

Helpdesk Research Report: Early Warning Indicators of violent conflict

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Query: Please review the literature on conflict early warning systems and produce an overview of currently-used indicators of the risk of violent conflict, including explanations of how these indicators are linked to the likelihood of conflict. In particular, please highlight short-term indicators.

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1. Overview

This report provides a general overview of the literature on conflict early warning systems (CEWSs) and identifies the most commonly-used indicators of violent conflict. CEWSs use a variety of data sources and models to predict conflict. These systems usually distinguish between long-term structural factors, medium-term proximate or accelerator factors, and short-term trigger factors ('immediate events that have the potential to move a high risk situation into active conflict or crisis') (see FEWER 1999, Hagmeyer-Gaverus & Weissmann 2003, Clarke 2005). This report focuses on indicators of medium- and short-term factors, particularly those that can be updated on a monthly basis.

Long-term structural indicators of conflict are often based on quantitative data produced on an annual basis. These indicators are often collected globally, permitting cross-country comparison. The best known example of a system that collects data in this way is the Minorities at Risk project.¹ These kinds of structural indicators are seen as fairly unproblematic in the literature. Short-term indicators, on the other

¹ See <http://www.cidcm.umd.edu/mar/>

hand, typically rely on qualitative data such as expert surveys and questionnaires or locally-generated information. There is some consensus in the literature that key medium-term accelerators and short-term triggers of conflict vary considerably according to context. As a result, most CEWSs that measure short-term indicators are locally or nationally based and rely on data sources that are context-specific. A large number of these short-term indicators exist and their relation to conflict varies according to context (depending on the nature of the conflict and the type of conflict that is likely to emerge).

While many short-term indicators are context-specific and are not based on globally replicable quantitative data sources, some short-term indicators appear to have broader relevance and can be generated from easily available global data sources; allowing cross-country comparison. These include movements of IDPs and refugees (from the Internal Displacement Monitoring Centre or IDMC), commodity price and currency related indicators (from the FAO, World Bank and the IMF). Other short-term indicators are produced globally on an annual basis – including those relating to governance, human rights, public opinion and security. Governance, human rights and security indicators are produced more regularly for some regions, countries or localities by various regional, national and local early warning systems.

2. Approaches to Conflict Early Warning

Early warning systems generate indicators in a variety of ways. Hagemeyer-Gaverus and Weissmann (2003, p.4) identify three main approaches to monitoring and forecasting patterns of violent conflict:

- **'A database model based on statistical indicators**, often time series data, provided on an annual basis by international organisations such as the World Bank and the United Nations.
- Models that use **expert knowledge to forecast trends**. The expert model bases its information on questionnaires and interviews, thus creating a separate set of indicators. Expert models usually obtain information from a wide range of informants in a regular, quick and standardised way. Information sources include research institutes, embassies, NGOs and local networks.
- **News-wire monitoring/analysis systems** that assess the risk of conflict through systematic machine coded coverage of news services such as Reuters'.

Most of the debate in the literature concerns the **relative effectiveness of quantitative and qualitative approaches**. There is some evidence that long-term quantitative systems can be effective. Goldstone (2008, p.4), for example, has argued that the Political Instability Task Force (PITF) model² is 'able to attain accuracy of over 80 percent in identifying countries that will have, or will not have, major political crises two years after the data of the observation period, using just four variables—the regime type (derived from the annually updated Polity data set on regime characteristics); infant mortality (estimated annually from UN data); the presence or absence of high levels of discrimination (derived from the Minorities at Risk data set, which gives annual data on groups facing discrimination); and the number of neighbouring countries with violent conflicts (obtained from the annually updated Armed Conflict and Intervention data set)'.

² See <http://globalpolicy.gmu.edu/pitf/>

Most of the literature notes that while it may be possible to identify and measure long-term structural factors using quantitative methods, **short-term triggers or signs can be only be monitored effectively by using a combination of quantitative and qualitative methods** (Clarke 2005, Goldstone 2008, Bercovitch & Jackson 2009, Grimm & Schneider 2011). Some are highly critical of purely quantitative approaches – Clarke (2005) refers to the quest to improve quantitative datasets as the ‘search for the holy grail of early warning’, while Austin (2004, p.16) likens the quest for causes of conflict that are observable without reference to subjective analysis or an understanding of perceptions to a ‘search for unicorns’.

Quantitative indicators can be problematic for a number of reasons:

- Data are often not available from open sources (especially for security-related indicators such as arms sales).
- Most organisations (particularly civil society) are reluctant to collective sensitive information (for example relating to criminality, narco-trafficking and mafia wars).
- Data availability can skew analysis (government indicators are often more easily available than rebel ones).
- Quantitative approaches tend to be based on the assumption that socio-economic factors are the key drivers of conflict rather than ‘grievance’ factors such as ideology, power and identity.
- The same conflict indicators can have different meanings in different contexts.
- Most CEWSs have tended to neglect cooperation indicators (indicators that demonstrate greater inter-group cooperation). Violent events have driven most CEWSs (Matveeva 2006).

