Earlier stages of conflict prediction models

War studies: Clausewitz and the fog of war (rationalité limitée), Sun Tzu and the art of war.

When a prevailing opinion becomes so accepted and unchallenged that it is equated with **'common sense'**, the risk of **strategic surprise** is at its zenith.

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). Much of work was done in the context of policy oriented research for the U.S. government during the Vietnam War.

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.

We make a **distinction here between predictions and forecasts**. A prediction is the product of a guess—educated or otherwise—about the future; **forecasting, on the other hand, involves extrapolating from the data and from observed events to make informed judgements on the future course of particular patterns**, trends or phenomena. That there will be another World War before the end of the 21st Century is a prediction; that the eastern expansion of methamphetamine will continue and lead to an increase in property crimes and assaults in the Atlantic region within the next 36 months is a forecast. Predictions are often mere postulations; forecasts are extrapolations and projections from observable facts. The distinction can be subtle, but it is an important one.

Why Conflict prediction models?

Given that **policymakers may not react** to any particular threat unless they are able to perceive what countermeasures might do and what negative results will arise from inaction, **better cost benefit analyses** are required for all types of responses under consideration, which should also include accountability for those taking or not taking action.

A key defining criterion for preventive diplomacy is the intensity of the conflict. Preventive diplomacy is concerned with low levels and incipient stages of the conflict rather than high levels. It aims at preventing conflicts. **What is a conflict in that perspective? Any form of violence.**

Acknowledging that successful prevention lies in an awareness of potential conflict situations, **the ability to analyze relevant information, and the political will to take the right action when it is needed are key**. Beyond a "fire-fighting" approach to crises, there is also a need to consider more predictable policy approaches to conflict prevention and to address the structural causes of conflict and not only its symptoms. The **central premise** behind I&W analysis is that **events and phenomena do not occur in a vacuum; they affect, and are affected by, various forces and conditions in both the national and international environment, some of which are directly or indirectly observable**

It exists many different models of conflict or crisis prevention. **A number of scholars and policy makers are proponents of competing and sometimes contradictory theories as to which indicators will predict the onset of conflict and instability.** What are the <u>assumptions about conflict</u> that have informed the various models? These will naturally influence which indicators are chosen and how they are used.

Further, even a well-designed model is only as good as the indicators it relies on. In-depth and **reliable information is often difficult to find in conflict zones**. To what extent have models succeeded in overcoming this challenge?

Indicators used by conflict prediction models

Indicators are just what their name implies: conditions that, if observed, could be indicative of a threat's emergence or its potential to emerge.

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)'.

Short-term triggers or signs can be only be monitored effectively by using a combination of quantitative and qualitative methods

'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'

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:

Justice and human rights
Socio-cultural factors
Internal security setting
Geopolitical setting
Military and security
Environment and resource management
Governance and Political Stability
Socio-economic factors
Regional and Country-Specific factors

<u>**Other examples of indicators set:**</u>

1) **from the 'Conflict Management Toolkit', SAIS-CM**

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).

2) **Conflict Prediction Model, Center for Strategic and International Studies**

1. Security	2. Governance	3. Justice & Reconciliation	4. Economics	5. Social Well-Being	6. Cross-Cutting
Accountability	Civic Participation	Effective & Unbiased Police	Inflation & Unemployment	Demographics	International Influence
External Defense	Formal Rules, Institutions, & Processes	Human Rights	Macroeconomic Stability	Displacement	Structural Inequalities
Civil-Military Relations	Local Governance	Independent Judiciary	Poverty & Existence of Informal Economy	Education	The Environment & Natural Resources
Internal Stability	Regime Effectiveness	Local Dispute Resolution Mechanisms	Resource Competition	Health	
Professionalism	Regime Legitimacy	Transitional Justice Mechanisms	Trade	Social Tensions	

