



STRATEGY
& CHANGE

DETECTING ELUSIVE CRIMINALS

RESEARCH FOR TACKLING EUROPE'S
GRAND CHALLENGE OF TRANSNATIONAL
ORGANIZED CRIME

THE HAGUE CENTRE FOR STRATEGIC STUDIES AND TNO



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TNO and The Hague Centre for Strategic Studies (HCSS) program Strategy & Change analyzes global trends in a dynamic world affecting the foundations of our security, welfare, and well-being.

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THE GRAND CHALLENGES PROJECT

Over the past century, Europe has become more and more prosperous. We are healthier, richer, safer and live longer than ever before. But there is a downside to this success: it poses new challenges that threaten our future wellbeing. Ironically, many of these challenges are prices we pay for progress. Our economic growth comes at the cost of a changing climate and resource scarcity; new technologies breed new types of international organized crime; modern lifestyles lead to new diseases; increasing life expectancy puts pressure on public finances; and new production patterns lead to food safety concerns. Policy makers, researchers, companies and citizens in Europe need to look at ways to deal with these trends. The Grand Challenges project aims to further the debate by looking at how we can use research and development to tackle the most pressing societal challenges to Europe's future. In six separate reports, we highlight grand challenges on six key issues. We show how these developments may impact Europe's future and look at the potential of applied science to address these challenges and create new opportunities for European societies.

EXECUTIVE SUMMARY

Organized crime for the European market is a multi-billion dollar business that feeds on, as well as sustains, poverty and poor governmental control. As factors like the economic crisis and the emergence and growth of urban slums will sustain organized crime, this threat is likely to stay with us in the foreseeable future. Against this background, this report answers the following question: what research strands need to be explored further in order to find solutions for the threat posed to Europe by transnational organized crime?

The flexibility of criminal networks is remarkable, as they seem to think nothing of moving operations to other countries, entering into new partnerships and using other modes of transportation. Also, they are often quick to pick up on new technologies that help them run their businesses. The consequent lack of signature and standard operating procedures on the part of criminal networks means that they are increasingly difficult to detect. The fact that a criminal cell has at one point been in touch with another cell, says little to nothing about the likelihood that they will be in touch again. In general, it is questionable to what extent past behaviors can be used as clues to predict future conduct and eventually find and catch criminal cells.

Current research strands that have to do with the detection of criminal networks fail to take into account the state of flux that is characteristic of organized crime. Technological detection tools like scanners and air sampling devices are deployed statically, and fail to uncover more than a small part of all organized criminal activity. Knowledge discovery approaches, in which criminal networks can be detected through the analysis of digital data, are mostly based on police records. This means that approaches along these lines are largely reactive in nature. A similar objection can be raised against crime mapping exercises that are carried

out by scholars and government research departments. They register trends and developments in organized crime after they have taken place. This means that organized crime mapping, while useful, is always a step behind- a shortcoming which could be a problem against a threat that changes rapidly and constantly.

Therefore, we suggest a series of research strands that are more preventive in nature. First, the detection of criminal networks should be applied to the preventive and early warning phase. We should development frameworks and vulnerability assessment tools to predict or estimate whether a certain area - a neighborhood, a city, a region - will in the near future have to deal with criminal networks. This will help governments act quickly and at an early stage, which is crucial when dealing with a fluid and adaptive threat like the one posed by organized crime. For the development of such vulnerability and early warning frameworks, we need more research into what contextual factors make areas vulnerable to organized crime, and into the motives of criminal networks to choose certain areas of operation over others. We need, in other words, to learn more about the causes behind the trends and developments in organized crime. Second, research is needed to identify and address legal obstacles to the sharing of information between and within governments needed to detect criminal networks or make vulnerability assessments. What should be addressed is not only the legal obstacles between governments, but also within governments and between the government and the private sector. Finally, we should look into technological tools for criminal network detection (e.g., data mining) as well as into possibilities to generate human criminal intelligence, as such an approach will be non-intrusive and will help law enforcement agencies win the trust of the local population.

1 INTRODUCTION

Although the Colombians nicknamed it *El Ataúd* ('The Coffin') in a reference to the risks involved in its use, the new type of narco-submarine stunned law enforcement agencies on both sides of the US-Mexican border.¹ Unlike previous versions, the new narco-subs are fully submersible, are thought to be able to travel the distance between South America and the US, and can in some cases carry ten tons of cocaine. With these capabilities, they are a marked improvement from the small speedboats that were used before. And more importantly, they are indicative of the drug cartels' willingness to invest in R&D to secure their business. The degree of professionalism is underlined further by the fact that these submarines are being produced in the jungle and at a rate that makes it impossible for law enforcement to intercept all, or even a sizeable part, of the loads that are trafficked by sea.²



FIGURE 1: NARCO-SUB SEIZED IN ECUADOR

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- 1 D. Kushner, "Drug-sub Culture," *New York Times*, April 26, 2009, <http://www.nytimes.com/2009/04/26/magazine/26drugs-t.html>.
 - 2 M.S. Schmidt and T. Shanker, "To Smuggle More Drugs, Traffickers Go Under the Sea," *New York Times*, September 9, 2012, <http://www.nytimes.com/2012/09/10/world/americas/drug-smugglers-pose-underwater-challenge-in-caribbean.html>.

While admittedly an extreme example, the use of the narco-subs is indicative of the lengths that criminal networks go to in order to stay out of the hands of the law. Many groups operate in a considerably less sophisticated way, but even then many of them are hard to dismantle. Given the flexibility of these networks, the lack of fixed organizational structures and operational patterns and their creative use of ICT, organized crime will be a security threat in the decades to come, and one from which Europe is far from exempt. In fact, Europe is, together with North America, the most important destination of almost all types of illicitly traded goods. Trafficking to Europe is a multi-billion dollar business strand, with cocaine trafficking alone generating some \$34 billion per year, a revenue that puts it on a par with companies like Amazon.com and Coca Cola (see figure 2).

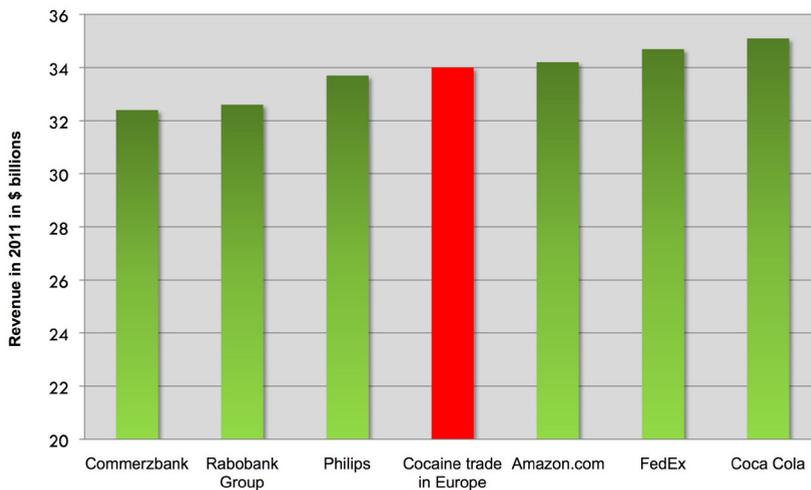


FIGURE 2: LICIT AND ILLICIT TURNOVERS COMPARED

SOURCES: CNN, GLOBAL 500 ([HTTP://MONEY.CNN.COM/MAGAZINES/FORTUNE/GLOBAL500/2011/FULL_LIST/](http://money.cnn.com/magazines/fortune/global500/2011/full_list/)) AND UNODC, THE GLOBALIZATION OF CRIME: AN ORGANIZED CRIME THREAT ASSESSMENT (2011), P. 16.

Unfortunately, there is no realistic chance that it will change essentially in the near or mid-term. When looking at organized crime's future prospects, it is difficult to escape the conclusion that there are several important factors that will probably sustain it. First, it is well-known that the world is currently undergoing a steady **urbanization** process. Much of this urban growth takes place in countries with low GDPs and will consequently take the form of the emergence and expansion of slums. Criminal networks thrive in zones like these. They can draw on a pool of unemployed and youthful recruits and can do so in an area where the law means little to nothing.³

Another important driver is the **economic crisis** that much of the western world is still dealing with. Antonio Maria Costa, the executive director of the United Nations Office on Drugs and Crime (UNODC), explained in 2009 that the economic crisis is a driving factor behind organized crime in the sense that banks, in dire need for cash but reluctant to get it from other banks, are more open to criminal funds. It is now easier for criminal networks to store and use their revenues. Costa even spoke of "a license for organized crime to penetrate into the financial system".⁴ A worrying sign of the times is the recent scandal around the British bank HSBC, which violated compliance standards to help Mexican drug cartels launder their money. The bank even went so far as to set up a branch on the Cayman Islands through which the cartels' revenues could enter the legitimate financial system.⁵ On top of that, there is the possibility that the economic crisis, as it leads to growing unemployment and a decline in licit opportunities, is making people lower their standards regarding the origins of the products they use, and even regarding their source of income. Put differently, people have less qualms about buying counterfeited products, and about working for or with criminal networks.⁶

3 T. van Dongen, "Urban Black Holes: The Changing Face of State Failure," *Small Wars Journal Blog*, 2011, <http://smallwarsjournal.com/blog/urban-black-holes>.

4 M. Astor, "UN Says Financial Crisis Boosts Organized Crime," *Guardian*, August 7, 2009, <http://www.guardian.co.uk/world/feedarticle/8598271>.

5 D. Rushe, "HSBC 'Sorry' for Aiding Mexican Drugs Lords, Rogue States and Terrorists," *Guardian*, July 12, 2012, <http://www.guardian.co.uk/business/2012/jul/17/hsbc-executive-resigns-senate>.

6 *The Globalization of Crime: a Transnational Organized Crime Threat Assessment* (Vienna: UNODC, 2010), 32.

Third, organized crime is being facilitated by the **ongoing instability of some regions in Africa and Latin America**. Criminal networks use these regions, with their weak law enforcement, corrupt officials, and poor border control, to traffic their goods to Europe.⁷ For instance, West Africa is an important transit area for cocaine, whereas Tajikistan plays a similar role in heroin trafficking. As long as these states remain weak, are left with inadequately built institutions, and remain unable to provide basic services to their populations, criminal networks will use them as transit areas through which they can smuggle their contraband to its destination.⁸

Given the scale of the problem, it should come as no surprise that the fight against organized crime has picked up as a policy priority. The European Union's 2010 *Internal Security Strategy* highlights "serious and organised crime" as one of the most important threats to Europe's internal security, and indicates that the threat is growing.⁹ Further, the Council of the European Union recently agreed on a "way forward" to tackle drug trafficking from West Africa, issued a directive on how to counter human trafficking, and adopted a decision on how to counter arms smuggling by air.¹⁰ In 2011, it formulated its overall priorities in the fight against crime. The *Council conclusions on setting the EU's priorities for the fight against organised crime between 2011 and 2013* mentioned as its priorities the countering of cocaine trafficking from West Africa, the curbing of illegal immigration through Southern and Eastern Europe, disruption of the trade in synthetic drugs, and the reduction of itinerate organized crime (on which more in paragraph 3.1.2). Reference is also made to criminal groups from

7 R.I. Rotberg, "Failed States, Collapsed States, Weak States: Causes and Indicators," in *State Failure and State Weakness in a Time of Terror*, ed. R.I. Rotberg (Washington, DC: Brookings Institution Press, 2003), 6.