There is widespread consensus that **the relative importance of conflict factors will vary according to context** and that regional, country, and even sub-national level weighting of indicators may be necessary (Van der Goor & Versteegen 2000, Nyheim et al 2001, Hagemeyer-Gaverus & Weissmann 2003, FEWER et al 2003, Clarke 2005). Nevertheless, creating a consistent template for early warning analysis can help to create a common understanding across the policy community and help to ensure that early warning analysis can be easily understood and used by senior policymakers (Clarke 2005). Matveeva (2006) concludes that statistical events-based methods may be more suited to conflict situations in weak states, with relative openness, high levels of violence and rich data availability. In West Africa, for example, identifying stakeholders and collecting data is not a major problem.

Many CEWSs, including the Conflict Early Warning System (CEWARN) developed by the Intergovernmental Authority on Development (IGAD)³ and the Network for Ethnic Monitoring and Early Warning (EAWARN)⁴, established by the Institute of Ethnology and Anthropology of the Russian Academy of Sciences, select key indicators for specific countries or regions. Nyheim et al (2001) provide a useful list of key conflict indicators in the Great Lakes and the Caucasus, which demonstrates this regional variation. Matveeva (2006) argues that it is generally more useful to work from a small selection of conflict indicators. Using a long list of indicators may include a lot of information that is irrelevant to the particular conflict situation.

³ IGAD is an inter-governmental organisation established in East Africa in 1996. See <http://igad.int/>. For more information on CEWARN see <http://www.cewarn.org/>.

⁴ EAWARN is a network-based system focused on ex-Soviet states and based largely on expert analysis. See <http://www.eawarn.ru/EN/bin/view>.

Most CEWSs that seek to monitor short-term triggers use a combination of quantitative data and expert analysis (Grimm & Schneider 2011). The Japanese International Cooperation Agency (JICA) uses a system of local security analysts who provide regular briefings (Matveeva 2006). The UK-based Forum on Early Warning and Early Response (FEWER) system used a combination of quantitative and expert-based methods. It was set up in 1997 and closed in 2004 due to shortage of funds (Matveeva 2006). The Early Recognition of Tensions and Fact Finding system (Frühanalyse von Spannungen und Tatsachenermittlung – FAST)⁵ of the Swiss Peace Foundation used four information sources: constant monitoring (qualitative analysis), event data analysis (quantitative analysis), expert network (external expertise), and fact finding missions (field investigations) (Austin 2004). This system is also no longer operational. SIPRI produces country reports on a monthly basis. These reports combine long-term base data from their Facts on International Relations and Security Trends (FIRST) database⁶ with short-term data from a regular internet-based questionnaire filled in by local experts (Hagmeyer-Gaverus & Weissmann 2003).

Quantitative early warning systems rose to prominence in the 1970s and 80s, with **event data analysis** systems such as the World Events Interaction Survey (WEIS) established by McClelland in 1976 and Azar's Conflict and Peace Data Bank (COPDAB), established in 1982 (Austin 2004). Events data systems come in a variety of forms. Most have focused on structural indicators and produce annual reports based on changes in base data. An example of this type of system is the Minorities at Risk project. Another type is the accelerator model, which focuses on short-term indicators that may escalate conflict. An example of this kind is the Global Event Data Survey (GEDS), which uses global newsfeeds to track events. A range of local and national-level CEWSs use expert surveys and questionnaires to build a picture of trends in events. By collecting information about, for example, violent events, peace initiatives or perceptions of government, these systems can identify broad trends that may accelerate conflict. Carment (2008) cites an example of the success of this kind of system – a dynamic data analysis system showed a decline in governance performance one year prior to a state of emergency being called in Pakistan in 2007. He notes that while these systems can be useful, they need to be used in conjunction with an analysis of structural factors (Carment 2008).

