An Introduction to Early Warning

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Abstract. Since the creation of the United Nations, the ban of the use of force has been collectively viewed as a founding principle of relations between states. However, the end of the Cold War and the strengthening of multilateral international institutions' role in conflict management has not resulted in a general and lasting commitment to the traditional principles of collective security. The use of force has been states' most evident strategy, but it is not the only approach. Actually, conflict prevention has been investigated outside the spotlight by academic circles, international organisations, and governmental institutions as an alternative option for the management of crisis situations. Conflict prevention is neither a new policy nor a new technical tool for avoiding war. Rather, it is a different approach to using existing tools of conflict management, and employing early warning systems. This paper investigates the development of the early warning concept and its application to the sphere of conflict management.

Keywords. disaster preparedness, conflict early warning, conflict management

Introduction

Since the creation of the United Nations, the ban of the use of force has been collectively viewed as one of the founding principles of the relations between states, as regulated in the UN Charter. Although war has continued, international community rules have never been as openly challenged as they are today. The bipolar order established together with the new organisation of international relations helped stigmatise global war. However, it certainly distorted the significance of the collective rules of international behaviour in many ways, especially with regard to conflict management within each superpower's sphere of influence. The end of the Cold War and the strengthening of multilateral international institutions' role in conflict management did not result in a general and lasting commitment to the traditional principles of collective security. On the contrary, in the face of the changing nature and scope of conflicts, the international community proved unable to act coherently with those principles and could not avoid recourse to "muscular" strategies. Today, especially as a consequence of 11 September 2001, a complete change of perspective regarding the use of force seems to have occurred so as to include military means among the ordinary instruments of conflict management and resolution.

However, although it is the most evident, this is not the only approach adopted by the international community in the face of the many and complex security challenges with which it must deal today. Actually, since the very beginning of the 1990s, conflict prevention has been investigated outside the spotlight by academic circles, international organisations, and governmental institutions as an alternative option for the management of crisis situations. Today, notwithstanding the current prevalence of military means in the panorama of international relations, it is not utopian to talk about conflict prevention and the instruments for accomplishing it. These last few years have in fact witnessed significant efforts to effectively translate theoretical discourses on conflict prevention into the practice of intergovernmental organisations, governments and NGOs. The mainstreaming of conflict prevention within the ordinary activities of these international bodies is becoming a real, although silent, trend that, in a not too distant future, could seriously challenge the current attitude towards the management of conflicts. For this to be accomplished, however, conflict prevention must be understood in its entirety. Conflict prevention is neither a new policy nor a new technical tool for avoiding war, rather it is a different approach to using existing tools of conflict management. In order to be effective, that is to ensure the prevention of potential conflicts escalating into open violence, a preliminary understanding of the whole crisis situation and an assessment of the best available preventive measures are needed, through the employment of early warning systems.

Though less popular than conflict prevention, early warning is of vital importance for conflict prevention itself, as it is its essential prerequisite. Initially associated with the issuing of warning signals regarding an impending escalation of conflict, early warning systems have developed into comprehensive instruments that are able to significantly influence the effectiveness of preventive strategies. Today's early warning encompasses different activities ranging from collecting information to anticipating conflict events but also, and especially, suggesting the most appropriate policy options for preventing conflict outbursts. Early warning has become the focal point for policy makers seeking practical instruments for preventive intervention, and is currently undergoing significant scrutiny. Its proponents insist that it contribute to conflict prevention decision making. For them the feasibility debate focuses almost exclusively on bridging the gap between early warning and early action, by providing those responsible for the implementation of conflict prevention with the most effective preventive strategies for each potential conflict.

This paper investigates the development of the early warning concept and its application to the sphere of conflict management. In particular, the intimate connection between early warning and conflict prevention is analysed, along with the evolution of conflict early warning from the simple issuing of a warning signal to the interpretation of conflict-related information in order to propose appropriate courses of action. This preliminary investigation on the nature of early warning, coupled with a brief discussion on the application of econometric techniques to political forecasting, will allow a better understanding of the current discussion on both the theory and practice of conflict early warning.

1. The Origins of Early Warning: from Intelligence and Disaster Preparedness to Conflict Early Warning

Early warning systems have long been used in government intelligence, and for natural disasters such as floods, hurricanes, volcanoes and earthquakes and their effects on people.

For the purposes of the Cold War, intelligence early warning systems were designed to enable the deterrence of an enemy's threat or the mitigation of its effects. They were used with a preemptive aim: advance notification of an imminent hostile act by the enemy allowed for preventive action, which could deter or even compel the enemy to cancel its planned action. For the superpowers, early warning mechanisms were useful as a trip-wire, activated whenever a dispute threatened to undermine international stability. In the context of nuclear weapons, early warning systems referred to technologies able to trace hostile nuclear attacks in time, based on satellite information. In fact, these systems were suited to prevent those nuclear interstate conflicts seen as the only possible threat to the East - West geopolitical order. The bipolar arrangement ensured that states' internal conflicts were suppressed in the interest of bloc unity. Bloc-based mechanisms and policies were also in place in order to contain intrastate conflicts through external actions [1].

Early warning was applied to natural disasters as early as the 1880s in India and the 1920s in Sudan, when the British introduced an information system for the timely prediction of food shortages. The African famines of the 1970s and 1980s stimulated interest in early warning systems for developing nutritional security strategies, resulting in the creation of early warning systems to predict climatic changes, droughts, famine and the following flow of refugees [2]. It was the Food and Agriculture Organisation (FAO) which developed the first early warning system not for self-defense: the Global Information and Early Warning System (GIEWS) was established in 1975 in order to provide policymakers and policy analysts with the most accurate and up-to-date information available on all aspects of food supply and demand. Such a system warns of imminent food crises, thus enabling the FAO to stockpile and locate food supplies to prevent famine [3].

In 1981, a study for the UN Commission on Human Rights (UNHCR), aimed at enabling the UN to prepare for and mitigate the causes of forced migration, recommended the creation of an early warning system within the UN to study and track the factors contributing to forced migration. Within this context, the UN Humanitarian Early Warning System (HEWS) was conceived in the late 1980s, with the objective of anticipating the refugee flows so that shelter, water and food supplies could be in place to mitigate the suffering of refugees, and preventive action could be taken to alleviate the causes which stimulated such flows [4]. More recently, in 1992 the UNHCR working group on international protection stressed that early warning was appropriate for specific UNHCR initiatives[5]. The UNHCR developed a matrix of parameters for monitoring country level situations relating to the forced migration of people, whereby obtaining analyses to communicate via regular and structured reports to decision-makers[6].