8 I. Briscoe and E. Dari, *Crime and Error: Why We Urgently Need a New Approach to Illicit Trafficking in Fragile States*, CRU Policy Brief (The Hague: Clingendael, 2012).

9 *Internal Security Strategy* (Brussels: Council of the European Union, 2010), 6.

10 *Coordination of Cooperation in Combating Organised Crime, Especially Drug Trafficking, Originating in West Africa* (Brussels: Council of the European Union, 2010); *Directive on Preventing and Combating Trafficking in Human Beings and Protecting Its Victims, and Replacing Council Framework Decision 2002/629/JHA* (Brussels: European Parliament and the Council of the European Union, 2011); *Decision on EU Action to Counter the Illicit Trade of Small Arms and Light Weapons (SALW) by Air* Council Decisions (Brussels: Council of the European Union, 2010).

the Western Balkans and to the fight against cyber crime and criminal use of the internet.¹¹

Adding up the observations from the previous paragraphs (resilient and large-scale threat, presence of sustaining factors, EU policy priority), it is safe to say that organized crime is a grand challenge to Europe. Of course, much research has been done into the functioning of criminal networks, but given the ever-changing nature of the problem (see chapter 3) and the limitations of the research that has been done so far (see chapter 4), it is still possible to identify a role for research in the fight against organized crime. Therefore, and with the goal of the Grand Challenges project in mind, the research question that will be answered in this report is the following: *what research strands need to be explored further in order to find solutions for the threat posed to Europe by transnational organized crime?*

1.1 STRUCTURE OF THE REPORT

The first step towards an answer to the research question is providing clarification on the definition and demarcation of a broad and multi-faceted phenomenon like organized crime. This will be done in chapter 2. In chapter 3, the most important trends in organized crime will be identified. These need to be taken into account to credibly formulate promising research directions. The next step, elaborated on in chapter 4, is an examination of what is lacking in current strands of research. What are the gaps that are left by current research into organized crime? The answer to this question is the basis for chapter 5, which suggests some future research directions that will be helpful in the fight against organized crime.

¹¹ *Council Conclusions on Setting the EU's Priorities for the Fight Against Organised Crime Between 2011 and 2013* (Brussels: Council of the European Union, 2011), 3.

2 RELEVANT TERMS AND DEFINITIONS

2.1 DEFINING ORGANIZED CRIME

As is the case for many phenomena in the field of geopolitics and international security, there is no generally accepted definition of 'organized crime'. In a telling illustration of the divergence on this point, German criminologist Klaus von Lampe lists up to 150 definitions on his website.¹² From these 150 definitions, we had to pick one that reflects the nature of the security threat we want to discuss in this report. In other words, there are some characteristics of organized crime that, at least in our view, should be mentioned in the definition.

First, we understand organized crime to be **a-political**. All forms of political violence are excluded from our perception of organized crime, even though some may argue that terrorism should be included. Terrorism is, of course, organized crime in a literal sense: it is a form of crime and it is, except in cases of so-called 'lone wolf' terrorism, organized. On the other hand, it is also a form of political action aimed at changing a policy or an entire social order in a given territory. This sets it apart from organized crime as we understand it here. From this, however, it cannot be deduced that political actors like terrorist and insurgent groups cannot engage in organized crime aimed at financial or material gain. In fact, there are numerous well-documented cases of terrorist and insurgent groups that trade drugs and other contraband to finance their violent political campaigns.¹³ For much of its existence, the Basque separatist group ETA has been involved in the

12 K. von Lampe, "Definitions of Organized Crime," accessed November 5, 2012, <http://www.organized-crime.de/OCDEF1.htm>.

13 S. Hutchinson and P. O'Malley, "A Crime-terror Nexus? Thinking on Some of the Links Between Terrorism and Criminality," *Studies in Conflict & Terrorism* 30, no. 12 (2007): 1095-1107.

trafficking of narcotics and illegal firearms.¹⁴ Another important example is the Provisional IRA, which ran a vast network of illegal businesses, and was involved in the trafficking of various kinds of contraband, ranging from drugs to video and audio bootlegs.¹⁵ The group also committed armed robberies, this to the horror of some of its members. IRA-defector Eamon Collins recounts in his memoirs how shocked he was to find that his fellow Provos were stealing money from a hotel they had just bombed.¹⁶ With examples like these, there is no denying smuggling and illicit trade may be crucial activities for terrorist and insurgent groups. Therefore, while we exclude political violence from our analysis, we do consider a drug racket run by a terrorist or insurgent group to be organized crime because the immediate purpose of this line of activity is financial gain.

Second, the notion of organized crime suggests, even if only vaguely, a **certain order of magnitude** as a defining element. Accordingly, what we want to discuss in this report is crime on a certain scale, even though we are aware that this choice can be contested on conceptual grounds. There are many definitions of organized crime according to which a burglary or robbery carried out by two petty thieves should be considered organized crime. At the same time, though, petty theft and professional and highly complex trafficking operations are so obviously different that it is difficult to treat both phenomena on an equal footing. The numerical strength of the Italian criminal group *'Ndrangheta* (The Defiant and Valiant Ones) is estimated at six to seven thousand, which clearly puts it in a different category than the groups that consist of a handful of men who get together to commit the occasional burglary (see figure 3 for more examples of major criminal networks).¹⁷

14 J. Solomon, *Exposing the ETA Financial Network: Spanish Court Issues Historic Ruling*, World Check Terrorism Brief Paper (World-Check Terrorism & Insurgency Research Unit, 2008).

15 J. Horgan and M. Taylor, "Playing the 'green Card' - Financing the Provisional IRA: Part 1," *Terrorism and Political Violence* 11, no. 2 (1999): 8.

16 E. Collins and M. McGovern, *Killing Rage* (London: Granta Books, 1997), 103.

17 J. Hooper, "Move over, Cosa Nostra," *Guardian*, August 6, 2006, <http://www.guardian.co.uk/world/2006/jun/08/italy.johnhooper>.



FIGURE 3: CRIMINAL NETWORKS IN EUROPE. INFOGRAPHIC: JORIS FISELIER

On the basis of these considerations, the definition of organized crime adopted by the UN is a viable one for the purposes of this report. This means that we will understand ‘organized crime’ to mean “large-scale and complex criminal activities carried out by tightly or loosely organized associations and aimed at the establishment, supply and exploitation of illegal markets at the expense of society.”

The use of this definition also makes clear that we are in no way limiting ourselves to hierarchically organized and enduring networks. Some definitions of organized crime state that it is the work of criminal networks with fixed structures, but it is doubtful whether such a criterion corresponds with the way criminal networks operate today. Given the current modus

operandi of criminal networks, which generally have little fixed structure and are made of cells that interact on an *ad hoc* basis, the UN definition rightfully stresses the importance of both tightly and loosely organized associations.

A final point of explanation concerns the label '**transnational**'. In keeping with our perception of this grand challenge as emanating from larger criminal networks, we are aware that many criminal networks cross borders as they are carrying out their illicit trade. Therefore, much of the organized crime discussed in this report is transnational in the UNODC's meaning of the term. Although the organization eschews the formulation of a definition of transnational organized crime, it does provide a helpful elaboration on the meaning of the term 'transnational' in this context: "The term covers not only offences committed in more than one State, but also those that take place in one State but are planned or controlled in another. Also included are crimes in one State committed by groups that operate in more than one State, and crimes committed in one State that has substantial effects in another State."¹⁸

2.2 DEMARCATION

Now that we have defined transnational organized crime, there is the question of what activities we consider 'organized crime' and which ones we leave aside in the analysis underlying this report. We consider the following criminal activities, if transnational and if in accordance with the UN definition of organized crime, to constitute transnational organized crime (TOC):

- trafficking and illicit trade in drugs
- trafficking and illicit trade in arms
- trafficking and illicit trade in wildlife and waste
- human trafficking
- fraud
- counterfeiting
- property crime
- money laundering

¹⁸ "Organized Crime," *UNODC*, accessed November 5, 2012, https://www.unodc.org/unodc/en/organized-crime/index.html#what_organized_crime.

The exact sizes of these various organized crime branches are difficult to estimate, but there are UNODC-data that give us at least a rough idea about the amounts of money that are being made in these various branches by trafficking to Europe. Figure 4 shows a tree map of the various kinds of organized crime and how they relate to each other in terms of annual turnover. The data in the tree map do not include intra-European trafficking, but the patterns are so salient that we can get an idea of the relative sizes of the most important markets in Europe.



FIGURE 4: TREE MAP WITH RELATIVE SIZES OF ORGANIZED CRIME BRANCHES IN MILLION EUROS

By far the largest market is cocaine trafficking, the annual revenue of which is more than double that of heroine, the second-largest illicit product. This gap is not so much a reflection of differences in the amounts that are being consumed annually, but rather of the fact that cocaine is much more

expensive than heroin.¹⁹ The market for product counterfeiting, a form of crime that is widely thought to be on the rise, is about half the size of the heroin market. Other forms of crime that receive a lot of attention from policy makers, such as cyber crime, maritime piracy and human trafficking, are much smaller. This is not to belittle the importance of these forms of crime, or to argue that they should not be policy priorities. There are more indicators for the seriousness of a problem than merely money, but what these numbers do show, is where criminal networks have the biggest stakes. Figure 5 contains the UNODC estimates for the size and impact of several kinds of organized crime.

ORGANIZED CRIME PROBLEM	ORGANIZED CRIME PROBLEM ESTIMATED EXTENT ESTIMATED ANNUAL VALUE (€) POTENTIAL EFFECTS	ESTIMATED ANNUAL VALUE (€)	POTENTIAL EFFECTS
Trafficking in persons	70 000 victims (annual) 140 000 victims (stock)	2.3 billion (stock)	Human Rights violations
Smuggling of migrants	55 000 migrants (annual)	116 million (income for smugglers)	Irregular migration, vulnerability of migrants
Cocaine (from the Andean Region)	212 tons (depart) 124 tons (at destination)	29 billion (at destination)	Addiction, drug related crime, corruption and violence in the Andean Region, links with illegal armed groups in the Andean region, destabilization and corruption in neighbouring states, Central America and Mexico
Heroin (from Afghanistan)	140 tons (depart) 87 tons (at destination)	15.5 billion (at destination)	Addiction, increase in organized crime, funding for criminals and insurgents, corruption
Trafficking of natural resources (from Southeast Asia)	Perhaps 10 million cubic meters	2.7 billion (at destination)	Deforestation, loss of habitat, loss of species, climate change, increased rural poverty especially amongst indigenous people, irregular migration, flooding, soil erosion
Product counterfeiting	Some two billion articles per year	6.3 billion (at destination)	Loss of product safety and accountability, loss of revenue

FIGURE 5: SIZE AND IMPACT OF VARIOUS FORMS OF ORGANIZED CRIME

SOURCE: UNODC, THE GLOBALIZATION OF CRIME: AN ORGANIZED CRIME THREAT ASSESSMENT (2011), P. 16-17

19 See the UNODC estimates of prices of cocaine and heroin in Europe at http://www.unodc.org/unodc/secured/wdr/Cocaine_Heroin_Prices.pdf.

