threat area (Europol, n.d). This places an emphasis on the development of an intelligence-led approach in order to facilitate effective cooperation between MS law enforcement agencies and other EU institutions, agencies and third parties in order to combat serious and organised crime (Europol, 2013).

The most recent EU SOCTA reported in 2013 (Europol, 2013), and initiated a four year policy cycle. The 2013 assessment identified that the market for firearms in the EU was modest, and that trafficking happened on a small scale, and when trafficking occurs it is usually either of weapons intended for personal use, or to meet specific orders. At the time, the data available did not indicate any growth in the trafficking of heavy firearms, and trafficking was attributed to a small number of organised crime groups who engaged in this as a supplementary activity rather than as a focus of their business. Most weapons when seized were identified as originating from the Western Balkans and the former Soviet Union. The main sources of illegal weapons were identified as: the reactivation of neutralised weapons, burglaries and thefts, embezzlement of legal arms, legal arms sold in the illegal market, firearms retired from service by army or police, and the conversion of gas pistols. Trafficking of firearms as described was not identified as either a key threat or as an emerging threat in 2013. However, despite the 2013 SOCTA not explicitly identifying the trafficking of firearms as a key or emerging threat, the disruption of illicit manufacturing and trafficking of firearms was identified as one of the EU's nine law enforcement priorities for 2014-2017 (European Commission, 2013).

In 2013 the European Commission published a communication (COM(2013)716) which detailed an integrated policy for addressing the threat of the illegal trafficking of firearms. One of the four priority action areas identified a need to increase pressure on criminal markets by increasing cross-border cooperation between police and other agencies, and a further action priority reflected the need to build better intelligence through gathering and sharing more information on firearms crimes, and by targeted training of law enforcement officers. The communication proposed that law enforcement officers required clear guidance for cross-border investigations into seized or recovered crime-related firearms. The plan for coherent operational action included measures to develop coordinated collection and sharing of information on firearms crime involving police and other agencies; police control operations to tackle the main sources and routes of illegal firearms, emphasising the follow up of firearms-related alerts on the Schengen Information System, and a programme of joint police and customs operations to determine the risk of firearms being trafficked by passenger movements across MS.

The communication also highlighted the potential of firearms tracing for the detection of offenders as well as trafficking structures, although it was acknowledged that the capacity of individual MS to systematically investigate the origin of firearms was unknown. In addition, the potential role of enhanced ballistics identification capabilities was identified, and it was proposed that information sharing and best practice needed to be spread more quickly across the EU.

In 2015 an interim SOCTA was reported (Europol, 2015) and at this point the intra-EU trafficking of converted or reactivated firearms was identified as one of the main sources of illegal firearms in the EU supplying organised criminal gangs and others with weapons. However, the extent of trafficking was reported to be stable, with no identifiable increase from the 2013 report. However it was identified that significant intelligence gaps exist regarding the extent of trafficking, the actors involved and the modi operandi employed. The online sale through the surface web and Darknet as well as the use of fast parcels were identified as key modi operandi for trafficking firearms in the EU, and enabled trafficking from the US into the EU. Moreover, the conversion of blank firing weapons and the reactivation of deactivated firearms were identified as significant sources of illicit firearms. It was also acknowledged that the legislative loopholes identified in section 3 of this report were routinely exploited by organised criminal groups in order to purchase, import and convert/reactivate blank firing weapons or firearms identified as deactivated in some but not all MS.

Firearms trafficking was placed on the watch list due to its rapid evolution or threat potential. Specifically, it was the re-usability of firearms as well as the potential impact of their proliferation

among criminal groups and terrorists on the safety of EU citizens which was cited as the origin of a substantial threat. Moreover, the lone actor and terrorist events in the EU in 2014 and 2015 were identified as illustrations of this threat. Firearms trafficking was identified as increasing the availability of firearms among criminals and also enabling terrorists to more easily access firearms. The trafficking of firearms was identified therefore as a significant and substantial threat to the EU. It was acknowledged again however, that there remained significant intelligence gaps concerning those involved in the distribution of firearms, as well as the involvement of licit arms manufacturers in the diversion of legally produced firearms to criminal markets (pg 36).

The 2015 Action Plan against illicit trafficking and use of firearms and explosives (European Commission COM(2015)624 final), reiterated the need for cross border information sharing, greater cooperation with third countries, ballistics information sharing, and the training of law enforcement officers.

4.4 Policing gun crime

It is acknowledged that one of the greatest challenges facing police in relation to gun crime is the complexity of situational and personal factors that lead to a firearm being used within a crime (Roberts and Innes, 2009). Indeed the focus on 'gang culture' as the sole explanatory framework for gun violence and gun crime has been criticised by some for lacking explanatory power (Hallsworth & Silverstone, 2009), and as mentioned previously, the use of the term 'gun crime' to encapsulate this complexity as if it represents a unitary phenomenon has also been challenged (Squires et al, 2008). Nevertheless, changes in the policing response to gun crime in the UK have been led by the conceptualisation of gun crime as a gang crime, resulting from a number of high profile gang-related murders. This also had the consequence of focusing attention on gun violence specifically rather than gun crime more broadly. Strategic changes to the policing of gun violence are summarised by Hales et al (2006) and Squires (2015), and have included:

- The creation of specialist police units to investigate shootings e.g. Operation Trident in London
- The development of local multi-agency responses, and
- Closer working between the police and 'critical friend' community representatives

Roberts and Innes (2009) report on an ethnographic study of Operation Trident, a policing initiative in a borough of London aimed at reducing the number of gun deaths involving black perpetrators and black victims, and increasing the detection rate of these crimes that was implemented in May 1998. Initially, according to the Head of Trident, such was the pressure for the Metropolitan Police Authority to be seen to respond to these needs, amidst a climate of political and public scepticism concerning public safety, that the initial development of the operation was rushed and poorly thought through (pg.343). Over time the approach developed into a proactive rather than reactive policing strategy aimed at reducing the activity of the criminal network surrounding someone involved in gun crime. Police interventions also targeted the supply of firearms by tracing the supplier or converter of the weapons, as well as other criminals who may be interested in purchasing the weapons.

Operation Trident was viewed as a considerable success within UK policing, with reports of reductions in the murder of black citizens of up to 40%, reductions in attempted murder of 36%. In addition detection rates increased from 18% in 2000 to 85% in 2005. However, Roberts and Innes (2009) observe that despite Operation Trident being well embedded, and despite increased detection and imprisonment rates, the murder rate remained quite static between 2000 and 2005. Moreover the rates of other firearms incidents increased between 2000 and 2001 and increased sharply between 2004 and 2005. Robert and Innes (2009) argue that the narrow focus of Operation Trident on reducing gun violence, at the expense of maintaining community policing links associated with more mundane policing tasks, meant that many opportunities were missed for the collection of and reaction to relevant intelligence. Consequently, a community policing model was endorsed by the authors through which community intelligence can be gathered and acted upon in relation to gun crimes more broadly.

Silvestri et al (2009) reviewed the evidence regarding the effectiveness of a range of policy initiatives involving the police with a view to reducing youth gun crime. Only one UK based police-involved project was identified. Some evidence of a positive impact on gun crime was found from a problem-oriented policing and community safety initiative. Specifically, an initiative based on the highly successful USA Boston Gun Project was implemented in Manchester, England in 2001. The Manchester Multi-Agency Gang Strategy (MMAGS) was implemented with a view to:

- Enforcing the law through multi-agency, targeted action, to secure convictions and deter from gang and gun crime,
- Providing young people with education and employment opportunities as alternatives to gang and gun crime,
- Giving support to victims, witnesses and to the most vulnerable young people and families, and
- Rehabilitating those convicted of gun crime and gang-involved offending.

Although gang-related shootings in the city fell by a third during the three years following implementation, there is little evidence to suggest that this was directly as a result of this approach. Bullock and Tilley (2008) who evaluated the project found that the aims of the project had drifted from tackling what had previously been identified through research as the situational determinants of shootings, to the social determinants of gang membership, moving away from the original evidence base in order to focus on an issue that the project team perceived (without clear objective evidence) was the cause of the problem. Consequently, project activities moved from the enforcement of legal sanctions (i.e. policing), to deterrence from gang involvement (secondary prevention). As a result it was difficult to determine the influence of the policing, enforcement aspect of the project. Moreover, due to the shift away from the evidence-informed strategy, practitioners incurred challenges in defining gang and gang membership, identifying those at risk of gang involvement, and the risk factors for gang involvement. This resulted in too many young people being referred to the project on the basis of inconsistent information and poor judgement and also young people incurring stigma associated with labelled a gang-member.

The potential of a multi-agency approach to policing gun crime was also highlighted through the case study of Amsterdam reported by Golding and McClory (2008a). It was noted by the authors that the trend in the UK is for crime prevention and policing initiatives to be funded in the short term, typically two years, only. In contrast, in response to a peak in violent crime in 1999 Amsterdam devised and implemented an eight year strategy. The strategy focused on balancing enforcement and prevention. In collaboration with local government, the police and NGOs a series of policies and operations were developed. These included increased stop and search powers, monitoring of shooting clubs, spot checks on gun-license holders, information and inspection at schools and the screening of people visiting pubs and clubs. In addition, firearms investigations were increased, improved procedures for responding to intelligence, carried out more searches of residences, and conducted more vehicle checks. In addition, the training of those officers responsible for reducing firearms crime was improved through training, exchange of best practice. In addition work processes were aligned between departments to increase the efficiency of intelligence and information sharing. Finally, multi-agency coordination was increased between The Royal Marechaussee, the Economic Control Service, Customs Service, Ministry of Justice, Ministry of Foreign Affairs and other law enforcement agencies. Although this is an interesting case study which was selected by the authors as it was a city that has 'successfully dealt with a surge in gun and knife crime (pg.5), no data are presented to illustrate the potential impact that this change in approach has had.

These reports illustrate the complexity of gun crime and the level of co-ordinated action required across policing and other agencies in order to provide potentially effective responses. Moreover, it is suggested that preventative policing strategies that incorporate a community policing approach which facilitates the collection of situational intelligence may also offer improvements to the policing of gun crime. What these studies however neglect to consider is the potential role of policing within a

European context, and the potential challenges that such cross-border policing may face. The qualitative study presented next examines the policing of gun crime within the European context.

4.5 Method

Informants to this section of the report comprised 14 individuals (1 women) from 8 European countries. Participants represented all stakeholder groups. The data presented in this section were extracted from transcripts of the interviews that were conducted. The results are presented thematically with illustrative verbatim quotes provided to substantiate the claims made. However, due to the volume of data not all quotes relating to each theme are presented. A decision was made to present the themes for which the most substantial evidence existed across participants from more than one country. It must be noted however that given the cultural variations evident in previous research across EU member states, considerable variations in opinion and experience were expressed by the participants.

4.6 Results

Three key themes emerged from the analysis that explained a number of factors that impact on the policing of gun crime in individual member states and across Europe. These were; disparities in national and international priority given to gun crime; a disparity in police resources and investigations; and interventions.

4.6.1 Disparity in Priorities

Stakeholders reported that the EU SOCTA (Europol, 2013) was used to mobilize strategic priorities across Europe. However, this document does not include gun crime *per se*, but refers to the issue of illicit firearms trafficking, which until the 2015 update (Europol, 2015) was not acknowledged as a serious threat. The lack of European-wide prioritisation was supported in the Netherlands:

"In 2012, it [GEC] was not deemed such a threat that it should be prioritised among the 6 priorities that they (EU commission) would define.

[...]

"So there's no clear agenda with regard to illegal arms trafficking and how to deal with it, there's no overall plan or something. (3MNLP)

However, it appears that the prevalence of gun crime did not impact on the resources that were dedicated to fighting firearm offences. For example, gun crime is given high priority in the UK, where in proportion to all crimes recorded gun crime rates are one of the lowest throughout the EU.

"It is not a low priority for us is it? It is very serious" (5MUKSTAT)

In other countries with more frequent firearm offences, prioritisation of gun crime varied.

"It's very difficult to put firearms here on a very high priority. Every meeting we have about this, it's always a problem. And we all are aware of the situation but if you look at the numbers and if you look, actually they are dropping, again" (2MNLB)

Many of the responses given indicate that political, cultural and economic factors may have a stronger impact on the prioritisation to investigate gun crime than its actual prevalence. For example respondents from Denmark and Croatia:

"I think that the unfortunate thing is problem in many countries, that it's difficult to hype fighting gun crime; it's easier to hype fighting drugs or illicit trafficking, trafficking human beings" (3MDKLE)

"It's very seldom that it's their [Ministry of interior] top priority. Right now their top priority is the refugee crisis. Nobody is talking about gun problems and there are still gun problems, there are cases of illegal, of somebody being killed by or wounded by the illegal weapons. But this is not a

top priority” (1MHRNGO)

However, in countries that have recently experienced internal conflict respondents commented that high prioritisation was given to combatting gun crime:

“It has high priority. In the Section for organised crime, there is a section, in the Department for Organised Crime there is a section for fight against illegal trade in firearms and hazardous materials. This is a big section and it has a high priority” (3MMKLE)

Similarly, high-profile incidents in a country, such as amok shootings or terrorist attacks resulted in higher prioritisation of combatting gun crime.

“The issue of firearms was not a priority until after the shooting that occurred in Liege in 2011; this is because if there is no data, it is not a priority, which then means there are no resources or funding to develop and attain resources, which then causes a cycle” (2FBELE)

“Swedish government gave a task to police and customs to intensify the combat of the illegal flow of firearms into Sweden. Stemming from mainly a series of public shootings, mainly in southern Sweden at that time, City of Malmo, that were given very high media attention, calling for a political reaction” (2MSELE)

The data of this study indicated that there was also disparity in prioritisation of gun crime within individual member states. Dutch law enforcement and forensic respondents in The Netherlands suggested that different prioritisation between different geographic areas.

“So, you could imagine in Amsterdam the topic – illegal weapons – is on the agenda, but down in Holland, in Limburgh, near the Belgian border, it may not be a topic because there is not a problem. So that’s also making a difference in the choices nationwide” (1MNLLE)

This was supported by respondents from the UK:

“We know that firearms isn’t on everyone else’s, kind of, top agenda because you’ve got the disparity between forces, between the like of West Midlands, Met, Merseyside, GMP, which are all kind of your gun crime forces, and then you’ve got ones like Northumberland where their gun crime is non-existent” (7FUKLE)

4.6.2 Disparity in resources and investigations

During the interviews, participants described the impact of disparity in prioritisation, as having a direct effect on the resourcing and structure of policing and, therefore, on the investigation of gun crime.

“So when they have at certain moments a bit more staff, then you see they have a relative success. Then there are police operations where they are involved as well with the local police and certain gang are found and are taken away to prison and they find a whole range of weapons, and then we see what is the latest thing on the black market. But when the staff diminishes again, they can't do such actions” (3MBEP)

Within the UK separate forces historically had dedicated units who dealt with firearms crimes, which have since been disbanded.

“But actually what’s happened is that lots of those forces have dedicated gun crime investigation capabilities. Because of austerity and because of reduction in shootings, that’s gone” (4MUKLE)

The practice of reducing firearms units was echoed in Holland and Denmark:

“This specialism was taken away, as we needed more people on the street. So it was not main topic anymore and we only do investigations if we find it, due to other criminal acts, activities” (1MNLLE)

“But I think it's all about resources, that if we have some more resources to combating it, that could be better; if we have resources and the priority for example making controlled visit at some of the weapon collectors [...] I think it's a lot about priority and resources” (3MDKLE)

As a consequence of reduced resources, the scope and focus of investigations into incidents of gun crime is limited in identifying the source of the weapon used, as described by participants from the Netherlands:

“We do really the investigation on the gun itself in relation to other crimes, but the investigation to the person, where did he get it from? Where does it come from? Well, sometimes you do it and sometimes you don't, because if you start this kind of investigation you cannot always see the end and if you cannot see the end of the effort it will take from you, as an organisation, we do not” (1MNLLE)

A Belgian participant clearly showed the point that the source of the firearm is not a consideration in police investigations.

“Firearms are often of secondary importance in police investigations. When you have a homicide case, first thing they look at is who did it, can you prove this person did it. Why did they do it. Was he there? It's logical. How the person got his weapon, whether it's firearms or something else, is usually secondary importance” (1MBER)

The lack of complete investigation suggests that in order to tackle gun crime effectively two separate investigations need to be conducted focusing equally on perpetrator detection and wider issues of gun supply. For example, knowledge of the supply route for a firearm could assist to remove the armourer/supply and potentially reduce GEC.

In the UK, establishing the National Crime Agency (NCA) as central body that is responsible for collecting, analysing and disseminating information regarding firearm offences has proven to be beneficial in developing a national strategy to combat GEC.

“The national strategic assessment is an annual product. We then conduct a mid-year review in October, to see ‘right well how's the response that we, as the NCA, have put in place has that changed the risk? Has it mitigated the risk?’ God forbid it's made it worse and we do that as a sort of constant review almost” (7UKFLE)

The role of the NCA as a focal point was identified by UK ballistic intelligence personnel as key to creating an accurate picture of the movement and use of firearms.

“So, you get these regional differences but again we can only say that because it's been identified by having that single point where everything is examined and the Intelligence is all brought together. [...] So, whereas these things in the past might not get investigated because no one police force would see it as their problem and perhaps for whatever reason. [...] It will now always be picked up and it might be picked up by the NCA” (3MUKB)

Respondents recognised that better information regarding supply issues of firearms will help to more effectively tackle domestic and international gun crime.

“ After Charlie Hebdo, after Amrani started shooting in Liege, we said look, we have done a lot of progress on the legal framework, it's time to make progress on the other two main issues right

now, with first of all get a better image of the illegal firearms market because we don't have good data and if you don't have good data and a good image, it's very difficult to develop good policy" (1MBER)

4.6.3 Interventions

Respondents emphasised that the complex causes of gun crime necessitate a holistic approach addressing national as well as international social (e.g. education), economic (e.g. unemployment, housing) and cultural factors (e.g. gang and gun culture). For example in the UK and Sweden:

"Gun enabled crime is a small part of a wider approach and in fact your gun enabled crime actually becomes the symptom of what you should have been dealing with" (1MUKLE)

"It is important because we do not see from our side that it is a gun generated problem that it is the availability of firearms per se that causes the problem, but it's the other way around. It's these conflicts that create a larger demand for firearms. So it's the social context in which these conflicts have arisen that also leads to an increase in firearms smuggling and usage" (2MSELE)

Therefore, preventative interventions, in which attention is exclusively paid to detecting and prosecuting firearm incidents, are at risk of remaining impaired in their effectiveness. Within the UK, communities are encouraged to be part of the intervention process.

"Focus on the community and build spirit and strength in the community and if you can do that, you'll actually start to reduce your gun and gang crime" (1MUKLE)

The need to engage the community is also an effective strategy across the breadth of Europe, for example in Eastern European countries, such as Croatia and Macedonia:

"There is a comic book. [...] In the first stage of the campaign we used the message, the campaign's name is 'Less weapons less tragedies' and the slogan was 'Get the extruder out, make your home a safer place to live" (1MHRNGO)

"We are working with OBSE for a longer period in the local communities and in the public schools with the children where we present to the children the hazards from use of weapons" (1MMKP)

It is not only a holistic approach to tackling the causes of gun crime but also identifying different statutory powers that can be used. In Denmark the use of powers relating to seizure of assets have been used effectively to help combat GEC.

"They use what they call the Al Capone method. It's, I think it's known all over the world to go and look where do your income come from? [...] They did the same thing with the bikers and they took their motorbikes and expensive watches and cars and things from them and if they couldn't document their income. The tax authorities actually have the, they're allowed to search people's homes, in a way that police are not allowed to" (1MDKB)

Within the UK a number of powers and agencies have been used in interventions.

"So we have an, the Local Authority for example, has a whole raft of powers that we can use to tackle Serious Organised crime, and, you know, through licensing and trading standards...taxing, you know all these different aspects, but also through the other side of things, so through Adult Services, Troubled Families, Children's Services, you know looking at the other aspects, the families that are involved in Serious Organised Crime" (2FUKNGO).

4.7 Summary

The aim of this section was to scrutinize policing of gun crime in Europe. In previous research, attention has predominantly been paid to the effect of policy and legislative changes in relation to the complexity of gun crime and to the role of police in dealing with gun crime (e.g. Golding & McClory, 2008b). In this context, the use of qualitative data taken from interviews conducted across different countries within the EU in the present study, has offered a unique insight into the social, economic and cultural challenges of combating gun crime from a European perspective.

A key finding of this study was the lack of legal definition of gun crime which often means that during police investigations 'use of a firearm' is identified as an aggravating factor to a primary offence rather than a primary offence in itself. For example, in none of the EU member states 'armed robbery' is defined as stand-alone crime. Instead, the use of a firearm is usually perceived as an exacerbating factor to the offence of robbery. This means that police enquiries into issues of supply are conducted incompletely or not undertaken at all.

Many interviewees stated that after a firearm related crime had occurred, if the perpetrator was apprehended and the firearm was recovered, often no further investigative work was completed to identify how the perpetrator was able to source the weapon. In fact, one participant summed up a collective perception that the sourcing of the weapon was of 'secondary importance' in police investigations. The impact of not identifying the source of a weapon is vital to combating gun crime; failure to do so means that supply routes or 'armourers' are not identified, allowing further supply of firearms into the criminal world. A shared legal definition of gun crime might be helpful in changing the investigative mind-set of officers, to allow for a full and thorough investigation into the source of a weapon. This would allow intelligence on the illegal trading and trafficking of firearms to be gained and shared across member states, to better prevent other criminals arming themselves and potentially prevent future injury, death and damage. Consequently, until a clear definition of gun crime is introduced and universally shared by all EU member states, cohesive efforts to combat gun crime across the EU will remain impaired (Diquet & van Alsten, 2015).

Another finding of this study was a disparity of prioritisation of policing and combating gun crime within and across EU countries. A lack of ongoing maintenance of resources allocated to tackling gun crime was criticised by many interviewees in this study. Prioritisation and resourcing of combating gun crime in most countries often appeared to be a 'knee jerk' reaction to an increase in gun crime or a high profile incident such as amuck shootings or terrorist attacks. In the short term, by allocating resources and being proactive it is possible to initially achieve significant success in these areas. Nonetheless, due to alternative priorities, complacency or budgetary constraints resources are often removed over time.