It is in the sphere of international humanitarian policies that the contemporary conception of early warning for anticipating violent conflicts has its roots, namely in an attempt to identify situations enough in advance to change the conditions that could

provoke a violent conflict[1]. In this case early warning was eventually considered not only as an analytical forecasting tool for identifying the likelihood of specified events or conditions in certain locations, but also a proper preventive tool. Its primary function is not to simply predict humanitarian disasters, including conflicts, but rather to alert policymakers and highlight what to change, in order to prevent such disasters [7].

Such an interest in the preventive faculties of early warning is a result of the epochal changes brought forth by the end of the Cold War and the ensuing shift of global security perceptions. In fact, the considerable number of violent conflicts, mostly within states, which erupted after the bipolar order's collapse[2], and the growing awareness that it may be easier to tackle crises early before they reach the point of armed conflict or mass violence, produced an attention shift from conflict resolution to conflict prevention. A deeper consciousness about the need for conflict prevention reverberated through the international community after the failures of muscular peacekeeping operations in Somalia, Rwanda and the former Yugoslavia, which revealed the great difficulties in overcoming inaction and competition among great powers in a multipolar international system. Prevention was needed, if not out of moral obligation, at least for its cost-effectiveness when compared to excessive bills for subsequent relief, protection and reconstruction after conflicts. Furthermore, the new preoccupation with prevention was also a response to the globalisation of contemporary conflicts, which not only had causes related to the global system but also had global effects, through media coverage, refugee flows, the impact of diasporas and the destabilisation of surrounding regions [8].

Eventually, in the late 1990s, the turbulence that accompanied the end of the Cold War was partially contained. The increase in the number of conflicts culminated leading up to 1992, but since then there has been a slow but gradual decline. Three major positive trends have resulted from the enhanced efforts and increased resources used in managing and resolving conflicts, especially by the international organisations and NGOs that had been consigned to a marginal role during the Cold War. First, the decrease by nearly 50% in the number and magnitude of armed conflicts within and among states that has started since the early 1990s is persisting, and few of the many societal wars contained in the last decade have resumed; second, conflicts over self-determination are being settled with greater frequency, thus continuing to decline to their lowest level since 1960; third, most democratic regimes established in the 1980s and '90s have endured, despite political and economic crises, with the consequence that democratic governments outnumber autocratic governments [9]. Within this optimistic scenario, what is today worthy of greater attention is the chronic war proneness of certain countries like many in Africa, which experienced much conflict during the last twenty years of the Cold War and throughout the 1990s [10]. A recent survey of trends from 1946 to 2000 found that "for the last half century at least, societies at low levels of development have suffered much more from societal warfare than prosperous societies. […] Poor societies are at risk of falling into no-exit cycles of conflict in

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[1] In the case of natural disasters, the focus is on preparedness rather than on changing the conditions that provoke them (which would be possible only over a very long period of time). Similarly, intelligence early warning's main objective is to anticipate the enemy's moves in order to change behaviour accordingly; avoiding confrontation results from reacting to each other's stances rather than changing existing conditions.

[2] The Cold War formula of maintaining a global balance of power also affected intrastate conflicts. These were in fact contained and controlled in order to keep "the system" steady. Intrastate conflicts that erupted after of the collapse of the bipolar order had often been managed but not yet resolved. See further [12].

which ineffective governance, societal warfare, humanitarian crises, and lack of development perpetually chase one another" [11]. However, the link between poverty and violence is not direct. In fact, many poor countries have traditionally avoided violent conflicts. Thus, if it is true that poverty increases a society's proneness to war, it is also true that developing countries characterised by transitional or incoherent policies, weak institutions, horizontal inequalities and relative deprivation among groups are frequently affected by violent conflict [11]. These are the countries that are destined to continue experiencing serious wars unless global strategies for the prevention of violent conflicts are systematically implemented in the immediate future.

Conflict early warning is more problematic than early warning in intelligence and natural disasters. In fact, the uncertainty stemming from dealing with societies, which are complex and open systems that cannot be precisely described (neither according to status nor development), affects a system's ability to make an exact early warning prognosis. An additional problem, which contributes to making prediction ever more difficult, is that a society with a potential for conflict is sensitive to factors that would have no effect on a balanced system. Eventually, any prediction becomes impossible when conflict is imminent and the system is completely off-balance. As long as a society is relatively stable, the upper and lower spectrums of the probability of certain events leading to other identified events are rather well-defined. The more off-balance the system becomes, the more potential sequences can increase or can eventually no longer be determined, since an initial situation S1 can lead to S2, S3, or in the end to Sn [13]. This means that for a forecast to be as accurate as possible, it needs to be early, before any succession of events is impossible to determine.

2. Early Warning and Conflict Prevention

The rationale for having effective conflict early warning systems lies essentially in the intimate connection between early warning and conflict prevention. Early warning is closely tied to conflict prevention as it is its essential prerequisite. Only if warned about both the structural weakness and current tense situation existing in a certain country or region that could possibly provoke an armed conflict, can international organisations, NGOs, and national governments plan coherent preventive interventions. Moreover, conflict early warning systems are the first instruments of prevention. Not only do they pave the way toward prevention, but they have preventive functions themselves. For instance, the decision to issue an early warning signal is an indication to the conflicting parties that their actions are being followed by outsiders and to third parties that preventive actions are needed [14]. Conflict early warning is a sort of tension meter from which it is possible to gauge the span of time that states and the international community have to sound the alarm and begin the process of prevention [2].

When does one resort to early warning and conflict prevention? How does one decide the timing of prevention? According to a core definition, conflict prevention is "any structural or intercessory means to keep intrastate or interstate tensions and disputes from escalating into significant violence and use of armed force, to strengthen the capabilities of potential parties to violent conflict for resolving such disputes peacefully, and to progressively reduce the underlying problems that produce those

issues and disputes"[15][3]. If we rely on this definition, thus implying that conflict prevention relates only to circumstances where violent conflict has not yet erupted, actions must be taken during the *unstable peace* phase, in which violence has not escalated but is characterised by tension and suspicion among parties. In this situation "[a] 'negative peace' prevails because, although armed forces are not deployed, the parties perceive one another as enemies and maintain deterrent military capabilities" [16]. Having an early warning signal in time to plan and implement a preventive strategy would be the ideal circumstances for the effective prevention of conflict.

