UNDERSTANDING AND FORECASTING POLITICAL INSTABILITY AND GENOCIDE FOR EARLY WARNING
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Charles R. Butcher
Benjamin E. Goldsmith
Dimitri Semenovich
Arcot Sowmya
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Genocide is not an inevitable feature of the modern world. Nor, when the killing has started, is the process inexorable. Genocides can be prevented, or, at least, stopped when they begin. The fact that genocide continues to occur, and continues to attract a range of international responses from the ignorant to the anemic and, occasionally, the forceful, no doubt reflects the reluctance of concerned major powers to become militarily involved in foreign conflicts where traditional national interests are not at stake. Information, however, also has a role to play. Accurate and reliable forecasts of genocide can act as a ‘force multiplier’ by increasing the efficacy of prevention and intervention strategies, and, where these fail, improving the chances of successful prosecution to deter other leaders from committing these crimes in the future. And while no forecasting model can be a substitute for political will, adequate forewarning and monitoring should alleviate some of the uncertainty associated with deployments in foreign lands and close the window for states to obfuscate and avoid real opportunities (some would say obligations) to prevent genocide.

In this report, we discuss the design, results, and usefulness of a quantitative model to forecast genocide. Adopting a widely used definition, we take genocide to mean the ‘promotion, execution, and/or implied consent of sustained policies by governing elites or their agents – or in the case of civil war, either of the contending authorities – that result in the deaths of a substantial portion of a communal group or politicized non-communal group’. This definition includes the targeting of groups because of their ethnic or communal identity as well as the targeting of groups based upon political beliefs, or ‘politicide’. Further discussion of this and related definitions, and of issues surrounding the use of the terms ‘genocide’ and ‘politicide’, can be found in the Appendix to this report. For brevity, we use the term ‘genocide’ to refer to events of both genocide and politicide in the remainder of this report. Such events include the 20th century’s most notorious cases of mass-killing – for example Pol Pot’s murderous reign in Cambodia during the mid-1970s and the killing of at least half a million Tutsi and moderate Hutu in Rwanda in 1994 – along with some less well known cases – such as Burundi from 1965 to 1973 and Sri Lanka from 1989 to 1990. Our model identifies the Central African Republic (CAR), the Democratic Republic of the Congo (DRC), and Chad as the top three states at risk of the onset of a new genocide in the period to 2015.

We begin this report by detailing how an ‘early warning’ system capable of identifying countries at the highest risk of genocide might enhance prevention, intervention and prosecution efforts. This is followed by a brief overview of global and regional trends in the occurrence of genocide.
after World War II. We then discuss the design of our forecasting model and how the forecasts for 2011-2015 should be interpreted. The register of fifteen ‘at-risk’ states for the years 2011-2015 is then presented. Predictors that place these states at high risk, along with some historical and contemporary examples, are then discussed. We conclude by reflecting upon some future directions for forecasting events of massive human rights violations. In addition to discussing definitional issues, the appendix provides a list of the predictors used in the models and data sources.

Why Are Forecasts Useful?

Early Warning for Long-Term Prevention

It seems self-evident that, as with many of the most deadly blights upon humanity, so it is with genocide: proactive prevention is better than reactive treatment, and the earlier that risks can be identified the more effective prevention can be. Prevention by definition would reduce the human costs, and the economic and material costs also can be expected to be much lower, although rigorously assessing these would be challenging. States have a raft of policies at their disposal that might plausibly reduce the chances of genocide. These include: the promotion of civil and political rights, reducing corruption, security sector reform, development projects, arms controls, and programs to reconcile grievances between hostile groups. Preventive strategies have a number of advantages over reactive interventions. First, it is unlikely that they are anywhere near as expensive as United Nations (UN) or regional peacekeeping forces and the post-conflict reconstruction and peacebuilding that must accompany any such intervention. The African Union and United Nations Hybrid Operation in Darfur (UNAMID), for example, cost roughly $1.8 billion in 2010. Second, genocide prevention has the added bonus of reducing other forms of political instability, such as civil or ethnic wars and coups. A recurring finding from the social science literature is that genocide does not erupt from stable or harmonious political settings. Some form of ‘serious political instability’ appears to be a necessary, although