Thus, a continued focus by politicians and police will not only help in maintaining a low national prevalence of gun crime but also has the potential to allow for a more harmonized approach to gun crime across EU member states. As the data of this study has shown, a disparity in prioritisation of gun crime across the EU does pose an obstacle to communication and free exchange of intelligence among government agencies from different EU member states, which ultimately undermines cross-national attempts to investigate and fight gun crime more coherently.

In this context, the new action plan by the European commission to implement the European Agenda on Security (European Commission, 2015a) invites member states to set-up inter-connected national focal points on firearms to develop and share expertise and improved analysis of gun crime. In the UK, having a central firearms focal point such as the National Crime Agency (NCA), has been crucial in gathering and analysing information on gun crime as well as strategically disseminating intelligence to politicians, constabularies and the general public. This has helped responsible authorities to coherently develop and maintain effective holistic approaches to combating gun crime over time.

Although the existence of the NCA has not completely prevented national disparities regarding the extent and nature of resources being allocated to fighting gun crime it has helped to harmonise police

enquiries in their duration, intensity and focus. Hence, by providing a platform to better share information regarding prevalence and nature of gun crime within and across EU member states, central firearms focal points will be essential in enabling governments to develop national strategies on how to self-sufficiently yet coherently fight gun crime across the EU.

Throughout the interviews respondents highlighted the complex nature of the causes and motivations for perpetrators to be involved in gun crime which supports previous findings (Hales, et al, 2006; Robert & Innes, 2009; Squires, et al 2008). For example, law enforcement participants within the UK articulated the social conditions that can act as a route into gun crime for young people, revealing that perpetrators do not always have a desire to be involved in such crimes, but utilise them as a means for social acceptance, social status and financial rewards, and show that gun crime may be embedded in the culture of that person's life. This was echoed by respondents from Eastern European states where use of firearms by young people were reported in reference to conflicts that are inherent to the social environment in which they are raised.

Hence, in order to reduce gun crime effectively any action has to be holistic in its approach, to reflect the complex local causes of gun crime itself and the routes that perpetrators take into this criminal world. Indeed, the Action Plan (European Commission, 2015a) calls for the development of a better intelligence picture to understand the perpetrators involved in illegal firearms trafficking. Equally, and as aforementioned, such actions should be sustainable, implying the need for long-term local interventions to change gang culture, and social causes of gun crime. Multi-agency approaches involving education, local councils, social services and the police are better able to protect vulnerable people such as the under-aged.

An example of good practice was given by a respondent from the UK, where law enforcement alone had limited impact on reducing the levels of gun crime in a community notoriously associated with high levels of it. Consequently, a multi-agency approach, involving the community, was used to tackle a socially and financially deprived area, rejuvenating it, removing problem families and encouraging community strength. By doing so, this community was better able to make decisions about their own lives and work with different agencies to reduce the problem. In contrast, in Macedonia and Croatia school children were very much directly targeted to tackle gun crime. By working with communities, and gaining their trust and support, it was highlighted by participants that information and intelligence is more likely to be shared between communities and law enforcement agencies; which are key to successful prevention and investigation of gun crime.

5. THE ROLE OF BALLISTICS INTELLIGENCE IN PREVENTING THE ILLEGAL USE OF FIREARMS

Jeane Gerard, Rebecca Crookes and Helen Poole

5.1 Introduction

It was clear from our participants that there was an intelligence gap concerning the nature of gun crime and also the origins of firearms that are used within such crimes. The potential role of ballistics intelligence gathering, analysis and sharing has garnered increasing attention. Most recently, the 2015 EU Action Plan (European Commission, 2015b) required the development of national focal points to improve the collation and analysis of criminal and ballistic intelligence. This section and section 6 of the report examine how countries currently use and process ballistics intelligence, as well as determining the potential value of ballistics to combating gun crime and the illicit trafficking of firearms.

5.2 Nature of ballistics intelligence processing

The use of automatic ballistic comparison systems is now commonplace within forensic labs, enabling quick comparison of recovered bullets and cartridge cases from crime scene to a database. When analysing ballistics evidence, ballisticians must examine and compare the unique markings that are transferred onto the bullets and cartridge cases when fired from a firearm. This is known as 'rifling', in which unique lands and grooves are indented on the bullet as a result of travelling through the barrel of the gun. Additionally, markings and impressions can be made by the firing pin, breach face and ejector/extractor marks on the cartridge cases (Gerules, Bhatia & Jackson, 2013). These markings provide essential evidence for linking bullet/cartridge cases to guns.

By comparing these unique markings, experts are able to link firearms to crimes. Therefore, many forensic institutes maintain what are known as open case files (OCF), where exhibits (i.e. bullets and cartridge cases) from unsolved crimes are stored (Rham, 2014). Confiscated guns can be test fired to compare the projectile with the OCF, as well as new evidence found on crime scenes, in order to identify potential "links". The exhibits of an OCF are organised according to "class characteristics": *'for bullets, these characteristics include the calibre, number, and direction of land impressions together with their width and pitch; for cartridge cases, characteristics include the calibre, shape of firing pin impression, breech face impression, and the position and shape of ejector and extractor marks'* (De Ceuster et al., 2012, pp238). The manual use of microscopes to compare the markings can be used in conjunction with automated systems to compare markings. As such, the use of automated ballistic comparison technology enables ballisticians to compare bullets/cartridge cases at a much faster rate and to combat gun crimes by linking firearms to crimes (Gagliardi, 2012), known as hits. There are two types of hits: "warm" hits that are investigative or intelligence led, whereby investigators indicate a probable connection; and "cold" hits, in which a link or identification is made when no previous intelligence existed (De Ceuster et al., 2012). De Ceuster et al. (2012) noted that OCFs are of great value when finding "cold" hits.

However, De Ceuster et al. (2012) highlighted numerous limitations of ballistics comparison systems, such as: the limited capabilities of the correlation algorithms; the size of the database reducing the 'hit' rate as it increases, as "noise" is created by non-relevant evidence in large database; and correlations influenced by factors such as the material in which the bullet or cartridge case was made or the presence of lacquer on the casing. Due to numerous limitations found with regard to the correlation efficiency, De Ceuster et al., (2012) concluded that the use of cross-border sharing systems had limited value at that time.

Despite the limitations raised by De Ceuster et al. (2012), numerous advantages have also been shown, such as economic benefits and time efficiency with the possibility of a faster process of ballistics

identification, and the reduction of backlogs and delays of these analyses, which in turn prevent further gun-enabled crimes (Gagliardi, 2010, 2012; Leon, 2006). Another argument favouring automated ballistic systems that is worth mentioning is the successful results that were obtained by the National Integrated Ballistic Information Network (NIBIN) in the USA. In 1999, in an attempt to improve the efficiency of ballistics imaging in the USA, as well as sharing ballistic intelligence between the different States, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) and the Federal Bureau Agency (FBI) agreed on the implementation of a new system "NIBIN", under the responsibility of the ATF. According to King, Wells, Katz, Maguire and Frank (2013), NIBIN was considered an effective system, totalling over 47,000 'hits' by 2012.

Automated ballistics systems are widely used across Europe. Several countries including the United Kingdom, Belgium, the Netherlands, Croatia and Kosovo have adopted the use of this technology, although the use of automatic ballistic comparison systems is not homogeneous, with different systems used in different countries; such as, PAPILLON Arsenal, Evofinder and the Integrated Ballistics Identification System (IBIS). These systems provide the possibility to compare evidence at a national level but also offer the possibility of comparing evidence at an international level where weapons appear to travel across countries. However, compatibility issues arise between systems due to the use of different file formats, which in turn renders data sharing problematic (De Ceuster et al., 2012).

Previous research has illustrated the importance of sharing ballistic evidence across borders (De Ceuster Hermsen, Mastaglio & Nennstiel, 2012). The Interpol Ballistics Information Network (IBIN), founded in 2009, supports cross-border exchange of ballistic data within the EU and beyond for countries which are equipped with IBIS technology. However, non-IBIN member countries can also benefit from IBIN's international ballistics database through Interpol, using evidence recovered from test fires or double-casting resin replicas (making copies of bullets/cartridge cases) that can then be entered on IBIS and compared with other IBN member countries (see Interpol website).

Despite the limitations highlighted by De Ceuster et al. (2012), the technology behind these systems is continually evolving; as such, an up to date picture was essential to establish whether the conclusions made by De Ceuster et al. (2012) have been remedied by updates, or whether they are still applicable today. Therefore, given the absence of research providing evaluations on cross-border facilitation of sharing ballistics data, this study aimed to: review the latest available figures for the number of ballistic evidence that were received in the labs, as well as submitted to the automated system within selected European countries; to identify the number of hits obtained; and to examine how ballistic data was shared across borders.

5.3 Method

This was a mixed-methods study, consisting of semi-structured interviews and quantitative questionnaires examining ballistic examination and cross-border information sharing. The quantitative questionnaire aimed to examine key ballistic and cross-border information, such as what systems are being used (if any), the number of bullets and cartridge cases that have been acquired and correlated nationally and internationally within the last 12 months, the use of double casting methods, the number of hits, and the use of Service Level Agreements. This was completed by nine participant countries between April 2015 and May 2016. A descriptive account of the data is reported in the results section. It should be noted that these data are extremely limited due to different definitions and recording practices across the participant countries and accordingly, no detailed statistical analysis of the data provided is possible. Data from the semi-structured interviews have also been used to support the findings.

5.4 Results

A number of key issues arose from the interviews, which are broadly categorised in terms of: structure, training, staffing and accreditation of laboratories that deal with ballistics evidence; the choice and use

of automated ballistics comparison systems; methods of ballistic comparison; service level agreements and timeliness of comparison work; international comparative systems; and knowledge exchange and networks. It was noted by participants that most of the ballistics pieces that became subject to comparison technologies, were related to crimes of homicide and armed robbery.

It became apparent through interviews with stakeholders that the prosecutorial system within a country directly impacted on the way ballistics evidence was managed. Broadly, within countries that employ an inquisitorial system, prosecutors or investigative judges lead investigations, though in some instances, the police are able to submit requests for ballistic analyses to the laboratories. However, in those countries with adversarial systems, the police lead the investigation and any expert forensic analysis that was required.

“Investigations are led by the prosecution. Often we are asked by the prosecution to undertake certain investigations in which case we would send them the results of our investigations. Nevertheless, also the police can ask us to investigate something” (1MFDLE).

“The cartridge cases and all bullets from that scene will then be gathered together by the Crime Scene Investigators. They will then be put onto our NABIS database which is an electronic database which records everything coming through Police hands that meets particular criteria” (3MUKB).

One of the issues for those countries with inquisitorial systems, was the ability for the lead investigator (i.e. a prosecutor or investigating Judge) to appoint an expert of their choice, which resulted in some criticism regarding the choice of independent experts (see below).

5.4.1 Ballistics Comparison Services: structure, training, staffing and accreditation

Variations are apparent across the countries as to the structure of laboratories. For instance, some countries such as England have a single national forensic institute in which all police forces feed ballistic evidence for analyses, whereas other countries have regional laboratories, which feed into the central laboratories, such as France and Spain. In some jurisdictions, there were clear differences in the role of central and local laboratories:

“Every county has its own police force and our colleagues from the different counties send us everything and we put everything into our electronic system [EVO finder] that we use to compare ammunition or parts of ammunition, and we also store any ammunition or parts of it that is sent to us, there is a collection of the physical objects” (1MFDLE).

“...the fact is that we are the Central Lab and we can make every kind of study. It’s not the case of the regional labs. Imagine a case, a homicide, where you have to develop not only ballistic examinations but also GSR – gun shot residues – examinations and also DNA examinations and also fingerprints examinations. So, a combined report that affects different departments. So, it’s not possible to do it in Seville or in Barcelona or in some other place because they only have ballistic lab in this regional labs. So, in these cases, all the case has to come to Madrid” (1MESB).

In terms of staffing levels, there was a mixed picture in terms of whether participants felt they had sufficient staffing. For example, Germany was generally satisfied with staffing levels, whereas Spain were one of a number of participants that felt there were insufficient staff to meet the demands of the workload.

“Well, as far as we are concerned, surely, more personnel wouldn’t harm, more scanning stations would be better too, just to register any events more immediately. Otherwise, as far as processing material is concerned we are pretty well staffed” (1MFDLE).

“No, not enough because we should have more people. At the moment the Central Lab is composed by 14 experts and the central labs have between 3 and 4 experts. And it’s not enough

because we can't manage with all the work we have. Maybe, in my opinion, if in the Central lab we had around 20 or even 18 people it could be enough to do all the work we have" (1MESB).

Staff and resource shortages also reduced the capacity of states to maintain an open case file or cold database:

"And they certainly won't talk about a cold database because of course it can cost a lot of money. Not the database itself but the infrastructure and the staff needed to do all these proof shots" (3MBeP).

Staffing, however, was not the only resource issue for participant countries. There were also concerns raised regarding the absence of a robust infrastructure, including suitable laboratory space and appropriate storage space for evidential pieces. This was perceived as a serious obstacle to the development of a ballistics intelligence capacity.

"Well in our case I have to say that we have all the equipment and materials we want, so I don't have any problem with that but the real problem is our infrastructure. We don't have a real building, a real lab building... But the fact is that it should be absolutely necessary to build a new lab larger and more suitable to develop the kind of work we do. But the fact is we do our best with our infrastructure" (1MESB).

In terms of the training of ballistics technicians, there is generally a dependence on the existing community of ballistics experts to share their knowledge with others. This might take the form of trained staff within a facility training new staff such as in Spain; continuing professional development activities provided through meetings with other forensic workers and workshops; or international exchanges of good practice, often provided by experts from the United States. For example, a participant in Spain discussed a previous collaboration with colleagues in the San Francisco Police State who provided training on sub-class characteristics. Collaborations with other police agencies for training purposes was also discussed in the Denmark focus group. However, in Kosovo* it was stated that there was no training available for new staff.

"Yes we went to NABIS seminar last week and we just heard an investigator talking about that, saying that in most of the cases they went directly for the person behind the firearm, instead of going for the firearm and the story of the firearm actually. So there's a lot of information there that's lost and that's our opinion as well" (Denmark).

In terms of academic qualifications, some countries such as Italy required ballisticians to hold a Bachelor's degree in science. However, in some countries technical staff did not necessarily have a scientific background, often coming from a background in policing or criminal procedures (1MXKP).

However, training is not just an issue for those working in laboratories. The need for police and prosecutors to understand laboratory work was also widely discussed across the interviews. The participant from Portugal mentioned that training is provided to police and justice staff on how to do improve their standard of work (1MPTB). However, participants from Belgium said there is an absence of training for police forces, though training is offered to magistrates. Introduction and refresher courses are available in both France and the Netherlands, but it was felt that there still needs to be an increase in awareness within the justice system on the ballistics process.

The use of independent ballistic experts was raised by participants from Belgium, France and Italy. In Belgium, independent experts are usually used when gun crime is being investigated by a small local police force. However, participants stated that the use of independent experts is problematic, as they do not have access to the national database. Therefore, thorough comparisons cannot be made between recovered evidence and the OCF, and vice versa. The potential impact of this lack of information sharing was highlighted by an account of a case in France where the lack of integration of independent experts with central systems led to a loss of highly valuable intelligence:

“We had a year or two ago, an investigation that was called the killer of XXX. It was a guy who had killed 4-5 people, and in fact, the first element had been sent to a private expert, a year before, at the first killing. And so, one year later, a new case occurs and we haven’t linked it to the first case from the private expert who had never told us about his evidence. However, if we had made the connection, we would have gain time by saying: Caution, there is a serial killer who has already started to kill, and we could have worked faster, so it can be really important. As such, since that enquiry, we now have ballistic criteria for Justice which have to be put into place, to be accredited and to avoid that this type of event happens again” (1MFRB).

Another difference with independent experts, aside from a lack of access to the national database, is that independent examiners undertake more practical work such as analysing the crime scene, and conducting reconstructions and comparison work. Additionally, it was noted by the participant in France that magistrates tend to appoint independent experts who are known to them, some of whom are perceived to provide a poor standard of work.

“It happens that these people receive ammunition pieces that are entrusted to them by the Justice, and, these private experts, they are not public. They are not connected to our database, they are not connected to our files or to nothing at all, and so, you have a few private experts who are “charlatans”, we can say it. Because they are acquaintances to some Magistrates or who are just armourers and who can do a ballistic identification by just looking at the cartridge case” (1MFRB).

It was apparent that the accreditation of ballistic laboratories is important, whereby all ballistic processes have to be undertaken under service standards (1MXKP). It was felt that accreditation was necessary for the credibility of the laboratory when undertaking expert work for the courts. As such, efforts are being made towards accreditation in a number of countries. For instance, four countries (France, Kosovo, Portugal, and the Former Yugoslav Republic of Macedonia) reported working towards accreditation.

“In fact our ballistic lab is the only one is Spain that has this accreditation with the ISO 17025. So, very important for us because, as you know, it’s, in my opinion, it’s absolutely necessary to have this accreditation in order to show, when you have to go to a trial, you need to accredit that your work was well done” (1MESB).

Italy was aiming for accreditation for genetic analysis in September 2015. They outlined the difference between the ISO certificate and the ISO 17025 accreditation. The ISO certificate involves an overall assessment of lab management, whereas ISO 17025 accreditation validates the analytical methods employed. The latter requires constant repetition of analysis in order to demonstrate consistency in outcomes.

Whilst laboratory accreditation is important, as ballistics correlation analysis is based on individual expert assessments, it was noted in Italy that accreditation of the individual as an expert witness may also become more important. One country outlined how ballistic scientists could achieve accreditation through a combination of experience, training and academic qualifications, followed by a process that was outlined as follows:

“And so, as expert, it produces a list of people who are accredited, every year, in all the different areas, as well as in ballistic. With these criteria, which are criteria retained for these people. So, someone who wants to be accredited in ballistic will make their requests through the Institute. The request will be analysed by the administrative council, in public council, and then, if accepted of course, following the criteria that I just described, will be introduced to the Highest Court of Appeal as being an expert, someone who has authority and is accredited to sign expertise reports” (1MFRB).

5.4.2 Choice of automated ballistics comparison systems

The need for automated ballistics intelligence systems was broadly accepted by participants due to the amount of evidence being received by forensic science laboratories, particularly when policy requires the acquisition of all viable ballistics pieces. Such systems were also felt to make analysis easier and clearer, and accelerate the process of identifying correlations. However, it is acknowledged that automated systems can only perform part of the task, and once correlations are identified, ballistics experts are required to undertake manual comparisons to identify probable hits. Nevertheless, the systems were largely regarded as increasingly efficient with advances in technology. However, where there are low levels of gun crime, some respondents did question the value of automated comparison systems.

“Perhaps correlation speed can go up, but it's not bad. I mean, from database, about 600 items, if you count about 3 minutes, 3-4 minutes to correlate against everything” (1MBeBal).

“So it is automated but there is still, let's say the weak spot is still, that there is a lot of human resources needed, for all the checking” (2MNLB).

“And the system nowadays, I think, they could probably improve, still improve, but they are quite efficient in a sense that finding their matches, if the signature is reproducible, it will come up high in the ranking list” (1MBeBal).

“Because they are very expensive these stations and you have to use them every day the full day. But we do not have a lot firearms, not enough firearms. You can actually check 2000, 3000 firearms per system, per year and we check 1500 for the whole country” (2MNLB).

One function of automated ballistics comparison systems is the ability to develop a national, and international, profile of gun related crime which can be used as an intelligence tool to target resources. Thus, the technology not only provides intelligence for individual crimes, but has the potential to be used to develop an intelligence picture of significant trends and issues.

“So we are always involved, whenever a gun is used we are informed and brought in. I think we have a pretty good understanding of what's on the market in Germany, on the European market and what is shipped from where, how you obtain a gun in Germany. At the same time, we are the point of contact whenever a gun is seized in Germany. Hence, we do have a pretty good overview in terms of stats but also in terms of identifying different modus operandi and to initiate investigations” (2MFDB).

“Actually every country in Europe will benefit from having a single point at which all the Intelligence is gathered together around firearms and with that overview. And I think there's little doubt of that. And one colleague says when he talks often to other countries in Europe he says ‘So, what's your problem is?’ they don't have that strategic overview that we do now in the UK. And I think it is fair to say we didn't used to have it in the UK either, did we? Up until NABIS came along” (3MUKB).

Participant countries were asked which of the available ballistic identification systems were operational in their country. There was a lot of variation with two main systems coming to the fore: Evofinder and IBIS. However, there was great disparity in the version of IBIS in use, and alternative systems employed in South East Europe.

Table 5.1: Use of automated ballistic systems across countries

Country	Automated Ballistic System used	Date acquired
Belgium	IBIS Heritage	2002-2010
	Evofinder	Acquired in 2010, in use since 2014
France	CIBLE	1994 – present
	Evofinder	March 2015 – present
Netherlands	IBIS BrassTrax	2007
Germany	Evofinder	2006
Spain	IBIS Heritage	1999
	IBIS Trax (Brasstrax)	2006
	IBIS Trax (Bulletrax)	2009
Portugal	IBIS Heritage	c. 2015
FYR Macedonia	IBIS Brasstrax V2.4	2007
Denmark	IBIS HD3D (bullet and cartridges)	Unknown
Sweden	IBIS HD3D	2013
Serbia	Russian Arsenal (Papilion)	
Bosnia-Herzegovina	Russian Arsenal (Papilion)	
Albania	Russian Arsenal (Papilion)	
Kosovo*	IBIS Trax (Brasstrax and Bulletrax)	
	BERT	
Italy	IBIS (version variable)	
UK	IBIS HD3D	

As displayed in Table 5.1, it was reported that three countries use Evofinder: Belgium, France and Germany. Interestingly, it appears that two of the countries use both Evofinder and another system; Belgium use IBIS Heritage, and France use Cible. The interviewee informed us that, for Belgium, new items of evidence are being recorded in the latest system (Evofinder), and all the physical evidence from their OCF has been scanned back on the new system (4MBeB). France has been carrying a double seizure of elements on both Cible and Evofinder whilst Evofinder becomes fully operational and networked. In addition, France will re-enter the physical elements stored in their OCF on their new system (1MFRB).