The above definition is nevertheless general and not exhaustive, since measures for conflict prevention, provided that they are suited to the events, can be taken until the very last moment before resorting to armed force, and used in post-conflict situations to prevent violence from occurring again. The Carnegie Commission on Preventing Deadly Conflict's 1997 report makes the distinction between structural prevention and operational prevention, according to the timing of the intervention. Structural or deep prevention takes into account the underlying relationships and clashing of interests among the actors, addressing either problems of international relations or internal issues of development, community relations and political culture [8]. Operational or light prevention does not necessarily address the root causes of a conflict but aims principally at preventing latent animosities from becoming armed conflicts. Systems for conflict early warning are a necessary condition for any strategy of conflict prevention and the specific type of preventive instruments that are chosen naturally differentiate according to the structural/deep or operational/light nature of preventive action[4].

Early warning systems may give different outputs according to the type of preventive intervention, either deep or light, that the systems themselves want to stimulate. Actions of deep prevention will be implemented where early warning systems have singled out proneness to chronic instability, but where violence is not imminent. In such cases, the objective is to address the root causes of conflicts. Thus the instruments used for preventive intervention consist of measures to promote good governance, wider economic opportunities, protection of human rights, and strengthened social relations. In these circumstances, international organisations have the opportunity to adopt a joint, cooperative strategy, using instruments such as international legal systems, dispute resolution mechanisms, and cooperative arrangements, which can minimise both external and internal threats to states' security. For example, external security could be increased through the promotion of broader participation in and stronger commitment to the several existing arms control treaties, and through states' involvement in regional structures of cooperation, which would ease eventual problematic relations among neighbours. As for the development of internal security, this can be assisted by encouraging the adoption of internal norms and practices for governing interstate relations, avoiding and resolving disputes, and encouraging practices of good governance [17]. As a consequence of such a global approach, conflict prevention's aims broaden considerably, from simple avoidance of undesirable outcomes to the creation of preferred circumstances like security, well-

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[3] Such a definition does not contradict using conflict prevention strategies and early warning systems in a post-conflict situation to avoid the recurrence of conflict.

[4] However, this does not mean that the two aspects of conflict prevention are clear-cut, since they define a continuum of activities undertaken at different points of a conflict's life cycle.

being and justice. These not only improve the condition of people's lives but also reduce the potential for conflicts [18].

As far as the actions of operational or light prevention are concerned, they should be carried out according to early warning regarding the imminence of violence. Although in these circumstances the warning is better defined as "late" instead of early, there is still manoeuvring room to prevent mass violence. In these cases tools range from preventive diplomacy and economic measures such as inducements or sanctions, to the deployment of troops.

In the face of a possible crisis, preventive diplomacy should be implemented together with traditional diplomacy. The situation requires urgent efforts from ambassadors, special envoys, senior Foreign Office officials to exert pressure and mediate to avoid the eruption of violence between opposing parties. Furthermore, instruments of preventive diplomacy such as bilateral negotiations, third party informal diplomatic consultations, track-two diplomacy, and third party mediation, are all suited to the involvement of non-governmental actors such as NGOs and private individuals[5].

Economic measures such as inducements and sanctions can be used to influence potential belligerents not to resort to force. Although the effectiveness of sanctions in preventing mass violence is in doubt [18], sanctions can have an important deterrent effect. They are especially useful as a signal to the offending state that more drastic actions can be taken if the situation does not improve, including the use of force if necessary. It is important, however, to make sure that economic sanctions are part of a broader strategy aimed at putting maximum political and economic pressure on the offending party. The sanctions should be targeted as much as possible at the body directly responsible, in order to avoid severe consequences for the population. As for inducements, these can take many forms. They can be political, enhancing a government's political standing (e.g. a visit by a foreign president, or political cover for difficult domestic choices); they can be social, providing a country with symbols of status or prestige (e.g., hosting the Olympics or obtaining a permanent seat on the UN Security Council); and they can also be personal, appealing to a particular leader or leaders. By themselves, inducements rarely alter state behaviour. However, they can have a powerful effect if integrated into an overall strategy that makes countries feel they have a stake in complying with international regimes and practices[6].

Although it might seem contradictory to consider the use of military means for preventing armed conflicts, the deployment of armed forces can be necessary when diplomatic responses prove insufficient to avoid violence. The experience of the first UN Preventive Deployment Force (UNPREDEP) in Macedonia in 1992 is a good example of the use of preventive military response rather than diplomatic means, by positioning troops between disputing parties. Its effectiveness suggests the potential preventive value of such an instrument. It should not be seen as a last resort in circumstances of exceptional gravity, especially when certain conditions are present,

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[5] In the case of intrastate conflicts, which nowadays outnumber interstate conflicts, these contacts are fundamental, since the actors involved are also civil groups, not reachable by traditional diplomacy conducted at government level.

[6] In addition to economic sanctions and inducements, states and international organisations have other economic measures at their disposal, such as conditionality and dispute resolution mechanisms of international trade organisations [18].

such as a relatively low degree of tension, a clear mandate, cooperation with regional and non-governmental organisations, and the support of political parties and society.

If we accept that prevention is possible throughout a conflict's whole life cycle (by using one or more of the aforementioned preventive tools according to the situation's characteristics), we assume also that early warning has a role to play not only in the pre-conflict phase of crises, but also in the intra-conflict and post-conflict phases as well. In fact, categorising prevention and early warning as early stage activities, and conflict resolution as a final stage activity, does not reflect reality [1]. Our assumption is even more valid considering that there are several entry points for early warning and conflict prevention in the whole evolution of a conflict. In fact, notwithstanding the usual representation of conflicts as sequences of phases, conflicts are not one-dimensional and they unfold in a disjunctive, rather than linear, manner. Moreover, a conflict is also made up of the actors' goals, interests and internal conditions, which offer additional opportunities for intervening within the conflict dynamics. Then, the multiplicity of levels among which the conflict moves must be considered: individual, group, region, state and international levels are dynamically connected and interventions at each of these levels can help prevent the spillover of violence. In other words, we have to pay attention not just to means, but also to causes and objectives. In this way we can design early warning and conflict prevention strategies that reveal both the underlying structural sources of conflict and the dynamics of conflict processes[1].