Indicators' trends
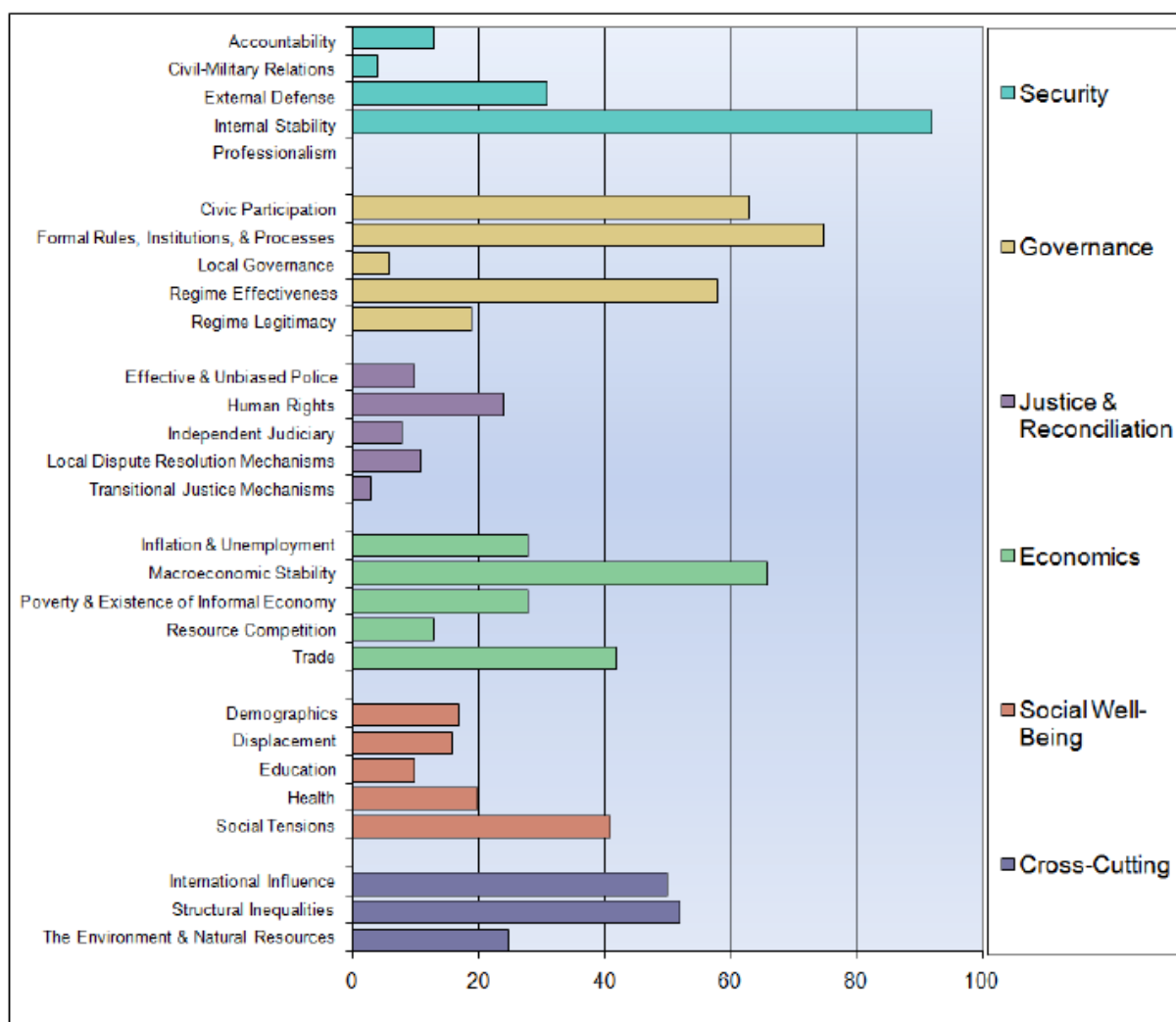
Because models have different numbers of total indicators, there is the potential for models with a **large number of inputs to distort the overall tally** of indicators. For example, one model could bias the total results toward the security category if it relied on 15 security-related indicators but only one or two in the other categories. Two options for resolving this would be 1) expanding the total number of models surveyed or 2) weighting the models to adjust for the number of indicators. Problem: what **ponderation?**

What about environmental disasters?

Overall, the private sector models have a narrower focus and rely on fewer indicators, placing more emphasis on economic indicators and less on social well-being, for instance. This is potentially because they were built with different objectives in mind. Most private sector models are geared toward corporations evaluating business and investment opportunities.

Experts creating the models do not find data in categories such as demographics, health, and education to be reliable (but they are: **Arab spring is a good example**). The figures are either too out of date or too static to make useful inputs.