4 See Evans, Gareth (2008) The Responsibility to Protect: Ending Mass Atrocity Crimes Once and For All. Washington D.C: The Brookings Institute, Chapter 4; Ervin Staub (2000) Genocide and Mass Killing: Origins, Prevention Healing and Reconciliation. Political Psychology 21(2): 375. It must be recognised that it is difficult to assess the specific causal impact of prevention policies upon the risk of genocide. One reason is that there are few cases in which it is known that a genocide would likely have occurred but for the application of a particular policy. We also acknowledge that an additional pillar in any genocide prevention strategy will be finding ways to translate early warning into early action. In this sense, the recent initiative by the Obama administration to make mass-atrocity prevention an important aspect of national security planning is encouraging. See: http://www.whitehouse.gov/the-press-office/2011/08/04/fact-sheet-president-obama-directs-new-steps-prevent-mass-atrocities-and.


not sufficient, condition for genocide. Policies that reduce the chances of genocide, therefore, would typically reduce the chances of political instability as well, and vice versa. Infant mortality, for example, is a powerful predictor of civil wars, ethnic wars, adverse regime changes and genocide. Successful measures to reduce poverty and the state’s neglect of basic human needs could therefore be expected to dampen the prospects of these varying forms of large-scale violence, not just genocide.

For prevention strategies to be effective however, they need time to work. It is in this most obvious way that a forecasting tool would be useful. States are usually willing to commit only a small measure of their national budgets to foreign assistance and reliable forewarning would enable these resources to be directed to the most dangerous situations.

There is no one-size-fits all model for genocide prevention. Policies should not be expected to work equally well in all cases and some policies may enflame some situations. Policies that increase a government’s perceived level of threat have the potential to incite a regime to more extreme mass killing. Demobilisation of parts of the regular army, for example, might push a government to rely upon paramilitaries for regime security, and, by creating an armed force unfettered by the institutional constraints of the regular military and answerable directly to the executive, might actually increase the chances of genocide. Paramilitary forces were an essential component in the infrastructure of genocide in Darfur, Rwanda and Guatemala. Prevention strategies must be tailored for specific political, social and economic contexts and decision-makers must know in advance which countries they are to be tailored for. A forecasting tool would increase the effectiveness of prevention strategies by allowing better calibration to the specific situations faced by at-risk states.

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9 Kathman and Wood see the likelihood and severity of genocide as a function of both the perceived level of threat faced by a government committing or prepared to commit genocide and the costs of implementing that policy. A prevention policy that increased the level of threat faced by the regime would not necessarily increase the likelihood or severity of genocide if it were offset by policies that increased the costs of committing genocide, according to this model. Jacob D. Kathman and Reed M. Wood (2011) Managing Threat, Cost, and Incentive to Kill: The Short and Long-Term Effects of Intervention in Mass Killings. Journal of Conflict Resolution 55(5): 735-760.

10 Colaresi and Carey find in their study that large numbers of military and paramilitary forces in the hands of a politically unconstrained executive leadership increases the chances of those forces being employed in genocidal campaigns. Colaresi, Michael and Sabine C. Carey (2008) To Kill or to Protect: Security Forces, Domestic Institutions, and Genocide. Journal of Conflict Resolution 52: 39-67.