"In the pre-conflict phase preventive strategies are primarily internal and non-coercive, relying on bargaining between the main parties to the dispute. Ideally this means that the parties institutionalize a process or create mechanisms that permit a mutual dialogue to address their long-term relationship and transform the root causes of the conflict" [1]. There is no doubt that preventive actions in the pre-conflict phase involve mainly the parties to the potential conflict, and require their strong commitment to reciprocal dialogue. However, it is erroneous to say that this process is exclusively internal. In these circumstances, external intervention is needed to create either the ground for dialogue or better conditions of social equity and economic development, in order to ease grievances and dissatisfaction. Also, at this stage third parties may be needed to help create institutional venues for addressing the root causes of the crisis, especially when all the pre-conditions for escalating into conflict, although latent, are in place. Of course, the importance of an external presence increases as we move to the intra-conflict phase, when the opportunities for an internal settlement are extremely low. At this point, early warning systems should be able to identify the limits that parties would be ready to cross to escalate the war and try to reach their objectives. This type of warning would provide the opportunity to plan an external intervention in order to prevent the escalation of war. In the post-conflict phase, when early warning should be used to alert of any breakdown in the peace-building process that could cause a resume of violence, both internal and external involvement are needed. In fact, reconstruction and reconciliation need both the commitment of the war-torn society and political and economic assistance from international entities in order to be successful.

"By definition, preventive action is a response to warnings" [19]. However, one should ask if this is a response to any kind of warning or only to warnings that have a certain format. Is unstructured information an early warning *per se*, assuming that it is available in time to fuel preventive action? Also, could international organisations' or foreign ministries' experts in particular countries or regions be considered an

appropriate source of advice and warnings on problematic areas at risk of violence? Monitoring what is going on in twenty to thirty countries of the world enables experts to give a summary of what is happening in one of those countries at a certain point in time. However, it is unrealistic to expect them to be able to keep track of how events and conditions are unfolding and foresee with a certain degree of confidence that something bad will happen in one, two, or six months [20]. Furthermore, is an alert issued by fieldworkers of an international NGO credible enough to cause governments and international organisations to act? Prevention failures and successes during the 1990s have shown that no rule exists yet for deciding whether or not to intervene preventively. The experiences of Rwanda and Kosovo are usually reported as an example of lack of will to intervene in the face of very worrisome alarms from international workers in the field about the likelihood of mass violence and murder. On the contrary, the success of UNPREDEP in Macedonia has been achieved through smoother processes of preventive diplomacy, established well before signals of instability became alarming. Definitely, the international community's contrasting conduct is related to the evident difficulties in making prevention acceptable to decision makers, especially in situations when there are no direct third parties' interests at stake and there is no certainty that the foreseen conflict will erupt. However, this also has to do with the lack of systematic early warning systems [4][7] that are able to foresee the imminence of a specific violent crisis and its expected consequences, and to indicate strategic options for an effective intervention.

In fact, notwithstanding the impressive amount of information accessible to the public and the existence of many agencies and organisations that maintain early warning systems, the art of early warning is far from mastered [3]. Though much has been done regarding the collection of information, the systematic analysis of that information and the formulation of appropriate strategic choices must be further improved. It is true that warnings did exist about ethnic rivalry in Rwanda and Kosovo, but historical and current information was probably not properly used.

3. The Early Warning Impulse and Conflict Prevention's Evolution

After international organisations regained the main responsibility for multilateral conflict management, throughout the 1990s many statements and official documents were devoted in international *fora* to the concepts of early warning and conflict prevention. Although only in recent years have such ideas started to be streamlined into operational processes, the incubation period during which early warning and conflict prevention were debated has been indispensable for giving these concepts with broader international recognition.

Furthermore, the rediscovered centrality of conflict prevention in the mandate of the UN has been of fundamental importance. The central role of the UN and its bodies in implementing the objective of prevention [23] is clearly stated in the UN Charter. Article 1, paragraph 1, establishes that a principal purpose of the UN is "to take effective collective measures for the prevention and removal of threats to the peace".

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[7] In support of this view see also [21] and [22].

Article 2, paragraph 5, makes a minor reference to prevention by saying that all Member States are requested "to refrain from giving assistance to any state against which the United Nations is taking preventive or enforcement action". Instead, the UN Security Council preventive mandate is implicitly stated in Article 34, which authorises this body to "investigate any dispute, or any situation which might lead to international friction or give rise to a dispute, in order to determine whether the continuance of the dispute or situation is likely to endanger the maintenance of international peace and security". This article, which has been the legal and political basis of inquiry and fact-finding missions, clearly affirms that the Security Council can use its power long before a situation has erupted into an open international crisis. Also, in addition to giving the Security Council general responsibility for the prevention of crises, the charter grants the Security Council significant freedom in choosing the means for positively affecting the behaviour of parties to a potential conflict. Article 40 states, *inter alia*, that "[i]n order to prevent an aggravation of the situation, the Security Council, may, before making the recommendations or deciding upon the measures provided for in Article 39, call upon the parties concerned to comply with such provisional measures as it deems necessary or desirable". The fact that the aforementioned provisional measures can be taken prior to or even without the determination under Article 39 gives the Security Council unlimited leeway for actual preventive action well beyond the letter of the Charter.

This overview of the charter provisions demonstrates the existence of an adequate legal framework ensuring that the UN system and the Security Council are fully entitled to and equipped for conflict prevention. In fact, after a period of constrained ability in preventive missions, which were perceived by the superpowers as illicit interference, the end of the Cold War marked the reactivation of the Security Council with the launching of a number of new peacekeeping operations and a strong interest in recommitting the UN to the purposes and principles of the charter. The Security Council Summit of 31 January 1992 (the first at head of state or government level) marked the highest peak of confidence in the UN to regain the role envisaged by the charter for the maintenance of international peace, also through the conflict prevention.