Abstract categories such as accountability (13), professionalism (0), and regime legitimacy (19) also rank on the low end. A good illustration is the much **higher use of indicators measuring regime effectiveness (58) compared to regime legitimacy**.

There is a detectable **bias towards short-term indicators, underemphasizing long term structural factors**. Poverty, human rights, demographics, displacement, education, and health are important factors for anticipating instability in a long-term time frame yet relatively few models rely on indicators in these categories. This observation suggests the models are geared towards anticipating near term crises rather than predicting long term trends.

The adage *'absence of evidence is not evidence of absence'* is particularly relevant here; just as the **presence of indicators is not necessarily evidence of a threat's emergence, the absence of those indicators is not necessarily proof that no threat exists.** A number of reasons could account for why indicators have not been observed: the issue has not been on the law enforcement radar; we have **not identified and exploited the right sources; indications exist but the 'signals' are lost in the 'noise'; or, no indications presently exist because the expected scenario is years away from emerging.**

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 collect 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

Overview of Methodologies

Future-oriented methodologies and techniques can be used individually or in combination, inside or outside scenario development. Each has specific advantages for developing perspectives and insights that contribute to systematic examinations of the future. Here is a selection of a few major methodologies.

The Delphi method

The Delphi method facilitates the location or construction of consensus among experts on predictions concerning a specific issue. It follows a structured and iterative process of brainstorming, and involves **sending a series of questionnaires to selected experts in order to collect their predictions** on various trends. Each new **round of questionnaires** includes all of the participants' earlier responses, presented anonymously, and lets the participants modify and adapt their own statements.

This usually leads to a consensus forecast on future trends, as the expert opinions converge on a single position. **A monitor filters and analyzes the questionnaires** to control interaction among the participants. **Each round of questionnaires is based on the analysis of the responses to the prior one.** By presenting the perspective of one group of stakeholders, the

Delphi method promotes scenario development and enriches multidisciplinary efforts to identify trends.

Horizon scanning

Horizon scanning is a technique for detecting early signs of potentially important developments through a systematic examination of potential threats and opportunities, with emphasis on new technology and its effects on the issue at hand. **The method calls for determining what is constant, what changes, and what constantly changes**. It explores novel and unexpected issues as well as persistent problems and trends, including matters at the margins of current thinking that challenge past assumptions.

Horizon scanning is often **based on desk research**, helping to develop the big picture behind the issues to be examined. Desk research involves a **wide variety of sources**, such as the Internet, government ministries and agencies, non-governmental organisations, international organisations and companies, research communities, and on-line and off-line databases and journals. Horizon scanning can also be undertaken by small groups of experts who are at the forefront in the area of concern: They share their perspectives and knowledge with each other so as to 'scan' how new phenomena might influence the future.

A solid 'scan of the horizon' can provide the background to develop strategies for anticipating future developments and thereby gain lead time. It can also be a way to assess trends to feed into a scenario development process.

Steps:

i. Topic identification process—The identification of threat scenarios for inclusion in the *WatchList* begins with an all-source, global environmental scan. From this scan, the warning analyst identifies conditions, phenomena, actors or groups. From this informal, collaborative review process, scenarios that are deemed plausible and carry conceivably important implications for law enforcement are flagged for more in-depth research and analysis. **The WatchList is concerned with specific threat scenarios rather than broad possible futures.**

ii. Initial research—The identification of a potential threat scenario represents the first stage of the *WatchList* process; preparing an issue for inclusion in the *WatchList* requires more focused research. **The research phase involves identifying and answering the key questions concerning the particular threat scenario.**
While these questions will depend largely on the specific scenario under examination, some key questions could include: **Is there a precedent for this threat; where has it occurred, and under what conditions; what are the push/pull factors or conditions**;

iii. WatchList indicators—While all types of intelligence—background (or basic), current, estimative and warning—make use of indicators to inform analytical judgments, warning analysis is distinguished from other methods by the pre-eminence of indicators in the analysis and in the finished product. **The *WatchList* not only provides a description of the threat scenario and its potential implications, but also identifies some of the key indicators that are monitored to detect the early signs of a threat's emergence and development.**
Indicators provide a means to observe changes over both the short and long term, and help signal when it is necessary to revise key judgements, such as assessments of impact and probability. Displaying indicators within the product helps to bridge the tactical with the strategic, enabling

intelligence consumers—as well as the information contributors—to see how tactical information informs strategic judgements.