Seven countries reported using various versions of the IBIS system through the questionnaires and a further four through interview, with Portugal using the relatively outdated 2D technology of IBIS Heritage. The Former Yugoslav Republic of Macedonia and the Netherlands both have IBIS TRAX (Brasstrax) for the cartridge case component, and Spain and Kosovo* have IBIS TRAX (Brasstrax and Bulletrax) for analysing both bullets and cartridge cases. Denmark, Sweden and the UK have the latest version of IBIS: HD3D. The Carabinieri in Italy were said to use IBIS but the version used depends of which part of Italy they are located in (1MITLE). Alternative systems were in use on SE Europe. For instance, Serbia uses Russian Arsenal (Papillon) which was also said to be used in Bosnia-Herzegovina and Albania (1MRSP).

A central emergent debate arose from the data when evaluating IBIS and Evofinder. There were several advantages and disadvantages reported for each system. It was generally argued that Evofinder performed just as well as the IBIS systems, if not better (1MFrBallis). The system reportedly has very good image quality and an advanced digital camera (Denmark), as well as larger screens which allows for easier analysis. For those who chose Evofinder over the IBIS systems, it was clear that two factors influenced the decision-making process: the systems being used in neighbouring countries, and cost. However, a disadvantage of Evofinder is that it does not provide 3D imaging, unlike the most recent

versions of IBIS. Furthermore, a few of the participants highlighted a lack of evidence to suggest that the Evofinder was capable of networking across different countries. With this in mind, one participant concluded the Evofinder is better suited for a small country or a country with only one database.

“We did a benchmarking towards other countries, to see who had what and we realised that our neighbouring countries, like Switzerland, Germany, Belgium etcetera had all acquired Evofinder” (1MFRB).

“The second biggest difference is, besides how widespread it’s used, how much it costs. EVO finder costs 10% of what IBIS costs. Based on the fact that both do more or less the same it is a value for money question” (1MFDLE).

“On the other hand, the problem is that the database is not so... doesn’t have the same capacity as the IBIS system. So, in my opinion, EvoFinder system is good for a small country or even if the country is as big as Germany, is good if you only have one database only for one country. But if you need a network then I think at the moment it could be difficult to use this system” (1MESB).

The IBIS system was perceived to be user-friendly, and able to facilitate good networking information sharing internationally within IBIN. Though the IBIS system is more expensive than other systems available on the market, many participants stated that the other systems do not have the same capabilities that IBIS has, such as the networking as well as the correlation engine. It is also perceived to have good performance and results; for example, the new IBIS system has a digital microscope that can be used as a microscope or a comparison tool. The user-friendliness of the system and 3D imaging were also cited as the reasons for choosing IBIN.

“I think in terms of user friendliness, over the last years IBIS has made a big leap forward and does now also provide 3D imaging of marks in a relatively professional way. That’s something Evofinder can’t at the moment”(1MFDLE).

“Why IBIS? IBIS was actually selected because of... because if you want to share information, with Evofinder and all the others, you cannot share images with Interpol IBIS for example, because the format of the images is different” (1MXKP).

“Not to offend anyone, but the strong part of IBIS and the reason why it’s so expensive is that it has a correlation engine, you know, when you’re put in the cartridge case it will go through the database and will find candidates and it will in 80% of the cases for the bullets it will find a match if it’s there and in close to 100% for the cartridge cases we’ll find a match; and I don’t think that Evofinder is capable of that” (Denmark).

Serbia stated they use the Russian Arsenal system, a system that is also used in Albania and Bosnia and Herzegovina (1MRSP). The Russian Arsenal was chosen because the initial cost of the system and its maintenance is less than other available systems on the market. The system was also being widely used amongst other Eastern European countries. However, it was reported that it could be more advantageous to change the system or adjust the system to make it more compatible with other EU systems, due to the trafficking of guns towards the EU.

“But now that the market has changed and the market demand is towards the European Union, so the firearms are ending up in the European Union. And the requests are mostly coming from the European Union, then you would need to actually accommodate that you’re able to communicate in the same language and in a proper timeframe with the European Union jurisdictions” (1MRSP).

5.4.3 Processes and methods of ballistic comparison

This part of the investigation was undertaken to form a better understanding of approaches to ballistic comparison, from collection of evidence at crime scenes, through to the eventual identification of a probable ballistic 'hit'. Once again, differences in approach were widely reported by participants through all stages of the process. Furthermore, as already stated, the statistical information provided through the questionnaire by nine countries is highly problematic, and can only provide a limited insight into quantities of materials being processed, correlated and matched.

It was widely reported that every effort is made to recover all ballistic evidence from crime scenes, including bullets, cartridge cases and firearms. A participant from Germany pointed out that there is a higher proportion of bullets recovered in comparison to cartridge cases. Though, one participant from the UK stated that seizing bullets is very time consuming and the decision was made to stop collecting them from crime-scenes (2MNLB).

However, not all recovered material is acquired onto ballistics comparison systems. It was widely stated that bullets are often too damaged for accurate or usable analysis (1MPTB), and that cartridge cases make for better evidence (Germany). When bullets are analysed, the participant from France noted that only the surrounding of the bullet is looked at (1MFRB).

Open case Files (OCFs) were held by many of the participant countries. Retaining materials from unsolved crimes was felt to be important because of the possibility of future correlations (1MBeBal). However, the perception of best practice on the topic of populating the OCF/automated ballistic system was found to vary greatly between countries. Countries that use an IBIS system agreed that all ballistic evidence should be inputted into the system. This includes non-crime evidence, such as antique firearms. However, unless there is some indication that they have been involved in a crime, this type of evidence will not be looked at. However, concerns about overloading systems with data, and the subsequent increase in 'noise' in the system, which may reduce efficiency and compromise the identification of probable hits, was expressed by some participants. Thus, some participants considered that maintaining a smaller database increases the likelihood of obtaining a correct match. Other participants simply reported that OCFs were ineffective, although it was suggested that due to a lack of awareness, OCFs are not being efficiently and effectively used.

"... 'granddad gun's or 'loft guns'. And they tend to be war souvenirs. So, there will be hand guns, submachine guns and things like that. And certainly when we started off the view was they should all come in. It is extremely unlikely they've been used in crime but they should all come in. We've revised that slightly in that what we've said is, after 6 years of running and looking at literally hundreds of these 'granddad guns', the number of links that we've established is tiny. And they've all been to self-loading pistols. So, what we've said is if it's a revolver and it is manufactured prior to 1945, unless there's some intelligence to say it's been used in crime, we won't look at that. Self-loading pistol manufactured prior 1945, we'll test-fire it but we'll just check the cartridge cases on the IBIS system and we won't do any manual search or anything else. And we should pick up any potential link doing that. It's just streamlining the process" (3MUKB).

"That's another little study we did, the smaller your database, which is obvious, the bigger the likelihood that whatever is included and has anything to do with a particular case will be identified. Hence, we have these 3000 objects in our working database, which we try to keep at this size" (2MFDB).

It was also apparent from the interviews that there were differences in terms of how far back ballisticians look at ballistic items, depending on the type of crime committed, and any statutory limitations on prosecutions.

"But those manual searches on a typical shooting would be local, so it would only be the Forces which are looked by that Lab and it would go back two years. However, if it was a homicide and

therefore it's that much higher profile and more emphasis on getting any potential links, if there are, we would do a 5 year manual search and that would be done at all of the laboratories" (3MUKB).

"This way we take out anything which, even if we identify them, would not result in prosecution and keep our database at a size that makes comparisons possible...In addition, we have a database for murders which don't fall under the statute of limitation. These are ammunition parts that were secured in murder cases. Those don't fall under the statute of limitation but we do take them out of the working database as it is extremely unlikely to find anything after 15 years. But we keep them in a separate database as it could be possible that we might get leads at some point. It's possible that we get leads after 20 years that a certain gun was used to commit a particular murder" (1MFDLE).

However, despite the clear benefits of an OCF that could present new leads in old cases, it was reported that the extra work and resources required, led to resistance to investigate it further.

"It sounds terrible but you think he or she, as Investigators, they are investigating a murder. Actually being told that that weapon was used 18 months ago in another part of the country it's like, doesn't affect the murder they are investigating. It's just more paper work and more work for them" (3MUKB).

In terms of test firing, it was deemed good practice to test fire all firearms retrieved from crime scenes and compare the spent bullets and cartridge cases against the OCF and databases. 1MBeBal stated that they test fire 9 shots. Further, 6MBELE said there is willingness to test fire all military weapons in case of robbery.

It was apparent from the interviews that ballistic analyses are the last in the investigative process, with DNA and fingerprint checks typically conducted before ballistics analysis. However, according to a few participants, it is rare to find DNA on bullets and cartridge cases (Germany). Participants from the UK suggested that a single place for forensic analysis would reduce these delays.

"...every time there has been a shooting and they collect items from the crime scene, it often goes in for DNA analysis, and then it goes down to the fingerprint analysis, and lastly it will come to us" (3MSweB).

"So I think some of it is an update on things like NABIS operating processes and procedures, so that people are clear about things are submitted. There's also, 'cause that's not changing slightly because there's a bigger debate around whether NABIS should do more forensic services, 'cause we do, we're seeing a lot more evidence now since NABIS is used, by people wanting to do low count DNA sampling of rounds or guns, so that means they're delaying them coming into NABIS laboratories, so should NABIS do some of that stuff or should the forces supporting NABIS do that work?" (4MUKLE).

In terms of selecting evidence for analysis, bullets and cartridge cases are selected based on the best markings when a lot of evidence has been retrieved. According to Spain, a large sample of bullets and cartridge cases are used if the weapon has not been recovered (1MESB). However, the decision to select the best pieces of evidence is mostly for technical reasons; inputting a few best pieces instead of all items into a system provides a clearer picture and decreases the 'noise-level', thus improving the efficiency of the ballistic systems:

"Suppose if you had a case where there is a lot of cartridge cases that have been found, the first thing that we do is comparison with a comparison microscope to see how many firearms have been used, if they were all shot in the same gun, then we are going to have a look at those cases. Essentially select different brands, if available and then we look at those that demonstrate the most reproducible signature of a firearm and that don't contain parasites traces, like traces from, I

don't know, being scratched over the ground or manufacturing marks and so, that can influence the automated system in a wrong way. The decision to select among evidence is mostly technical for better efficiency of the system- no sense to input it all" (1MBeBal).

Although some participants discussed following a protocol for analysing markings, the way in which it is followed varies. As such, when analysing different marks on cartridge cases to compare to other exhibits and test for a potential match, inconsistencies between processes are apparent in terms of the markings that are analysed. For instance, 2MNIB stated that they do not look at other marks aside from the breach face and firing pin as this is time consuming and ineffective, although they do claim to adhere to the IBIS protocol. Conversely, practices in France, Portugal and Belgium involve examining all markings, as well as other factors that would affect the analysis, such as a change in light.

"...that's a certain protocol that IBIS has, a certain protocol how to use it. We more or less adopted that, so the information you put in as data, so the number of the cases etc., occurrence data, that's all the same. But how you actually put your evidence, how you make your pictures actually, although it is automated, it's, your orientation etc. And what do you actually use that's more that could differ a little bit per country. But you always take certain marks like the breach face and the firing pin, every country uses that, so you can always compare that to other countries. And we do not use other marks, because it's time consuming to do that and not very effective in my opinion" (2MNIB).

"And you must look at everything. The fire pin, the breech face, the ejector, and change the light" (1MPTB).

Respondents to the questionnaires were asked for information on the number of bullets and cartridge cases submitted and subsequently acquired onto automated ballistic systems. The results are presented in table 5.2 below.

The amount of bullets and cartridge cases submitted into the labs in the last 12 months varied across countries, ranging from approximately 100 to 1,200 bullets, and approximately 143 to 2,730 cartridge cases. These items were recovered from crime-scenes, test fires or unknown origins.

As shown in table 5.2, only a proportion of the ballistic items received at the laboratory were acquired into the ballistic system, though Denmark and Sweden had submitted all items. Amongst cartridge case acquisitions, which are generally regarded as the most successful for generating hits, acquisition rates varied between 5% of submissions in Spain, to 100% in Denmark. This may be attributable to the much lower rate of submissions in Denmark and Belgium, but is also a result of variations in policy. In Sweden for example, the policy is to acquire all pieces onto the system other than approximately 5% of pieces that are not suitable for IBIS (eg partial bullets) (3mSweB). In other countries there are limitations on how much material from each case should be acquired into ballistic systems.

"We have a regulation that says that all the firearms, all bullets, all cartridge cases that are found in crimes should be sent to us for registration and comparison. Even if you have an 80-year-old man who has a firearm at home and he doesn't have a license, the firearm should be sent to us for registration. The regulation is really spot-on, everything should go into registration" (3MSWEB).

"I think that if we insert evidence into the OCF, what we'll do is, let's say if we have cartridge cases, we usually choose those that are most pristine and different brands of ammunitions, if available, because these markings can be a bit different but not always. So that is how we make our selection. We usually put in 2 to 3 cartridge cases from the crime-scene into the system" (4MBEB).

Another possible reason why all pieces may not have been acquired, is backlogs. However, backlogs were not reported as a major issue for most respondents. Participants from Spain and Former Yugoslav Republic of Macedonia did report having a backlog, both stating that this is due to the amount of cases

and the circumstances surrounding them. At the time of the interview, the backlog across participant countries reportedly ranged from under 5 cases up to 425 cases, (which usually varies throughout the year). Portugal and Denmark both reported not having any backlog.

"We have 800 cases a year handled by 10 people, in other words 80 cases a year per person, or one case in every 4/5 days" (1MITLE).

"I don't have a backlog anymore, of firearms cases, few other cases but or cold files case checks, I don't have a zero backlog for the moment. Everyone is working on the last case that arrived. That can fluctuate, sometimes it gets a bit busier, we are also in July and August so people are on holiday, not only us but also the magistrates, so cases are coming and they will probably be treated as they get back from holiday. So it could go back up again in September. Or it couldn't. It is really hard to predict" (1MBeBal).

Respondents to the questionnaire were also asked to record the number of ballistics pieces correlated and how many of those resulted in a probable hit. The results are presented in table 5.3 below.

The anomalies in data presented in table 5.3 suggests that countries are using different measures for recording this phenomenon. For example, the number of correlated cartridge cases ranged from 43 in Portugal to a maximum of 175,800 in Spain. However, Spain reported that they included not just physical evidence in this number, but also online evidence. When asked for further information, they cited the number of acquired pieces, suggesting different understandings about the nature of a correlation. Additionally, the number of correlated bullets range from 0 to a maximum of 36,900 (see above for clarification). The percentage of correlations resulting in hits, ranges from 0.02% (although this is likely to be a result of the interpretation of 'correlations') to 100% in Portugal. Although it appears that a hit rate from correlations of between 1 and 10% can be expected, there are clearly differences in the way hits are being recorded. Furthermore, there is no discernible pattern between the hit/ correlation percentage and the ballistic system in operation in a country. For example, Belgium and Portugal use the same system, with very different reported hit rates. Interview information explains some of these anomalies.

Table 5.2: Number of ballistic items that were submitted/acquired in the last 12 months

Country	No. of submitted bullets	No. of bullets acquired in ballistic system	% of bullet submissions acquired	No. of submitted cartridge cases	No. of cartridge cases acquired in ballistic system	% of cartridge case submissions acquired
Belgium	110 items or group of items	82 were manually compared	75%	143 items or group of items	86 items or group of items	60%
France	Not counted	1985	-	Not counted	3869	-
Netherlands	Approx. 1200	0	0%	Approx. 2000	Approx. 400	5%
Germany	550 (evidence ammunitions)	1890*	-	540 (evidence ammunitions)	3030*	-
Spain	1164 test-fire bullets 99 unknown bullets	582 test fired bullets 33 unknown bullets	50% 33%	2730 test-fire cartridge cases 500 unknown cartridge cases	1365 test fired cartridge cases 100 unknown cartridge cases	50% 20%
Portugal	293	667*	-	72	3114*	-
FYR Macedonia	Approx. over 100	Approx. over 2600*	-	0	Min 340*	-
Denmark	380	380	100%	994	994	100%
Sweden	707	c.800	100%	1097	1600*	

*In the case of Germany, Portugal, Sweden and FYR Macedonia, acquisitions are greater than submissions. They may be reporting the total held on the OCF (Germany reported they retain an OCF of about 3,000 pieces), as opposed to acquisitions during that year. Alternatively, submissions may have been counted per case, or else may have been submitted from a previous period and only acquired within this period due to a backlog.

Table 5.3: Correlations and hits

Country	No. cartridge cases correlated	No. bullets correlated	No. of hits in the last 12 months	% of correlations resulting in a hit
Belgium	86	82	3 cold hits	1.7%
France	Not counted	Not counted	14	-
Netherlands	400	0	46	11.5%
Germany	3030	1890	28	0.57%
Spain	Max. 175800*	Max. 36900*	43	0.02%*
Portugal	43	4	47	100%
Former Yugoslav Republic of Macedonia	340	0	3	0.88%
Denmark	994	380	7 cold hits	0.5%
Sweden	c.1600	c.800	c.60	2.5%

*The correlation figures for Spain appear anomalous, and this may be a total figure rather than just correlations for the last 12 months.

As demonstrated in Table 5.4, Belgium and Denmark have identified that the hits they have obtained have been cold hits; i.e. hits that have not been intelligence-led, whereas other countries might record intelligence-led hits. Furthermore, some countries count multiple links to a single weapon as one hit, and others, such as Portugal, count hits even when it is known that crimes are related as they involved the same individuals.

And also if we found for example 8 cartridge cases coming from a single weapon this will count for one hit, whereas in IBIN it will count for 8 hits (1MFRB)

So we have three years ago, we have 200 hits, because case goes to is a gang, they work and armed robbery of bank. It's a big gang, I think around 20, almost 30 people. They work in groups, they go to the bank one day and the other group go to the other bank so and other guys go do the work (1MPTB).

Variations were also apparent in terms of which items they look at in the list of correlation and ranking of hit list, though at a minimum, countries appear to look at the first 10 correlations.

In our experience if an ammunition part was fired from the same gun it will be amongst the first 10 of this hit list. The hit list is as long as our collection is big, but there is no point to look the lower ranks. The first 10 hits, as we say, are then compared on the screen. The caseworker will then look if there are, indeed, any similarities. (2MFDB)

....throughout the Netherlands, which means that we say, well at least look at the first 15 but if possible look at them all, and all means 40, 45 maximum. (2MNLB)

As with other forms of forensic evidence, there is clearly a process of attrition, which starts with the collection of ballistic material from crime scenes and test fires, through to the submission of bullets and cartridge cases, the acquisition on pieces onto automated systems or through manual comparison, the number of correlations that are identified, and then those that result in a hit. Following this, further attrition will occur through the investigation and prosecution process. Due to anomalies and differences in recording and reporting of this process, it is difficult for this study to accurately state the average number of hits as a percentage of the number of ballistics items submitted and acquired. In order to assess the effectiveness of ballistic intelligence systems in identifying hits therefore, more consistent and robust systems are clearly required to evaluate this process, or else a more in-depth study, which follows individual cases in a consistent way would need to be undertaken.

5.4.4 Service Level Agreements and timeliness

The questionnaire asked whether a service level agreement (SLA) was in place, which details the time in which labs will report results from a ballistics comparison to an investigator or intelligence office. Of the nine countries who completed the questionnaire, only two reported that an SLA was in place: France and the Netherlands. In France, it was reported that it usually takes around 20 days maximum for non-multi-disciplinary files, but they can always respond within the police custody timeslot and when an investigation needs urgent answers (1MFRB). In the Netherlands, it was discussed that 'standard' comparison cases have a turnaround time of 30 days, whilst tailored made cases (ballistic, technical, reconstruction questions) have a turnaround time of within 60 days. In addition, a 'rush' of 'urgent' cases can be done within 6 days when it is possible. They argued that they deliver their reports in 95% of cases within the agreed time (2MNLB).

For the seven countries that do not have an official SLA, they all aim to work within a timeframe. As such, Belgium has a turnaround of two months for non-urgent cases, but can work within one month if the suspect is in prison as there is a possibility of requesting a deadline for the full reports which varies in terms of urgency. For Spain, the time needed to obtain the final full expert report varies depending on the type of crime: terrorist and other important cases (1-3 days); homicides and attempted murder (1 week – 2 months); violent robberies (1-12 months); other crimes, mainly illegal possession of firearms (over 12 months). Sweden reported turnaround times of between five days and three months.

Turnaround times can also depend on the case or the lab in charge; for instance, whether the lab is central or regional. The Former Yugoslav Republic of Macedonia aim to respond to investigators in a frame of up to 30 days, but the Prosecutor gives orders for how many days to conduct it. They also had a fast procedure facility, and can respond to a request on the same day depending on the scope of the offence (such as the number of firearms involved, and the number of cartridges and projectiles at the crime scene). In Denmark, the turn-around for a statement on a quick case (which they defined as a case in which they have the firearm and a piece of ammunition and the investigator wants to know (a) whether it is functional; (b) whether it has been used in any known crimes; and (c) what regulations the firearm falls under) is around 90 minutes. For more complicated cases, such as the presence of more than one firearm or the level of danger the firearm presents, the turnaround time is less than 5 working days and these cases are usually prioritised. In addition, the UK explained in their interview that their SLA indicated a turnaround time of 7 days for 'shots fired' cases (whereby a firearm has been fired but no one is injured) and all other cases have a turnaround time of around 28 days, though cases were prioritised. When the report is not finished, there is a verbal update to Investigating Officers. In Germany, cases were also prioritised and they aimed to provide a result-based product to the investigator within 8 hours for high priority cases. For example, if they get ammunition from a crime scene they processed it nearly immediately with limited delays. They were flexible and would also work during out-of-office hours if necessary. The

flexibility of labs to respond to urgent cases quickly reported by the majority of participants, meant they saw no need 'walk-in Wednesdays'¹.

"A quick case is a case where the question is 'is the firearm functional?' 'has it been used in any known crime cases/crime scenes?' And 'what part of the regulations is it included in?' So that's the three questions that mostly seen in our cases actually and we answer these three questions and it's out of the door again; that's the prioritisation, priority" (Denmark).

"If someone does have something extremely important then they can come to us [at any time]. And this is actually sometimes the case, that colleagues come to us personally and want something examined directly, which we do. But it doesn't have to be on a Wednesday. It could also be during a weekend. It depends, as mentioned before, on how important it is. So that there would be a particular day when we would prioritise certain cases that doesn't exist here" (1MFDLE).