Some forms of organized crime have been left out of the list and the discussion above. For example, given the specific modus operandi of maritime pirates and the fact that it is often treated as a separate security challenge, we decided not to address it in this report. On similar grounds, we decided to leave out cyber crime, which we understand as criminal activity aimed at digital targets. First, while it may be organized, cyber crime is more fruitfully considered part of the cyber security domain. It involves hacking and the breaking of digital codes to get access to certain digital data or systems, and so has more in common with cyber espionage than it does with drug trafficking. This similarity applies to the nature of the threat as well as to the nature of the possible solutions. Countermeasures against cyber crime will be more akin to countermeasures against other cyber threats than to those against drug trafficking. The second reason is the obviousness of technology-driven solutions against cyber threats. It is clear that the means to counter cyber security threats should primarily be sought in the digital sphere. Detection of attacks, information exchange between relevant players and protection of likely targets are all tasks that require digital tools. For 'off-line' challenges like human trafficking and money laundering, the nature of the adequate response is less clear-cut. Drawing on these arguments, we felt justified in excluding purely digital forms of crime, as they form a threat category that is clearly separate from the forms of organized crime covered in this report.

None of this is to suggest that there is no digital dimension to the forms of organized crime listed above. Criminal networks use online forums to get in touch with each other and in some cases have access to highly sophisticated ICT-equipment. This dimension will be addressed in the following chapter.

3 THE INCREASING ELUSIVENESS OF ORGANIZED CRIME

The threat of organized crime to Europe is currently undergoing changes with far-reaching consequences. The essence of these changes is that criminal networks are working less and less according to fixed patterns. For each of their operations, they cooperate with different partners, engage in different kinds of crime and move their goods along different routes. This chapter will, primarily on the basis of organized crime threat assessments of Europol, the UNODC and various European governments, outline and illustrate this trend towards more elusive criminal networks. It will also elaborate on an important implication, the growing need for more sophisticated tools to detect criminal networks.

The focus of this chapter will be on the development of organized crime as a whole. Addressing all shifting transit routes, all decreasing and increasing markets and all new smuggling techniques, and doing so for every single organized crime branch, suggests a level of detail that goes far beyond what is necessary and feasible for the purposes of this report. The goal of this chapter, therefore, is not to give a comprehensive overview of all recent developments in organized crime. Instead, it is intended as an assessment of the ways in which the functioning of criminal networks, insofar as these constitute a grand challenge to Europe, is changing.

This chapter addresses current trends and recent developments, but mention should also be made of the high degree of continuity that is typical of some aspects of organized crime. Money laundering and fraud are as important as they have always been, most of the victims of human trafficking still end up in the sex industry, and cocaine trafficking is still the most lucrative form of drug trafficking. Cigarettes are, as ever, popular items for counterfeiting and Afghanistan is still by far the most important source country for heroin. In other words, it is possible to identify some major changes that are currently taking place, even while recognizing that not everything is in flux and that these changes take place over a longer period of time.

3.1 TRENDS AND DEVELOPMENTS IN ORGANIZED CRIME

HORIZONTAL DIVERSIFICATION

Partially driven by the economic downturn in the western world, criminal cells and networks in Europe no longer specialize in one particular branch of organized crime. Instead, they have become **polycriminal**. Many criminal networks today react to market opportunities as they present themselves, and are by no means tied to a certain product or product line. It is quite common for criminal networks to traffic drugs and human beings as well as arms and counterfeited products.²⁰ A clear example is the rich portfolio of the Italian criminal group *Sacra Corona Unita* (United Sacred Crown), which is involved in cigarette smuggling, arms trafficking, drug trafficking, kidnapping, extortion, fraud, illegal immigration, loan sharking, money laundering, murder, people smuggling, political corruption, and illegal gambling.²¹ Factors that determine a criminal network's choice for a type of operation include the opening up of access routes to Europe, chance offers by other criminal networks, law enforcement pressure and rising and falling profit rates.

This horizontal diversification, as it would be called in regular business terms, suggests that a given criminal cell today engages in **a wider variety of contacts and partnerships**. For a long time, criminal cells would only deal with other criminal cells that had a similar cultural or ethnic background and could be counted on to speak the same language. Today, even though cultural and ethnic ties still count, criminal cells are more pragmatic. They enter into the *ad hoc* partnerships and alliances they need for their business, regardless of the ethnic or cultural background of the other cells. In seeking opportunities for lucrative cooperation, criminal groups also cross the boundaries between the various branches of organized crime. It is, simply put, no longer true that drug traffickers only deal with drug traffickers and Albanians only with Albanians.²²

20 *EU Organised Crime Threat Assessment 2011* (The Hague: Europol, 2011), 8.

21 "Italian Organized Crime: Overview," *FBI*, accessed November 30, 2012, http://www.fbi.gov/about-us/investigate/organizedcrime/italian_mafia.

22 J.P. Bjelopera and K.M. Finklea, *Organized Crime: An Evolving Challenge for Us Law Enforcement*, CRS Report for Congress (Washington, DC: Congressional Research Service, 2012), 18.

Also, criminal networks sometimes **work together with professionals from very different and legal lines of work**. This is clear from the somewhat bizarre story of Colombian ‘queen pin’ Angie Sanclemente, who started a drug racket to get back at her former boyfriend, a Mexican cartel leader nicknamed ‘The Monster’.²³ Herself a former beauty queen, Sanclemente recruited a group of models to run a cocaine trafficking network. Their occupation provided the perfect cover for their operations, as Sanclemente’s team was never suspected of drug trafficking, until one of them tried to smuggle 120 pounds of cocaine, worth some €2.5 million, on a plane.²⁴ This episode illustrates how criminal networks seek the cooperation of non-criminal actors in order to use legal activities as a cover-up.

A more common example of the misuse of legitimate professions for criminal purposes, mostly through corruption, is the **entanglement of organized crime and public administration**. In return for the bribes they pay, criminal networks can get a degree of protection, or can get politicians and public officials to turn a blind eye to criminal activities. These practices take place on many levels and in many kinds of public organizations. Political leaders are bribed, as are border control personnel, the judiciary and police officers.²⁵ In some cases, organized crime has worked its way into the public sector to the point where one can speak of the merging of the criminal and public sphere.²⁶ A prominent example of a country with a strong collusion between organized crime and government, sometimes called ‘state capture’, is Italy, where the ‘*Ndrangheta*’ have a significant

23 B. Leach, “Lingerie Model Runs One of World’s Largest Drug Gangs, According to Police,” *Telegraph*, February 24, 2010, <http://www.telegraph.co.uk/news/worldnews/southamerica/argentina/7304510/Lingerie-model-runs-one-of-worlds-largest-drug-gangs-according-to-police.html>.

24 K. Penhaul, “Model, Allegedly Drug Queen, on the Lam,” *CNN*, March 27, 2010, <http://edition.cnn.com/2010/WORLD/americas/03/24/colombia.drug.queen/index.html?hpt=C1>.

25 P. Gounev and T. Bezlov, *Examining the Links Between Organised Crime and Corruption* (Sofia: Center for the Study of Democracy, 2010), 33–52.

26 *Eindrapport Verkenningen: Houvast Voor De Krijgsmacht Van De Toekomst* (Den Haag: Ministerie van Defensie, 2010), 106.

presence in the public sector.²⁷ Other disquieting cases are Russia, some former Soviet republics, and Bulgaria.²⁸

The increasing cooperation of criminal networks with other actors and products also applies to their **ties with terrorist and insurgent groups**. Trafficking networks stand much to gain by lawless environments through which they can freely smuggle their goods to their destinations. To operate in such areas, however, criminal networks need the cooperation of the actors that fill the power vacuum left by the state. This means that they are regularly in touch with local criminal networks, but also with more politically-minded organizations. When state power has eroded so deeply that the state is no longer able to fulfill its basic tasks, like providing security and health care, it often happens that militant or insurgent groups step in to provide these basic services to the population. After having taken on such a role, they are in some cases strong enough to charge a toll in return for which they allow traffickers unhindered passage through their territory. A good example is *Al Qaeda in the Islamic Maghreb* (AQIM), a group of Islamist militants active in Algeria, Mauretania, Mali and Niger. AQIM was forced out of northern Algeria and moved to the southern border region, where it now makes money off the cocaine flows from Latin America through West Africa to Europe.²⁹

This criminal-militant collusion sometimes has the effect of drawing militant groups away from the political and deeper into the criminal realm. Most of the time, the money gained this way is used to finance militants' violent campaign, but it happens that profit becomes a more important motivation than politics. AQIM, the Taliban and the FARC are probably the best-known examples of insurgent groups whose violent political campaigns

27 L. Paoli, "De 'Politiek-criminele Nexus' in Italië: 150 Jaar Betrekkingen Tussen Maffia En Politiek," *Justitiële Verkenningen* 35, no. 3 (2009): 43.

28 D. Siegel, "Misdaad En Politiek in Rusland," *Justitiële Verkenningen* 35, no. 3 (2009): 77; P. Gounev and T. Bezlov, "Georganiseerde Misdaad, Corruptie En Politiek in Bulgarije," *Justitiële Verkenningen* 35, no. 3 (2009): 80.

29 J.P. Pham, "Foreign Influences and Shifting Horizons: The Ongoing Evolution of Al Qaeda in the Islamic Maghreb," *Orbis* 55, no. 2 (2011): 248.

degenerated, at least to a considerable extent, into organized crime.³⁰ It is not always clear to what extent financial motives have entirely eclipsed the political goals of groups like these, but their deepening involvement in organized crime certainly suggests that the contacts of criminal networks active in Europe are diversifying to include more politically-minded actors. A second important implication of the crime–militancy nexus is that cooperation with terrorist and insurgent groups feeds horizontal diversification. As a result of these ties, criminal networks get access to transit routes for products and sellers that they were unable to reach before.