3. Key Short-term Indicators

The most comprehensive database of early warning indicators has been produced by the Stockholm International Peace Research Institute (SIPRI), which identifies 1260 potential indicators. A full list of these indicators is available from their [website](#). These indicators have been divided into nine main indicator categories and thirty-five sub categories (Hagmeyer-Gaverus & Weissmann 2003, p. 6-7):

- Justice and human rights
- Socio-cultural factors
- Internal security setting
- Geopolitical setting

⁵ FAST is no longer operational. A sample quarterly risk assessment for Burundi can be found here: http://www.swisspeace.ch/typo3/fileadmin/user_upload/Media/Projects/FAST/Africa/Burundi/FAST_Update_Bur_03_02.pdf

⁶ See <http://www.sipri.org/databases/first/>

- Military and security
- Environment and resource management
- Governance and Political Stability
- Socio-economic factors
- Regional and Country-Specific factors

Clarke (2005) provides a similar categorisation of indicators and notes that categories mostly include structural or long-term indicators (socio-economic conditions, state conditions), while others are short-term triggers (human rights and civil liberties, behaviour of actors). Other categories (regional/international dimensions, security, public discourse and ideological factors) contain both structural and short-term indicators. The CM Toolkit largely concurs with this assessment, arguing that 'whereas military/political conditions serve as triggers for the outbreak of violent conflict, economic and social indicators are important for the structural background conditions within societies that provide a potential breeding ground for discontent and political mobilization' (CMP 2011, no page number). It divides conflict early warning indicators into five categories:

- **Demographic** (Sudden demographic changes and displacement/movements of people, increasing "territoriality" of groups/peoples)
- **Economic** (Short-term and long term changes in economic performance of a country or a region, increase in poverty or inequality, rise of unemployment rate, economic shocks or financial crises)
- **Policy-Related** (Deliberate acts of governments against a specific group or region, destruction or desecration of religious sites, active discrimination or legislation favouring one group over another, potentially destabilizing referendums or elections, government "clamp-downs")
- **Public Opinion or "Social Factors"** (a rise in "societal" intolerance and prejudice, an increase in numbers of demonstrations or rallies)
- **External** (intervention or support on behalf of one of the parties/groups by an external actor, "diffusion" or "contagion" of ideologies or conflicts in neighbouring regions, an influx of refugees from a conflict in a neighbouring country).

The remainder of this section provides a list of indicators collected from a range of active and defunct short-term early warning systems. It is possible to collect data for all of these indicators on a short-term (usually monthly) basis. Most are collected by local networks or experts or by analysing news reports or satellite data, but some have been based on global data sources. The list divides these indicators into six categories, largely following the CMP (2011) categorisation.

Demographic/ Migration

Rapid demographic shifts caused by refugee movements can put pressure on resources and state institutions and spark local conflicts (see Salehyan & Gleditsch 2004). Many of the indicators noted below can be tracked using worldwide data sources that cover a large number of countries. One of the most useful is the Internal Displacement Monitoring Centre (<http://www.internal-displacement.org/>), which provides comprehensive information and analysis on internal displacement in 50 countries.

- *Civilian movements across borders* (FEWER 1999, Van Der Goor and Versteegen 2000)
- *Destabilising settlement patterns* (Van Der Goor and Versteegen 2000)
- *All-male migration* (CEWARN 2010)

- *Restriction of movement into and out of the state* (FEWER 1999)
- *IDP Movements* (Joseph & Carment 2000)

Economic

There is evidence to suggest that commodity price shocks and food price shocks are closely associated with the outbreak of civil conflict (see Bruckner & Ciccone 2010, Arazeki & Bruckner 2011). Similarly, there is evidence that food shortages can trigger conflict (Messer & Cohen 2011). Commodity price databases are easily available from a range of sources while the FAO maintains a regularly-updated global food price index (<http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/>). The ILO produces monthly unemployment statistics for some countries although countries at high risk of conflict tend to have the least comprehensive unemployment data (see http://laborsta.ilo.org/sti/sti_E.html). Most of the other indicators listed below are available globally but only on an annual basis (e.g. capital flight, external investment patterns). Others such as livestock prices and livestock losses are only collected for selected countries or regions.

- *Economic Deterioration* (Van Der Goor and Verstegen 2000)
- *Commodity Prices* (CEWARN 2010)
- *Destablising external investment patterns* (Van Der Goor and Verstegen 2000)
- *Destablising international policies including trade and aid* (Van Der Goor and Verstegen 2000)
- *Devaluation of national currency* (Van Der Goor and Verstegen 2000, Joseph & Carment 2000)
- *Inflation/ Price Stability* (Joseph & Carment 2000)
- *Unemployment rate* (Joseph & Carment 2000)
- *Capital flight* (Joseph & Carment 2000)
- *Forecasted Yields of Key Crops* (FAST 2008)
- *Livestock Prices* (CEWARN 2010)
- *Livestock losses* (CEWARN 2010)
- *Food shortages* (FEWER 1999)
- *Competition over resources* (Van Der Goor and Verstegen 2000)
- *Failure to pay salaries of state workers* (Van Der Goor and Verstegen 2000)
- *Bride Price* (CEWARN 2010)
- *Mitigating behaviour (relief distributions)* (CEWARN 2010).