Indicators generally fall under one of two categories: ***primary* indicators (or *agency* indicators) and *secondary* indicators (or *structural* indicators)**. **Primary indicators are those directly relating to activities** (or *transactions*) of target individuals or groups. An example of a primary indicator in the case of the arrival of a foreign street gang could be the local identification of the gang's graffiti tags, or the arrest of prominent members in a Canadian city. **Secondary indicators, on the other hand, constitute the conditions that would either enable (make possible) or promote (make more likely) something to occur**. For example, structural indicators of a gang's arrival could include the size of the potential recruiting pool the gang could draw from, or the existence of a power vacuum or market opportunity that could attract the gang and enable it to establish itself locally.

Primary and Secondary Indicators

Threat Environment

Specific Threat

Primary Indicator — Directly relates to actions or characteristics of target/specific threat

Secondary Indicator — Relates to conditions in threat environment; push/pull factors that may impact threat
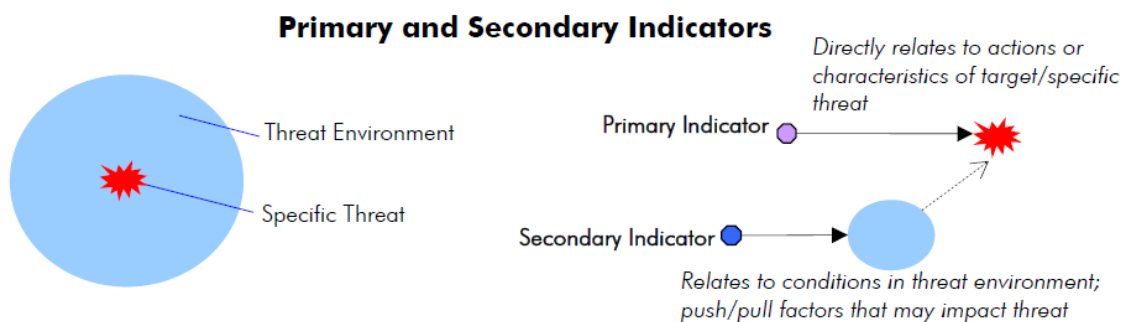
Figure 9 – The relationship and difference between primary and secondary indicators.

iv. Building the WatchList—The *WatchList* consists of four principal components for each threat scenario under evaluation (Figure 12 illustrates): 1) the *Threat Issue* section provides a brief narrative of the threat scenario and its potential significance; 2) the *Monitored Indicators* column identifies potential trends or conditions that could serve as tripwires to facilitate the detection of a threat's emergence and development; 3) the *Possible Indications* column records key observations that could signal an indicator's presence; and, 4) assessments of *impact* and *probability*

v. Monitoring—A lesson learned from the history of strategic surprise is that **potential threats cannot be dismissed and forgotten simply because they are deemed a low risk**. Perceptions of risk could be wrong, or conditions could change that increase the likelihood of a threat. Strategic surprises are often products of both pathologies: inaccurate perceptions and a failure to re-evaluate assumptions in light of new or changing realities on the ground. It is for this reason that regular monitoring and re-assessment are integral features of any strategic early warning system.

VI. Development of systemic analysis

System of systems analysis

Trend impact analysis

Correlational models: use of multiple regression to test the strength of a postulated set of causal links among variables. They use information and developments that took place in the past.

Trend impact analysis is a simple forecasting approach that **extrapolates historical data into the future**, while taking into account unprecedented future events. This method permits an analyst to include and systematically examine the effects of possible future events that are expected to affect the trend that is extrapolated. The events can include technological, political, social, economic and value-oriented changes.