11 These included, respectively, the Janjaweed in Darfur, the Interahamwe in Rwanda and the ‘death squads’ in Guatemala. Samuel Totten and William S. Parsons (eds.) Century of Genocide: Critical Essays and Eyewitness Accounts. New York N.Y: Routledge.
Early Warning for Short-Term Intervention

Stopping ongoing or impending genocides will remain a major focus given that prevention strategies are effective in the long-run and that states face major difficulties converting foreign assistance packages into policy-outcomes abroad. Military deployments are the most visible form of intervention, but there are a range of policies from economic and military sanctions to diplomatic intervention and the jamming of radio communications that can be utilised in the short-term. Although intervention to avert an impending or ongoing episode of genocide in the short term is more costly and less politically palatable than longer-term prevention, the costs of inaction may be higher and can be counted in the number of mass graves, generations of social trauma, and the message to would-be genocidaires that the promises of states and the United Nations to protect victims and punish perpetrators are empty. In addition, the Rwandan catastrophe casts doubt upon the notion that states can ignore genocide today and expect that the security consequences tomorrow will be mild. Failure to stop the killings of 1994 contributed to a chain of events that cost up to 2 million lives in the DRC and drew states from Angola to the Sudan into a continent-wide war. It took the largest and most expensive peacekeeping mission ever assembled, at a current cost of $8.73 billion, to deal with the fall-out, and the shockwaves are still felt by the civilians of Eastern Congo today.

A forecasting tool would assist the efficacy of short-term intervention strategies in two important ways. First, at-risk states can be the focus of intensive monitoring for ‘triggers’,

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12 Translating development projects into sustainable economic growth, for example, has proven to be especially difficult.
13 David Yanagizawa-Drott, for example, finds that 10% of participation in the Rwandan can be explained by Radio Television Libre des Mille Collines broadcasts that dehumanised the Tutsi and encouraged people to join in the killing. David Yanagizawa-Drott (2012) Propaganda and Conflict: Evidence from the Rwandan Genocide. Unpublished paper, Harvard University March 10. Available from: http://www.hks.harvard.edu/fs/dyanagi/Research/RwandaDYD.pdf
14 At the time of writing, government soldiers from the DRC, in alliance with UN peacekeepers were battling the newly-formed M23 rebels. The rebels are allegedly supported by Rwanda. Nearly 200,000 people have fled areas north of Goma to escape the violence. “DR Congo’s M23 rebels ‘attacked’ by UN forces” BBC News Online: Africa. 25 July 2012. Available from: http://www.bbc.co.uk/news/world-africa-18983159
‘catalysts’ or indicators that occur close to a genocidal event. Initiatives such as the Satellite Sentinel Project (http://satsentinel.org/) could be harnessed to monitor these countries and provide critical information on activities of armed forces and the vulnerability of civilian populations. Other potential partners include the Economic Community of West African States (ECOWAS), which monitors states in the region for precursors to conflict and crisis, Genocide Watch, International Crisis Group (ICG), country analysts and the intelligence communities of concerned states. Many of these monitoring projects, are, however, expensive, or limited in their resources (the Satellite Sentinel Project, for example, only presently monitors the Sudan). Combining a small but comparatively reliable watchlist of states at highest risk of genocide with close monitoring would increase the likelihood that the attention is focused where it is needed. No such list could provide perfect prediction, of course, but the goal of this project is to develop the most reliable such lists that we can.

We see that such collaboration can lead to two important ‘force multipliers’. In the case that evidence of an impending genocide or genocidal intent is established, relevant financial and troop contributors and potential veto-players can be lobbied early and the hope is that a package of sanctions and (potentially) inducements tailored to the case at hand can be implemented. It is, perhaps, overly optimistic, but it remains our hope that states will be reluctant to obstruct efforts to avert an impending genocide or arrest an ongoing one in the face of clear, credible, and voluminous evidence provided by such monitoring efforts. At the very least, the ability of state leaders to claim a level of plausible deniability would be greatly reduced. Second, as evidence regarding short-term triggers and signals of genocide surfaces, states may use policy-interventions short of military force to deter those planning it from proceeding with genocide. At each of ‘Genocide Watch’s’ eight stages of genocide, for example, a policy prescription is provided. A collaborative effort between Harvard University’s Carr Center and the U.S. Army has also developed a set of mass-atrocity response guidelines which vary with the context of the event. A well-targeted and sequenced combination of sanctions, inducements, military preparations, and diplomacy may adequately communicate resolve to punish any instigation of genocide, and obviate the need for a foreign military to forcibly protect civilians. Finally, states may be reluctant (in part) to address genocide with military intervention because the requisite attention from political leaders, policy-makers, and the media is only generated once mass-killing is imminent or underway. As such, peacekeeping missions (whether unilateral or multilateral) must be assembled quickly, with fragmented intelligence and little space for military planning tailored to local conditions. John Heidenrich concludes, in his book How to Prevent Genocide, that:

“The lesson [from Kosovo] is this: having three or four months of early warning, while better than no warning at all, is not much time to prevent a genocide. For instance, to arrange a multinational peacekeeping force typically takes the UN at least 3 months of planning and preparation – and that is after the Security Council has debated the issue and agreed to act. Ideally, therefore, a genocide early warning system should forecast a genocide, or at least genocidal trouble, several months or even years in advance.”

15 These include the blocking of hate-speech, banning international travel of state or militia leaders, freezing foreign assets and the provision of military assistance to groups of potential victims.


An ability to identify states at high risk of genocide over the next 1-5 years would enable defence departments and the UN to draw up plans for a military deployment to protect vulnerable civilians and gather the necessary intelligence on the strength and strategies of combatants and important geographic and logistic factors long before any such deployment is required. It would also allow independent and within-government organizations to focus monitoring efforts earlier, and thus to have more information at hand to substantiate the danger of genocide onset, in order to build political will behind prevention efforts at an early enough stage to increase the chances of success.

**Early Warning for Prosecution**

Where states fail to arrest atrocities, information gathered through a combination of forecasting and monitoring may serve as evidence to prosecute offenders in the International Criminal Court (ICC) or specially convened international tribunals. To date, individuals from Rwanda, Bosnia and Cambodia have been convicted in *ad hoc* tribunals, although the ICC has jurisdiction to prosecute crimes of genocide as well. Recently, a string of convictions for war crimes and crimes against humanity have been made, including the former Liberian president and sponsor of the Revolutionary United Front in Sierra Leone, Charles Taylor, although, again, Taylor was convicted by a Special Court for Sierra Leone, not the ICC. The president of Sudan, Omar al-Bashir, is presently under indictment by the ICC and there are cases before the court relating to conflicts in Uganda, the CAR and the DRC. However, the ICC in 2009 ruled that insufficient evidence existed to charge Bashir with genocide. It took one more year before sufficient evidence could be presented. Similarly, in 2012 the ICC dropped all 13 counts of war crimes and crimes against humanity allegedly committed in the DRC in 2009 by former Rwandan rebel leader Callixte Mbarushimana due to insufficient evidence. Early warning which leads to monitoring of at-risk countries should lead to better and more evidence being available at earlier stages for speedier justice. Successfully convicting and punishing perpetrators of genocide and mass killing in the present, should, over time, raise the perceived costs of such responses to domestic instability in the future. Indeed, one of the founding visions of the ICC was that the ‘guarantee that at least some perpetrators of war crimes or genocide may be brought to justice acts as a deterrent and enhances the possibility of bringing a conflict to an end’. Justice may also be crucial to successful post-conflict transformations and is a moral imperative that should be pursued both at the level of individuals, and at the level of states.

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18 The definition of genocide in international law and the definition used in our study differ, mainly on the extent to which ‘intent’ to eradicate a specific group must be established. Therefore, some cases that are coded as genocide in our forecasting model may not satisfy the criteria for genocide in international law, but may be considered crimes against humanity or war crimes. It is our hope that focused monitoring efforts can assist in gathering evidence of intent where it exists.