Security

Security-related indicators have been a key feature of most local and regional CEWSs. Most of the indicators below are only collected by regional, national and local systems such as CEWARN or the FAST system used by the Foundation for Co-Existence in Sri Lanka (now defunct). These systems typically rely on local networks of field officers or experts to compile data. These indicators are tracked globally on an annual basis by a number of initiatives such as the Minorities at Risk Project and the Global Peace Index.⁷

- *Number of armed clashes* (CEWARN 2010)
- *Number of raids* (CEWARN 2010)
- *Other crimes* (CEWARN 2010, Van Der Goor and Verstegen 2000)

⁷ See <http://www.cidcm.umd.edu/mar/>; <http://www.visionofhumanity.org/info-center/global-peace-index-2011/>.

- *Number of deaths* (CEWARN 2010)
- *Armed intervention* (CEWARN 2010)
- *Military build-ups* (FEWER 1999)
- *Political assassinations* (FEWER 1999)
- *Cross-border shootings* (FEWER 1999)
- *Mitigating behaviour (law enforcement)* (CEWARN 2010).

Political/ Policy

Several political and policy-related indicators are compiled globally. Transparency International, for example, provides updates on national levels of corruption on an annual basis. Other measures of regime legitimacy and stability are produced on an annual basis by systems and organisations including the Failed States Index and Freedom House.⁸ One source of data on the proliferation of opposition groups are produced by the Centre for Systemic Peace's Polity IV Project.⁹

- *Integrity of elections* (FEWER 1999)
- *Voter intimidation* (FEWER 1999)
- *Politically motivated arrests and violence* (FEWER 1999, Van Der Goor and Versteegen 2000)
- *Discriminatory policies* (FEWER 1999)
- *Imposition of curfews* (FEWER 1999)
- *Corruption* (Joseph & Carment 2000)
- *Proliferation of opposition groups* (Joseph & Carment 2000).

Public Opinion or 'Social Factors'

Most of the indicators below are only collected for selected regions, countries and localities. These systems typically rely on local networks of field officers or experts to compile data.¹⁰

- *Number of demonstrations* (CEWARN 2010)
- *Aggravating behaviours (a range of indicators including media controls, negative media coverage)* (CEWARN 2010)
- *Political exploitation of differences* (Van Der Goor and Versteegen 2000)
- *Fragmentation of elites* (Van Der Goor and Versteegen 2000)
- *Mitigating Behaviour (Positive media coverage)* (CEWARN 2010)
- *Peace Initiatives (range of indicators including NGO peace initiatives, local peace initiatives)* (CEWARN 2010)
- *Alliance formation (inter-ethnic group alliance, ethnic-group/government alliance)* (CEWARN 2010)
- *Changing Alliances* (FEWER 1999)

Human Rights and Civil Liberties

Most CEWSs see levels of human rights and civil liberties violations as important short-term conflict indicators. Srinivisan (2006) has argued that better incorporation of minority rights issues into early

⁸ See <http://www.foreignpolicy.com/failedstates>; <http://www.freedomhouse.org/template.cfm?page=1>.

⁹ See <http://www.systemicpeace.org/polity/polity4.htm>

¹⁰ See, for example, this CEWARN report on Ethiopia:

http://www.cewarn.org/index.php?option=com_docman&task=doc_download&gid=72&Itemid=87

warning systems, using the context of Darfur as an example. Alerts about human rights abuses often play a critical role in informal conflict early warning mechanisms. Human rights groups regularly present evidence at the UN Human Rights Council, for example.

While a number of sources produce these indicators globally (see, for example Freedom House, Amnesty International, Human Rights Watch), these are generated on an annual rather than a monthly basis.¹¹ Some national or local early warning systems generate more regular monthly or bi-monthly reports based on human rights information.¹²

- *Freedom of Expression* (FEWER 1999)
- *Freedom of Movement* (FEWER 1999)
- *Freedom of Religion* (FEWER 1999)
- *Freedom of Assembly* (FEWER 1999)
- *Human Rights abuses* (FEWER 1999, Van Der Goor and Versteegen 2000, Joseph & Carment 2000)
- *Number of Political Prisoners* (FEWER et al 2003)
- *Constitutional abuses* (Joseph & Carment 2000)

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¹¹ See <http://www.freedomhouse.org/template.cfm?page=1>, <http://www.amnesty.org/en/annual-report/2011>, <http://www.hrw.org/en/world-report-2011>

¹² See, for example, this CEWARN report on Uganda from 2006: http://www.cewarn.org/index.php?option=com_docman&task=doc_download&qid=118&Itemid=87

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5. Additional Information

Key websites: African Union, Berghof Centre, CEWARN, CIFP, Clingendael, DIE, EAWARN, FEWER International, International Alert, GPPAC, Reliefweb, SIPRI, Swisspeace, USIP

Experts consulted:

Gerd Hagemeyer-Gaverus, SIPRI

Mikael Weissmann, Swedish Institute of International Affairs

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