INCREASING MOBILITY

The increasing flexibility, or opportunism, on the part of criminal networks is thus clear in their choice of products and partners, but also extends to their ability to move goods and activities around. The most important dimension is the variety in **transport routes** that are being used.³¹ Criminal networks no longer stick to one route or a small number of routes, nor do they need to. With the increasing ubiquity of transport networks and infrastructure, at least within Europe, they can choose their preferred routes on the basis of their assessments of police activity and other relevant circumstances. In some cases, this involves taking detours. Some African human trafficking victims are first sent to Moscow or Istanbul, then to Eastern Europe and from there to their final destination in Western Europe.³² With the increasing numbers of flights and roads, the potential for variation is considerable.

And what is more, transnational criminal networks are increasingly using weakly regulated areas to access Europe. One of the most important developments in recent years is the emergence of new trafficking routes in West Africa for cocaine from Latin America. As a result of the shrinking demand for cocaine in the US, Latin American traffickers shifted their focus to Europe, where the consumption of cocaine increased from some 63 tons

30 W. Thornberry and J. Levy, *Al Qaeda in the Islamic Maghreb*, AQAM Futures Project Case Study Series (Washington, DC: CSIS, 2011), 5; A. K. Cronin, *How Terrorism Ends: Understanding the Decline and Demise of Terrorist Campaigns* (Princeton and Oxford: Princeton University Press, 2009), 150–151; G. Peters, *How Opium Profits the Taliban*, *Peaceworks* (Washington, DC: United States Institute of Peace, 2009), 33.

31 *The Globalization of Crime*, 3.

32 *Transnational Trafficking and the Rule of Law in West Africa: a Threat Assessment* (Vienna: UNODC, 2009), 44.

in 1998 to some 124 tons in 2008.³³ Given the region's lawlessness, trafficking via West Africa is a sensible option for Latin American criminal networks that want to deliver cocaine to destination markets in Europe. Also, the West African diaspora in Europe constitutes a trusted network that can be used to take the cocaine from West Africa to its destination markets.³⁴ According to recent estimates by the UNODC, about 27% of all cocaine in Europe has been trafficked through West Africa.³⁵ But in West Africa, too, transit routes changed, if the locations of the drug seizures are anything to go by (see figure 6).

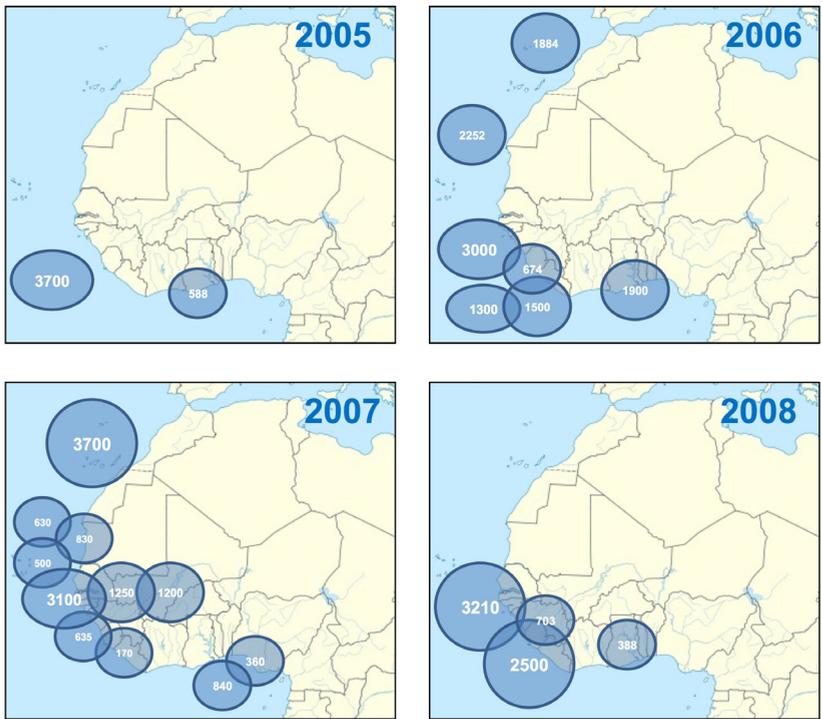


FIGURE 6: DRUG SEIZURES IN KILOGRAMS IN WEST AFRICA, 2005-2008

SOURCE: UNODC, *TRANSNATIONAL TRAFFICKING AND THE RULE OF LAW IN WEST AFRICA* (2009), P. 14

³³ *The Globalization of Crime*, 102-103.

³⁴ *Transnational Trafficking and the Rule of Law in West Africa*, 15.

³⁵ *Ibid.*, 17.

The mobility of criminal activities can be further illustrated by the development of the production and trade in **synthetic drugs** in Europe, which is becoming more and more widespread. Europol reports that no less than 65 new kinds of synthetic drugs were discovered in the period 2009-2010.³⁶ Unlike other types of drugs, synthetic drugs do not require any form of agriculture. This means that they can be – and are – produced everywhere in the world, and that the production can easily be moved around.³⁷ Lack of access to technology and expertise could be limiting factors, but it is widely believed that criminal networks are able to either enlist trained chemists or simply use rudimentary production facilities and methods.

Another criminal phenomenon related to increased mobility is **itinerant organized crime** or, more prosaically, criminal tourism, a kind of criminal activity mostly perpetrated by groups from Central and Eastern Europe.³⁸ Essentially, these groups travel around Europe and commit crimes along the way. Itinerant organized crime groups commit a wide variety of offences, but the various kinds of property crime (burglaries, organized shoplifting, car thefts, etc.) probably account for the lion's share of their activities.³⁹ In some cases, they recruit minors for their actions. Many of these groups are plugged into a wider network. In order to process their stolen goods, they get in touch with criminal groups in their home countries. This way of working makes it difficult to distinguish petty crime from organized crime. There is no way of knowing whether a car was stolen by an isolated individual, or by a car thief with access to a large network he or she can use to sell the spoils. As has been mentioned before, the Council of the European Union has made the fight against groups of this kind one of the main priorities of its fight against organized crime. But the problem is not limited to the EU. The Swiss federal police also reports itinerant organized crime, primarily perpetrated by Eastern European groups.⁴⁰

³⁶ *EU Organised Crime Threat Assessment 2011*, 16.

³⁷ "Synthetic Drugs and Precursor Chemicals," *Interpol*, accessed November 9, 2012, <http://www.interpol.int/Crime-areas/Drugs/Synthetic-drugs-and-precursor-chemicals>.

³⁸ *Tackling of Itinerant Criminal Groups* (Brussels: Federale Politie, 2010), 11.

³⁹ S. van Daele and T. Vander Beken, "Exploring Itinerant Crime Groups," *European Journal on Criminal Policy and Research* 16, no. 1 (2010): 1-13.

⁴⁰ *Jahresbericht 2010* (Bern: Fedpol, 2011), 12-13.

NEW TECHNOLOGIES, NEW ORGANIZATION

The flexibility in the three aspects discussed above – products, partners and locations – requires a certain organizational agility. By this, we mean that the separate components of a criminal network should be left the freedom to respond to opportunities as they present themselves. In recent years, we have seen the emergence of criminal networks that clearly display such qualities. Even though some Italian groups and some American groups with Italian roots (see figure 7) still function this way, the hierarchical network, with its relatively fixed organizational structure and working procedures, appears to be on the decline and is being replaced with **the decentralized network**.



FIGURE 7: HIERARCHY IN ITALIAN CRIME FAMILIES

In this latter model, cells do not follow orders from a centre, but act on their own accord. A long-standing example is the Dutch criminal scene called the 'penose', perhaps more accurately considered a social environment than an organization. As opportunities present themselves, members of this network seek each other out to join up in impromptu configurations, which disband as quickly as they are formed. The penose has no official or explicit hierarchy, nor does it have a set division of labor.⁴¹ This way of working not only adds to a criminal network's flexibility, but also to their security. Criminal networks that operate according to fixed patterns are more vulnerable to policing, at least in highly regulated environments like Europe. It is easier for law enforcement agencies to know what traces to look for to disrupt the activities of such criminal networks. A cell or network that constantly changes its ways of working is decidedly more difficult to track down.

The increasing flexibility and decentralization of criminal networks is related to the **new technologies** that criminal networks have been quick to adopt. Much like other forms of social activity, organized crime increasingly relies on new media and new means of communication. Criminal networks use online forums to find markets, partnerships, recruits, and, in the case of human trafficking, victims (see figure 8).⁴² Skype and Facebook are frequently used for such purposes.⁴³ As the example of the penose shows, the trend towards more decentralized networks predates the introduction of many of these social media, but it has been accelerated by it.

41 P. Klerks, *Groot in De Hasj: Theorie En Praktijk Van De Georganiseerde Criminaliteit* (Rotterdam: Erasmus Universiteit Rotterdam, 2000), 69.

42 *EU Organised Crime Threat Assessment 2011*, 9; A.P. Sykiotou, *Trafficking in Human Beings: Internet Recruitment* (Strasbourg: Council of Europe, 2007).

43 *EU Organised Crime Threat Assessment 2011*, 44.

The screenshot shows the Silk Road anonymous market interface. At the top, it displays 'messages 1 | orders 0 | account \$0.00'. The main navigation includes a search bar and a 'Go' button. On the left, there is a 'Shop by Category' menu listing various items such as Drugs (Cannabis, Dissociatives, Ecstasy, Opioids, etc.), Apparel, Books, Collectibles, and more. The main content area features a grid of product listings, each with a small image and text describing the item and its price. For example, one listing is for '5G Cocaine Pure Cristal Flakes' priced at \$41.94, and another is for '28.0G High Quality Crystal Meth' priced at \$188.72. There is also a 'SPECIAL OFFER' for 'BRAND SUBOXONE' at \$0.91. A 'News' section on the right contains several bullet points, including 'Closing the Armory' and 'A brand new look for Silk Road!'.

FIGURE 8: SILK ROAD, ONLINE FORUM FOR ILLICIT TRADE

Another interesting example concerns the use of GPS for the tracking of contraband. A criminal network that has handed over its goods for transportation is now able to see where the transporter is at all times, which reduces the risk of double-crossing. This is an important innovation in a world where both mistrust and cooperation are crucial for a cell's survival.⁴⁴ The use of GPS also allows for the transfer of smuggled goods from one criminal cell to another with little, if any, contact between them. As long as both cells have the means to track down a certain piece of merchandise, the transfer can take place, and there are very few leads for the police to go on. Furthermore, there are reports that organized criminal networks are able to block or jam GPS to keep their stolen goods from being tracked down by the police.⁴⁵

44 D. Schiller, "Hidden GPS Gives Drug Traffickers a Secret Eye on Their Loads," *Houston Chronicle*, October 24, 2011, <http://www.chron.com/news/houston-texas/article/Hidden-GPS-gives-drug-traffickers-a-secret-eye-on-2232824.php>; *Houston HIDTA 2011 Threat Assessment* (Houston: Houston Intelligence Support Center, 2011), 20.

45 M. Warman, "Organised Crime 'Routinely Jamming GPS'," *Telegraph*, February 22, 2012, <http://www.telegraph.co.uk/technology/news/9096080/Organised-crime-routinely-jamming-gps.html>.