The point of departure is the **'surprise-free' projection based on historical data, assuming an absence of unprecedented future events**. Expert opinions are then used to identify future events that might cause deviations from the surprise-free projection and calibrate their likelihood and potential strength. A 'high-impact' event would strongly affect the trend, positively or negatively, compared to the surprise-free projection. **By combining surprise-free extrapolations with judgments about the probabilities and impacts of selected future events, trend impact analysis provides a solid basis for building scenarios.**

Scenario based analysis

The first step is the development of a central research question, which will usually take the form, *will threat scenario x develop to have implications for Burundi?* From this research question, a central hypothesis (for instance, *'threat scenario x will occur'*) and its null hypothesis (*'x will not occur'*) are put forward for testing. The specific hypothesis testing procedure will vary case to case, but it essentially involves breaking an issue down into more manageable components. Analytical inquiry assumes two related pathways: **identifying the trends/patterns of a particular threat (for instance, how has this threat manifested itself elsewhere); and an analysis of the threat environment for the conditions that would enable or promote the emergence of the threat.**

In any forecasting exercise, there will rarely be one single scenario consistent with the indications. In most—if not all—cases, a number of **alternative plausible scenarios can be constructed from the available facts.** Moreover, the probability of particular scenarios will often rely on certain conditions being present or activated, such as how an organized crime group will react to the introduction of a new criminal entity. As such, scenarios can often conceivably play out in a number of different ways. The *Sentinel Assessment* accommodates for this reality by offering the intelligence consumer three potentially different scenarios: **the best case; the worst case; and the most likely case**—a practice adopted from I&W in the military sector. The advantage of this practice is that **it provides intelligence consumers with the spectrum of alternative threat possibilities**. For those inclined towards worst case or best case planning, this helps to provide appropriate parameters to guard against unrealistically pessimistic or optimistic thinking. Developing these scenarios is an exercise in alternative hypotheses; the best and worst cases are developed by considering different possibilities that could realistically occur if certain conditions changed, whereas the most likely scenario reflects the primary hypothesis

Overview: The different poles in approaches

Although a future-oriented methodology may combine multiple aspects or be adapted for specific purposes, each methodology has specific, dominant characteristics.

Futurists distinguish normative forecasting from exploratory forecasting. Normative work is based on norms or values. Hence, normative forecasting addresses the question: **what future do we want? Exploratory forecasting explores what is possible regardless of what is desirable.**

A second clear dichotomy is between **qualitative ('soft data' such as interviews, discussions, reports) and quantitative ('hard data' such as figures, data, statistics) information**, which can be combined and help orient, for instance, a scenario approach towards convergent and divergent thinking: **Divergent thinking is the intuitive approach that involves a creative elaboration of ideas. Convergent thinking, on the other hand, is the goal-oriented, analytical, observational and deductive process.** The goal of Futures Thinking design in scenario development is to combine creativity with rigour, hence a balance of qualitative/quantitative and divergent/convergent approaches.

The table below informs which of the above approaches a range of methodologies is more likely to facilitate. It also indicates whether the approaches are appropriate for stimulating stakeholder engagements and spotting the unexpected.

	Quanti-tative	Qualit-ative	Norma-tive	Explora-tory	Engage-ment	Testing robust-ness	Spotting the un-expected
Scenario method	x	x	x	x	x	x	x
Delphi method		x	x	x	x		x
Horizon scanning	x			x			x
Trends impact	x	x		x			

Sources: Foresight Toolkit U.K. and The AC/UNU Millennium Project

The ICEW model

It relies on:

1) Rebellion, 2) Insurgency, 3) Ethnic Violence, 4) Domestic Crises, 5) International Crises

1. Rebellion. Our model for predicting rebellion uses proxies for the level of latent conflict between the government and the opposition, and then models the circumstances under which this latent conflict will lead to rebellions. The **proxies are directional measures of the number of conflictual words** (\demand", \disapprove", \reject", \threaten") **stated from the government towards opposition groups and vice versa**.

We suggest that the effect of conflict on the probability of rebellion **depends on the number of ethnically relevant groups that are excluded from power**. When there are no excluded ethnic groups, rebellion should be very unlikely, as disagreements can be solved in the political arena. However, if a **large number of excluded groups exist, coordination problems arise**, which also mitigate rebellions. Hence, rebellion becomes most likely when few excluded groups exist.

We also include **proximity to elections, which can bring about an increase in violence**. A recent example is the case of Kenya, where following the victory of incumbent President Mwai Kibaki, the opposition denounced the results and widespread protests led to violence. As Snyder argues, while elections and democracy are often seen as important mechanisms in the peace building process, they can actually increase the likelihood of violence (Snyder, 2000).