5.4.5 International Comparisons

Participants were asked about their use of double-casting: a method of creating a making microscopic quality replicas from ballistic evidence, as an alternative to sending original evidence for the purpose of international comparison or linking to previous crimes, as well as in situations whereby the ballistic systems used were not interoperable between the interested parties. They were also asked about their use of IBIN to seek international comparisons. The results are presented in table 5.4 below.

¹ Walk-in Wednesdays: were developed by the Los Angeles Police Department(LAPD), to provide immediate feedback to the investigators concerning their ballistic evidence, after entering these into IBIS and searching NIBIN database.

Table 5.4: Double casting and use of IBIN

Country	Does the country use double casting?	No. of double casts produced	No. of double casts submitted to other country	Percentage double-casts submitted to another country	Use of IBIN to seek international ballistic connection?
Belgium	Yes	Around 50	Around 20	40%	No
France	Yes	None	None	-	No
Netherlands	Yes	Around 10-20	Around 25-40	100%+	Yes
Germany	Yes	Around 10	5	50%	No
Spain	Yes	44	16	36%	Yes
Portugal	Yes	5	15	100%+	Yes
Former Yugoslav Republic of Macedonia	No	/	/	-	Yes
Denmark	Yes	Around 30	30	100%	Yes
Sweden	Yes	2-3	2-3	100%	Yes

Generally, double casts are made if the evidence needs to move to another region (1MBeBal) often upon requests from IBIN members (Macedonia). Although double casting was used by all countries but one (Former Yugoslav Republic of Macedonia), a relatively small number of casts was produced (varying between none and around 50) when compared to the number of exhibits received. Although France had the facilities to produce double casts, none were produced in the last 12 months as double casting is only undertaken when collaborating with IBIN (1MFRB). Of those who did produce double casts, four submitted 100% or more of them to another country. Between 36% and 50% were submitted by the other respondents. This suggests that for many countries, double-casts are not produced speculatively, but with a view to submission to another country.

Double-casts were regarded as the best method for international comparison by some countries, whereas others regarded the original evidence as easier to compare (1MBeBal), and it was noted that the process of double-casting is time consuming (1MESB). Often requests for double casts came from neighbouring countries, such as in the case of the Netherlands (2MNLB). With regards to hits, Belgium stated they had one hit using the double casting method, but it was intelligence led. Therefore, there have been no cold hits using this method (1MBeBal).

Whilst some countries were using double casting to submit samples to other countries, not all were using the IBIN facility for cross-comparisons. Among the countries that returned the questionnaire, six were members of IBIN. Many regarded the facility as important in tackling cross-border organised crime.

“This is the slide of the first IBIN hit. Of course, trans-national crime you know that implies international connection, crime mobility for the criminal organisation and their members and they use weapons and they perpetrate violent acts, it’s known by everybody. So, the possibility to compare ballistic data is very important” (1MESB).

Concerns were expressed as to whether a cross-border OCF would be effective, however, the OCF shared between Sweden, Denmark and Norway, was regarded as effective, and it was reported that daily correlations were identified between these countries (Sweden). However, some participants were doubtful that hits could be found outside of neighbouring countries. Indeed, during the last 12 months, only two of the international comparisons through IBIN were successful, with hits found between Portugal and Spain as well as between Denmark and Sweden; three hits were reported by Denmark with Sweden within the last year. From the interviews, it appeared that the UK and the Netherlands also got a hit but not through IBIN. Former Yugoslav Republic of Macedonia had used IBIN to find a correlation but the results were negative. Belgium, France and Germany all received requests from IBIN but with no correlation found. Another concern regarding the use of cross-national comparison technology was a perception that this would breach data protection legislation.

“I think the idea of IBIN is probably good, if you say selectively I have some sort of indication that someone has left Guatemala who has carried a firearm and I would like to check if there is a hit with our data. But the system is not made for checking out of the blue and trying to find something. Considering that out of the 600,000 entries only 35 hits were found, all of which were between neighbouring countries, confirms our assumption that there are easier ways of doing this” (2MFDB).

“There has been a study on, which was done by BKA, study concerning the numbers of cross-border hits and whether it was interesting to compare... Well, we agree and think that same. Yes maybe one day we will be able to do a hit between France and Spain, maybe, but it is still ballistic hits, it is not identifications of people” (1MFRB).

“...it’s just suggested that you can input some data in some part of the world to then get a result at another part in the world, and that neither meets our legislation around data protection nor is the quality of the firearm details that are being put in sufficient for using it. Hence, the whole system is compromised” (2MFDB).

5.4.6 Knowledge exchange and networks

Many of the participants are part of the European Network of Forensic Science Institutes (ENFSI) Working Group, and five of the participants mentioned their membership and the opportunities of knowledge exchange that ENFSI can provide. The European Firearms Experts (EFE) network was also identified as a knowledge exchange vehicle for investigators. As noted above, in addition to the existing network expert group, some of the participating countries work in close relationship, such as Portugal and Spain or Denmark with Sweden and Norway, who share common borders.

“We are a working group and just to give a simple example, at some point we did a workshop there. That was on, let’s say converted firearm, gun alarm, pistols that were converted to normal, bullet, shooting, firearms. So everybody, alright everybody, many people explained about the situation in their country, what do you see, what kind of firearm do you see, and it was already clear that you see different guns in different countries or different areas of the country, so there must be roads, that those guns come in but there they are disposed or being sold on the black market and they might be used but you see them only occasionally, coming towards other countries. At least that was my idea from that, from those presentations” (4MBeB).

“There is also the EFE, the European Firearms Group, which in a European level I think are more interesting for investigators and for us ballistic experts there is the ENFSI, the European Network of Forensic Science Institutes. There are different work groups and one of them focuses on firearms. And there is a regular exchange of information. On a European level I would say these are the main ones” (1MFDLE).

5.5 Summary

The ability to draw firm conclusions regarding the value of ballistics comparison systems, either on a national or cross-border basis, is hampered by inconsistencies regarding data recording practices and definitions. However, there are a number of conclusions that can be drawn when combining statistical and interview data. Firstly, there are inconsistencies between countries in terms of who undertakes ballistics testing (central/regional labs, independent experts), and this has a potential impact both in terms of quality, and the potential for losing important intelligence from central systems. Secondly, there is currently no single shared European database and, at present, the potential for linking databases on an EU basis is restricted due to the use of reportedly incompatible systems. Whilst there are processes for cross-border checking through the Interpol IBIN system, double-casting and linking compatible systems in neighbouring countries, the capacity for cross-border networking is currently limited. However, there is some acknowledgement that such capacity would be beneficial, and this is further explored in the following section. Finally, knowledge exchange between countries demonstrates clear benefits both for exchanging best practice, and for improving understanding of trends and issues in firearms movements, allowing for more efficient targeting of resources.

6. AN EXPERIMENTAL INVESTIGATION OF CROSS BORDER BALLISTICS INTELLIGENCE SHARING

Matt Lewis, Paul James and Helen Poole

6.1 Introduction

As part of the EFFECT Project, an experimental study was undertaken to evaluate the potential of cross-border ballistics intelligence sharing in understanding and combatting the illicit trafficking of firearms between states. The significance of this phenomenon has come into sharp relief following the commencement of the project, specifically in relation to the terrorist attacks in Brussels and Paris. In the aftermath, and as a result of police and counter-terrorism investigations, the focus has come to rest on the flow of SALW from post-conflict zones such as the Western Balkans.

6.2 The Western Balkan Context

Whilst organised crime in the West Balkan region pre-dated the conflicts in the 1990s, it is felt that the various political changes and instability that this created, did 'provide opportunities for organised crime to proliferate' (Small Arms Survey, 2012: 3). Accordingly, the Western Balkans has become both a transit region, and a major source of SALW traded on the international weapons market. Whilst this is a commonly held belief, it should be noted that there has been no systematic attempt to examine organised crime and arms trafficking in the region, and thus there is no empirical evidence to support such assumptions (Small Arms Survey, 2012).

Nevertheless, the proliferation of arms from post-conflict regions has long been a concern within and beyond the EU. This includes not just the Western Balkan region, but also other states such as Turkey, which borders conflict zones and is experiencing its own civil unrest. Other areas affected by ongoing or recent conflicts that contribute to the proliferation of firearms, include the former Soviet Union which has been identified by the UN as the source of many SALW (UNODC, 2010). It should also be noted that the destination of such illicit firearms is not only the EU, but also East, Central and West African regions.

The source of these weapons is complex, often shipped by organised groups to conflict zones, with seemingly legitimate paperwork to a legitimate end-user, and then diverted post-delivery or at the point of departure (UNODC, 2010). For example, in 2002, 5,000 AK-47s from Yugoslavian stock piles were moved from Serbia to Liberia under the guise of a legal transaction with Nigeria (Arsovska and Zabyelina, 2014). The value of such trade is estimated at between 1 and 10 Billion Dollars per year. Whilst such large shipments are generally destined for conflict regions to arm specific groups, they also result in stockpiles of illicit firearms that find their way into the hands of criminals and terrorists.

In relation to the Western Balkans, it was estimated in 2010, that there were 8 million weapons still in existence in former Yugoslav countries (UNODC, 2010), and, whilst many of these weapons were out-of-date, they were still deployable as firearms. There is also a high civilian possession rate estimated at between 3.6-6.2 million (both registered and unregistered), a factor that has been linked to the relatively high (although decreasing) homicide rate and insecurity in the region (Small Arms Survey, 2014). Of these, an estimated 1.1 million registered, and up to 1.5 million unregistered firearms are in civilian hands in Serbia alone, the highest prevalence in the region (Small Arms Survey, 2014). The reason for high levels of gun ownership are complex, resulting from values of patriotism; fear and trauma resulting in a conflict mentality; and gun cultures defined by honour, passion and masculinity (Arsovska and Zabyelina, 2014). Therefore, the rationality of gun ownership

in such regions, cannot be understood from a Western European paradigm, and may require different approaches to control and reduction.

One of the major concerns for Serbia is the flow of convertible weapons both in transit and for the Serbian market, which have been seized and confiscated on its borders with other Western Balkan countries (SEESAC, 2009). Often such weapons are modified by amateurs, without any technical skills, which pose as much danger to the user as the intended victim/s. However, there also exists a significant skills base in firearms in Serbia, due to the large number of Serbians previously employed in the arms industry in the 1990s. 60% of arms production during the conflicts took place in Serbia (Arsovska and Zabyelina, 2014). Nevertheless, Serbia has robust legislation around convertible firearms, and this is felt to have prevented an organised illicit industry in the modification of convertible firearms from developing (SEESAC, 2009).

6.3 Intelligence Sharing

The need to combat the illicit trafficking of firearms and other substances is a firmly established focus for the EU, with the Council inviting Member States, the Commission, Europol and Interpol to strengthen its response (European Commission, 2015b). Whilst legislative measures have been put in place, operational cooperation at an EU level among MSs and third countries is identified as a priority. Part of this process includes building a better intelligence picture of firearms trafficking, leading to the call for stakeholders to map out global firearms trafficking routes to the EU.

This has been previously noted by another EU commissioned project as a significant issue. Project Odyssey noted that whilst the majority of law enforcement agencies believed that criminals actively use and move firearms across the EU and therefore, 'criminals, guns and evidence move across borders', data held by agencies in Member States does not move across borders so readily, despite being commonly collected (Akhar and Yates, 2011). Based on the Odyssey Platform, the 2015 EC communication specifically addresses ballistics intelligence sharing and states that 'the Commission will facilitate the exchange of ballistics' information through a dedicated platform using the Ballistic Information Network and other relevant systems in use by Member States' (European Commission, 2015b:10).

This part of the project therefore attempts to assess the potential contribution of cross-border ballistics intelligence sharing between states, focusing on Serbia due to its recognition as a transit country, and comparing ballistics information with a number of EU and third countries. This part of the project was undertaken by a sub-contractor, Arquebus Solutions, based in the UK.

6.4 Methodology

Arquebus Solutions developed and delivered a ballistics comparison exercise to compare the ballistic material of Serbia with that of the following participants: Denmark, Italy, Kosovo*, Norway, Serbia, Sweden, and The Former Yugoslav Republic of Macedonia. (Bulgaria and Croatia who were detailed in the originating documentation were not able to participate.) The purpose of this experiment was to illustrate the movement of firearms, and to identify incidences where the same gun has been used on more than one occasion, by comparing discharged cartridges from crime scenes, as well as through the test firing of recovered firearms.

6.4.1 Data Protection

Extended negotiations took place with representatives from law enforcement agencies and government officials of Croatia and Bulgaria, with a view to gaining approval to share their ballistics data. Despite there being some clear advantages to both countries in becoming involved, the main barrier to their participation was a perception that such data was personal, and therefore fell under

Data Protection legislation. This brings to the forefront the whole issue of whether the sharing of ballistic data contained within a Ballistic Identification System (BIS) contravenes the principle of the protection of personal data established by the Data Protection Directive (95/46/EC) and reinforced by the Prüm Convention.

The majority of data contained within the utilised Ballistics Identification System (BIS) is directly concerned with the demographic information relating to the firearm or ballistic material. Concerns were raised that a Case File Number could be used to link information contained within the BIS with information contained in the Case Management System of the participant country, and that this would constitute a breach of the Act. In order to address this concern, verification has been provided that this would only be possible if the user had access to both systems, as there is no link between the BIS and the investigative case management system.

The above provided a representative example of a concern that has been expressed by a number of participants regarding data protection and the sharing of ballistics data. This is an important issue as one of the key benefits of sharing ballistic intelligence is the anonymisation of the data and the fact that no personal information is exchanged.

6.4.2 Acquisition and correlation of ballistic material

In order to perform the ballistics correlation activity, Arquebus worked closely with the Head of the National Criminalistic Technical Centre (NCTC) of Serbia. The NCTC provided consistent and notable support in the pre-activity required to collate and prepare the 1,000 pieces of ballistic material required for the activity. It should be noted that this task was complicated by the absence of an Open Case File (OCF). Due to an OCF not being present Arquebus was unable to readily access recovered and test fired ballistic materials originating in Serbia. The absence of an OCF can lead to ballistics correlations being missed and historic data being lost or misplaced.

As a result of the absence of an OCF, Arquebus worked with representatives from the NCTC to locate ballistic material from within the Criminal Justice System of Serbia. As described above, the goal was to acquire, correlate and review 1,000 cartridge cases from crime scenes, and from the test firing of recovered firearms. This proved to be a considerable challenge with ballistic material located in police property stores in a variety of locations across Serbia, as well as with prosecutorial staff and within the NCTC laboratory itself.

In the initial planning phase, Arquebus had anticipated the relocation of its Integrated Ballistics Identification System (IBIS) to the NCTC laboratory in Serbia. This approach was taken in order to negate the movement of criminal evidence outside of Serbia. However, due to Customs restrictions, Arquebus was not able to get the necessary equipment into Serbia in a timeline that would have been acceptable to the overall project.

In tackling this issue the team sought to utilise the Interpol approved Double Casting process in order to create duplicates of the original material for transportation back to the Arquebus Ballistics Laboratory in the United Kingdom. The Arquebus team faced a number of considerable challenges with this approach, the most notable being that the current Double Casting process is geared towards the creation of individual items using small scale equipment and consumables, rather than large-scale production. To address this, Arquebus sent staff to Forensic Technology in Montreal, Canada to receive certificated Double Cast training and to assess the feasibility of large-scale Double Casting. Through this feasibility exercise, it was established that Arquebus would need to create a new process in order to meet the necessary requirements of large scale Double Casting. Arquebus has tested and evaluated a number of different process variations and equipment in order to

achieve a successful outcome that not only allows for the large scale production of Double Casts in a timely manner, but also ensures the extremely high levels of quality demanded by this process.

Following this successful outcome, Arquebus shipped a complete large scale Double Casting capability to the NCTC Firearms Laboratory in Belgrade, Serbia. This equipment was utilised by Arquebus Ballistics Technicians working in conjunction with Scientists from the NCTC to Double Cast all 1,000 pieces of ballistics material. This material was subsequently transported to the Arquebus Ballistics Laboratory in the UK for acquisition, correlation and review. In support of the above recommendations, and to ensure that the project is able to have a positive legacy impact, Arquebus has agreed to donate to the NCTC all of the Double Cast ballistic material it has created as part of Project EFFECT back to the NCTC in order that it can have an operational OCF for the first time.

Following a Quality Assurance process, the Double Cast items from Serbia were acquired into the Integrated Ballistics Identification System (IBIS) BrassTRAX 3DHD system of Arquebus. This ballistics comparison technology allows for the breech face, firing pin, ejector and extractor markings left on the cartridge case upon firing, to be uniquely matched to marks left on other cartridge cases fired from the same gun. In acquiring images of these marks through ballistic comparison technology, such as the IBIS system, a comparison can then be made against a database, or databases of acquired images to establish ballistic links between incidents, in this case the databases of Denmark, Italy, Kosovo*, Norway, Serbia, Sweden and The Former Yugoslav Republic of Macedonia.

In performing the correlation activity Arquebus amended its original project plan of performing a single correlation exercise against all of the databases contained within the defined dataset to a two-phase approach. This was for logistical reasons, as well as to improve the quality of the correlation activity due to the varying technology levels of the participants. The Arquebus team correlated the dataset of Serbia against the following participants within Phase 1; Denmark, Norway, Sweden and the Former Yugoslav Republic of Macedonia. Phase 2 correlations saw the correlation of the Serbian dataset against remaining participants; Italy and Kosovo*, as well as within Serbia itself. It should be noted that the correlation methodology used in this process is an outwards facing correlation. This process sees the ballistic dataset of Serbia compared with that of the participants. It does not allow for the correlation of all of the datasets on mass, therefore, the process does not see the correlation of material from Italy with that of Sweden, for example.

6.5 Findings

Following the completion of the correlation exercise, Arquebus has reported a total of 53 probable ballistic connections. Probable ballistics connections are defined as an IBIS based comparison where the certainty of a connection being established is highly likely.

The following table defines the breakdown of these connections on a territory-by-territory basis.

Table 6.1 Summary of the number and nature of hits identified

Country 1	Country 2	Number of linked shootings	International	National
Serbia	Sweden	2	1	1
Serbia	FYR Macedonia	1	1	-
Serbia	Kosovo*	1	1	-
Serbia	Serbia	49	-	49
Serbia	Italy	-	-	-
Serbia	Norway	-	-	-
Serbia	Denmark	-	-	-

The ballistic connections made as part of this project demonstrate clear potential in understanding the movement of criminal firearms. Of particular interest is the three ballistic connections established between Serbia and Sweden. (An additional connection between the originating item and a test fire in Sweden was also established.) These connections clearly demonstrate that firearms, and their components, are being trafficked from South East Europe to Northern Europe, where they are subsequently being used in crime.

When considered in the context of the limitations of the data available to the project team, and the fact that the search was only made of the Serbian database individually against the databases of the other participant countries, the findings of these linkages are notable. The data would suggest that the use of a cross-comparison system on a larger scale, could facilitate cross-border working between law enforcement agencies to understand both the value of individual hits, and the broader context of the nature of gun enabled crime internationally. However, it is also apparent that further research needs to be conducted to understand the significance of the ballistic identifications that have been made, and their value in the detection and prevention of gun related crime.

One of the key findings of the research is the number of internal links found within Serbia itself. The Laboratory in Serbia operates an alternative BIS to the IBIS system used within the project, but the fact that a considerable number of new links between incidents were highlighted that had not been previously identified by the existing process, exemplifies the importance of ensuring that countries within South Eastern Europe have access to the correct technology, processes and infrastructure to identify ballistic links within their own territory. By effectively tackling the illegal possession, use and supply of firearms in their own jurisdiction, not only will the threat to the safety of citizens of these countries be reduced, but the increased ability to remove firearms from criminal possession will reduce the potential for them to be transported across borders and threaten the security of the EU.

Although all of the direct connections are of extreme importance in this process, it is the presence of commonality in the class and subclass characteristics displayed within the datasets of the participants that may provide the most notable evidence that the criminally held firearms of Europe and South East Europe clearly transcend borders; in doing so these firearms are travelling considerable distances between crimes.

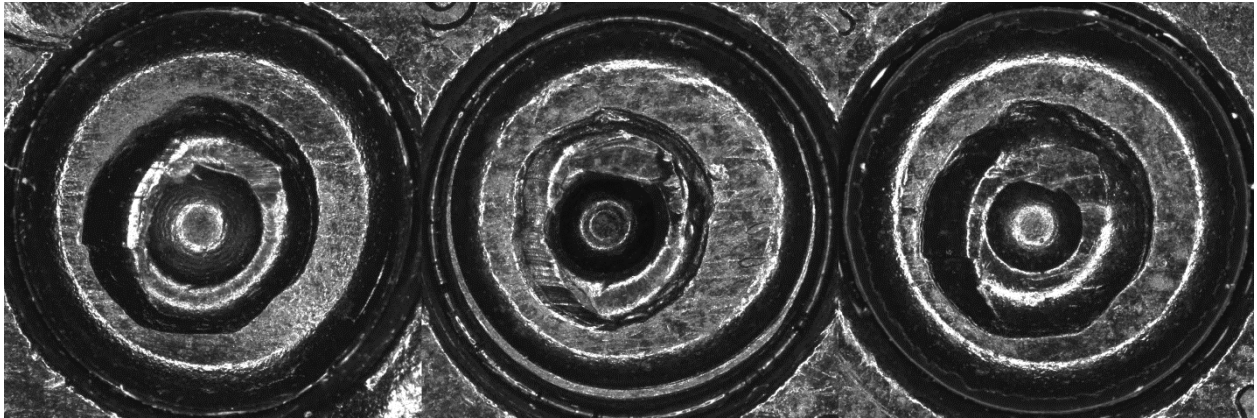
The exhibits in an OCF are usually organised and subdivided according to the so-called “class characteristics” and “subclass characteristics”. For bullets, class characteristics are calibre, number and direction of land impressions, together with their width and sometimes their pitch. For cartridge cases, the most important class characteristics are calibre, shape of the firing pin impression, breech face impression and the position and shape of ejector and extractor marks. Subclass characteristics are marks created during batch lot manufacturing and are present only on tools from a specific batch lot.