ORGANIZED CRIME GOES 'GLOCAL'

The term 'glocal' hints at a situation that is shaped by local factors as well as by global factors. In the words of American sociologist Roland Robertson, it is "the simultaneity --- the co-presence --- of both universalizing and particularizing tendencies."⁴⁶ In relation to organized crime, this means that some criminal activities, especially property crimes, are very local in the sense that they are a response to an opportunity structure in the criminals' direct environment, but are at the same time global, because they are part of the activities of an international network. With the new communication means available, it becomes easier for local, petty criminals to get in touch with larger networks. Thus, local crime feeds into transnational organized crime.

What is problematic about this is not only that it is easier for local criminals to access the market for stolen goods as sellers, but also that it is becoming more difficult to tell the difference between petty and organized crime. In this way, the '**glocalization**' of crime poses a similar problem as itinerant organized crime. Previously, it was possible to make a distinction between local crime (car thefts, burglary) and forms of crime (cocaine and heroin dealing) that could only take place when certain goods were imported into a certain region from without. This latter form of crime can be said to be 'top-down', as it reaches the local level from the international level. The 'glocalisation' of crime now suggests that there is also a 'bottom-up' process: local crime enters the international level in search for markets. Before this trend had materialized, it could be assumed that cocaine trafficking was the work of larger networks, and burglaries or car theft rather the work of petty criminals. The latter of these two assumptions is now obsolete. An important consequence of the 'glocalisation' of crime is that one can no longer safely guess the extent of a perpetrator's involvement in transnational organized crime from the kind of crime that has been committed.

46 R. Robertson, "Comments on the 'Global Triad' and 'Globalisation'," in *Globalisation and Indigenous Culture*, ed. I. Nobutaka (Tokyo: Institute for Japanese Culture and Classics, 1997), 221.

3.2 IMPLICATIONS

Summing up the findings of the analysis of trends and developments in organized crime, one can say that European governments are facing increasingly agile opponents. The flexibility of criminal networks is remarkable, as they seem to think nothing of moving operations to other countries, entering into new partnerships and using other modes of transportation. Also, organized criminal networks often quickly pick up on new technologies that help them run their businesses.

The consequent lack of signature and standard operating procedures on the part of criminal networks means that they are increasingly difficult to detect. Criminal networks no longer work according to more or less stable patterns, which lends a degree of unpredictability to their actions and makes it hard to adequately map their activities. After all, the fact that a criminal cell has at one point been in touch with another cell, says little to nothing about the likelihood that they will be in touch again. Similarly, a criminal cell's use of a certain transit route can no longer be used as a clue that that same cell will use that same transit route again. It is questionable to what extent past behaviors can be used as clues to predict future behavior and eventually find and catch criminal cells.

We need a new approach to deal with this challenge, that is, tools to deal with the fluidity and elusiveness of organized crime. The need for more effective methods and devices to identify, locate, and find criminal networks will be there as long as there is organized crime, but right now, given the ways organized crime is currently developing, we are especially hard-pressed for new solutions. In the next chapter, we will review the current research that is most likely to help us in detecting criminal networks.

4 RESEARCH ON CRIMINAL NETWORK DETECTION

The findings of the previous chapter suggest a clear need for sophisticated tools and methods to detect criminal networks. In this chapter we will examine some current research strands to see to what extent they address this need.

4.1 MAPPING AND MONITORING ORGANIZED CRIME

Organized crime has, of course, long been the topic of scientific and applied research. A wide variety of scholars and researchers have addressed topics as different as perpetrator characteristics, links between crime and terrorism, impact on victims, penitentiary regimes, and the public perception – or fear – of crime. Also, much effort is being spent on the evaluation of measures to prevent and repress organized crime. Another important topic, and one that is particularly relevant for the increasing elusiveness outlined in the last section of the previous chapter, is the mapping of organized crime. Many studies **describe developments** in certain organized crime branches, or in organized crime in a certain region. Some of this work is being done by governments. Countries like Bulgaria, Canada, Germany, the Netherlands, the UK, Northern Ireland and Switzerland publish threat assessments that outline recent trends and developments in organized crime in their countries. Many of these reports are drawn up by police forces or by research institutes that are affiliated to a ministry of justice or of internal affairs.⁴⁷ Europol and the UNODC publish

⁴⁷ *Serious and Organised Crime Threat Assessment 2010-2011* (Sofia: Center for the Study of Democracy, 2012); *2010 Report on Organized Crime* (Ottawa: Criminal Intelligence Service Canada, 2010); *Organisierte Kriminalität: Bundeslagebild 2011* (2012: Bundeskriminalamt, 2012); KLPD, *Nationaal Dreigingsbeeld 2008: Georganiseerde Criminaliteit* (Zoetermeer: KLPD - Dienst IPOL, 2008); H.G. van de Bunt and E.R. Kleemans, *Georganiseerde Criminaliteit in Nederland: Derde Rapportage Op Basis Van De Monitor Georganiseerde Criminaliteit* (Meppel: Boom Juridische Uitgevers, 2007); *Jahresbericht 2010*.

similar reports, the latter organization often about particular regions or particular types of organized crime. Studies of this kind contain detailed information about shifting transit routes, emerging markets and the nationality of victims as well as perpetrators. In the same vein, the scholarly literature on organized crime contains many assessments of recent developments in a particular type organized crime, sometimes focused on a particular region.⁴⁸ Some scholars have taken a more structured and less descriptive approach and have developed frameworks to measure the presence of organized crime in a given city or region.⁴⁹

There is undoubtedly a need for solid research into the ways organized crime is developing. If anything, we need more research along these lines. As we have seen in the previous chapter, criminal networks are constantly adapting and responding to changes in their environment. Consequently, information about how and where these groups operate may soon be outdated. We must also think of ways to improve the ways in which the information that underlies these analyses is collected. Insistent on the need for more knowledge that would help governments find criminal networks, the 2011 Home Office document *Future Directions for Organised Crime Research* states that research is needed to enhance the “investigation, surveillance and tracking” capabilities of the British police.⁵⁰ The Australian Institute of Criminology, a governmental research organization in the field of crime and criminal justice, issued calls for research to enhance law enforcement agencies’ ability to detect human trafficking networks.⁵¹

48 L. Holmes, “Corruption and Organised Crime in Putin’s Russia,” *Europe-Asia Studies* 60, no. 6 (2008): 1011-1031; D. Silverstone, “From Triads to Snakeheads: Organised Crime and Illegal Migration Within Britain’s Chinese Community,” *Global Crime* 12, no. 2 (2011): 93-111; K. von Lampe, “Organized Crime in Europe: Conceptions and Realities,” *Policing* 2, no. 1 (2008): 7-17.

49 F. Calderoni, “Where Is the Mafia in Italy? Measuring the Presence of the Mafia Across Italian Provinces,” *Global Crime* 12, no. 1 (2011): 41-69; T. Vander Beken, “Risky Business: A Risk-based Methodology to Measure Organized Crime,” *Crime, Law and Social Change* 41, no. 5 (2004): 471-516; J. van Dijk, “Mafia Markers: Assessing Organized Crime and Its Impact Upon Societies,” *Trends in Organized Crime* 10, no. 4 (2007): 39-56.

50 *Future Directions for Organised Crime Research* (London: Home Office, 2011), 11.

51 J. Putt, *Human Trafficking to Australia: a Research Challenge*, Trends and Issues in Crime and Criminal Justice (Canberra: Australian Institute of Criminology, 2007), 3.

Improvements along these lines would enhance the accuracy of our crime mapping efforts.

But while one can argue that we need more and better crime mapping when organized crime is as elusive as it currently is, there is also a fundamental limitation to this approach that should not be overlooked. At best, it provides us with the information or the tools to see to what extent organized crime is a problem. It does not allow for a more preventive approach. Analyses of trends and patterns in organized criminal activity tell us when and where things have gone wrong, but not when and where it is about to go wrong, or when and where there is a serious risk that things might go wrong. In this sense, it is a fairly **reactive** approach, a point we will return to in the next chapter.

4.2 KNOWLEDGE DISCOVERY

By knowledge discovery, we mean “the nontrivial extraction of implicit, previously unknown, and potentially useful information from data.”⁵² It is a broad concept and includes the **mining of various kinds of data, including audio, text and pictures**. As organized criminals, much like non-criminals, are leaving more and more digital traces, it only makes sense to develop tools that help us use these traces to discover organized crime patterns.

Some ten years ago, computer scientists made the first attempts to apply knowledge discovery tools to criminal records. In a response to the explosive growth of the volume of available digital data, Coplink, now in use by the police department of the Arizona town of Tucson, was developed as a framework that could be used to assess and quantify connections between all suspects mentioned in police records.⁵³

52 W.J. Frawley, G. Piatetsky-Shapiro, and C.J. Matheus, “Knowledge Discovery in Databases: An Overview,” *AI Magazine* 13, no. 3 (1992): 58.

53 R.V. Hauck et al., “Using Coplink to Analyze Criminal-justice Data,” *IEEE Computer* 35, no. 3 (2002): 2-9.

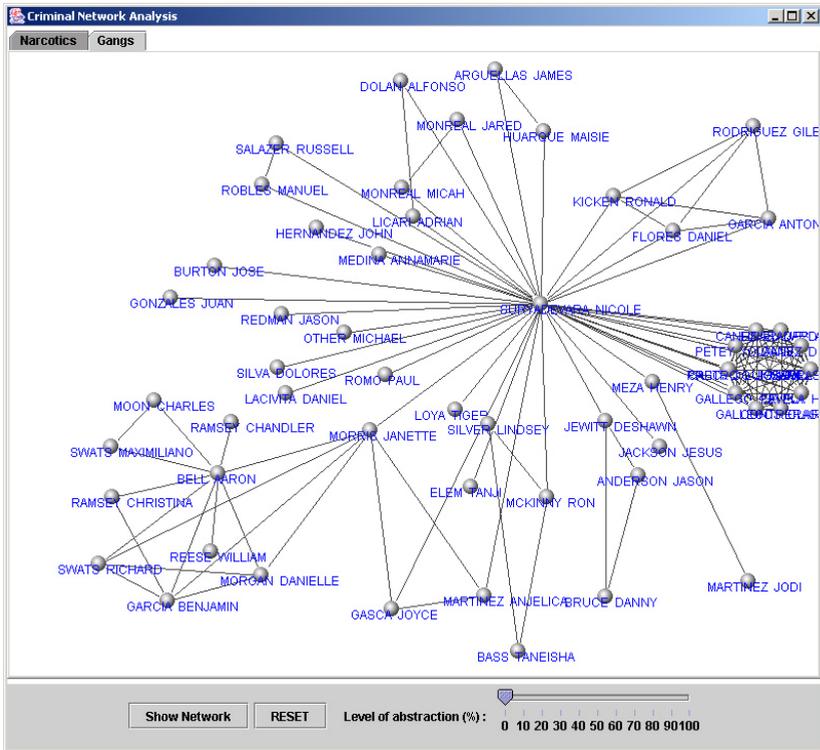


FIGURE 9: A CRIMINAL NETWORK VISUALIZED IN COPLINK

In subsequent years, several scholars followed this lead and dedicated themselves to the development of analytical tools to discover connections between criminals. Today, many Canadian, British and US law enforcement agencies apply knowledge discovery tools to their **police records** to solve their criminal cases. Particularly widely used are geo-profiling tools, which use information from a crime scene to find out where a perpetrator lives.⁵⁴

54 S. Nielsen-Dumzsur and S. Chainey, "Criminal Geographic Profiling: Assessing the Interpretative Confidence of Geographic Profiling Techniques" (presented at the 7th National Crime Mapping Conference, London, 2009); S.C. Smith and C.S. Bruce, *CrimeStat III User Workbook* (Washington, DC: National Institute of Justice, 2008); D. Canter and D. Youngs, "Geographical Offender Profiling: Applications and Opportunities," in *Applications of Geographical Offender Profiling*, ed. D. Canter and D. Youngs (Aldershot and Burlington: Ashgate Publishing, 2008), 3-24.