2. **Insurgency.** Access to power is a key variable to understanding the causes of insurgencies. Insurgencies involve groups attempting to wrest political power from the sitting government, and so groups without access to political power are especially of interest. **The larger this excluded population, the more likely violence will be used to change the political landscape**. Furthermore, evidence has shown that violence designed to undermine the government is faced with a collective action problem. However, if anti-government groups observe attacks against the government, they may change their calculus. Thus, we include a measure of dissident groups actions against the government because such actions can be used as a rallying force and recruiting tool, increasing the probability of insurgency. Similarly, it follows that **insurgencies in nearby countries may update individuals beliefs about who else will act against the government of their own country**. For this reason we include a measure of insurgencies in nearby countries, lagged by three months. We also suggest that nearby insurgencies could **potentially disrupt effective government repression**, **liberating sources of weapons, money, and information for would-be insurgents in the target country**.

3. **Ethnic Violence**. While most quantitative studies focus on the effect ethnicity has on conflicts between rebels and the government, we are interested in **inter-ethnic and inter-religious violence**. Thus, our concept of ethnic violence matches ideas of non-state war, non-state conflicts, or subnational wars, where the primary involved actors are non-state actors. In line with recent work on ethnic conflicts, we argue that **government policies play an important role in explaining these dynamics.** Thus, in our models, we include the **number of politically excluded ethnic groups** in a country and the overall proportion of the excluded ethnic population. The existing literature also points to a polarization effect of political exclusion, which suggests including the squared term of the proportion excluded. In addition, we argue that periods of political transition increase incentives to lock in political power in future institutions. Hence, we include Polity and its squared term to model political transition periods. Finally, we are interested in the spatial component of ethnic conflict. An increasing number of scholars not only highlight the transnational dimensions of civil conflict, but also its ethnic component. Thus, our model takes into account possible **spillover effects from neighboring countries**.

4. **Domestic Crises**. Domestic violence and protests are frequently triggered by elections that were perceived to be unfair. We include **proximity of elections** in our model, with different effects depending on the level of executive constraints. We propose this approach because in countries with moderate levels of executive constraints, elections have meaningful implications, but governments have the latitude to manipulate the elections and therefore domestic crises are more likely to center around elections. A second major factor that we believe it affects the propensity of domestic crises onsets is a **country's ethnic composition**. When ethnic groups are excluded from political processes grievances are likely to arise. In authoritarian systems this effect is likely to differ from democracies, so in our model, the effect of the number of excluded groups varies by executive constraints. Hence, the likelihood of domestic conflict is conditional on different levels of executive constraints, with the coefficients for the proximity to elections and the number of excluded groups also varying by executive constraints. In addition to the random effects for proximity to election and number of excluded ethnic groups, we control for GDP per capita, population size, and a spatial lag of domestic crises.

5. **International Crises**. Our model of international crises tries to capture those situations when a leader is unable or unwilling to make the necessary concessions to avoid a crisis. A leaders incentives to avoid international crises will be conditional on domestic political institutions. Leaders in more democratic regimes may be less able to make concessions internationally due to threat of domestic audience costs. **The costs of a crisis might be lower for leaders of more autocratic regimes since their constituency will not bear the brunt of any potential fighting** (Bueno de Mesquita et al., 2003; Schultz,2001). To account for systematic differences between the prevalence of crises under different regime types, **the model includes a random intercept based on a countrys democracy polity score**. In addition, homogeneous populations impose few constraints on the bargaining of leaders in democracy. So, the model also includes a random effect for the **number of politically relevant ethnic groups conditional on level of democracy**. We also control for population size, international crises in politically similar states and include measures for both domestic political pressure and domestic conflict.

Weakenings within early warning methodologies

1. **Knowledge of conflicts is still rudimentary – Big questions remain: what are the critical triggers of conflict?** How are they perpetuated? How do they end? Scholars do not agree on basic assumptions, such as whether an open investment environment in a non-democratic state may be more conducive in the long term to democratization, or if a one-party state may be preferable to a democracy in deeply divided societies. As a consequence, different prediction models have different end-states in mind, and thus place a base value on very different issues. Accordingly, they focus on a number of often competing themes, such as international influence, civic participation, or individual versus community-level issues. Still others are interested in formal rules, institutions, mechanisms, and/or data and less on subjective matters, such as individual or community perceptions of the directions their lives and societies are heading.