The answer to the expectations raised at that Summit is the well-known 1992 report "An Agenda For Peace", presented by the UN Secretary-General Boutros Boutros-Ghali. It is a milestone in the explicit recognition of the need for conflict prevention and of the UN's central role in achieving it. The report acknowledges that one of the organisation's fundamental aims is "[t]o seek to identify at the earliest possible stage situations that could produce conflict, and to try through diplomacy to remove the sources of danger before violence results" [24]. In particular, preventive diplomacy is presented as the instrument to be used in order to "prevent disputes from arising between parties, to prevent existing disputes from escalating into conflicts and to limit the spread of the latter when they occur". It is described as requiring confidence-building measures, early warning based on information gathering and informal or formal fact-finding and, if necessary, preventive deployment and demilitarised zones. In the light of the prevention concept's evolution since 1992, it is too limited today to equate conflict prevention with preventive diplomacy. Actually, preventive diplomacy is just one of the tools of conflict prevention, which range from economic assistance and development cooperation to human rights promotion and military deployment. Nevertheless, the views and proposals made by the Secretary-General on the prevention of conflicts were significant, if only for the changes they

forecasted in multilateral conflict management and the endorsement they obtained by UN Member States. Furthermore, it was in pursuit of the proposals of "An Agenda for Peace" that steps were taken to develop an early warning mechanism within the UN [25].

In the years after this initial commitment to the principle of conflict prevention, a number of pronouncements, debates and guidelines were issued, not only by UN bodies but also by other international organisations. Within the United Nations, two public debates were organised on the subject by the Security Council in November 1999 and July 2000. At these debates, the then Secretary-General Kofi Annan stressed the need to move "from a culture of reaction to a culture of prevention" and the importance of addressing conflicts' deep-rooted causes such as "poverty, repression and undemocratic government and endemic underdevelopment, weak or non-existent institutions, political and economic discrimination between ethnic or religious communities" [26]. Suggestions for steps to be taken by the Council for an effective prevention policy ranged from "making greater use of fact-finding missions; encouraging States to bring potential conflicts to the attention of the Council; and establishing an informal working group or a subsidiary organ to study early warning and prevention" [27] in order to revitalise those "Charter's provisions relating to prevention [that] have been under-utilized" [27]. Attention was called also on the room for action offered by the closer interaction with "non-State actors that have expertise in prevention or can make a difference to it" [27], such as civil society.

The report on the prevention of armed conflicts issued in June 2001 by the Secretary-General represents a review of the progress achieved in developing the conflict prevention capacity of the United Nations, and gives recommendations on how the efforts of the United Nations system in this field could be further enhanced. The UN Secretary-General, by proposing ten principles which, in his view, should guide the United Nations' future approach to conflict prevention, explores the specific contributions that can be made by the General Assembly, Security Council, Economic and Social Council, International Court of Justice and Secretary-General as well as by the cooperation between the United Nations and outside actors, such as regional organisations, NGOs, civil society and the business community. The report recalls the well-known concept of a comprehensive approach to conflict prevention that must encompass "both short-term and long-term political, diplomatic, humanitarian, human rights, developmental, institutional and other measures taken by the international community, in cooperation with national and regional actors", but it is far from being rhetorical. Indeed, it highlights two significant and often ignored concepts. First, it underlines that the UN's major challenge is to find out "how to mobilize the collective potential of the United Nations system with greater coherence and focus for conflict prevention, without necessarily requiring major new resources", meaning that there is a need to exploit the preventive potential of the developmental programmes and projects which are already in place. Second, it highlights that "[t]he time has come to translate the rhetoric of conflict prevention into concrete action" by means of sustained political will and long-term commitment of resources by both Member States and the United Nations as a system [28].

Reactions within the UN system to this document were immediate. Security Council Resolution 1366 of 30 August 2001 articulates the Security Council's complete endorsement of the views expressed by the Secretary-General in his report. It

significantly pledges intervention by expressing "its commitment to take early and effective action to prevent armed conflict and to that end to employ all appropriate means at its disposal including, with the consent of the receiving States, its missions to areas of potential conflict". It grants the Secretary-General's request by urging Member States to "provide the necessary human, material and financial resources for timely and preventive measures including early warning, preventive diplomacy, preventive deployment, practical disarmament measures and peace-building as appropriate in each case". More specifically the Security Council makes explicit reference to the need for enhancing the conflict prevention capacity of regional organisations, in particular in Africa. In addition, it refers to extending "international assistance to, *inter alia*, the Organization of African Unity[8] and its successor organisation, through its Mechanism of Conflict Prevention, Management and Resolution, as well as to the Economic Community of West African States and its Mechanism for Prevention, Management and Resolution of Conflicts, Peacekeeping and Security".

Since the adoption of Security Council Resolution 1366, the important evolution of conflict prevention at normative, political and institutional levels has resulted in the adoption of other noteworthy UN documents. These reaffirm the centrality of conflict prevention in the maintenance of international peace and security, and the instrumental role of early warning tools, while confirming the approach of the Secretary-General's 2001 Report for implementing responsibilities[9].

Moreover, in 2002, at the request of the General Assembly, a review process was initiated for both UN conflict prevention capacities and opportunities for strengthening them. It made the United Nations system as a whole consider the mandates of all its agencies, funds and programmes through a prevention lens[10]. In fulfilling this mandated capacity review, the former Secretary-General issued a second comprehensive report on the prevention of armed conflict. The 2006 Progress Report on the Prevention of Armed Conflict notes that the culture of prevention which was invoked at the beginning of the new century is beginning to take hold at the UN. It states that "Member States have also begun to advance the indispensable notion of national infrastructures of peace and to clarify what external support is needed". Five years after the UN's first reflection ever on the prevention of armed conflict, the 2006 Report takes the debate forward and shifts attention from mandates and responsibilities to awareness of what is to be prevented and through which instruments. Thus, it creates some hope that developing and making effective international and national mechanisms for preventing violent conflicts has been accepted as a shared responsibility.

The existence of an established role for early warning mechanisms is confirmed by the wording of the aforementioned UN documents. Early warning, along with preventive diplomacy, preventive deployment, practical disarmament measures and post-conflict peace-building, is counted among the "interdependent and complementary components of a comprehensive conflict prevention strategy" (UN Security Council Resolution 1366 (2001)).

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[8] African Union (AU) since 2002.

[9] These documents are the UN General Assembly Resolution 55/281 of 13 August 2001, UN General Assembly Resolution 57/337 of 18 July 2003, and the UN General Assembly Resolution 60/1 of 24 October 2005.

[10] UN General Assembly Resolution 57/337 of 18 July 2003.

As already mentioned, other international organisations besides the UN have been paying increased attention to the issue of conflict prevention since the early 1990s.