Although the algorithms that are used, are sophisticated, the underlying idea of tools of this kind is quite simple. The starting point is that full use should be made of information that law enforcement agencies have about criminal incidents and their perpetrators. It has rightfully been pointed out that the increasing volumes of digital information available to law enforcement agencies pose a challenge as well as an opportunity. On the one hand, there is the risk of information overload, especially when this information is scattered over various databases, and when the databases where this information is kept, are unstructured. At the same time, this information, when used the right way, can also prove a treasure trove for law enforcement agencies looking for organized crime patterns and links between perpetrators.⁵⁵

To realize the potential of police records for the detection of criminal networks, various authors have suggested ways to mine these data for links between criminals. In very practical terms, this means that criminals who operate in the same way, or at the same places and at the same time, are grouped. Other factors that can be included in such analyses are family names, places of residence and shared use of the same resources, e.g., cars or weapons. What thus emerges from a haystack of incident reports and criminal records, is a picture of which criminals work together to the extent that they can be considered a network.⁵⁶ In such an approach, it is also possible to make a distinction between core and peripheral members of the network. The numbers of links a person in a criminal network has and

55 C. Chibelushi, B. Sharp, and H. Shah, "ASKARI: a Crime Text Mining Approach," in *Digital Crime and Forensic Science in Cyberspace*, ed. P. Kanellis et al. (Hershey: Idea Group, 2006), 155-174.

56 F. Ozgul et al., "Combined Detection Model for Criminal Network Detection," in *Intelligence and Security Informatics*, ed. H. Chen et al., Lecture Notes in Computer Science 6122 (Berlin and Heidelberg: Springer, 2010), 1-14; F. Ozgul, J. Bondy, and H. Aksoy, "Mining for Offender Group Detection and Story of a Police Operation," in *Proceedings of the Sixth Australasian Conference on Data Mining and analytics-Volume 70* (Australian Computer Society, Inc., 2007), 189-193; M.A. Tayebi, P.L. Brantingham, and U. Glässer, "Organized Crime Detection in Co-offending Networks" (presented at the Third Annual Illicit Networks Workshop, Montreal, 2011), http://www.erdr.org/textes/tayebi_glasser_brantingham.pdf; G. Oatley and B. Ewart, "Data Mining and Crime Analysis," *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery* 1, no. 2 (2011): 147-153.

the frequency of his or her contacts can tell us something about how important this person is in his or her criminal network. By analyzing the patterns in the network's communication, one can also identify the role that someone plays in a criminal network, e.g., leader or gatekeeper.⁵⁷

Unfortunately, these approaches are **not without difficulties**, even apart from the possibility that police information is incomplete, inconsistent, or even simply wrong. On a technical level, it is possible that various pieces of information are stored in different formats, not all of which may lend themselves to knowledge discovery tools. Further, it is important to realize that the use of police records suggests a limitation to, or at least a strong bias towards, criminal offenders that have actually been arrested. This suggests two shortcomings. First, data mining of police records will only give us the links an offender had as s/he was carrying out a crime for which s/he was arrested. Second, it will only show links to other offenders that have been arrested. It is certainly conceivable that this covers only a part of the activities of a criminal network. After all, not all criminal contacts that an offender had during the commitment of a crime for which he or she was arrested, will surface in police records. And, of course, some crimes go undetected altogether.

A way around the limitations of police records could be to mine other data that can be linked to a criminal, like e-mails, websites, blogs, chat logs, Google Waves and files found on notebooks or USB sticks. An analysis of, for instance, weblogs and e-mails, may enable police investigators to identify criminal network members who have not been arrested.⁵⁸ The relations that are uncovered here, are relations between various bloggers and e-mail users, not between various arrested criminals. Moreover, when such analyses are carried out with information that covers a longer period of time, it can also become clear when certain members drifted into and

57 J. Xu and H. Chen, "Criminal Network Analysis and Visualization: a Data Mining Perspective," *Communications of the ACM* 48, no. 7 (2005): 101-107.

58 C.C. Yang and T.D. Ng, "Terrorism and Crime Related Weblog Social Network: Link, Content Analysis and Information Visualization" (presented at the 2007 IEEE Intelligence and Security Informatics, New Brunswick, NJ, 2007), 55 -58.

out of the network.⁵⁹ Given how technology-prone criminal networks generally are, approaches along these lines may prove to be welcome contributions to governments' attempts to not let criminal networks have an edge over them in the use of ICT.

Still, it remains to be seen to what extent the knowledge discovery approach will realize its potential, as it is also hamstrung by other factors. Much will depend on the **linguistic capabilities** of tools that are used for such purposes. Given the transnational nature of many criminal networks, such a tool would have to be able to process data in more than one language. Currently, there are very few tools that have that capability. Another linguistic problem is the use of slang, which contains many words and terms that are not part of any official language. As the use of slang is not uncommon among criminals, it will be difficult to extract useful insights from various kinds of data generated by criminal networks.

But even if all these problems would be solved, and the knowledge discovery tools would function perfectly, there is still at least one limitation and one obstacle to this approach. To start with the latter, before these tools can be used, the **political and administrative setting** needs to be in order. The sharing of data is difficult in the EU, where the successful implementation is likely to be complicated by discrepancies between national legislations as well as by the lack of a common information infrastructure through which data can be easily pooled. The limitation that needs to be addressed, is very similar to the one that was briefly discussed at the end of the previous paragraph. Like the mapping of crime, this approach is largely **reactive**. Criminal networks are being identified on the basis of information acquired or generated only after suspects have been arrested. As most of the knowledge discovery tools discussed in this section are used to solve criminal cases, this is not surprising, but for an approach to crime fighting that does more than arrest suspects and bring them to justice, it is not enough. Both these issues, the obstacle and the limitation, will be addressed in the next chapter.

59 R. Al-Zaidy et al., "Mining Criminal Networks from Unstructured Text Documents," *Digital Investigation* 8, no. 3-4 (2012): 147-160.

4.3 DETECTION DEVICES

For decades, a wide variety of **scanners and detection equipment** has been used to spot weapons, explosives, drugs and other illicit goods. The best-known example is the x-ray baggage scanner currently used at virtually every airport in the western world. Also, the authorities at major ports routinely use x-ray scanners to see whether trucks or cargo ships are carrying stolen or illegal goods. A more recent application for similar purposes is air sampling. In this approach, air samples from around a person or asset are being analyzed, mostly for traces of explosives or chemical, biological, radiological and nuclear (CBRN) substances. There are also technologies that are specifically designed for the detection of narcotics. Two years ago, Heathrow Airport acquired the world's first automatic narcotics detector, which is now used to screen baggage from destinations known for the production and trafficking of drugs.⁶⁰

Detection devices have of course been in use for decades and hardly constitute a new or emerging research field. It is, however, a field in which research is constantly taking place to improve security solutions, because there is a consistent demand for new and better products. For example, when outlining its research priorities on the subject of drug trafficking, the UK Home Office unequivocally stated that “[d]etection technologies are a priority”.⁶¹ To meet such demands, major companies involved in the development of technologies to enhance security in the civilian realm, like AS&E, RapidScan and Smiths Detection, typically spend tens of millions of Euros per year on R&D.⁶²

60 “Heathrow Airport Takes Automatic Narcotics Detection Technology,” *Defense File*, March 25, 2012, http://www.defensefile.com/News_Detail_Heathrow_airport_takes_automatic_narcotics_detection_technology_7308.asp#axzz2DKoL05UK.

61 *Future Directions for Organised Crime Research*, 10.

62 *Annual Report 2012* (Billerica, MA: AS&E, 2012), 17.



FIGURE 10: OVERVIEW OF COMPANIES AND ACTIVITIES

The focus of their efforts is not necessarily on the development of completely new technology-driven security solutions, but rather on the perfection of existing ones. Their R&D efforts are largely focused on the development of equipment that is lighter, faster and smaller. Other important goals include increased accuracy and user-friendliness, as well as the equipment's ability to function under difficult circumstances, for instance in dusty or moist environments.⁶³

As for the relevance of detection equipment in the fight against organized crime, it should be noted that it is **limited to the detection of goods that**

63 "Research and Development," *Smiths*, 2012, <http://www.smiths.com/smiths-detection-research-and-development.aspx>; "Case Studies," *Smiths*, 2012, <http://www.smiths.com/case-studies.aspx>; "ITMS Technology," *Safran Morpho*, 2012, <http://www.morpho.com/r-d/detection-340/itms-technology-trace-detection/?lang=en>; "Quadruple Resonance," *Safran Morpho*, 2012, <http://www.morpho.com/r-d/detection-340/quadrupole-resonance/?lang=en>; "Research & Development," *AS&E*, 2012, <http://www.as-e.com/resource-center/research-development/>; *Rapiscan Research & Development: Meeting Security Screening Challenges Through Innovation and Applied Research* (Torrance, CA: Rapiscan Systems), accessed November 26, 2012, http://www.rapiscansystems.com/en/products/research_and_development.

are likely to be trafficked by organized criminal networks. Drug trafficking is often the work of transnational criminal networks, so a narcotics detector can pick up on indication that organized crime is taking place. Unlike the data mining methods discussed in the previous paragraph, detection devices do not pick up on criminal networks, but only on crimes that are likely to have been committed by criminal networks.

The usefulness of detection devices is further limited by the **static and predictable** way in which they are often deployed. Border control around the European Union has tightened considerably in the last decade, but still criminal networks are able to smuggle tons of cocaine per year across European borders. We have seen in chapter 2 that criminal networks display a certain creativity when it comes to finding new transit routes or access points. They look for the weak spots in Europe's lines of defense, and have a keen sense of where the most advanced detection devices are being deployed. These observations inform their operational choices. This way of working limits the pay-off of detection devices; as long as not every possible point of entry into the European Union is secured, there will be ways for criminal networks to bring their contraband to European markets. As it is impossible to secure every point of entry into the EU, expansion of the EU's external border control is not the way forward.