From reviewing the phase one results it is clear the Serbian dataset shares considerable commonality with a vast subset of the Swedish dataset (both crime and test fires). This would appear to demonstrate that weapons originating in South East Europe are subsequently trafficked into Northern Europe; that being said, the South East European region is clearly being impacted upon by these illicit firearms, not only in terms of being exploited by criminals in relation to the supply of firearms, but also being victims of their use.

A key example, the Zastava CZ99 pistol, appears frequently in Serbian comparisons to Sweden. Although Arquebus found a direct ballistic connection between these two countries for this particular weapon type, it is important to note the considerable commonality between the types of class and subclass characteristics for those items that were not connected. Arquebus observed that the similarity is strong enough to believe these firearms originate from a common source.

It is also essential to note what is not common in order to understand in which direction firearms move. It is clear much of the Serbian dataset shows little commonality to that found in Italy. Exhibits which demonstrated characteristics of converted weapons were uncommon in Serbia, however these were frequently seen in Kosovo and Sweden. This gives some strong indications of the types of firearms converted in different areas of Europe. The 7.62x39 calibre is ubiquitous however, often associated with AK variant weapons and appears in South East Europe, Italy and Northern Europe. However, the class and subclass characteristics are more difficult to observe as they often bear resemblance to the Serbian manufactured Zastava M70.

Image 6.1 Three examples of Zastava CZ99 breech face images from different countries.



Box 6.1 below provides a detailed case study illustrating how ballistics data can lead to clear hypotheses concerning the illegal trafficking of firearms and their constituent parts:

Box 6.1 Case Study

Case 322/07 (PU Pirot 2007) shows a strong connection to five cases (.32 auto calibre) by resemblance of breech face characteristics. The firing pin and ejector for case 322/07 however, does not bear resemblance to any of these five cases.

The five cases bear resemblance to each other across breech face, firing and ejector marks. These cases are: KT 301-1313/08 (PU Nis Sept 2008), UV 685/09 (PU Kraljevo 2009), KT 301 1131/09 (PU Nis Oct 2009), KT 301-1461/09 (PU Unknown Dec 2009), KT 813-556/13 (PU Novi Pazar 2013). In these five cases the firing pin appears to have rotated and bears marks at a variation of angles relative to the repeating breech face marks.

The firing pin from the original case 322/07 (PU Pirot 2007) does bear resemblance to a firing pin found in a search against the Swedish .32 auto database case from 2013 that was reported to the NCTC and Swedish Police previously. There have been no matches found in the Serbian database for this firing pin.

This would infer the weapon used in the initial case 322/07 has been broken down and rebuilt between 2007 and its next usage in September 2008. We would suggest it has then been refitted with a new firing pin and ejector. The new firing pin is seen across five further cases, however it appears to rotate either intentionally or due to being rebuilt poorly. The original firing pin appears to have been discarded after its initial criminal use, for use in another weapon, potentially related to the connection found in Sweden in 2013.

6.6 Summary

Despite the relatively small and limited nature of the Serbian ballistic material used in this exercise, the findings in relation to the direct connections, and class and subclass characteristics clearly show that there is a significant gap in the current EU and South East European Intelligence picture in this area.

It is clear that a considerable limiting factor in current pan-European ballistic comparison activity is that there is no one system or protocol for the 'proactive' correlation of ballistic material across either the EU or South East European geographic area. That is not to say that the available IBIN system or protocol is not helpful or supportive, however, it must be recognised that not all territories within the region are members of Interpol. In addition, it should also be noted that a number of countries inside the EU are not members of the IBIN network, this includes some countries who are users of the technology utilised within the IBIN system architecture, namely IBIS.

As a result, the respective law enforcement organisations of both the EU and South East Europe are reliant upon specific intelligence that two incidents may be linked before commissioning any cross border comparative work to be conducted. This is completely contrary to the proactive nature of intelligence sharing that is being advocated.

One of the key findings of the research is that considerable untapped knowledge regarding the supply, movement, illicit manufacture, conversion, use and origins of illicit firearms lies within the data held both within the ballistic comparison systems of EU and non-EU members, as well as within their respective intelligence and investigative capabilities. The collection, integration, evaluation, analysis and dissemination of the aforementioned ballistic, intelligence and reporting information could have a significant impact on the prevalence and use of illicit firearms both within the EU and South East Europe.

7. FINDINGS AND RECOMMENDATIONS

7.1 The Nature and Prevalence of Gun Crime

Question: What is the nature, prevalence and impact of gun crime across Europe?

Currently, it is not possible to determine the true extent of gun enabled crime across Europe due to the fact that 'gun enabled crime' is not an identified notifiable offence category, nor is it consistently defined in legislation. Countries do not consistently record the presence of a firearm when a crime has been committed/recorded. Statistical data obtained from each country concerning the amount of crime committed with a firearm revealed more than 20 different offence categories. Homicide and robbery were the two categories in which the presence of a firearm was most commonly identified. However, three (out of 13) countries did not report homicides with a firearm, and seven (out of 13) countries did not report robbery with a firearm when data were requested concerning 'the use of firearms in crime'. Some countries returned data that simply identified the number of crimes against the 'Firearms Act' or equivalent, and these did not specify whether they were crimes of violence or crimes regarding the licensing or possession of weapons. When data concerning specific criminal offences involving a firearm were provided they were most often violent criminal acts.

Morbidity data for European countries provided an estimate of firearms deaths that were not self-inflicted ranging from 1,665 – 2,093 with considerable variation in the rate of deaths per 100,000 between countries (0 – 1.39). However, in most instances it was not possible to determine which firearm type was involved due to poor quality data collection and the use of an 'unspecified' firearm category. It was also estimated that in addition to these deaths, there would be between 33,300 – 83,720 hospital visits for non-fatal gunshot injury, and between 499,500-627,900 outpatient appointments per year associated with gunshot injuries. Police data concerning robbery obtained from nine countries identified 25,705 incidents in the most recent year, and again the rates varied substantially between countries (1.3 Portugal; 86.02 Sweden).

Due to the poor quality of the data available, determining the full economic cost of gun crime in any given European country is difficult. Moreover, many costs of gun crime are hidden and not included when economic calculations are conducted. These include many indirect costs associated with lost productivity. Based on data available in the UK for six crime categories, taking the most recent years gun crime figures, it was estimated that gun crime costs the UK economy at minimum €252,792,244 per year.

Participants who were interviewed expressed a range of opinions regarding what constituted gun crime in their country. Many referred to local legislation and penal codes, whereas some suggested that 'real' gun crime is '*a violent crime in which a firearm is used*', ranging from robbery, assault, and murder and including terrorist incidents. Interviewees were clear that 'better data' needs to be obtained regarding the use of guns in crime so that an adequate response can be developed to what is generally perceived as an increasingly important issue. Moreover, the availability of reliable and valid data that captures the full range of crimes in which firearms are used will enable the impact of local and national responses to gun crime to be evaluated, which are in general lacking.

In accordance with the 2015 Action Plan (COM(2015)624 final) our findings lead to recommendations which similarly highlight the need to improve statistical and analysis tools in order to obtain a more precise intelligence picture regarding the nature and prevalence of gun crime. Moreover, we support the suggestion of the development of national focal points within each country to facilitate data analysis and sharing.

Recommendation 1:

- Countries should develop their crime recording procedures to indicate when a firearm has been used within any existing notifiable offence.

Recommendation 2:

- It is recommended that in all EU member states one national central point shall be established to gather, analyse and disseminate data and intelligence information regarding GEC. This will ensure that accurate intelligence-led knowledge about gun crime is equally shared amongst law enforcement agencies, within and across EU member states, allowing for regional as well as cross-national factors that have an impact on GEC to be highlighted and effectively responded to.

Recommendation 3:

- A cross-EU definition of 'gun crime' should be adopted within the legislation of each MS. Gun crime should be defined as 'any actual, attempted or threatened act of violence, or terrorism in which a firearm or an item perceived to be a firearm has been involved (used or recovered), and/or the possession of a prohibited firearm'
- Statistics should be compiled on an annual basis and 'gun crime' statistics reported in relation to the following categories:
 - Crimes in which a firearm has been used and resulted in death
 - Crimes in which a firearm has been used and has resulted in non-lethal injury
 - Crimes in which a firearm has been used to threaten or coerce a victim
 - Incidents of Terrorism where a firearm has been involved (recovered or used)
 - Possession of a firearm based on Annex I of Directive 91/477/EEC classifications.

Recommendation 4:

- Gun crime statistics should be reported as frequencies, a percentage of reported crime and in relation to the number of offences per 100,000 of the population.

It has been suggested that mortality data can provide a proxy measure for gun crime prevalence, however this is only the case for serious instances that lead to death. Victim surveys too are challenging to implement in that they are expensive, and are inconsistent in their definition of crimes, making international comparisons difficult. Consequently, a range of data collection activities are needed in each country using approaches that are as standardised as possible given the local context, in order to capture data that can be triangulated to provide a true picture of gun crime.

Recommendation 5:

- Routine emergency room data should be collated that identify the number of people attending the emergency department of local hospitals due to gunshot injury; these data need to be collated and reported as the rate of emergency room visits for the treatment of firearms related injury per 100,000 of the population.

Recommendation 6:

- Population surveys should be conducted on a regular basis in order to provide retrospective estimates of gun crime experience to supplement health and criminal justice surveillance data and these data should be reported as the rate of victimisation cause by gun crime per 100,000 of the population.

7.2 The Development and Implementation of Legislation:

Question: What assists and impedes the development and implementation of gun crime legislation?

Answer: Participants acknowledged that firearms legislation typically focuses on the control of legally held firearms, and that this is most often amended in response to gun enabled crime. In addition, sentencing rules had been modified in some countries to increase the severity of punishment for crimes committed with a firearm. It was identified that firearms used in crime are most often illegal rather than legally owned firearms. There were divergent views regarding whether existing national firearms legislation was adequate, and whether additional national and/or EU wide legislation is needed. Some participants felt that current firearms legislation was completely adequate, whereas others were concerned that it was outdated. Participants reported that the process of developing and implementing firearms legislation in response to gun enabled crime was very challenging, and that the tendency to make small changes leads to a situation where legislation is unclear and inconsistent and requires a complete overhaul.

Participants identified that even when the firearms legislation was good, it was not always understood, or enforced accurately by courts, prosecutors and the police. The process of amending legislation is typically driven by major events (e.g. Paris attacks) as these events serve to soften public opinion, increasing the likelihood that changes will not be challenged. The fact that gun crime is a political issue was deemed to be problematic as politicians may raise issues of gun crime in their election manifestos, but then not deliver once they have been elected. Lobby groups are widely consulted on legislative change, but this was not always perceived as helpful with some indicating that this slowed down the process. Indeed public opinion was deemed to be a very influential factor in relation to the development and implementation of legislation. In countries which were deemed to have a high level of gun ownership, societal views that were positive towards gun ownership, and vocal shooting clubs and lobby groups, legislative changes were more widely challenged due to the onus of legislation being the regulation of legally held firearms. Additional factors that make the process of implementing legislation more difficult include: recent national conflict, existing other priorities (e.g. economic pressures), the impact of the economic crisis on resources, and the fact that 'gun crime' has not been officially recognised as an issue requiring a legislative response.

Despite the United Nations Firearms Protocol definition of what constitutes a firearm, there remain differences across the EU in defining firearms within legislation. It was clear that firearms legislation varied considerably, even when countries were adopting policies following the EU Firearms Directive, and that these inconsistencies led to loopholes that could be exploited by criminals. Of specific concern were the divergent definitions and control of antiques weapons; disparities in deactivation standards between countries, and lack of consensus regarding the definition and control of readily convertible firearms. Our recommendations consequently supplement the proposed amendments to the Directive (European Commission, 2015b) published in November 2015.

Recommendation 7:

- The stature of antique weapons should be reviewed in order to preserve historical items in the most respectful way whilst ensuring that criminals do not have access to functioning firearms.

Recommendation 8:

- The definition of 'readily convertible firearms' should be harmonised and a process of type approval for blank firing / acoustic signalling firearms should be implemented across all member states whereby firearms designs are assessed both before sale and continuously thereafter in order to ensure non-convertibility. This process could be incorporated into the

amendments to the EU firearms directive 91/477/EEC and should be linked to EU importation regulations.

Recommendation 9:

- Deactivation standards should be harmonised and enforced across MS and when deactivation standards are changed, these should be applied retrospectively to all firearms that have been deactivated based on historical standards. If this is not feasible, then it is recommended that these weapons should be subjected to general weapons law.

Recommendation 10:

- The EU should survey international deactivation standards in order to inform decisions taken to develop harmonised deactivation standards across the EU.

Discrepancies in the basic licensing conditions of firearms between countries were highlighted as a mechanism through which firearms legally purchased in one country can be moved into countries where their ownership is illegal, thereby making it difficult to monitor and identify legal and illegal firearms.

Recommendation 11:

- Clear guidelines should be developed to clarify what data relating to gun crime and its prevention can be shared between MS, and the processes for sharing these data need to be clarified.

Recommendation 12:

- Personnel at all levels should be trained concerning the most up to date firearms legislation in each country.

7.3 The Detection and Policing Of Gun Crime

Question: What are the challenges to the effective policing of gun crime in Europe?

Answer: The majority of participants interviewed identified that firearms were of secondary importance in the detection and policing of crime where a firearm is involved. Instead of focusing on the firearm, investigations are reactive and focus on identifying and apprehending the perpetrator. Police resources are allocated to the investigation of such crimes, as deemed appropriate. However, many participants felt that there was much less emphasis placed on the proactive investigation of the source and supply of a weapon, and the history of its movement into criminal circles. In practice, considerably less effort and resources are allocated to such proactive policing. A more coordinated approach to identifying high risk firearms, supply networks and emerging threats is required. Our recommendations consequently support the major tenets of the 2015 Action Plan (European Commission, 2015a) concerning the need for better inter-agency and multi-sectorial responses to gun crime, and also improved training for frontline police personnel.

Recommendation 13:

- Prioritisation regarding the investigation of GEC should be maintained at all times and with specialist resources identified and deployed accordingly. Doing so will help change the investigative mind-set of law enforcement officers, enabling a police response which is thorough, proactive and which includes the investigation of the source/supply of the weapon as a priority rather than a secondary consideration.

There was some evidence from participants that the most effective way to intervene in order to reduce the levels of gun crime is by adopting a multi-agency approach with major emphasis on the involvement of the community. Various examples of interventions were given where the police worked in partnership with the local council, Non-Governmental Organisations (NGO's) and voluntary groups. By focusing on gun crime as a specific issue and by adopting a holistic approach with appropriate levels of resourcing, significant decreases in the levels of gun crime can be achieved that provides reassurance to the community.

It was felt that such partnership activity cannot be viewed as a short term measure but needs to be maintained over the long term to build on what has been achieved and to deliver lasting beneficial change. Several factors were identified that influenced decisions to end initiatives designed to reduce gun crime, including responding to economic pressures and austerity measures, and the higher prioritisation of other issues including drugs and the refugee crisis. Some participants indicated that these decisions were taken in response to an identified reduction in levels of gun crime.

Recommendation 14:

- A multi-agency approach to tackling gun crime should be adopted as good practice building on the approach taken by existing successful initiatives. The involvement of the community is of paramount importance. Such a holistic approach should recognise the socio-economic context in which the causes lie.

Recommendation 15:

- A long-term approach should be taken to the establishment of initiatives to tackle gun crime, and resources should not be removed in response to a short term drop in levels of recorded crime.

Recommendation 16:

- Given the dynamic character of gun crime, Firearms Focal Points (FFP) should be trained and resourced accordingly in order to ensure that the role of the FFP is both focused and exclusive. Good practice should be developed in support of this process from successful examples such as those seen in the UK with the National Crime Agency (NCA) and NABIS.

7.4 The Use of Ballistics Intelligence

Question: How can ballistics intelligence be used to combat gun crime?

Answer: Data illustrates that the current system of conducting correlations across borders is normally reserved for exceptional cases, or where there is specific intelligence or information to support a correlation/comparison via the transfer of physical material/duplicates, or through the utilisation of the IBIN network. A number of limitations were identified within this current system of work, namely its 'reactive' nature and possible limitations regarding the international exchange of ballistics data.

Participants were broadly in favour of cross-border ballistics information sharing. An improved Pan-European system could enable the greater sharing of ballistics data that is often 'siloed' on a country-to-country basis; this was more pronounced in countries where the participant was not an IBIN member.

Participants expressed mixed views concerning the technical and resource viability of a shared cross-national ballistics system. The specific barriers to adopting such a system included perceived

challenges concerning the potential for an increase in data 'noise', and a consequent lowering in the chances of identifying ballistic 'hits' expeditiously if all European Open Case File (OCF) data were to be compared routinely. There were also concerns about the cost and resource implications of performing a greater number of correlation reviews.

Participants expressed that enhanced cross-border ballistics information sharing could be achieved through the intelligent use of a cross-national system. As an example, geography, firearms demographic information, risk and threat information and intelligence data could all be used to define ballistics correlation activity in order to achieve the most efficient and valuable use of such a system. The current Scandinavian IBIS system architecture demonstrates good practice in this area.

Our recommendations support those actions identified in the 2015 Action Plan (European Commission, 2015a) which highlight the need to improve ballistics information sharing practices across EU MS, and the potential role of Firearms Focal Points in collating and analyzing ballistics intelligence.

Recommendation 17:

- Consideration should be given to implementing an EU-wide Ballistics Information Network. The network should facilitate the proactive correlation of European ballistic material based on an agreed Pan-European protocol. Such a network should incorporate a common set of processes and products in line with those of the Firearms Focal Points.
- In order to inform such a development, a feasibility study should be carried out to determine the achievability of a pan-EU network. Such a study should assess the technical and process capabilities required to implement such a solution. The study should specifically seek to address participant's concerns regarding data noise, whilst providing a detailed understanding of the potential limitations and benefits of such a system.

In the course of delivering the Work Package Two activities, a number of issues and challenges relating to the sharing of ballistics data for the purposes of ballistic comparison were encountered. A number of beneficiaries highlighted that the sharing of ballistics data could be considered to be contrary to the European Data Protection Act, in that it may disclose, or could be linked to, personal information.

In conducting the cross-national ballistics correlation activity, it has been noted that the majority of data contained within the utilised Ballistics Identification System (BIS) is directly concerned with the demographic information relating to the firearm or ballistic material. One beneficiary represented the view that a Case File Number could be used to link information contained within the BIS with information contained in the Case Management System of the participant, and this would constitute a breach of the Act. In order to address this concern, verification has been provided that this would only be possible if the user had access to both systems, as there is no link between the BIS and the investigative case management system.

The above provided a representative example of a concern that has been expressed by a number of participants regarding data protection and the sharing of ballistics data. This is an important issue as one of the key benefits of sharing ballistic intelligence is the anonymisation of the data and the fact that no personal information is exchanged.

Recommendation 18:

- A definitive statement on the position of ballistics data in relation to European Data Protection regulations should be clearly articulated in order to facilitate the consistent sharing of information on a Pan-European basis in order to support a cross-national ballistics information system and its associated activities.

The ballistic comparison activity carried out as part of the programme of activity has not only generated a substantial number of ballistics 'hits' but it has also highlighted significant trends in the distribution of firearms types across the participating countries. These have been observed through the class and subclass characteristics of the processed data. It is apparent that this data, along with Pan-European ballistics linkage information could provide a critically valuable resource for the intelligence and ultimately investigative capabilities within the EU. However, at the present time, there is no one central location for the collection, integration, evaluation, analysis and dissemination of ballistics data and associated intelligence/information.

Recommendation 19:

- A dedicated European Firearms Fusion Centre should be created within Europol to collect, integrate, evaluate, analyse and disseminate ballistics data and reporting information from the European and SEE European Firearms Focal Points, as well as from data contained with the proposed EU and South East European Ballistics Information Network.
- The European Firearms Fusion Centre should act as the conduit for the facilitation of Pan-European investigations and intelligence matters following a cross-border ballistic hit facilitated by the ballistics correlation server.

Recommendation 20:

- The individual FFP's should, through an agreed protocol and Memorandum of Understanding (MoU), feed information, intelligence and data to the European Firearms Fusion Centre based at Europol.

Recommendation 21:

- Consideration should be given to the establishment of a South East European Ballistics Information Network. Such a network should be established to operate in alignment with the proposed EU-wide Ballistics Information Network in order to facilitate the sharing of ballistics information both within the region and with the EU.

Recommendation 22:

- All beneficiaries in the South Eastern European region should be provided with requisite support to acquire and effectively utilise the appropriate technology to develop ballistic intelligence. This should include support in implementing processes and developing an infrastructure that enables them to further reduce the availability and use of illegal firearms.

The cost implications of acquiring and staffing forensic capabilities in relation to the examination and analysis of ballistic material for territories that experience relatively low levels of gun crime can mean that the investment in ballistics technology, infrastructure, and staff is difficult to justify when compared to other competing priorities. In addition, participants expressed contrasting views concerning the strengths and weaknesses of the available ballistic comparison systems, with factors such as cost, systems used by neighbouring countries, networking capability, and the ability to interface with IBIN, influencing these perceptions.

Interpol does provide support to its members through the provision of the global Interpol Ballistics Information Network, which provides participants with the ability to cross-match against the databases of other participating states on a case-by-case basis, although the data suggests that this capability is not used on a routine basis. In addition to the limitations of the IBIN network highlighted above it is noteworthy that not all territories within the region are members of Interpol. In addition, it is also noted that a number of countries inside the EU are not members of the IBIN network, this includes some countries who are users of the technology utilised within the IBIN system architecture, namely IBIS.

These factors combined with the fact that more than one BIS is in use in Europe, and that different systems are not compatible with each other, leads to an inconsistent approach to the exchange of ballistics information on a Pan-European basis. The need for a consistent system of information sharing is clear.

Recommendation 23:

- Interpol and Europol should work closely to provide support, good practice guidance and technical capability to all EU countries and neighbouring states in regard to ballistics intelligence and the sharing of ballistic material. This should be in line with the development of the European Firearms Fusion Centre and the creation of an EU-wide Ballistics Information Network. Such work should ensure the development of a complete and robust Pan-European intelligence picture in relation to the criminal use of firearms.