The Organization for Security and Co-operation in Europe (OSCE)'s strong engagement in the sphere of conflict prevention is the consequence of adopting a comprehensive concept of security, that relates the maintenance of peace to the respect for human rights and fundamental freedoms, as well as to economic and environmental solidarity and cooperation. The Helsinki Summit Declaration of 1992 expresses the recognition by OSCE Member States that the prevention of conflicts in the OSCE area is directly affected by the implementation of human rights and fundamental freedoms, the development and support of democratic institutions, and by the protection of minorities and the upholding of the rule of law [29]. The OSCE approach's originality consists in its consideration of the human dimension (for example, respecting the whole range of human rights and fundamental freedoms), as the military dimension's necessary complement in identifying potential tension and conflicts both within and between states [30]. Also, from the point of view of institutional capacities for preventing conflict, the OSCE is very advanced. Its Office of the High Commissioner on National Minorities, Centre for Conflict Prevention headquarters and its field missions are involved in monitoring and fact-finding tasks as well as in more structural preventive activities [31].

As for the European Union, in the last decade it has officially committed to the principles of conflict prevention. Within such a short period of time, the EU has managed to achieve significant results in the implementation of a coherent approach. In fact, with the Commission Communication on Conflict Prevention (April 2001) and the EU Programme for the Prevention of Violent Conflict (June 2001), the EU offered concrete recommendations for reform and a strategic outline in order to place conflict prevention at the heart of its policymaking [32]. In particular, with its Communication on Conflict Prevention [33], the European Commission launched an attempt to integrate most of the activities belonging to the field of conflict prevention into one policy concept, thus outlining its ideas on mainstreaming conflict prevention. In this document the Commission highlights how, by using the instruments at its disposal in conducting external relations, the EU has the opportunity to develop a comprehensive strategy to address the many sources of violent conflict. On the one hand, development policy and other cooperation programmes provide the most powerful instruments for addressing all aspects of structural stability in counties at risk in a long-term and integrated perspective. On the other hand, in the face of imminent crises and conflicts, the EU has the potential to react quickly by using both traditional instruments like political dialogue and special representatives, as well as dedicated and accessible financial instruments like the new Instrument for Stability that is "able to provide more flexible and rapid assistance in response to pre- and post-crisis situations, complementing and kick-starting efforts that are being undertaken under the more long-term community instruments" [34].

The EU Programme for the Prevention of Violent Conflict, adopted by the Göteborg European Council on 15 and 16 June 2001, represents the Member States' "political commitment to pursue conflict prevention as one of the main objectives of the EU external relations" [35][11]. The specific objectives are being systematically

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[11] See *Presidency Conclusions from the Göteborg European Council* (point 52).

monitored by implementation reports[12], and include setting clear political priorities for preventive actions; improving early warning, action and policy coherence; enhancing instruments for long- and short-term prevention; and building effective partnerships for prevention. Such a programme is more than an overview of the principle inspiring the EU strategy on conflict prevention; it is a listing of operational and political activities that needs to be implemented with the fundamental commitment of the EU Member States.

The Organisation for Economic Co-operation and Development (OECD) has traditionally put great emphasis on conflict prevention for the reduction of poverty and helping sustainable development. In particular the 1997 OECD/DAC[13] guidelines, "Conflict, Peace and Development Cooperation on the Threshold of the 21st Century", were envisaged to shape the design and implementation of development cooperation for conflict prevention in post-conflict recovery. The supplement to that work, "Helping Prevent Violent Conflict: Orientations for External Partners", which was approved in April 2001 [36], addressed some new challenges and changes. The organisation has attained paramount importance to the relationship between security and development, strengthening peace processes, building partnerships with states and civil society actors, and working with the private sector to promote growth and avoid fuelling violence. It also has been at the forefront in promoting the mainstreaming of conflict prevention into policy formulation and paying early attention to risk factors through early warning tools. While the guidelines focused primarily on addressing the roots of violent conflicts through long-term structural preventive measures integrated into development programmes, the recent OECD/DAC report on conflict early warning and response [37] also tries to foster tools for operational prevention. The report is aimed at helping the integration of conflict early warning analysis and response into states' programming.

4. From Early Warning Ideas to Early Warning Systems

The concept of conflict early warning has deeply evolved since its first appearance as one of the prerequisites of an international post-Cold War conflict management system. Although the first study about the application of social science research to the development of early warning indicators for conflict forecasting was published in 1979 [38][14], theoretical work and definition of practical instruments for early warning advanced rapidly only in the very last two decades. Leading up to the 1990s, the actual practice of early warning, other than for military purposes, was almost totally restricted to the prevention of humanitarian disasters [39].

The main aspect stressed at the very beginning of this evolution was the information gathering feature. In fact, in order to predict the outbreak of a conflict, information is needed about its main features on the one hand, and the situation at risk on the other hand. Information gathered on the field, collected and released, was

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[12] Implementation reports have been presented annually to the European Council since June 2002, when *Presidency Report 9991/02 on the Implementation of the EU Programme for the Prevention of Violent Conflicts*, was presented at the Seville European Council.

[13] Development Assistance Committee.

[14] This study was the first to centre conflict early warning on the identification of key indicators.

initially considered sufficient for signaling an impending escalation of violence and motivating preventive intervention. Similarly, early warning was also viewed in terms of information sharing, emphasising again the importance of data gathering. Simply having a constantly-updated database on regions in danger of conflict, whose data were disseminated among interested agencies, was considered sufficient as an early warning system [15]. This approach was enabled by the significant increase in information collection and dissemination capacities since the mid-1980s, thanks to electronic networking, widespread availability of personal computers and advances in technology for data management and analysis. However, today it appears too simplistic, as it reduces early warning to a mere smoke alarm system. Especially after the international community's failures in preventing humanitarian emergencies during the 1990s both in "peripheral" African countries and in inner Europe, it has been clear that early warning goes beyond the collection and sharing of information. In fact, it is vital that both the analysis of the information, and formulation of appropriate strategic choices based on that analysis, are included [4]. Analysis is indeed the essential component to monitoring, since it provides risk assessments, that are fundamental complements to reliable information and help decision makers devise optimal preventive measures for each crisis situation. A comparison among the three main approaches to early warning highlights the importance of interpreting the available information in a way that ensures appropriate responses to early warning signals.