4.4 TOWARDS A NEW APPROACH?

This chapter started out from the observation that criminal networks are becoming more agile and move quickly from one area or one product to another. With this development taking place, it is important to note that, while there are specific flaws or limitations to each of the three research strands discussed above, all three of them are mostly reactive in nature. What has been said above in relation to knowledge discovery, also applies to the other two strands: it shows us where problems are, not where they are going to be.

RESEARCH AREA	GOALS	LIMITATIONS	SOLUTIONS
Mapping and monitoring organized crime (par. 4.2)	Establishing patterns, trends and developments in organized crime (products, transit routes, markets etc.)	Reactive, descriptive (no attention paid to causes of trends and developments)	Add causal analysis (how can shifting organized crime patterns be explained?)
Knowledge discovery (par. 4.3)	Using digital police records to identify criminal networks and to characterize the roles played by various nodes in the network	Information overload, flawed data, undetected crime / limited to known criminals, linguistic problems, inadequate legal framework, reactive	Expand data pool, research into legal possibilities for information exchange
Detection devices (par. 4.4)	Technological tools to spot weapons, explosives, drugs and other illicit goods	Reactive, static (criminal networks know how to avoid detection devices)	Increased mobility and deployability

FIGURE 11: OVERVIEW OF INTENTIONS AND WEAKNESSES OF RESEARCH DIRECTIONS

Given the swiftness of the ways criminal networks change the nature of their operations, what is needed is research that will help us detect organized crime at an earlier stage, or even before it actually occurs. Monitoring and detection should not only be a matter of examining police records, but also of early warning systems and vulnerability assessments of areas that are not yet afflicted by organized crime. It is certainly not our intention to denigrate the approaches discussed in this chapter, or the insights they generated, but for a more comprehensive approach to the detection of organized crime, one that also takes drivers and early warning signals into account, a new approach is needed. The next chapter will make suggestions for research strands that could be helpful in developing new ways of organized crime detection.

5 FUTURE RESEARCH DIRECTIONS

To address the gaps identified in the previous chapter, we suggest a series of future research directions. The main thrust of these suggestions is that we should fight organized crime by taking a more preventive approach, one that would help us avoid the actual occurrence of organized crime and the social damage that comes with it. The idea is not that the research outlined in the paragraphs below should replace the research discussed in chapter 4. Rather, the development of ideas that help us add a preventive strand to our strategies against organized crime should supplement more reactive approaches.

As should be clear from paragraph 2.2, organized crime comes in many shapes and forms, which will undoubtedly require specific solutions. In the paragraphs that follow, we have outlined the research directions in general terms, but this does not mean that all directions are equally relevant to all forms of organized crime. Also, we allow for the possibility that some of the research directions discussed below will have to be tailored to the form of crime they will target.

5.1 FROM MAPPING TO PREDICTING

As argued in the previous chapter, monitoring and mapping should be about more than the occurrence of crime. A more preventive approach requires the monitoring of risk indicators and of early warning indicators of organized crime.

ORGANIZED CRIME RISK INDICATORS

Ideally, organized crime risk indicators should be integrated in an **organized crime risk index** of some variety, or perhaps separate indices should be formulated for various types of organized crime, or for different regions. Such an index would consist of a series of organized crime risk indicators on the basis of which a composite score could be calculated. For instance,

an area that scores high on indicators like 'poverty / unemployment' and 'erosion of state power' would have a high organized crime risk. The idea would be that it can be applied to a certain area - a neighborhood, a city, or a region - to see how likely it is that this area will soon have to deal with organized crime when nothing is being done. We are looking for a model with some predictive value; it should say something about whether the area is at risk, not whether organized crime has already worked its way into the area. This means that we need to know first what factors attract organized crime. Several elements of the social context could be examined for their importance as organized crime risk factors.

- **Socio-economic factors.** Poverty and unemployment are factors that are associated with crime, and are perhaps also relevant risk indicators for organized crime. The reduction of licit opportunities by poverty and organized crime may drive people into criminal networks. This sets in motion a vicious circle, as experience with violence at a young age may affect someone's moral fabric to the point where he or she sees little wrong in pursuing a career in organized crime. Another interesting idea to pursue is the notion of 'gateway' crimes, criminal activities that at-risk individuals typically commit before pursuing a career in organized crime. Membership of youth gangs might be an example. An increase in such 'gateway crimes' in a certain region could indicate organized crime risk. To explore options like these, we need to learn about the way people grow into criminal networks. The pre-organized crime careers of members of criminal networks should be examined to see whether there are set paths or patterns.⁶⁴
- **The role of the government.** This is a contextual factor that may matter in several ways. First, people who feel alienated and poorly provided for by the state, are more likely to structurally disregard its rules. If the state is then also unable to punish criminal behavior, the area's susceptibility to organized crime may increase even further. Then there are the differences in legislative frameworks against organized crime. No two Schengen signatories have the same criminal code, so criminal networks can pick

64 E.R. Kleemans and C.J. de Poot, "Criminal Careers in Organized Crime and Social Opportunity Structure," *European Journal of Criminology* 5, no. 1 (2008): 69-98.

and choose the country that offers the most room for their business, the products of which they can still smuggle to other countries.

- **Preferences of criminal networks.** Regarding the criminal networks themselves, we should try to find out what kind of areas they prefer.⁶⁵ What are the factors that inform their decision making processes concerning new areas of operation?

It should be noted that these are examples. The research we suggest should lead to more definite and specific statements about what factors can indeed be seen as risk factors. Neither is this list comprehensive. Other factors may be worth examining as well.

EARLY WARNING

A similar approach can be applied to the stage in which organized crime is beginning to expand into a new area. For this we need research about how, in very practical terms, criminal networks **try to get access** to markets or to regions. What are the first steps they take? What do they do, who do they approach, and through what channels? If we know the initial steps that criminal networks take when they penetrate a new area, we can formulate **early warning signals**. As soon as policy makers pick up on these signals, they can divert resources to that area to nip this development in the bud. In the same vein, signals indicating that criminal groups or gangs are crossing over to organized crime could be helpful in alerting policy makers at an early stage to organized criminal activities from groups of homegrown criminals. For this, we need to learn more about the transition process from petty crime to organized crime.

5.2 INVOLVING THE POPULATION

The previous paragraph addressed research to identify information needed to alert practitioners to emerging organized crime threats. Another interesting research direction concerns ways to get that information. There is a strong tendency on the part of policy makers to look for solutions in hardware and tooling, but there are salient advantages to approaches that rely on human input. They are cheaper and less intrusive than, for instance,

65 K. Von Lampe, "Transnational Organized Crime Challenges for Future Research," *Crime, Law and Social Change* 58, no. 2 (2012): 188.

electronic detection tools like surveillance cameras. Also, the regular contact with the authorities that reliance on human intelligence suggests, may increase the visibility and trustworthiness of the police, or the state in general, in areas with high levels of organized crime risk. Therefore, it may be worth our while to look into the development of so-called '**smart operations**', through which the police and other government agencies draw on citizens to provide them with the information that is needed to maintain situational awareness in a certain area. Approaches along these lines may be applied to a wide variety of crimes, which means that the population, where necessary, will have to be informed about signals that point to the existence of ongoing criminal activity- for instance, the production of synthetic drugs or marihuana.

The most straightforward way of trying to get citizens to participate in the fight against crime is the publicity campaign. In the US, the Department of Homeland Security (DHS) recently launched the Blue Campaign, instructing citizens on how to recognize signals of human trafficking and persuading them to report possible cases.⁶⁶ In the Dutch city of Alkmaar, the police, the judiciary and the municipality started a similar initiative, publishing a brochure on how to recognize human trafficking and where to report it.⁶⁷

That more subtle, or perhaps manipulative, approaches are possible as well, is clear from an anti-crime project in Sugunami City, a district of Tokyo. The district administration decided to plant flowers in the streets, hoping this would put an end to the wave of burglaries that was plaguing Sugunami City at the time. District official Kiyotaka Ohyagi explained the rationale of the plan by pointing out that "[b]y planting flowers facing the street, more people will be keeping an eye out while taking care of the flowers or watering them."⁶⁸ This simple but clever way of luring people into positions where they can pick up on signals of crime, shows that we can gain much from the development of low-tech and non-intrusive surveillance mechanisms. Research into new options could focus not only on the role of

66 "Blue Campaign," *Department of Homeland Security*, 2012, <http://www.dhs.gov/blue-campaign>.

67 *Uitgebuut: Mensen Zijn Geen Handel* (Alkmaar: Openbaar Ministerie, 2011).

68 Y. Kubota, "Residents Fight Burglars with Flower Power," *Reuters*, June 12, 2009, <http://www.reuters.com/article/2009/06/12/us-flowers-idUSTRE55B3LC20090612>.

a neighborhood's residents, but also on professionals who regularly pass through the area, such as bus drivers and mailmen.

5.3 MAPPING CRIME

Even though mapping crime is by itself not enough for a more comprehensive approach against organized crime, it is absolutely necessary and **must be continued**. As has been argued in the previous chapter, the emergence of new forms of crime forces us to constantly renew our understanding of the functioning of criminal networks. Also, without this kind of research, we will not be able to draw up an organized crime risk index. Only after we developed an accurate idea about where and on what scale various kinds of organized crime occur, can we go look for risk factors and early warning signals. The crime mapping research described in paragraph 4.1 should form the basis of the organized crime risk index, as it allows for a comparative perspective: what do areas where organized crime occurs, have in common with each other and what sets them apart from areas that are not afflicted by organized crime?

Where this line of research can be improved, is in the extent to which it offers insights into the **causality** behind trends and developments in organized crime. As yet, very little is known about the internal workings of criminal networks and their motivations for moving into and out of certain geographical areas. We need to learn more about factors that inform decision-making in criminal networks. In a report on future research directions, the *Expert Working Group on Organized Crime*, assembled by the US Department of Justice, lamented the lack of research into “the logistics of IOC [International Organized Crime]”, and said that as a result, “practitioners do not have a systematic understanding of how crime groups move people around, communicate, or run other aspects of their multinational operations.”⁶⁹

69 J.T. Picarelli, *Expert Working Group Report on International Organized Crime* (Washington, DC: National Institute of Justice, 2010), 6.

5.4 THE ADMINISTRATIVE CONTEXT OF THE DETECTION OF CRIMINAL NETWORKS

Another set of research priorities concerns the administrative context within which the detection of criminal networks, whether pro-actively or reactively, takes place. Particularly important for the research directions discussed in this and the previous chapter is that the context allows for the **efficient exchange of data and information**. First, knowledge discovery and the mapping of transnational organized crime patterns will be more fruitful when carried out on the basis of input from a larger group of countries. Second, the vulnerability of a certain area to organized crime also depends on the vulnerability of other areas. It is not the vulnerability in absolute terms that matters, but the vulnerability in relative terms. Criminal networks have to choose between various areas and will choose the one that is the most vulnerable. Third, information and data exchange can support early warning systems, as some of the signals that criminal groups are relocating to another area will be not available to police forces or other government agencies in that area.