Considerable variations in the time taken to process ballistic material at the laboratory impacted directly on the effectiveness of the sharing of ballistics data. It was noted that homicide/terrorism cases were consistently prioritised and actioned within a five-day turnaround, whereas other crime testing could take up to 60 days. Only two of the eight participants reported that they had a backlog of material to process at the time of interview, however, it was expressed by a number of participants that ballistics evaluation was secondary to Trace Evidence Recovery (TER). These TER processes often caused considerable delays in ballistic material being analysed.

Recommendation 24:

- A standard, best practice time scale expectation for the acquisition, correlation, and reporting of ballistic crime related items should be considered in order to increase the intelligence and investigative value of ballistic material. This should be based on crime type and public impact and should ensure the integration of TER and evidential processes.

A particular procedural challenge highlighted within the research is the method of defining and counting 'hits'. Participants provided variable accounts of what does and does not constitute a hit, and how hits are both counted and recorded.

Recommendation 25:

- Best practice guidance should be published in line with the creation of an EU-wide Ballistics Information Network, defining ballistic hit recording protocols.

In accordance with the recommendations and narrative surrounding the harmonisation of crime data, it is apparent that this inconsistency may cause data to be misread and misreported.

Throughout the research, it was noted that with the exception of the United Kingdom and its dedicated National Ballistics Intelligence Service (NABIS), the majority of participants operated their ballistic forensics and firearms intelligence capabilities separately. This appears to be a very standard model of operation based on the requirement of the laboratories to service the need for evidential products. This model does provide for the considerable 'siloeing' of data and knowledge within the forensic, intelligence and investigative business areas. The NABIS example does appear to demonstrate that the integration of these areas and the development of integrated processes can result in a considerable reduction in gun enabled crime.

Interviews suggested that there was limited knowledge on how the ballistic laboratories carried out their work, specifically in relation to the Open Case File (OCF), and the potential value that they might be able to provide based on a ballistics intelligence type model, as demonstrated in the United Kingdom.

Recommendation 26:

- Ballistic intelligence training and best practice guidance should be developed for relevant staff in member states. This should include Investigators, Intelligence Staff, and Prosecutors and should include the provision of knowledge and understanding regarding the value of carrying out checks against the Open Case File.

Throughout the research, the team noted that there was generally a good uptake in the accreditation of laboratories to the ISO17025 standard, however in some cases, this was not achievable due to cost, resources or other reasons. In noting the challenges and process of achieving accreditation it would seem prudent that, as part of the development of an EU-wide Ballistics Information Network, all labs in the EU should aim to operate to this standard.

Recommendation 27:

- To ensure best practice, all labs across EU should strive for ISO 17025 accreditation.

The recommended establishment of a South East European Ballistics Information Network should adopt the same approach in order to support the consistent sharing of information with EU partners.

Recommendation 28:

- To ensure best practice all labs in the proposed South East European Ballistics Information Network should strive for ISO 17025 accreditation.

The dedicated research activity of Calabria University highlighted another area for development within the forensic arena, namely the training, evaluation and certification of Ballistics Experts across the EU.

Although the project did not seek to assess staff or their training it was apparent that no overall EU-wide accepted Firearms Expert test existed. In the absence of such a test, local training and certification was the accepted norm, however due the variation in standards and tests, such an approach did not provide a robust model across the participants.

It was highlighted that there was no register of Ballistics Experts in Europe. The combination of these two factors had, in some cases, caused Experts from a non-firearms field to be used in firearms cases with detrimental results.

Recommendation 29:

- Consideration should be given to the development of accreditation standards for firearms experts and the creation of a register of firearms experts working inside the EU. Such a register could be held by European Network of Forensic Science Institutes (ENSFI).

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Appendix 1.1 Interview schedules and ballistics questionnaire

Interview schedule

Laboratory personnel

General questions for staff in labs that process ballistic information (i.e. all interviews)

Can you describe the process used by your lab for handling firearms/spent brass/fired bullets retrieved from crime scenes?

How do you think that your organisation could improve its handling of firearms/spent brass/fired bullets retrieved from crime scenes?

What would need to be in place (policy/legislation/equipment/personnel) to achieve this?

What are the main challenges to the successful and effective processing of firearms/spent brass/fired bullets retrieved from crime scenes?

What role does the evidence gathered from firearms/spent brass/fired bullets play in the criminal investigations of gun crime in your country?

Do you have anything in place that provides investigators with the opportunity to process your ballistic material faster? E.g. LAPD (US) has put in place 'Walk in Wednesday' during which any police officer can walk into a lab with his material and get a quick answer.

If you had one recommendation on how gun crime could be prevented nationally what would this be?

If you had one recommendation on how gun crime could be prevented across the EU what would this be?

Questions for lab staff who indicated that some form of ballistics comparison technology is used

How is the firearms and ballistic material to be processed by the lab chosen? What criteria are used? Are there any situations where a firearm or ballistic information that meets this criteria would not be entered into the ballistics comparison technology used by your lab? Please provide an example.

Do you feel that the ballistics comparison system you are currently using imposes a significant burden on the resources of your department? Can you please explain?

How do you see this type of technology being used in your organisation in the future?

Questions for lab staff who indicated that the IBIN network had been used to seek an international ballistics connection

Can you provide an example of when the IBIN network was used and an international ballistics connection was made?

Questions for lab staff who indicated that Double Cast material had been submitted to another country

Can you provide an example of where Double Cast material was submitted to another country? Were any correlations identified?

Interview schedule

NGO personnel

Do you consider that there is a desire, nationally, to tackle gun crime?

What is the National strategy for combating gun crime?

From your perspective, what are the main causes of gun crime?

What are the main challenges for preventing gun crime?

Please tell me a little bit about your organisation and how it fits into the national agenda for combating gun crime.

How was your organisation set up – why was it needed?

How are you funded?

Did you face any opposition when the organisation was being set up?

How does your organisation tackle gun crime?

How do you know that what you are doing is successful?

How is the impact of the work you do evaluated and by whom?

Do you experience any challenges or barriers in your work? If yes, what are they?

What needs to be in place (local context) before an organisation such as yours can be effective?

Are you aware of any other effective interventions within your country that have had a positive impact on gun crime?

In your opinion is current legislation and policy effective in terms of reducing the risk of firearms to citizens? What evidence exists of its effectiveness?

What is your view on the judicial system in prosecuting gun crime offences?

How could the detection of gun crime be improved?

What is your experience of working with other agencies to tackle gun crime?

What are the challenges to effective multi-agency working?

If you had one recommendation on how gun crime could be prevented within your country what would this be?

Interview schedule

Police personnel

How is gun crime defined in your country?

How is gun crime recorded in your country?

Please tell me a little bit about your role and how it fits into the national agenda for combating gun crime

From a policing perspective, how much of a problem is gun crime in (NAME OF COUNTRY)?

From a policing perspective, what are the main causes of gun crime?

Who are the main perpetrators?

Does the Force [or equivalent term] have a strategy or plan to tackle gun crime?

What are the main challenges to implementing the plans?

What Police resources are allocated to gun crime investigation?

Is there a specialist team for this type of investigation? What training do they receive?

How could current legislation be improved?

What are the challenges or barriers to enforcing this legislation?

Can you describe the processes and systems your organisation uses to tackle gun crime?

How effective are they?

Do you have an example of best practice in tackling gun crime from a policing perspective?

What are the challenges to effective multi-agency working when it comes to tackling gun crime?

How is intelligence shared with other agencies, Police or otherwise?

What is your view on the judicial system in prosecuting gun crime offences?

What is the relationship between national and European law in relation to gun crime?

In your opinion and experience what are the most effective policies in relation to combating gun crime in this country? Is there evidence of their effectiveness?

Can you describe any effective community interventions for tackling gun crime that you are aware of in your country, and the results of their implementation?

How could the policing response to gun crime be improved in your country?

How could the policing response to gun crime be improved in relation to the trafficking of firearms?

Do you know what ballistic comparison technology is used in your country and whether your country is a member of IBIN?

Can you describe how decisions are made about what ballistic items are submitted for comparison?

Do you receive an evidential product in return, capable for use in a court of law? Example?

Can you provide an example of when you have received intelligence from the laboratory that linked the material to other crime scenes?

Is there any issue with the speed that you receive the product from the laboratory and can this impact on the investigation?

Are you aware of any process that may speed up the processing of ballistic material, for example 'walk-in Wednesday in the US'?

If you had one recommendation on how gun crime could be prevented nationally what would this be?

If you had one recommendation on how gun crime could be prevented across the EU what would this be?

Interview schedule

Policy representatives

Please describe what constitutes gun crime in your country.

What are the current national policies and approach in terms of tackling gun crime?

How does your role fit into the national agenda for combating gun crime?

What are the most effective legislative changes that have occurred in relation to gun crime, and what data is there to support the positive impact of these changes?

What are the challenges of adhering to EU/UN directives?

What do you feel are the most important barriers to effective gun crime policy in your country?

How could legislation be amended to improve the prevention of gun crime in your country? Are there plans to do this?

What, in your opinion, are the main causes of gun crime?

Are you aware of any interventions at community level that are effective in tackling gun crime, and how is effectiveness measured?

Are there any obstacles that prevent collaboration and information sharing in relation to gun crimes between your country and others?

What system is in place for the ballistic examination of firearms, bullets and cartridges? Are the results of these examinations used and shared?

Why was that system chosen?

How does the ballistics comparison technology you are currently using help detectives and prosecutors?

Is there any mechanism for measuring the success of how ballistic comparisons are used in tackling gun enabled crime?

How does the ballistic comparison technology you are currently using impact the resources of the police departments who are using it?

Are these processes of using the ballistic system being enforced and frequently reviewed for follow-up and management?

Have you any thoughts on how you could develop and implement a sustainable program that will help to resolve gun crimes more quickly or to prevent gun enabled crimes?

Are you a member an IBIN? If not, why?

What agency is responsible for maintaining an overview regarding the investigation of gun crime?

If you had one recommendation on how gun crime could be prevented nationally what would this be?

If you had one recommendation on how gun crime could be prevented across the EU what would this be?

Interview schedule

Statisticians

How is gun crime defined in your country?

Please tell me a little bit about how your role fits into the national agenda of combating gun crime.

How is gun crime counted and recorded?

Who decided upon the way that gun crime should be counted and recorded?

What are the weaknesses in the methods used to count and record gun crime?

What gun crime is recorded and included in open source data, and what is not?

How has the recording of gun crime changed in the last few years?

How could the recording and counting of gun crime be improved?

Do you think that nationally there is a shared understanding of how gun crime is defined, counted and recorded?

How is recorded gun crime data used by other agencies?

Are there any challenges in adhering to EU/UN directives in terms of recording gun crime? If so, what are they?

What training and development is available to staff in terms of the recording of gun crime? How widely is this available?

How easily can data on gun enabled crime be retrieved from the system, including the illicit trafficking of firearms?

Do you have any information sharing protocols or agreements in place with regards to sharing gun crime data with other agencies/departments/organisations (both nationally and internationally)?

Are there any challenges in sharing gun crime data on a national and cross-national level? If so, what are they?

How could these challenges be overcome?

If you had one recommendation on how nationally, gun crime could be prevented what would this be?

REF:

Please read each question carefully before providing your response:

What ballistic comparison technology is currently used by your country? (If more than one, please provide details of all systems including the versions, e.g. IBIS heritage)	
What year did you start using this system?	
How many bullets have been submitted into the laboratory in the last 12 months?	
How many cartridge cases have been submitted into the laboratory in the last 12 months?	
How many bullets have been acquired into the ballistics comparison technology that you are using, in the last 12 months?	
How many cartridge cases have been acquired into the ballistics comparison technology that you are using, in the last 12 months?	
How many bullets have been correlated and reviewed in the ballistics comparison technology you are using in the last 12 months?	
How many cartridge cases have been acquired into the ballistics comparison technology that you are using, in the last 12 months?	

REF:

Please read each question carefully and either provide or tick the appropriate response:

If you have an SLA what are the specified delivery times?	
If you have an SLA are you meeting the SLA as outlined?	
If you do not have an SLA, how long does it take between ballistic material entering the ballistics section of the laboratory to the notification of a result-based product to the investigator or intelligence officer?	
Are you a member of the Interpol Ballistics Information Network (IBIN)?	
Have you used the IBIN network to seek a ballistics connection on an international basis?	
Please provide an example of when a correlation was identified using IBIN.	
Do you use the 'double cast' process for making copies of ballistic material?	
How many Double Casts have been produced in the last 12 months?	
How many Double Cast pieces of material have been submitted to another country for the purposes of findings an international ballistic connection?	
Are there enough qualified workers to meet the current workload?	

Appendix 1.2 Case study: Italy

UNICAL FINAL REPORT

April 2016

Claudio Di Maio

Donatella Loprieno

Greta Massa Gallerano

Ercole Giap Parini

University of Calabria

Department of Political and Social Science

Arcavacata di Rende (CS)

Italy

INDEX:

A. SCHEDULE OF THE INTERVIEWS

B. RESULTS OF THE INTERVIEWS: AN OVERVIEW

C. FOCUS ON MAFIA-TYPE ORGANISED CRIME

D. DATA

E. LITERATURE

A. SCHEDULE OF THE INTERVIEWS

The interviews were conducted between July 2015 and February 2016 by University of Calabria team. They were mainly conducted in person in the workplace of the interviewees, others, via Skype or email. The interviews were conducted anonymously, for this reason all the names of the interviewees must remain confidential.

B. RESULTS OF THE INTERVIEWS: AN OVERVIEW

1) THE USE OF BALLISTIC INFORMATIONS

Collaboration and data sharing between Italian Police Forces

The Scientific Investigation Department of the Italian Carabinieri (RIS) and the Italian Scientific Police have National competence and they have the same duties. In general they cooperate in investigation and they share ballistics information. Moreover, the Magistrates may seek to the RIS or to the Scientific Police a technical advice even if the investigations are conducted by the other Police force. Therefore, there is a sharing and an exchange of evidences.

However, we have observed some difficulties in the sharing of the information between the different Scientific Police forces because of the use of different databases and technologies. Generally, the Italian Police forces do not have a unique system of analysis. Some central offices have adopted a more advanced system (3D) for the recognition of the bullet and the comparison of the cartridge case. In particular: The RIS have acquired IBIS together with the police.

Nevertheless, in recent years, Scientific Police has had no financial resources for the maintenance of databases. So, for now, the Scientific Police stopped the activities of IBIS. For this reason in the last years there haven't been sharing of information between the RIS and Scientific Police. However, the acquisition of the IBIS 3/D should be done both by the RIS and the Scientific Police.

The presence of the databases helps the Italian Police forces to exchange information easily. The magistrates can make references to the RIS or the Police for a technical evaluation even if the investigations are carried out by the other Police force; therefore there is a sort of sharing, an exchange of evidence.

For many respondents, the strength of the Italian organisation of law enforcement, which is often not understood abroad, is that in Italy there are two Police forces with national jurisdiction that do the same thing, and this leads to positive competition. There is cooperation. The positive competition will end when the spending review will put an end to this double jurisdiction and it will be decided that the Police and Carabinieri have to deal with different things. In relation to the Lab European Certification, there is a proposal for a joint project between the Carabinieri and the State Police to validate everything. Funds were requested from the European Union (about 200 million euro).

IBIS

The majority of the respondents highlighted the same problem with the use of IBIS: in Italy IBIS often fails to give positive match because organised crime, especially Mafia, uses a weapon only once. In fact, these Mafia organisations have the economic resources to buy a lot of weapons and, besides, they manage the illegal arms trafficking. Nevertheless, some famous cases have been solved with assistance from IBIS (e.g.: the murder committed by the Mafia of Francesco Fortugno, Vice President of the Regional Assembly of [Calabria](https://en.wikipedia.org/wiki/Calabria), 2005: https://en.wikipedia.org/wiki/Francesco_Fortugno).

Furthermore, the purchase of IBIS is very expensive, about one and a half million euro. So, the RIS of the Carabinieri chose to adopt a policy: the RIS in Rome will have a three-dimensional IBIS for shell casings and bullets; the RIS of Parma, Messina and Cagliari will have IBIS only for the shells.

International collaboration between law enforcement

Until the 1990's there was a collaboration and a data exchange with the Police forces of the other Countries. Today, the sector is suffering from inadequate exchange of staff

and materials especially because of the economic crisis, the spending review and the National Policy choices on the Defense sector. In fact, in the past, the Scientific Police had more contact with the FBI, Scotland Yard, the German Policewomen etc. Today, the relationship between the foreign police are mainly transmitted through Interpol through the exchange of investigative information. On the contrary, there is no longer an exchange of technical information. According to our respondents there is a need to organise more international meetings between ballistic experts of different countries for the exchange of technology information and working methods.

Crime scene reliefs

Another problem concerns the first crime scene reliefs, namely the possibility of an incorrect handling of the scientific evidence: first intervention of medical staff on the crime scene; which Police force is responsible for the case (Ris of the Carabinieri or Scientific Italian Police); detection, collection and transport of the evidence; transit of the evidence to the laboratory; judicial authorization to private consultant to visit the scene of the crime; pollution of the crime scene; seizure of the crime scene, etc. In general, one of the main problems is the amount of people who can enter the crime scene before the arrival of technicians. This can lead to a tampering with evidence.

Collaboration with the Academia

We finally point out some projects to modernize the system sponsored by the RIS in collaboration with some Italian Universities. For example: the use of the forensic imaging technology (Research Project sharing between the RIS of the Carabinieri and the University of Catania). The forensic imaging is the science that deals with all the computer data that have to do with the physical computer. The use arises whenever you need to extract a data from any digital device and create forensic evidence. The RIS and the University of Catania are trying to put together several scans in 3D. They are in the planning phase of this software that attempts to automate the alignment of these data, which now is done manually, through electron microscopes. The aim is also to have a number, the so-called match, which is currently done manually.

RIS of Messina, Sicily

As regards the ballistic investigations, the RIS of Messina (South of Italy) have to handle many cases compared to the other RIS Department (Parma, Roma and Cagliari). That's about 800/850 ballistic investigations per year conducted by 10 people, namely 80 investigations per years and per person, 1 investigations every 4/5 days. Sicily and Calabria are the Regions with more cases. Then the regions of southern Italy are still those with more crimes committed with a firearm.

In terms of people the ballistic section is composed of 10 persons like that of biology and chemistry as well as that of the amount of investigations. So in terms of human resources there is a correspondence. In terms of financial resources, the spending is very little. If we assume that the total expenditure on consumables in a year is 100: 80 goes to biology, 10 to fingerprints, 5-8 to chemistry and 1-2 to ballistics. Because for ballistics consumable expenses are very low. Dial gauge microscopes have an average duration of at least 10 years. They cost about hundreds of thousands of

euro but are not considered a big expense. On the contrary, the expenses for technological upgrades are pretty high. Maintenance is quite expensive and IBIS requires a good amount of maintenance.

The main problem of the RIS is that they have very few Marshals that have a Bachelor's degree in sciences. Especially in the physics and engineering fields. Furthermore, the RIS have resources that are about to retire. So, the problem is that in this moment of interest in forensic sciences a competitive exam is not provided for people outside of the Carabinieri. They could have the best graduates in physics and engineering do this work who are then willing to be ballistic experts at the RIS. However, only the Marshals with a law degree, who then obtain a degree in scientific disciplines, can take the competitive exam. Consequently, for many respondents the opportunity to improve resides in the ability to acquire external expertise.

RIS VS. Scientific Police

The RIS has more funding and good investments in terms of manpower and technological means compared to the Scientific Police. Over the past 15 years, the RIS received approximately between one million and two million euro per year for technological upgrade and new equipment. There are areas such as genetic analysis where the RIS have achieved a level of competence greater than that of any Italian University.

Furthermore, the Carabinieri immediately aimed at genetic analysis in all 4 RIS Departments (Parma, Rome, Messina, Cagliari) and it was a winning move. On the contrary, the Police carried out several investigations at the Rome headquarters and it is not easy to transmit the evidence to a single facility. The Police delivered the DNA analysis to Palermo and Naples after much time and now it will be delivered to Milan. This could be one of the possible explanations. Another important difference is in the staff organisation: we must not forget that the RIS has a military organisation and they depend on the Italian Ministry of Defense.

In addition, the RIS have focused very quickly and very well on the Genetic analysis in all the Departments (Parma, Rome, Messina, Cagliari) and it was a winning move. On the contrary, the Scientific Police carries out most of the tests to the headquarters in Rome and is not so easy to move the evidences to Rome from other parts of the State (in terms of time and use of personnel and resources). Finally, the big difference is the territorial dissemination of the Carabinieri stations. Unlike the Police, the Carabinieri are present also in the small countries. Consequently, we believe that today most of the forensic investigation is carried out by the RIS.

2) POLICING: GUN CONTROL, SURVEILLANCE, LEGISLATION

According to our respondents, one of the systems that have been adopted by the Police for the control of firearms crimes is the reduction of the firearms license renewals. In fact, the reduction of the number of held weapons can reduce the level of incidence of these crimes. Without the license the firearms are not used and the owners keep them at home. However, with the increase of thefts in apartments (+40%, ISTAT DATA - 2015) even the numbers of the stolen weapons and the possibility of crimes have increased.

So far, most of the interviewed people think that the Italian legislation relating to firearms control is well developed. However, two factors affect the GEC in Italy:

-The presence of the Mafia, especially in the South of Italy (illegal trafficking of arms; tampering of the weapons; Mafia murders). Indeed, it is important to point out that the Mafia firearm crimes are declining significantly since the 90's. Today, GEC in Italy are more connected to the small local crime (Please refer to the section C of the Report : "Focus on Mafia-Type Organised Crime").

-The possibility from 2006 to use a weapon for self-defense (Law n.59 of the 2006 that amending the article 52 of the Italian Penal Code).

In addition, we indicate an important provision of law that has influenced the collection of statistic data concerning GEC and it made necessary the study of the Italian criminal trial (additional interviews with magistrate and criminal lawyers): in Italy the use of a firearms does not constitute an "aggravating circumstance of a crime". Practically, for the Italian law is irrelevant if a crime is committed with firearms or with another weapon like a knife or a stick (For more information Please refer to the section D of the Report: "Data").