Genocide has been on the decline since the end of the Cold War.\textsuperscript{20} After the Second World War and the Nuremberg trials in Germany, genocides were comparatively rare until the early 1960s when a swathe of new states were created in the decolonisation movement. Genocide incidence reached a peak in 1975, the year that Angola emerged as an independent nation. During this year, genocides were ongoing in Chile, Equatorial Guinea, Uganda, Angola, Iraq, China, Pakistan, Cambodia, South Vietnam, the Philippines and Indonesia. This level remained fairly stable until 1990, when 9 genocides were still ongoing.\textsuperscript{21} Since then, ongoing genocides have dropped sharply to just 1 in 1996 before a small increase in 1997-1998 with the war in the Democratic Republic of Congo. Although the mass-murders in Bosnia and Rwanda

\textsuperscript{20} Interestingly, this general trend of decline since the end of the Cold War remains when a host of variables correlated with genocide onset, such as prior genocide, elite ideology, regime type and ‘the human defence burden’, are controlled for. This suggests that there are some factors that are presently unaccounted for in quantitative analyses, but roughly correlated with the end of the Cold War, that are reducing the chances of genocide onset. One might speculate that the increasing number of foreign interventions (both military and non-military) to halt ongoing instances of genocide is creating a deterrent. See Chad Hazlett (2011) New Lessons Learned? Improving Genocide and Politicide Forecasting [online] \textit{The United States Holocaust Museum.} Available from: http://www.ushmm.org/genocide/analysis/details/2011-10-05/Chad%20Hazlett%20Early%20Warning%20Final%20Long%20Paper.pdf. Pg 32 for an analysis of the probability of genocide over time, controlling for other confounders.

\textsuperscript{21} In Guatemala, Somalia, Angola, Sudan, Iran, Iraq, Afghanistan, Sri Lanka and Indonesia.
captured the attention of international media and policy-makers, these cases were actually part of a globally declining trend. From 2003 to 2008 this number was stable at 1 (Sudan). The end of the Sri Lankan civil war (2009) and the conflict in Libya (2011) witnessed genocide onsets by our coding, although neither continued into the following year.\(^{22}\)

There has been a marked decline of genocide and politicide in Asia, Central America and the Middle East since the end of the Cold War. Indeed, in 1975, one of the two highest years of genocide incidence, more than half (6) of the cases were from South or South-East Asia. With the exception of Sri Lanka in 2009 there has not been a single case recorded of genocide in Asia since 1992.\(^{23}\) While Guatemala and El Salvador experienced long periods of mass-murder during the Cold War and Argentina and Chile comparatively shorter episodes, there is no recorded instance of genocide in South or Central America since 1990. So too, this trend holds for the Middle-East (excluding Northern Africa). With the potential exception of events unfolding in Syria during 2012, the last recorded year of genocide in the Middle-East was 1992 (Iran).\(^{24}\)

In the context of a sharp global decline, Africa has experienced only a modest fall in the genocide onset rate and now accounts for a high proportion of ongoing genocides. Of the 33 country-years since 1993 where an ongoing genocide has been recorded just 7 (21%) were non-African. Although speculative, it is possible that Africa’s high levels of material deprivation, frequency of coups d’etat and civil wars, and peripheral status in the world economic system account for this slower drop-off.


\(^{23}\) Although events surrounding East Timor’s 1999 independence vote might deserve reconsideration as fitting the PITF definition (cf. Komar, Debra A. and Lathrop, Sarah. 2012 “Patterns of Trauma in Conflict Victims from Timor Leste,” *Journal of Forensic Sciences* 57, 1: 3-5) .

\(^{24}\) And Afghanistan if this country is included in the ‘Middle-East’, although we code it as a (South) Asian country. Libya was coded as a part of Africa.
Using quantitative analysis to forecast genocide is a recent development in the literature. In 2003, Barbara Harff published a seminal study in the *American Political Science Review* that was able to predict, with a statistical model fit to data from 1955-2001, 74% of genocide onsets correctly, whilst also classifying 73% of non-genocides correctly.\(^{25}\) Harff’s work was pioneering and of high quality, but her model (which forms the basis of some existing early warning approaches)\(^ {26}\) might not provide policy makers with the kind of lead time that effective prevention and intervention strategies require. There is a limited but active scholarly community presently working on the many remaining puzzles and challenges of forecasting genocide and mass killing.\(^ {27}\) Harff’s forecasting model, and a number of subsequent models, have restricted their sample of cases ‘at-risk’ of genocide or other mass atrocities to states already experiencing some form of serious political instability such as civil war, state failure, or an adverse regime change. That is, forecasts are only produced for states presently undergoing this kind of instability. While this decision is based upon the aforementioned insight that genocides occur in fragmented and violently polarized polities, such an approach introduces some problems.