It is by now a truism to say that the fight against organized crime, being an international problem, requires **cooperation between governments** if it is to meet with any degree of success. Unfortunately, this has not translated in a strong willingness on the part of all EU member states to be forthcoming in the sharing of data and information. As criminal justice is still the prerogative of the Member States, there are within the EU many different standards about what kind of information can be shared with other countries and under what conditions. Matters are complicated further by the need to involve the **private sector**. Many clues about the activities of criminal networks are unwittingly in the hands of airlines, train operators and ports. However, the inclusion of such actors also opens up various legal debates: what can governments ask from private partners and can the Member States find any common ground on this point? Research can help by identifying legal possibilities for information and data exchange both between Member States and between the public and private sector. Another point that is worthy of note, is that problems regarding information sharing are not limited to cooperation between countries. Information sharing **within governments**, i.e., between various organizations that are part of the same government, can be problematic as well. Bureaucratic rivalries, legal restrictions, sheer ignorance of the value of certain

information, and the lack of an adequate infrastructure are all factors that can stand in the way of satisfactory information sharing. This suggests that research could be undertaken to examine the nature of the obstacles on the intra-country level as well.

A question that is relevant for all these three spheres (international, public-private and intra-governmental), is whether the **legal possibilities** that currently exist, are being used to the full. Privacy is a good example of a topic that lends itself to such an analysis. On the international level, it is often quoted as a reason not to share information or data, but it is far from certain that all Member States are really pushing the limits of the laws and regulations that govern their actions on this point. At the same time, this is not to encourage further encroachment on the privacy of European citizens under the aegis of the fight against organized crime. It is important to see whether states are going far enough, but it is at least as important to see whether they are going too far.

Once the legal issues are out of the way and the administrative setting is in order, there are, of course, **technical questions** that need to be addressed. These pertain, for instance, to issues about how information is stored and processed, what search functions are available and what kind of information a shared database should contain. Designing a database or a tool to access various databases is no mean feat, and will require much thinking on feasibility, user-friendliness and efficiency. Also, the digitalization of organized crime as described in previous paragraphs, calls for the development of tools for digital forensics. For the detection of criminal networks as well as for the prosecution of individual members of these networks, the ability to link digital traces to individuals is of the utmost importance.⁷⁰

70 W. Mazurczyk and K. Szczypiorski, "Toward Effective and Reliable Digital Forensics," *Computer Journal* 55, no. 6 (2012): 651-652.

CONCLUSION

The increasing elusiveness of organized crime is posing a strategic dilemma to Europe. On the one hand, it is possible to bank on a reactive and repressive approach. Criminal networks will in such cases only be detected after someone has been arrested for the crimes they have committed. Another option is to push the detection of criminal networks back to the preventive phase. In such an approach, one not only keeps track of the movements of criminal networks, but also tries to predict or estimate where they may move to, or where they may newly emerge. We strongly suggest that more attention be paid to the second option. If we manage to equip governments with some foresight as to where organized crime can be expected, it will be possible to take countermeasures at a stage where it is possible to avoid the phenomenon's devastating impact.

An important notion that speaks from the research directions in line with this ambition is that there is a certain order that needs to be respected. For instance, the relevant legal issues must be cleared up *before* knowledge discovery tools can be implemented. This does not mean that the two research directions cannot be pursued simultaneously, but it does mean that there is little point to pursuing one path without pursuing the other. Also, research into paths through which people grow into criminal networks should precede the development of a framework to measure the vulnerability of an area to organized crime.

In sum, the future research directions we suggest as helpful in the fight against organized crime are the following:

- **Factors that attract organized crime:** what are the (socio-economic, political, cultural etc.) characteristics of an area that make it likely that organized criminal activity will be drawn to it?

- **Career paths in organized crime**, especially the early stages: how do people become involved in organized criminal networks?
- **Decision making processes in criminal networks**: on the basis of what criteria do they choose their areas of operation?

Research into questions like these should feed into larger frameworks to detect organized crime, or vulnerability to organized crime, before the real damage is done. These frameworks are important research directions in themselves.

- **Development of a tool or framework to assess an area's vulnerability to organized crime**: how can we structurally and on a regular basis examine how susceptible an area is to organized crime?
- **Early warning signs of organized crime**: what are the signals by which one can tell that criminal networks are gaining a foothold in a certain area?

The research strands above research could help us identify the information we need to counter organized crime at very early stages. Other research is needed to develop new ways to get that information. This research priority can be formulated as follows:

- **Human criminal intelligence**: in what ways can the population be involved in the collection of early warning signals or information on the risk factors?

To create the right conditions for the implementation of some of the tools that research should be aimed at developing, other research is needed:

- **Legal framework**: what are the possibilities for data and information exchange between Schengen countries and between EU Member States? Is there room for more exchange within the current legal framework, or does the framework need adjusting? If so, how? Another issue is the involvement of the private sector. How much can legitimately be asked from private sector organizations that may have information about organized crime?

There is more to countering organized crime than repression and punishment. Measures in the preventive sphere – i.e. luring people out of criminal networks, depriving them of the tools or market opportunities they need – are at least as important. The research directions formulated above will facilitate the use of these measures, as they allow governments to identify the right places for the implementation of such preventive instruments. In other words, they allow governments to take a more proactive stance in the fight against organized crime. Knowing where organized crime might emerge, or is emerging, will go a long way toward the timely and appropriate use of more preventive measures, and eventually to the containment of organized crime's grand challenge to Europe.

ANNEX 1: RESEARCH ORGANIZATIONS IN THE FIELD OF ORGANIZED CRIME

PRIVATE (NON-PROFIT, BUSINESS AND UNIVERSITY) RESEARCH INSTITUTES

- Association Française de Criminologie (www.afc-assoc.org/)
- Centro Siciliano di Documentazione "Giuseppe Impastato" (www.centroimpastato.it/)
- Chicago Crime Commission (www.chicagocrimecommission.org/Default.aspx)
- Center for the Study of Democracy (www.csd.bg/)
- Centre for Criminal Justice Studies, University of Leeds (www.law.leeds.ac.uk/research/criminal-justice-studies/)
- Centre for Information and Research on Organised Crime (www.ciroc.nl)
- Centre International de Criminologie Comparée (www.cicc.umontreal.ca/)
- Centre de Recherches Sociologiques sur le Droit et les Institutions Pénales (www.cesdip.fr/)
- Centre for Transnational Crime Prevention (ctcp.uow.edu.au/index.html)
- ECPR Standing Group on Organised Crime (www.ecpr.eu/)
- ENPATES - European NGOs Platform Against Trafficking Exploitation and Slaveries (enpates.org/)
- European Forum for Restorative Justice (www.euforumrj.org/home)
- European Institute for Crime Prevention and Control, affiliated with the United Nations (HEUNI) (www.heuni.fi)
- European Monitoring Centre for Drugs and Drug Addiction (www.emcdda.europa.eu/)
- European Society of Criminology (www.esc-eurocrim.org/)
- Global Anti-Counterfeiting Network (www.gacg.org/)
- Human Trafficking Studies Centre, University of Warsaw (www.ipsir.uw.edu.pl/en/about_us/institute_directory/chair_of_criminology_and_criminal_policy/human_trafficking_studies_centre)

- Institut de criminologie de Paris (www.u-paris2.fr/63728379/0/fiche_laboratoire/)
- Institute for International Research on Criminal Policy (www.ircp.org/uk/index.asp)
- Institut National des Hautes Etudes de Sécurité et de la Justice (www.inhesj.fr)
- Instituut voor Strafrecht, KU Leuven (www.law.kuleuven.be/strafrecht/)
- International Association for the Study of Organized Crime (www.iasoc.net/)
- International Centre for Criminal Law Reform and Criminal Justice Policy (www.icclr.law.ubc.ca/)
- International Institute of Higher Studies in Criminal Sciences (www.isisc.org/)
- International Institute for Strategic Studies, Transnational Threats and Political Risk (www.iiss.org/programmes/transnational-threats-and-political-risk/)
- Max Planck Institute (www.mpi.nl)
- Matthew B. Ridgway Center for International Security Studies (www.ridgway.pitt.edu/)
- Nathanson Center on Transnational Human Rights, Crime and Security (nathanson.osgoode.yorku.ca/)
- Netherlands Institute for the Study of Crime and Law Enforcement (www.ncsr.nl)
- Organised Crime Observatory (www.o-c-o.net/)
- TraCCC (policy-traccc.gmu.edu/)
- Transcrime (www.transcrime.unitn.it/tc/664.php)
- Queens University, Canada (www.queensu.ca/)
- Société Internationale de Criminologie (www.criminology-programs.org/index.php/fr/societe-internationale-de-criminologie)
- Society Ključ - Centre for Fight Against Trafficking in Human Beings (www.drustvo-kljuc.si/)
- Stiftelsen Tryggare Sverige - Foundation Safer Sweden (tryggaresverige.org/)
- La Strada Foundation against Trafficking in Persons and Slavery (lastradainternational.org/?main=lastradaoffices§ion=poland)
- Studiecentrum Rechtspleging (www.ssr.nl)
- Transparency International (www.transparency.nl/)
- UNICRI (www.unicri.it/)

GOVERNMENTAL BODIES ACTIVE IN RESEARCHING TRANSNATIONAL ORGANIZED CRIME

AUSTRALIA

- Australian Institute of Criminology (www.aic.gov.au/)
- Australian Crime Commission (www.crimecommission.gov.au/)

BELGIUM

- Dienst voor het Strafrechtelijk Beleid (<http://www.dsb-spc.be/>)
- Nationaal Instituut voor Criminologie en Criminalistiek (nicc.fgov.be/home)

BULGARIA

- National Commission for Combating Human Trafficking (antitrafficking.government.bg/en/)

CANADA

- Criminal Intelligence Service Canada (http://www.cisc.gc.ca/index_e.html)
- The Organized Crime Agency of British Columbia (www.ocabc.org)

CZECH REPUBLIC

- Institute of Criminology and Social Prevention (www.ok.cz/iksp/en/aboutus.html)

GERMANY

- Bundeskriminalamt (www.bka.de)

HUNGARY

- National Institute of Criminology (en.okri.hu/)

NETHERLANDS

- Bureau of the Rapporteur on Human Trafficking and Sexual Violence (www.bnrm.nl)
- Wetenschappelijk Onderzoek- en Documentatiecentrum (www.wodc.nl)

SWEDEN

- National Council for Crime Prevention (www.bra.se/bra/bra-in-english/home.html#&panel1-1)

UK

- Serious Organised Crime Agency (www.soca.gov.uk)

US

- National Institute of Justice (www.nij.gov)
- Congressional Research Service (www.crs.gov)

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