As anticipated, the Italian legislation on the possessions of firearm is a good legislation. However, the main problem remains the illegal arms trafficking run by organised crime. These weapons come mostly from the war zones. During the 90's these weapons came mainly from the Balkans, nowadays these come from the Middle- East, especially from Iraq and Afghanistan. The weapons enter in Italy from the southern areas; mainly from the Port of Gioia Tauro in Calabria. This happens even now with the illegal firearms used for the latest terrorist attacks in Europe.



Port of Gioia Tauro - Calabria, Italy.



The route of the weapons - 2015

3) POLICY: PUBLIC EXPENDITURE, ECONOMIC CRISIS AND SPENDING REVIEW

According to our respondents, there is a progressive cuts in Public expenditures for the forensic sector. In general, there is a progressive cut in the public expenditure for the "Defense" that is decreasing due to the economic crisis. However, after the terrorist attack in Paris (November 2015), the European Commission calls the member States to remove the defense expenditure from the European Stability Pact.

Especially for the Italian Scientific Police the forensic sector is not well financed and consequently also its growth is stuck (e.g.: Closure of many scientific police offices; Delays in the certification and accreditation of the ballistic laboratories; impossibility of acquire new technologies like 3D etc.).

Besides, the ballistics experts present in the Italian Police forces are declining (many retirements VS. few new recruitment):

- RIS: Impossibility to recruit ballistic experts that are not part of the Carabinieri (we remember that the Carabinieri are part of the Italian army and they depend on the Ministry of Defence).

- Italian Police: Public selections in the forensic sector are blocked from many years.

On the other hand, we have noticed an increase of the private ballistic consulting. Private studies of ballistics expert can invest more resources and they can use modern technologies like 3D. These resources come from the tuition fee that the students pay for the forensic private postgraduate courses.

Finally, for the Scientific Police and for RIS the biggest expense is for the technological renovation and certification of laboratories. In this regard, we would point out the breakdown of expenditure for the RIS forensic investigation in Messina, Sicily: In terms of people the ballistic section is composed of 10 persons like that of biology and chemistry as well as that of the amount of investigations. So in terms of human resources there is a correspondence. In terms of financial resources, I would say very little. If we assume that the total expenditure on consumables in a year is 100: 80 goes to biology, 10 to fingerprints, 5-8 to chemistry and 1-2 to ballistics. Because for ballistics consumable expenses are very low. Dial gauge microscopes have an average duration of at least 10 years. They cost about hundreds of thousands of euro but are not considered a big expense. On the contrary, the expenses for technological upgrades are pretty high. Maintenance is quite expensive and IBIS requires a good amount of maintenance.

4) BALLISTICS

-Assessment of the ballistic expert's work: For almost the respondents, ballistic investigation is a forensic science very much based on personal assessment compared to genetic analysis. In fact, ballistic investigation is based on the personal use of the microscope, the lights, etc. For these reasons, despite the use of database (like IBIS) ballistics expert manual role remains central. Currently, Very important is the professional experience than the type of Academic training.

- Register Of Ballistic Expert: In Italy there is not a National ballistic expert register; it is sufficient to have a person with the equipment that is familiar with the ballistic science and be able to do a convincing job. We have had cases in which were employed individuals with degrees not related to the sector and nowadays this is one of the main problem of the Sector.

- Private sector VS. Public sector: The technical advisor of the Public Prosecutor can be a Policeman a technician of the RIS (Carabinieri) or a private expert. Currently magistrates receive more advise from the private sector compared to the State institutions. The appointment of the ballistic expert is a subjective evaluation of the Public Prosecutor. The problem is that in Italy the advisers for the Public Prosecutor's Office may decide later to work for parts of the process. There is not incompatibility between the two professionals. For almost the respondents, we should put the subject in a position to make a choice in order to avoid cases of impasse.

Some advantages of the private sector are: ability to modernize the private sector; Bureaucratic process less complex; more human resources; economic opportunity to acquire good instrumentation; relationships with judges, Police forces, Universities, etc.

- Legal responsibility of the ballistic: The ballistics expert has the normal responsibilities of a technical adviser. In the Italian Penal Code there is the "false evaluation crime". This crime is an intentional crime. In addition, there are cases of negligence: in the evaluation of the evidence or in the unintentional and accidental deterioration of the evidence itself. In these cases, the expert is replaced. In general, in the case of a ballistic test, it may be repeated.

- Training of the ballistic: Until very recently, the ballistic studies were a small part of mechanical engineering. Regarding what has occurred in recent years, the explosion of forensic studies has done a disservice to the sector. The fact that in Italy many people improvise themselves as criminologists may adversely affect the criminal trial. So, there is a need of a more specific training and the need to create a National Official Register Of The Ballistic Expert (Please refer to the next session on Training).

5) TRAINING

Most of the interviewed people prefer a post-graduate training (so-called "vertical training"). Namely not a Degree program in Forensic Science (Like in Losanna or Glasgow) but a specialization program to do after the graduation like:

Master:

University of Parma (http://old.unipr.it/arpa/scienfor/descrizione_it.html) & University of Roma La Sapienza (<https://web.uniroma1.it/masterscienzeforensi/>);

Specialization Postgraduate Courses:

Italian Ballistic Centre, University of the Tuscia: (<http://www.balisticaforense.com/>);

PhD:

University of Roma "Tor Vergata"

(<http://www.uniroma2.it/postgrad/download/Schede%20dottorati/Schede/Medicina/Scienze%20Forensi.htm>)

On the contrary, according to some respondents it is necessary to create a specific Degree Program in Forensic Science. This Degree Program should have three years of joint studies and two years of specialization in a specific field (ballistic, chemical, genetic etc.).

As we mentioned before, the Police human resources are not always sufficient and they do not have a specific level of education. Skills are mainly based on the laboratory experience.

Regarding the training of Police forces in the forensic sector, because of the decrease in public expenditures also the Police training are changing. The training courses are less and last less (Sometimes only a few months for the State Police). On the other hand, the courses for ballistic private consultants can work well because they are self-financed by student fees (fees are usually quite expensive).

Finally, almost all respondents (both Police as private consultants) agree that the formation of new ballistic consultants should be guided by a professional expert in this area. Namely, the profession "has been handed down" by the experts to the new generations. As a result, retirement in the Police forces is creating problems from this point of view. From this point of view it is urgent to create an Official Register Of Ballistic Experts and establish the minimum requirements for registration to this, such as training, the qualifications, experience, etc.

C. FOCUS ON MAFIA-TYPE ORGANISED CRIME

Due to the specific configuration of crime in Italy, Italian team has decided to investigate the relationship between the object of this Research and the strong presence of Mafia - Type Organised Crime (OC). In particular, after a preliminary study of the specific forms of this type of OC, the team have dedicated a section of the interviews to draft how the presence of the Mafias affects GEC and to understand which are the consequences for the ballistics and what are the methods of firearms traffic control.

In Italy there are four major type of Mafia: the "Cosa Nostra" in Sicily, the "Ndrangheta" in Calabria, The "Sacra Corona Unita" in Apulia, and the "Camorra" in the area of Naples.

The main peculiarity of these organisations is the specific type of power they exercise, which is called control of the territory (in some case territorial seignury to highlight its pervasiveness on human affairs)².

It is a type of power exercised on specific geographic Areas (mainly in Southern Italy) based on violence as well as on political and social consensus and economic control.

Due to the control over the territory the Mafia groups play a twofold influence on the GEC.

First of all, they exercise control over local and little groups' crime, since their role on a territory is often aimed at answering for social order by containing crimes and regulating these.

As actors competing for power, they affect the level of GEC by dramatically increasing them during times of internal conflicts.

One of the interviewees has put in evidence that the impact on the GEC has different forms. Sometimes 'Mafiosi' use violence for forcing their presence and their power. E.g.: During the 80's in Sicily and, between the 80's and the 90's, in Calabria, two big wars of mafia have been fought and dramatically increased the level of violence (11 murders upon 100 thousand inhabitants). (At present, the same rate is 2.7 murders upon 100 thousand inhabitants).

In other periods, the Mafiosi use violence against "enemies" of the organisation (we can say them legitimate competitors of their power, that is, magistrates, politicians, and police personnel). It is worth emphasizing that a lack of violence in the territories where Mafiosi exercise their power does not mean weakness: simply they prefer to solve their problems through other means such as corruption and acquaintances.

Nowadays, in the Southern areas of Italy there are around 279 murders per year, 53 percent of the national total (Eures Ansa, 2013).

Generally, the interviewees specify that nowadays mafia groups less and less have recourse to firearms and to violence, since they prefer working in the big business as traders and investors. However, little and local OC groups continue to use violence and firearms, among these there are also marginal groups of Mafiosi.

- Mafia and the ballistic evidences

In general, our interviewees agree that the strong presence of Mafia-type organisations is a factor that could weaken the use of ballistic evidences by inquirers, due to a threefold strategy (in part intentional, in part as a consequence of other factors) which allows Mafiosi to avoid a number of positive matches when using e.g. IBIS.

² A preliminary definition of OC of Mafia type is provided by the Italian Penal Law. The 416 bis article states: The organization is of a mafia type when the subjects belonging to it make use of the strength stemming from the associative link and of condition of subjection and of *omertà* in order to commit crimes, in order to acquire directly or indirectly the control over economic businesses, grants, licenses, contracts and public works or in order to make unfair profits or advantages for own selves or for other persons.

The first aspect concerns the type of guns they prefer to use; the second one is the care they have in order to use firearms once for each crime; the third – more limited – consists in the process of altering of firearms.

Consequently, the empirical evidences from the research work can be gathered considering three main aspects:

- (1) The specific types of firearms used by Mafias;
- (2) The ability to provide firearms for themselves in the firearms traffic;
- (3) The process of firearms modification.

Mafia-type OC and firearms

In general, Mafiosi use specific type of guns in consideration of their disruptiveness and the possibility to minimize traces left in the crime scene.

Favourite arms of the Mafiosi are revolvers, in particular the 38 special and the 357 magnum due to their efficacy in killing a person (it seems that it is enough 1 or 2 shots to kill in a disruptive way). In any case, the fact that the cartridge case is kept in the chambers is a factor very appreciated by the Mafiosi (in the crime scene for avoiding further matching).

In prevalence, in the past they appreciated revolvers made in the USA, purchased on the international illicit market. According to an expert, a traditional revolver of the Mafiosi is the Colt 45 (he told us that the supply of these guns had been provided by the number of revolvers left by the USA army during the World War II when soldiers landed in Sicily). These revolvers had been altered and adjusted to commit Mafia crimes in the 1960s and 1970s.

However, very often the disruptiveness and some symbolic issues are relevant: nowadays, a gun that Mafiosi use very often is a shotgun for hunting modified to be destructive by cutting the barrels ... the terrible sawn-off shotgun. Through this type of firearm a number of murders have been committed by the Mafias during the end of 80's and the beginning of the 90's at the times of internal mafia wars.

The case of the Camorra it is worth mentioning too: it seems that they use altered arms made in an important firearms producer from Belgium.

In any case, it is worth mentioning that in their long history Mafiosi have used other kind of firearms, such as Uzi from Israel and semiautomatic guns coming from former Yugoslav countries, since in the 1990s they were sold very cheap.

2) Firearms traffic

In general, the interviewees agree that a way for hiding evidences consists in the ability to provide firearms from international illicit traffics. In fact, this is at the base of the Mafias' capability of using firearms once.

This attitude reflects on the illicit international traffic of firearms. Due to their financial resources (Mafiosi can invest on this market huge financial resources)³ and to their ability to build alliances with other groups, they play an important role in the international illicit firearms trade.

³ It is estimated that the Italian Mafias' revenues from international illicit traffics (drug, firearms, and others) are between 110 and 130 mld euros (Eurispes, Confesercenti, Transcrime). The 'Ndrangheta revenues are estimated between 45 and 65 mld euros each year.

For some of our interviewees, this is the result of a twofold historical process. During the internal wars among Mafia groups, in particular in Sicily and in Calabria, the Mafiosi were among the most important customers on international markets. Then, once they had acquired a control over the sources for supplying, they become sellers of firearms also to different groups: to little crime groups as well as to terrorist groups (as an interviewed expert explained us in deep detail).

Nowadays, the illicit market of firearms seems characterized by two levels: a macro one, controlled by OC in particular of Mafia type, and a little traffic, mostly internal and oriented to the little criminality conducted by immigrants or ethnic based criminality. Then Mafias play an important role in a network, mainly aimed at selling guns to other countries' OC groups; at another level, little groups of immigrants provide firearms coming from ex-Soviet bloc's countries for mere survival reasons.

3) The process of firearms modification as a way to hide evidences

A controversial point pertains the role of Mafia groups in the firearms modification. For some of the interviewees, in particular among ballistic experts, this is a crucial point for Mafia groups; for others, this is just a practice of scarce relevance, if compared to the role in the international firearms traffic that allows Mafiosi to use arms once for each crime.

Some interviewees have shown that there is a connection between the firearms traffic and the modification process. The so called "Mediterraneo" Judicial Operation (2013) (reported by two of our interviewees) discovered a traffic of firearms coming from Slovakia lead by the 'Ndrangheta, aimed at buying de-activated firearms that in Gioia Tauro a high-skilled craft-man used to re-activate.

Another empirical case shows that when the Turkish Polices discarded his guns' endowment, an important firearms' Italian producer in the 1970s detected this supply and re-adapted these firearms to international market. Of course, this is not a case directly referable to OC, but some of the interviewees assured that the non-traceability of these items attracted the so called "black market".

Starting from these evidences, one critical point emerges pertaining the way European countries rule the de-activation and re-activation of firearms. So it happens that collectors and high-skilled craft-men are used (not only by the Mafias) to buy firearms in some countries and to re-activate them in others (maybe, more international control over the de-activation of firearms and unifying rules for the re-activation is needed).

In any case, what we have discovered is that two levels of altering exist: one made by high skilled craft-men, sometimes controlled by the Mafiosi, and another, more simple and superficial, which is typical of little crime groups. If the first one could weaken the efficacy of ballistic techniques, the latter refers to the fact that poor skilled craft-men leave more signs that – to a more effective analysis – allow to trace guns.

D. DATA

In Italian criminal law the weapons are not mentioned as a legal concept and, hence, are not included in statistics. There are several offenses concerning unauthorized or illegal possession of weapons. For this basic reason, the department "Criminality" of the National Institute of Statistics (ISTAT) does not process directly this data.

Nevertheless, the statistical department of the Ministries of Justice and Internal Affairs, along the last ten years have contributed to spreading some crime information for several reports commissioned by the European Parliament and the United Nations Office on Drugs and Crime

(UNODC). For these reasons, the statistical analysis of crimes committed with firearms has been conducted through several channels of investigation. Below, the results:

1) Ministry of Justice

The Ministry of Justice, through a statistical department, publish only several studies. This Ministerial Department is responsible to synthesize the data of criminal justice concerning phenomena of particular relevance and social interest. We are able to determine that these reports do not include the totality of the crimes, but only several topics of interest (e.g. "Criminal proceedings for crimes committed with terrorist intent and subversion of democracy"). Moreover, crimes are combined with legal proceedings with any mention of firearms, at least since 2009.

Criminal proceedings against known and unknown at the Public Prosecutors - 2013			Persons in proceedings at the Public Prosecutors in the year 2013, and their state of birth (%)				
Cases enrolled at the Public Prosecutors in the year 2013	Cases registered against unknown	Cases registered against known	People enrolled in proceedings against known	Italy	Others	-	Total
Total cases registered against known and unknown	117	81	314	61,8%	24,8%	13,4%	100,0%

Criminal proceedings against known and unknown enrolled at Public Prosecutors 2013	People with dismissal Decree (%)	Absolved persons (%)	Convicted persons (%)	Total
Total cases registered against known and unknown	84,3%	5,8%	9,9%	100,0%

Final conclusions: At the central level, the Ministry of Justice takes only a few reports of general interest. The local sections of civil, administrative and criminal courts collect some micro-data. Quarterly basis, an administrative charge is responsible for sending the data of court proceedings to the National Institute of Statistics to be processed and analyzed.

National Institute of Statistics (ISTAT)

Examining the latest Statistical Yearbook of the National Institute of Statistics (ISTAT) , "firearms" appears in a series between 1995 and 2011, but only related to deaths by suicide (<http://www.istat.it/com/files/2014/11/Asi-2014.pdf> | p. 142 et seq.).

Conversely, other crime statistics are available on the website, with a dynamic table by type, region and year. (<http://bit.ly/1M8ZEBh>) Also in this case, the variable "firearms" does not appear. In previous publications of statistics, the data is not mentioned. Only in some studies "ordered" to ISTAT (e.g. Violence against women - <http://www.istat.it/en/archive/169135> or Noi Italia 2015 Edition - <http://www.istat.it/en/archive/170089>).

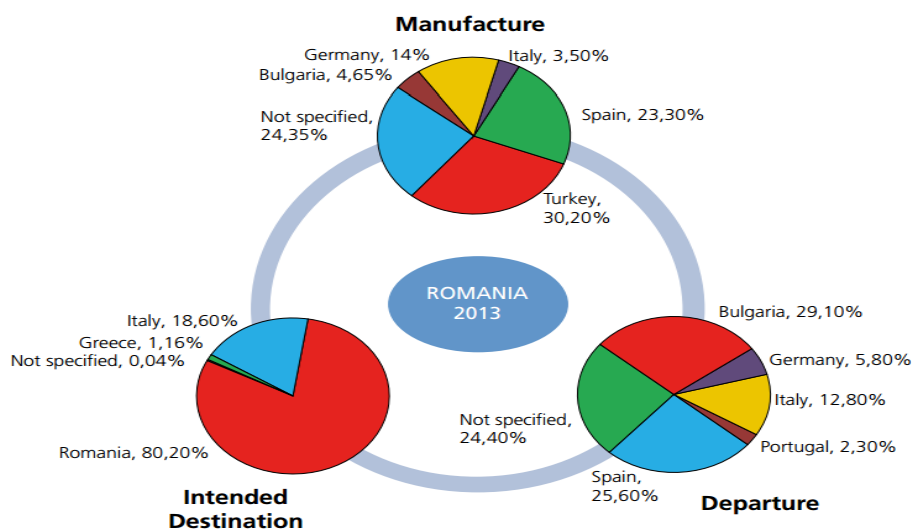
Women - 16 to 70 years - who have suffered physical or sexual violence by type of author and forms of violence suffered - 2006 (percentage composition) - ISTAT											
TYPE OF VIOLENCE	PARTNER			MAN NO PARTNER							
	current partner or ex-partner	current partner	Ex-partner	Unknown	Acquaintance	Colleague	Friend	Relative	Family friend	Not specified	
Used or threatened to use a gun	52,5	8,4	44,6	24,3	11,6	4,5	2,2	7,0	.	0,7	
FOR 100 VIOLENCE BY THIS AUTHOR											
Used or threatened to use a gun	5,7	2,3	7,4	2,4	2,8	2,6	1,1	5,1	.	2,1	
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	

Final conclusion: This data is not processed by ISTAT, unless specific request is made and, in any case, it is not structured in a way that allows for statistical measures. Regarding Crime data, ISTAT gather this data from the Public Prosecutors and it is encoded as legal classification. So let's analyze how a Magistrate qualifies illicit behavior. Public Prosecutors become the principal source of information when defining the procedure and decide whether they should proceed with the criminal proceedings. There are also other statistics: crimes reported by the police to judicial authorities. This data has been revised, as it came in the form of frequency tables that had already been processed by the Ministry of Interior. This tables do not include firearms.

3) Ministry of the Interior

We wanted to explore, with positive results, if the Ministry of Interior would collect these data. We have examined the Annual Report on Crime (<http://bit.ly/1LVYI63>). The data "firearms" appears in more than one case. However, the trend in the ratio of crimes is examined only based on two statistical data sources: documents from judicial offices and referred to the crimes for which to the judicial authority started criminal proceedings (as point 1) and statistics consisting of the crimes reported by police.

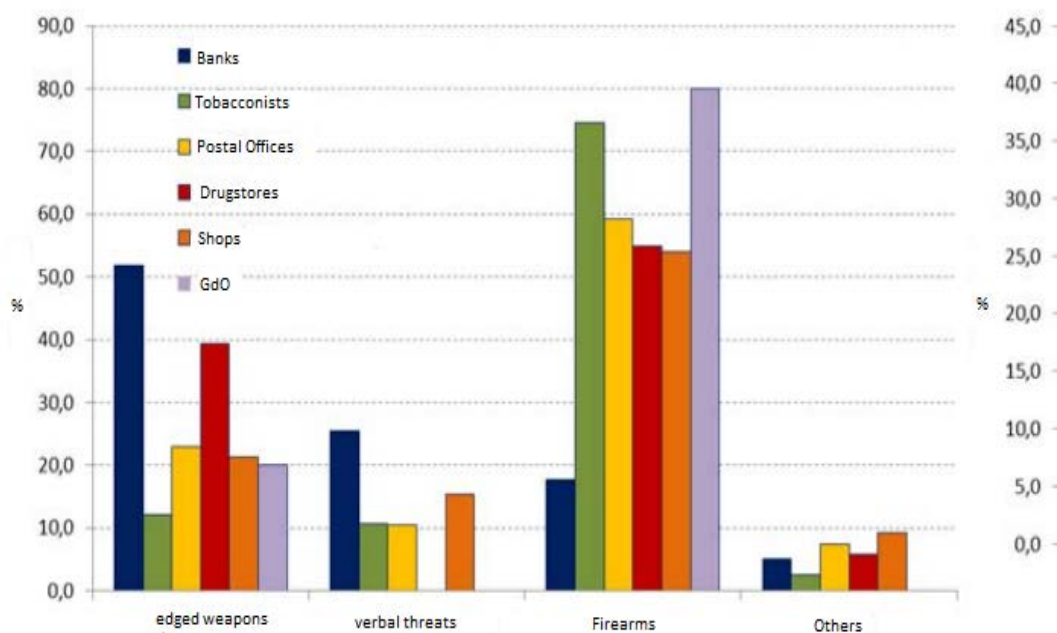
Final conclusion: The Ministry of the Interior provides a good set of statistics data but they are processed by the State Police. Actually, the gun crime data does exist but it is not processed because it is kept in a separate archive. This data is collected but the statistics are not available to the public use. For each offense, the Ministry has a database that contains the fields with the "Author", "Victim" and finally a "Notes" field with the description. These events should be analyzed individually but not collected for a statistical analysis process. In 2013, this information has been previously provided to the United Nations for a specific publication (<http://bit.ly/221Vfs5>). On the other hand, the Ministry has rejected the request to contribute to the EU Crime Trade Survey.