2. **Models do not prioritize -** At the macro level, the models do not prioritize conflicts that have an impact directly (or indirectly, by spill-over into neighboring states). At the micro level, they do not prioritize competing information and data in ways that make sense to policy-makers: Is infant mortality more important than unemployment? Would assistance that reduced infant mortality stabilize the state? Is a corrupt police force more problematic than macroeconomic instability? Does high military spending translate into a more professional military? At both macro and micro levels, these models do not adequately explain **where the tipping point might be** for each indicator.

3. **Baseline data is often unreliable -** In all conflict zones, it is extremely difficult to obtain accurate, real-time information: reporting is uneven, journalists often use unverified and anecdotal accounts, and data about population size and other indicators is usually dated and gathered in a non-rigorous manner. In fact, **much of the data utilized in these models is not based on regularly updated field work**, but rather on data entry by non-country experts, very far from the conflict zone. Two examples illustrate this point. In Afghanistan, the last census was conducted in 1979, yet this dated information is still used as the baseline by most international and national agencies, even though it is surely unreliable. Since the Somali state collapsed in January 1991, statistics have been impossible to accrue with accuracy given the insecurities on the ground and the lack of regular and reliable data collection, and because up to half of the population is nomadic. Thus, Somalia has not been included in the United Nation Development Programme's (UNDP) global Human Development Index since 1997, even though, in recent years, data collection in some sectors has improved.[5] Different organizations – both Somali and international – gather data in different ways, with no agreed methodology or reliable means for accumulating information over time. When the raw information is inaccurate, the implication for the models is obvious.

4. **Small pools of experts dominate interpretations -** It is nearly impossible to predict outcomes from chaotic and complex situations, and even the experts tend not to get it right any more than lay people do. In fact, **experts often overlook information that goes against years of viewing a place in a certain way**, while minority voices are typically ignored. Nor do these models help to predict or account for first time events, such as the fall of the Shah of Iran or the decline of the Soviet Empire or even 9-11
.

5. **Weighting what really matters is difficult -** The models have difficulties distinguishing a real signal from noise (i.e., **identifying and disaggregating unambiguous indicators of conflict and instability from other events in volatile countries**). Forecasting is possible but

establishing causation is more difficult. It is not clear why certain small events trigger larger collapse in some instances, and not in others. Researchers have also not yet determined how to test a country's resilience and ability to withstand competing domestic and international pressures, which will have a direct impact on triggers. Most computer-generated models simplify variables and mask assumptions (and, as noted, are often managed by people with little country expertise). There are competing theories about how small events can have big consequences, while the models do not indicate what to do about false positives. Related to this is **how the conflict itself is defined, is it a situation of state implosion? Is it a failed state? An insurgency? A terrorist situation? A civil war?** Is religion the cause of the fighting, or does it mask more complicated societal fissures? How the conflict is defined affects the response, and definitions are still too ambiguous, even amongst the experts.

The models should also be integrated with more subjective, qualitative data. For example, the PCR *Measures of Progress* methodology tries to circumvent the problem of imperfect information typical to conflict zones by combining and balancing a variety of sources.[7] Through the monitoring of media, polls, and public sources as well as in-depth interviews conducted by CSIS staff and local researchers, the *Measures of Progress* tells the story of reconstruction that metrics alone cannot. Once the data are collected they are presented in a simple grid that policymakers can easily digest.

Given that policymakers may not react to any particular threat unless they are able to perceive what countermeasures might do and what negative results will arise from inaction, better cost benefit analyses are required for all types of responses under consideration, which should also include accountability for those taking or not taking action.

How to use it?

At the **United Nations**, the Security Council benefits from monthly "horizon-scanning" briefings by the Department of Political Affairs, which serve as an alert mechanism for potential conflict situations.

At **NATO**, the NATO crisis center holds a horizon scanning panel.