As mentioned above, early warning can be understood as field monitoring. This accepted meaning was traditionally associated with reports given by diplomats and local representatives of international organisations to account for any event or information pointing to an imminent escalation of conflict. Such type of monitoring and reporting was of great potential value, due to the high quality and immediacy of the information generated. For this reason, it has been used for decades by many NGOs and UN agencies concerned with humanitarian issues [40]. However, despite these advantages, this kind of early warning was unable to directly identify conflict risks unless subsequent synthesis and assessment were conducted separately[16].

In the early 1990s, the discussion of conflict early warning systems focused on using indicators for risk assessment. The basic idea was that indicators, rather than unstructured data, would allow policy makers to confront situations with appropriate model data. Although this approach was valuable, because it systematised information and made it immediately available, it had two main drawbacks. First, indicators are more suitable for tracking country situations than for anticipating changes, as they describe event backgrounds, rather than events themselves [4]. Second, indicators can surely help decision makers regulate the flow of information they receive, but do not give them the filters they need for screening and interpreting it.

A third interpretation of early warning is the development of explicit models used for the interpretation of available information. Early warning systems of this nature use indicators as a starting point. Models then "identify which measurable conditions, in what combination and relative importance establish a potential for which kind of crisis"

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[15] An example is the work done by the IRIN unit of the Department of Humanitarian Affairs of the United Nations. See [4], p. 52.

[16] In early 1993, the UN Office of Humanitarian Affairs held its first consultation to synthesise information collected over several years related to the potential flow of refugees. On the basis of this assessment ten countries, such as Zaire, were identified as at risk for escalating conflict and refugee flows [4].

[4]. These models identify the type of crisis, specify the combinations of risk factors and sequences of events likely to lead to crisis, and distinguish between structural conditions and dynamic intervening factors. They therefore allow planning of both long- and short-term responses.

It is this systematic, model-based early warning that is nowadays considered the most reliable instrument for both anticipating and responding to humanitarian crises and violent conflicts. In fact, today most academic researchers, dedicated national and international agencies, and NGOs, agree on a complex concept of early warning, made up of three, equally essential main components. Accordingly, FEWER[17]'s definition of early warning is "the collection and analysis of information about potential and actual conflict situations, and the provision of policy options to influential actors at the national, regional and international levels that may promote sustainable peace" [41]. Early warning is therefore not only the communication of information about a crisis (the first element), but is also the analysis of that information (the second element), and the development of potential, timely, strategic response options (the third element) [4].

According to this view, a conflict forecasting system should build upon three keywords: understanding, anticipation and intervention. Understanding means to develop theoretical knowledge about the causes and dynamics of conflict[18] or, in other words, to know about its root causes and conditions. Anticipation means to recognise patterns of events and actions leading to potential crises. Intervention, or the indication of potential moments and fields for action, should be the result of both understanding and anticipation [43]. Early warning systems should not be simple mechanisms that provide alerts, but broader institutional and procedural environments that take early warning alerts, process them, and bring them to the attention of the appropriate individuals and organisations [20]. The key concept is the transformation of the early warning idea into early warning systems, composite tools that help interpret information on a global scale, not just unstructured reports flowing from the field.

5. Applying Forecasting Methods to the Set Up of Early Warning Models

When entering the territory of forecasting we must first avoid the common mistake of confusing prophecies with scientific forecasts. The former assumes that fate exists, and events are predestined; the latter derives logically from theories and models aiming to explain reality, and is influenced by probability. Despite mistakes that may occur, forecasting is of fundamental importance for decision making processes, since there is no strategic planning without scientific forecasting [44]. This holds true not only in technology but in the social sciences, even though the anticipation of political,

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[17] FEWER, Forum on Early Warning and Early Response, was a consortium of NGOs and academic research institutions aimed at creating a global network for information exchange; and promoting partnership with the UN, intergovernmental organisations and government agencies for early warning of violent conflicts. It closed down in 2004.

[18] Research on conflict early warning models implies a continuation of research on causes. The difference of this type of research is that its findings are translated into standardised analytical models. In fact, in order to analyse the information available about a given situation, general models of the causes and dynamics of crises and violent conflict are needed. See [42] and [43].

economic and social events is more uncertain, since it is influenced by human volition and preferences.

Within the social sciences, forecasting has largely been the domain of economists. However, the virtual explosion in ethnic violence in the late 1980s and early 1990s, coupled with decades of quantitative research on the causes of collective violence, have generated enthusiasm for forecasting political and humanitarian crises [45]. Although it is commonly considered impossible to forecast exact outcomes of social events, the development of early warning models[19] has been identified as the most appropriate instrument for attempting a scientific anticipation of violent conflicts. A foundation in science is fundamental, since too many inaccurate early warnings can jeopardise the credibility of all early warning research [46]. Issuing an alarm for a situation that doesn't escalate into violence (false positive) is as discrediting as not giving any signal for a conflict that does (false negatives)[20].

Existing forecasting techniques can be classified into two broad categories: data-based and judgment-based models. Data-based forecasting requires the collection of large data sets (either over time and/or over a cross-section of cases), and statistical data analysis. In contrast, for expert-based methods, the main emphasis is not on the collection of data or their systematic analysis, but on experts' subjective assessment, based on relatively less specific methodology.

Conflict early warning systems commonly make use of data-based models. Data are used to build the model, and to fill the parameters of the developed model in order to make specific predictions. In the first case, the data come from substantive knowledge about the humanitarian crisis or type of conflict being studied. In the second case, the data derive from analysis of the current situation being monitored, according to the model's instructions.

The models most commonly used for early warning purposes have been categorised by Gurr and Harff into three types: correlational models, sequential models and conjunctural models [42].

Correlational models belong to the family of causal models, and more broadly to the econometric method of forecasting, which involves the development of detailed statistical models. Like causal models, correlational models attempt to explain the future by identifying causal factors and possible relationships with the future[21]. The correlational model approach is based on the assumption that certain indicators, or measures of the political, economic and social situation in a country, co-vary with the measured level of violence there. More radically, it assumes that the variables represented by those indicators cause the level of violence.

Causal analysis requires the analyst to specify the causal linkages that bind the dependent variable with a set of independent variables. "On the right hand side of the

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[19] A model can be defined as an analytical structure made of dependent and independent variables, and tied up by the scientist's methodological framework. In international relations their ambition is to describe, through analogy and approximation, a system of interpretative hypotheses about the behaviour of actors within the international system. See [46] .