UNODC FIREARMS 2015 - Trafficking routes identified by reporting authorities, Romania

4) Statistics of Private entities

Annually, the Italian Banking Association (ABI) and the Italian Post (Poste Italiane) are conducting an investigation on the criminal offenses mostly related to their activities. In one of the reports (https://fip.org/files/fip/news/Attacks_in_Italy_2013.pdf) the "firearms" data is repeated many times. The same happens for various reports that are published by Private Institutes of Forensic Medicine (eg. Murders and suicides committed with weapons in Milan - <http://bit.ly/1QLjbWc>). Final conclusion: The "firearms" data appears on reports conducted by private entities just because it is analyzed in a small geographical area. This restriction allows researchers to gain access to reports and documentation at the local level, which facilitates statistical analysis.

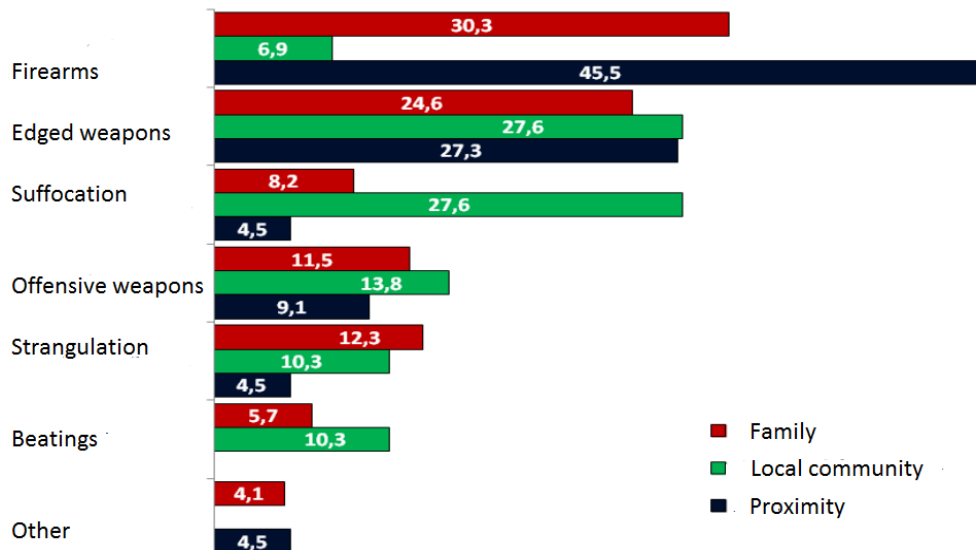


Robbery for used weapon. percentages, 2012. Based on data from OSSIF, Poste Italiane, FIT, Federfarma, Federdistribuzione e Confcommercio.

5) EURES/ANSA

Another possible source is the homicides database of private institute EURES. These documents are elaborated through the consultation of various sources (press release of the main national and local newspapers, Criminalpol, Carabinieri, Prefectures) and with the help of the DEA Archive of National Agency of Press (ANSA). The last Report on homicides in Italy are available at <http://bit.ly/1rjxF9R>.

Final conclusion: EURES is a private institution that works on demand. Despite their availability to collaborate with our project, the Institute has not been able to produce a series of data to describe the phenomenon of gun crime in the country with our specific criteria.



Eures / Ansa Report - Weapon used in the main types of femicide - year 2013

6) FISAT

FISAT Web is an amateur database, updated from 2012, which collects all the crimes committed in Italy, with the possibility to choose the weapon, firearms license, the nature of the crime etc. The association (FISAT) seems to update it in order to support the right to legal possession of arms for law-abiding citizens. However, we do not know their reliability (<http://www.cavalierifisat.it/watson.php>).

7) European Commission

At the end of 2013, The European Commission issued the Communication “Firearms and the internal security of the EU: protecting citizens and disrupting illegal trafficking”. In preparation for its Communication, in 2013 the Commission conducted a public consultation about the possibility of introducing EU common standards on legal firearms. The statistical data about Italy (<http://bit.ly/1SBUCzB> | pp. 21-22) European Commission uses as source the UNODC Small Arms Survey (<http://bit.ly/1QFZe58>) and Web database Project Gunpolicy (<http://www.gunpolicy.org/firearms/region/italy>); these figures are compared with responses to the Flash Eurobarometer 383 (http://ec.europa.eu/public_opinion/flash/fl_383_en.pdf).

8) First considerations

The collection of statistical data concerning gun crime in Italy is difficult by poor communication between the various institutional representatives. On the one hand, if the Ministries of Interior and Justice put in place administrative machinery that collects all the information related to the crimes committed and judicial proceedings, on the other hand there is an evident lack of contact between these institutions and the National Institute of statistics. However, the ISTAT does not have full access to all micro-data and, in some cases, only receives a statistical elaboration that do not allow a deepest level of analysis.

9) Main difficulties

The lack of "firearm concept" in the Italian criminal law does not allow to be highlighted some data in this research. From the legal point of view, it would be necessary to understand whether the crimes analyzed in the reports are committed with weapons or through firearms. In this regard, penal codes regrouped many offenses related to ammunition, parts of weapons or legal classification.

10) Recommendations

In comparison, especially at European level, the Statistical institutions should take into account differences in inequalities. There are crimes that are classified differently in many European countries, as well as different situations represented in the same form in the European Union. Especially with statistics, there is a risk that two different concepts may be grouped together as if they were the same concept.

Concerning Eurostat, the situation is quite critical due to the lack of sensitivity on the subject. Years ago, an excellent survey was conducted which was later rejected by the European Parliament. Italy and other EU countries need greater sharing of data in this area, as well as a structural framework for comparison. All EU states that opposed the investigation union should be made aware that knowledge of the phenomenon is vital in formulating public policies. For precisely this reason, full data sharing is paramount. There is also a rather foolish stance on financing prevention only. However, prevention should be structured bearing in mind statistical knowledge of the phenomenon.

11) Italy Factsheets⁴ (last year available: 2012)

% of homicides by firearm	66.7
Number of homicides by firearm	417
Homicide by firearm rate per 100,000 population	0.71
Rank by rate of ownership	55
Average firearms per 100 people	11,9
Average total all civilian firearms	7,000,000
Intentional homicide, counts per 100,000 population	530
Intentional homicide, rate per 100,000 population	0,9
Intentional homicide count per 100,000 population in the most populous city	24
Intentional homicide rate per 100,000 population in the most populous city	0,9
Suicides by firearms per 100 000 population	0,81
Crimes recorded by the police (N=1000)	2818,8
Violent crimes recorded by the police ((N=1000)	147,4

⁴ Our calculations based on:

WHO.2014.'Inter-country Comparison of Mortality for Selected Cause of Death - Gun Homicide in Italy.' European Detailed Mortality Database (DMDB).Copenhagen:World Health Organisation Regional Office for Europe,20 June.

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Eurostat, Statistics explained, Crime statistics, http://ec.europa.eu/eurostat/statistics-explained/index.php/Crime_statistics

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Appendix 2.1 Complete data set of gun crimes obtained

Table A2.1 Incidence and prevalence rate per 100,000 of the population for each form of gun crime reported on by respondents

Country	Source of information	Year	Offence	Incidence	Population	Rate	
Albania	INSTAT	2014	Intentional homicide with a firearm	67	3,020,209	2.22	
			Robbery with a firearm	44		1.46	
Austria	National Police	2014	Murder	14	8,223,062	0.17	
			Manslaughter	0		0.00	
			Aggravated Manslaughter	2		0.02	
			Assault	26		0.32	
			Aggravated Assault	9		0.11	
			Intentional Aggravated Assault	3		0.04	
			Other unintentional assault	21		0.25	
Belgium	Federal police	2010	Homicide with a firearm	36	10,895,568	0.33	
		2013	Armed robbery	4,401		11,136,147	39.52
		2013	Armed robbery on public transport	143		11,136,147	1.28
		2013	Armed robbery on the street	17		11,136,147	0.15
		2013	Armed robbery in a public place	131		11,136,147	1.17
		2011	Illegal possession of a firearm	10,121		11,047,744	91.61
Bulgaria	National Statistics	2014	Illegal production, possessing and use of a weapon, explosion and ammunition	370	6,924,716	5.34	
Croatia	Ministry of Interior	2014	Offences against public law and order act (Illicit firing)	46	4 473 534	1.03	
			Firearms act	2,358		52.71	
	European Sourcebook	2011	Intentional Homicide	1	4,302,000	0.02	
Cyprus	Cyprus Police	2014	Illegal entrance of an armed person with intention to steal	0	1,172,458	0	
			Juveniles involved in serious offences against Firearms Law	3		0.25	
	Criminal statistics report	2011	Possessing firearms with intent to injure	3	1,133,803	0.26	
			Offences Against the Firearms Act	93		8.20	
Denmark	Statistics Denmark	2014	Firearms Act	7,272	5,569,077	130.58	
			Law on weapons and explosives	2		0.04	
			Firearms Act, firearms	693		12.44	
			Firearms Act, other	3,318		59.58	
Estonia	Statistics Estonia	2014	Unlawful handling of firearms or essential components or ammunition	111	1,257,921	8.82	

Finland	Finnish Homicide Monitor	2014	Victims killed by firearm	11	5,268,799	0.21
France	French National Police	2013	Armed Robbery	4,033	65,800,000	6.13
			Armed robbery against a financial institution	116		0.18
			Armed robbery against industrial establishment	2,450		3.72
			Armed robbery against cash in transit	24		0.04
			Armed robbery of individuals	468		0.71
			Other armed robberies	975		1.48
			Carrying/possessing prohibited weapon	26,430		40.16
	French Gendarmerie	2013	Armed robbery	1,201	1.82	
			Armed robbery against a financial institution	39	0.06	
			Armed robbery against industrial establishment	671	1.02	
			Armed robbery against cash in transit	2	0.003	
			Armed robbery of individuals	257	0.39	
			Other armed robberies	232	0.35	
			Carrying/possessing prohibited weapon	5,638	8.67	
Germany	Police crime statistics	2013	Weapons act	31,440	80,620,000	39.00
			Thefts with firearms	615		0.76
	Ministry of Interior	2013	Illegal gun ownership or production	31,940	39.62	
			Crimes in which guns were used	10,093	12.52	
			Threats involving guns	4,940	6.13	
			Robberies involving guns	2,467	3.06	
			Robbery of shops	1,403	1.74	
			Robbery of petrol station	266	0.33	
			Crimes against liberty/freedom	1,845	2.29	
			Assault	261	0.32	
			Shots fired (involving people and/or property)	5,153	6.39	
			Murder/homicide	142	0.18	
			Greece	Hellenic Police	2014	Offences against the Law on Weapons
Attempted offences against the Law on Weapons	9	0.08				
Iceland	Office of the police	2014	Homicide	0	329,100	0.00
Ireland	Crime and criminal justice statistics office	2014	Assault causing harm	23	4,712,695	0.49
			Aggravated burglary	41		0.87
			Robbery of establishment	204		4.33
			Robbery of goods/cash in transit	15		0.32
			Robbery from person	44		0.93
			Murder/manslaughter	14		0.30

Italy	Ministry of Interior	2010	Homicides	209	59,280,000	0.35
FYR Macedonia	UNPoA report	2013	Criminal offences of illegal manufacture, possession and trade in weapons	205	2,107,000	9.73
			Celebratory shootings	5		0.24
		2014	Homicides	25	2,076,000	1.20
			Homicides of women	14		0.67
			Attempted murder	48		2.31
			Attempted murder with a seized weapon	19		0.91
Causing danger with firearm	55	2.65				
Malta	National Police	2014	Attempted homicide – wilful	2	412,655	0.48
			Attempted theft – armed robbery	3		0.73
			Wilful damage by shot	2		0.48
			Wilful homicide	3		0.73
			Armed Robbery	6		1.45
Netherlands	Dutch safety board	2011	People killed by a legal firearm	6	16,690,000	0.04
		2009	Total number of people killed by a firearm	41	16,530,000	0.25
Norway		2014	Homicide	4	5,109,059	0.08
Poland	Police headquarters	2014	Homicide (including attempted)	32	30,820,000	0.10
Portugal			Damage to health	22 (gun)	10,813,834	0.20
				2 (gas)		0.02
				25 (air)		0.23
			Assault and battery	9 (gun)		0.08
				3 (gas)		0.03
				1 (air)		0.01
				Rape		1 (gun)
			Robbery	99 (gun)		0.92
				35 (gas)		0.32
				6 (air)		0.06
Spain	National Statistics Institute	2013	Homicides by firearms		47,130,000	
		2013	Percentage distribution of intentional homicides by firearm			0.20
Sweden	Swedish national council for crime prevention	2014	Crimes against law on possession of weapons	5,176	9,723,809	53.23
			Robbery with firearm	8,364		86.02
			Murder	74		0.76
			Attempted murder/manslaughter	210		2.16

UK: England & Wales	Office for National Statistics	2014	Crimes involving a firearm	7,714	64,596,800	11.94
			Crimes in which firearms was discharged	4,320		6.69
			Crimes in which firearm was used as a threat	3,163		4.90
			Crimes in which firearm was used as a blunt instrument	231		0.36
			Crimes involving air weapons	2,869		4.44
			Crimes involving handgun	2,133		3.30
			Crimes involving shotgun	383		0.59
			Crimes involving imitation firearms	1,147		1.78
			Crimes involving rifles and other firearms	1,182		1.83
			Total violent crimes involving a firearm	1,842		2.85
	Home Office Police recorded crime	2013/14	Total criminal damage involving a firearm	2,433	3.77	
			Total robbery involving a firearm	1,972	3.05	
			All firearm offences (non-air weapons)	4,842	64,596,800	7.50
			Homicide	28	0.04	
			Attempted murder, assault with intent	416	0.64	
			Other violence against the person	1,011	1.57	
			Robbery	1,946	3.01	
			Burglary	112	0.17	
			Criminal damage	330	0.51	
			Public fear, alarm or distress	225	0.35	
		Possession of weapons	623	0.96		
		Other firearm offences	151	0.23		
		All firearm offences (including air weapons)	7,709	11.93		
		Homicide	30	0.05		
		Attempted murder, assault with intent	483	0.75		
		Other violence against the person	1337	2.07		
		Robbery	1971	3.05		
		Burglary	114	0.18		
		Criminal damage	2,439	3.78		
		Public fear, alarm or distress	246	0.38		
Possession of weapons	717	1.11				
Other firearm offences	372	0.58				

Appendix 2.2 WHO Mortality data concerning firearms injury related deaths

Table A2.2 summary of frequencies, rates and relative percentage in each country (taken from the WHO mortality database) for undetermined cause, accidental (firearms discharge) and homicide (assault by firearms) deaths by firearms

Country	Year	Cause of death	Frequency	Rate	(%)
Austria	2014	Undetermined firearm discharge	8	0.0936	40.00
		• Y22	1	0.0117	
		• Y23	1	0.0117	
		• Y24	6	0.0702	
		Assault by firearm	10	0.117	
		• X93	1	0.0117	
		• X94	0	0	
• X95	9	0.1053			
Belgium	2012	Undetermined firearm discharge	18	0.1662	41.90
		• Y22	0	0	
		• Y23	2	0.018	
		• Y24	16	0.1442	
		Assault by firearm	25	0.2253	
		• X93	1	0.009	
		• X94	2	0.018	
• X95	22	0.1983			
Bosnia & Herzegovina	2011	Undetermined firearm discharge	0	0	0
		• Y22	0	0	
		• Y23	0	0	
		• Y24	0	0	
		Assault by firearm	0	0	
		• X93	0	0	
		• X94	0	0	
• X95	0	0			
Bulgaria	2012	Undetermined firearm discharge	7	0.0959	15.29
		• Y22	3	0.0411	
		• Y23	0	0	
		• Y24	4	0.0548	
		Assault by firearm	25	0.3423	
		• X93	17	0.2327	
		• X94	4	0.0548	
• X95	4	0.0548			
Croatia	2013	Undetermined firearm discharge	0	0	0
		• Y22	0	0	
		• Y23	0	0	
		• Y24	0	0	
		Assault by firearm	12	0.3524	
		• X93	3	0.0705	
		• X94	4	0.094	
• X95	5	0.1175			
Cyprus	2012	Undetermined firearm discharge	0	0	0
		• Y22	0	0	
		• Y23	0	0	
		• Y24	0	0	
		Assault by firearm	12	1.389	
		• X93	0	0	
		• X94	2	0.2315	
• X95	10	1.1575			
Czech Republic	2013	Undetermined firearm discharge	11	0.1047	33.33
		• Y22	4	0.0381	
		• Y23	2	0.019	
		• Y24	5	0.0476	
		Assault by firearm	17	0.1618	
		• X93	11	0.1047	
		• X94	0	0	

		• X95	6	0.0571	
Denmark	2012	Undetermined firearm discharge	1	0.0179	25.00
		• Y22	0	0	
		• Y23	0	0	
		• Y24	0	0	
		Assault by firearm	3	0.0537	75.00
		• X93	3	0.0537	
		• X94	0	0	
		• X95	0	0	
Estonia	2012	Undetermined firearm discharge	4	0.3008	66.67
		• Y22	0	0	
		• Y23	1	0.0752	
		• Y24	3	0.2257	
		Assault by firearm	2	0.1504	33.33
		• X93	1	0.0752	
		• X94	0	0	
		• X95	1	0.0752	
Finland	2013	Undetermined firearm discharge	2	0.0386	11.76
		• Y22	1	0.0184	
		• Y23	1	0.0184	
		• Y24	0	0	
		Assault by firearm	15	0.2757	88.24
		• X93	5	0.0919	
		• X94	6	0.1103	
		• X95	4	0.0735	
France	2011	Undetermined firearm discharge	180	0.2847	45.00
		• Y22	1	0.0016	
		• Y23	14	0.0221	
		• Y24	165	0.261	
		Assault by firearm	149	0.2357	37.25
		• X93	1	0.0016	
		• X94	11	0.0174	
		• X95	137	0.2167	
Germany	2013	Undetermined firearm discharge	65	0.0806	49.62
		• Y22	16	0.0198	
		• Y23	4	0.005	
		• Y24	45	0.558	
		Assault by firearm	54	0.067	41.22
		• X93	29	0.036	
		• X94	4	0.005	
		• X95	21	0.026	
Hungary	2013	Undetermined firearm discharge	5	0.0505	41.67
		• Y22	1	0.0101	
		• Y23	0	0	
		• Y24	4	0.0404	
		Assault by firearm	6	0.0606	50.00
		• X93	3	0.0303	
		• X94	0	0	
		• X95	3	0.0303	
Iceland	2009	Undetermined firearm discharge	0	0	0
		• Y22	0	0	
		• Y23	0	0	
		• Y24	0	0	
		Assault by firearm	0	0	0
		• X93	0	0	
		• X94	0	0	
		• X95	0	0	
Ireland	2012	Undetermined firearm discharge	3	0.0654	13.64
		• Y22	0	0	

		<ul style="list-style-type: none"> • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	3 0 14 1 3 10	0.0654 0 0.3053 0.0218 0.0654 0.2181	 63.64
Italy	2012	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	2 0 1 1 219 13 15 191	0.0034 0 0.0017 0.0017 0.3678 0.0218 0.0252 0.3208	 0.68 73.99
Latvia	2012	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	5 0 1 4 5 0 1 4	0.246 0 0.0492 0.1968 0.246 0 0.0492 0.1966	 50.00 50.00
Lithuania	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	11 1 0 10 8 3 0 5	0.3685 0.0335 0 0.335 0.268 0.1004 0 0.1673	 55.00 40.00
Luxembourg	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	 0 0
FYR Macedonia	2010	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	0 0 0 0 22 8 0 14	0 0 0 0 1.0706 0.3893 0 0.6813	 0 88.00
Malta	2014	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	0 0 0 0 3 0 1 2	0 0 0 0 0.702 0 0.234 0.4679	 0 100.00
Montenegro	2009	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 	0 0 0 0 13 0	0 0 0 0 2.0585 0	 0 100.00

		<ul style="list-style-type: none"> • X94 • X95 	0 13	0 2.0585	
Netherlands	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	0 0 0 0 28 2 0 26	0 0 0 0 0.1666 0.0119 0 0.1547	0 100.00
Norway	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	0 0 0 3 0 3 0	0 0 0 0.0591 0 0.0591 0	0 100.00
Poland	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	34 1 3 30 25 8 2 15	0.0883 0.0026 0.0078 0.0779 0.065 0.0208 0.0832 0.039	53.97 39.68
Portugal	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	14 0 1 13 29 2 3 22	0.1344 0 0.0096 0.1243 0.2784 0.0191 0.0489 0.2104	31.81 65.91
Romania	2012	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	2 0 0 2 10 3 0 7	0.0094 0 0 0.0094 0.0469 0.0141 0 0.0328	10.00 50.00
Serbia	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	18 8 1 9 75 52 8 15	0.2514 0.1117 0.014 0.1256 1.0469 0.7259 0.1117 0.2094	18.75 78.13
Slovakia	2014	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	19 12 4 3 11 9 2 0	0.3499 0.221 0.0737 0.0552 0.2025 0.1657 0.0368 0	38.00 22.00
Slovenia	2010	Undetermined firearm discharge	1	0.0488	50.00

		<ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	0 0 1 1 1 0 0	0 0 0.0488 0.0488 0.0488 0 0	50.00
Spain	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	5 0 0 5 58 19 15 24	0.0107 0 0 0.0107 0.1245 0.0408 0.0322 0.0515	5.56 64.44
Sweden	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	5 4 1 0 22 15 5 2	0.0521 0.0417 0.0104 0 0.2291 0.1562 0.0521 0.0208	18.52 81.48
Turkey	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	0 0 0 0 770 0 173 597	0 0 0 0 1.0056 0 0.2275 0.785	0.00 55.52
UK	2013	Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	10 1 3 6 23 1 6 16	0.0156 0.0016 0.0047 0.0094 0.0373 0.0016 0.0094 0.025	26.32 60.53
Total		Undetermined firearm discharge <ul style="list-style-type: none"> • Y22 • Y23 • Y24 Assault by firearm <ul style="list-style-type: none"> • X93 • X94 • X95 	428 54 43 331 1665 212 270 1183		12.4 47.6