The **AU Continental Early Warning System** (CEWS) was created under the 2002 protocol establishing the Peace and Security Council to provide "timely advice on potential conflicts and threats to peace and security to enable the development of appropriate response strategies to prevent or resolve conflicts in Africa." Itdeals with early warnings that include analyses of conflict relevant structures, actors, and dynamics and that identify trends and conditions conducive to
conflict. The third element relates to the formulation of recommendations, through scenario building, development of response options. The CEWS relies on analytical and news sources such as Oxford Analytica and BBC Monitoring, as well as online news sites such as the Africa Media Monitor (AMM).

The Ushahidi platform (*ushahidi* means "testimony" in Swahili) was initially developed for humanitarian early warning following the post-election violence in 2008. The platform uses crowdsourcing—namely, reports submitted via the web and mobile phones—to map incidents of violence and peace efforts throughout the country. It has helped civil society organizations to connect and share information.

Annex I: an example of database construction:

GROUP OF INDICATORS	PRESENCE OF:	INDICATOR	PRODUCED BY:	MEASURES:
POLITICAL	• Corruption, ineffective or illegitimate government (poor governance)	Corruption Perceptions Index (CPI)	Transparency International	Perception of Corruption
	• Deficiencies in rule of law (weak legal and law enforcement institutions)	Worldwide Governance Indicator	World Bank	Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption
	• Inflammatory or divisive rhetoric in political discourse	Ad hoc analysis		
	• Unequal treatment or position of different groups vis a vis the state	Freedom House	Freedom House	Political Rights and Civil Liberties Ratings
	• Degree of repression (incl. Freedom of speech), Human Rights abuses	Cingarelli Richard (CIRI) Human Rights database	By David L. Cingranelli and David L. Richards	CIRI measures a range of rights, including physical integrity rights and civil liberties
SOCIAL	• Fragmentation along religious or ethnic lines	GrowUp	Swiss Federal Institute of Technology	Distribution of ethnic groups by country
		Fractionalization	Alesina	
			Uppsala University	
	• Unequal income distribution/socio/economic gaps	GINI index	World Bank	
	• Religious fundamentalism, political extremism and militancy	?	?	?
	• Health, Education and Living Standards	Human Development Index	UNDP	Life expectancy, Schooling, Gross National Income
ECONOMIC	• Negative or slow GDP growth	GDP Growth	World Bank	GDP
	• Low income/poverty	Multidimensional Poverty Index Unemployment Rate	University of Oxford	Life expectancy, Schooling, Gross National Income
	• High Unemployment Rate		World Bank	Share of the labor force that is without work
	• High Inflation rate	Inflation , GDP Deflator	World Bank	Inflation rate

DISASTER/C ATASTROPH Y/HUMANIT ARIAN	• Epidemics, pandemics	Global Health Observatory Data	World Health Organization	50 datasets on priority health topics
	• Exposure to natural disasters, Weak crisis response infrastructure • both environmental public health and ecosystem vitality	UN World Risk Index Environmental Performance Index	The United Nations University (UNU) Yale University	Exposure, susceptibility, coping capacities and adaptive capacities. Environmental Health, Water, Air Pollution, Biodiversity and Habitat, Forests, Fisheries, Agriculture, Climate Change
	• Food or water scarcity	Food Prince Index	Food and Agriculture Organization	Average of 5 commodity group price indices (meat, dairy, cereals,oil and fat, sugar)
	• Large Numbers of Refugees, IDps	UNHCR Database	UNHCR	Number of IDP, Refugees
SECURITY	• Insurgency, uprising, violence along ethnic or religious lines • Civil war • Popular unrest • Regional instability or overt conflict • Inter-state tensions or conflict (incl. Aggressive rhetoric, border skirmishes, arms races, cross-border raids and hostile operations)	Global Peace Index	Institute for Economics and Peace	Military expenditures, weapons imports, neighbouring country relations
	• Unresolved territorial disputes	List of territorial disputes	Wikipedia	list of territorial disputes around the world
	• Terrorist groups and infrastructure	Global Terrorism Database (GTD)	University of Maryland	terrorist events
	• Parts of territory not under government control • Trafficking of humans, drugs or weapons	UNODC World Drug report	UNODC	

		Global Report on Trafficking in Persons 2012		
DETERIORATION	• Experienced civil war or other types of significant violence in the last 15 years	UCDP Conflict Encyclopaedia	Uppsala University	Georeferenced Event Dataset Armed Conflict Dataset UCDP Non State Conflict ...