[20] An "antidote" to such a problem is the testing or validating of models. This means that they require testing against the empirical reality of a large number of conflict situations to ensure that they identify the potential for escalation with acceptable levels of accuracy. See [47].

[21] For an overview of forecasting methods see [48].

equation are the indicators believed to contribute to the likelihood of whether a situation will become a violent conflict or not in the not-too-distant future. On the left-hand-side is the outcome indicator with values such as conflict or no conflict or close to a conflict or possibly some more precise measure of the level of violence. […] If the values of the indicators on the right-hand-side of the equation reach values such that the calculated value of the outcome (at the left-hand-side of the equation) corresponds to a violent conflict, there then exists a reasonable basis for a conflict alert" [49]. While this method is useful for identifying universal and specific causal connections and their relative importance, it has two major drawbacks for the purpose of conflict early warning. First, since causal relations change over time, it needs to be re-estimated periodically using new data. Second, because it takes into account only background conditions and not the immediate precipitants of conflict, it does not help identify entry points for policy changes or external engagement [42] [47]. For the same reason, the results of this type of model should be regarded as risk assessments and not forecasts.

Sequential models describe how an environmental change determines the occurrence of a specific event or a change in a specified variable. For example, where a basic correlational model would explain a certain level of violence as a function of the unemployment rate, a basic sequential model would explain violence as a consequence of changes in society produced by the unemployment rate. Such changes could be expressed as the increase in discontent among workers, fuelled in turn by a rise in the price of bread [47]. One of the most important features of this approach is that the element of time is explicitly involved. This model is therefore much better suited to tracking crisis situations as they evolve over time than correlational models [42].

In addition to background and intervening conditions, the model includes so-called accelerators. These are defined as special events outside the system parameters that, when they occur, rapidly increase the level or significance of the most volatile general conditions. By activating or inactivating relationships between different elements of the model, as well as by changing the pace or dynamic of such relationships, accelerators initiate a cascade of events that tend to trigger episodes of massive violence. Because of these characteristics, a computer simulation is the most appropriate tool for sequential model implementation. "A computer simulation directly corresponds to a sequential model. The unique feature of computer simulations is that they step through the sequence of steps in an accelerated manner inside the computer. […] It is through this accelerated movement through time that a sequential model implemented in a computer can provide an early warning of violent conflicts. As the model simulates the situation between or within countries, the model can, in effect, get to the future before the 'real world' gets there" [49].

Conjunctural models have only recently been theoretically investigated [49], after an initial operational approach was presented in 1994 at the International Workshop on Early Warning of Communal Conflicts and Humanitarian Crises at the University of Maryland [42]. As their name implies, conjunctural models focus on conjunctions or combinations of conditions and events that lead to violent conflicts. The fundamental assumption is that different combinations of events or circumstances lead to different outcomes. While correlational models start from the premise that explanatory (independent) variables co-vary with the output or dependent variable, and that explanatory variables are independent from each other, conjunctural models consider the particular combination or configuration of indicators (independent variables) and

violent conflict (dependent variable) to be the key feature of their relationship. What is important here is interaction among indicators and not the idea that they are independent [49] [50]. Brecke's approach to applying this model to conflict early warning is to use pattern recognition techniques to identify particular configurations of conditions (or conjunctions of indicator values) that precede the outbreak of violent conflicts consistently, historically and for a number of countries [49] [51].

Our analysis above has concentrated mainly on the objective methods of forecasting, as their advantages are fairly obvious. When we are dealing with a large amount of data, the underlying relationships among them are often unclear to a casual observer. Thus, statistical methods can provide us with precise quantitative estimates of the relative and absolute impact of independent variables on dependent variables. On the other hand, subjective methods are best suited to describe the socio-cultural dynamics associated with political events barely captured by econometric modelling. However, subjective models have their shortcomings. When forecasts are conducted on the basis of subjective assessment, they are likely to be influenced by the forecaster's prejudices, preconceived ideas, ideology and self-interest. According to this reasoning, and bearing in mind that predictive efficiency is a relative concept, the combining of forecasting techniques suggested by Gupta, quoting Peter Kennedy (1987), seems a good idea: "[i]n general, research has indicated that the 'best' forecast is one formed as an average of a variety of forecasts, each generated by a completely different technique. If the principles on which these different forecasts are based are sufficiently different from one another, an average (or a weighted average, if more confidence is placed in some of these forecasts than others) of these forecasts, called an *amalgamated forecast,* could prove superior to any single forecasting technique" [45].

The technical discussion above, about the objective and subjective methods of forecasting, has been expressed in the current debate on conflict early warning in terms of quantitative vs. qualitative analytical tools.

Quantitative tools are mainly forecasting models and structural analogy methods aimed at collecting and analysing structural and/or events-based data about a potential/actual conflict situation on the basis of indicator-based models. These tools and methods have proven highly predictive, particularly those related to political crisis and instability, and of immediate policy value in terms of setting policy priorities and identifying watch lists of potential crises. However, they provide decision makers with little insight into what is happening on the ground or what needs to be done, and are therefore more useful for assessing risks than for identifying appropriately targeted preventive measures[22]. The strengths and weaknesses of these models have led to the development of conflict early warning systems that apply a mix of quantitative and qualitative methods.

Qualitative methods for conflict analysis were developed in the second half of the 1990s, as tools for better understanding violent conflicts and responses to them [53]. Qualitative methods provide rich contextual information and analysis, are more easily adaptable to planning processes within institutional settings and are usually designed to take stakeholders' views into account. However, significant limitations prevented their

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[22] This holds true especially considering that they cannot reflect all possible interactions of structural data, that are more stable over time, with factors that are specific to individual countries, and open to significant changes over time. See [52] and [53], pp.37-62.

exclusive and autonomous use within early warning systems. They tend to oversimplify the complexity of violent conflicts, apply technical solutions to complex political issues and rely too heavily on the personal judgment of the analyst.

As concluded by the OECD's 2009 report, "there is no 'best methodology' […]. There is basic good practice in quantitative and qualitative analysis and a range of methods draw on this. These are designed to serve the interests of their target institution. […T]he best approach is to combine quantitative and qualitative tools, and sometimes to combine different sets of quantitative methods. This ensures the necessary triangulation required for creating a robust evidence base for decision making" [53].

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