There are a number of cases where genocide commenced not long after the beginning of serious political instability (as was the case in Sudan in 1956 and 1983, or Burundi in 1988). If part of our aim is to create an ‘early warning’ system, then a lead time of months, or even weeks, is not early enough. In addition, it is difficult to make forecasts over a longer time period, say 3 or 5 years, by selecting only states which today are experiencing some form of instability. Our approach of including all states in the world, and then including the risk of instability as a part of the model, does not place such restrictions on the forecasts. Indeed, of the fifteen states which we list in Tables 1 and 2 as most at risk of genocide onset for 2011-2015, only five were experiencing serious instability in the last year of available data, 2010. We also believe it is more reliable to test a model’s out-of-sample forecasting performance on a dataset which consistently contains the same countries, rather than attempting this on ‘conditional’ models which choose a potentially different set of countries (only those experiencing instability) for each year that is sampled.

We believe our forecasting model takes important steps towards addressing these issues. Our model estimates the probability of genocide in two stages. In the first stage, the probability of a country experiencing ethnic war, civil war or a reversion to authoritarianism is calculated. For this first stage, we have drawn heavily from the literature on political instability and civil

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“Overall the model was able to correctly classify 82% of onsets, whilst also correctly classifying 79% of non-onsets in an out-of-sample test from 1988-2003”.

28 This estimate of the probability of serious political instability is then incorporated into the second stage, along with a second set of covariates to estimate the likelihood of genocide.29 States do not, therefore, have to be experiencing political instability to show up in our lists as being at a high risk of genocide onset. It may be that a state is at a high risk of political instability and this risk increases the risk of experiencing genocide as well. In this way our model is capable of producing forecasts for all countries, not just those already experiencing instability. A large number of variables correlated with political instability and genocide were tested for their predictive power.30 Broadly, we have included variables that capture aspects of a country’s conflict history, political institutions, economic conditions and time-specific events such as assassinations and elections (a full list including data sources is found in the appendix). The inclusion of this final category is important, and represents another distinctive aspect of our approach: we focus on predictors which show considerable change year-on-year. These

30 Variables were included/excluded based upon Receiver Operating Characteristic (ROC) Area Under the Curve (AUC) and the Akaike Information Criteron (AIC) measurements for in-sample forecasts. For discussions of this see ; Goldsmith, Benjamin E., Butcher, Charles Robert, Semenovich, Dimitri and Sowmya, Arcot, Forecasting the Onset of Genocide and Politicide: Annual Out-of-Sample Forecasts on a Global Dataset, 1988-2003 (March 20, 2012). Available at SSRN: http://ssrn.com/abstract=2027396 or http://dx.doi.org/10.2139/ssrn.2027396.
‘time-variant’ factors, we expect, collectively enhance the precision of forecasting capabilities, although most on their own have only moderate forecasting power (see Tables 1 and 2 below). Our model uses only publicly available data, reflecting the practical constraints of real-time forecasting.\footnote{There are some factors that may be correlated very closely with genocide, but are not useful for forecasting purposes. The psychological disposition of state-leaders may be one, for example, but without psychological profiles of every state leader in every given year, this variable could not be included in a forecasting model.} To produce the forecasts for 2011-2015 displayed in Tables 1 and 2, the model takes data from 1974-2005 to estimate the relationships between causal variables and genocide. It then ‘plugs in’ data from 2010 to produce the five-year forecasts.\footnote{We do not use data up to 2009 to train the model because such data would overlap with the 5-year ‘future’ period of the outcome variable we are forecasting in these models. It should also be noted that the machine-learning based Generalized Additive Models used to generate the data in Tables 1 and 2 incorporated Instability into a single-stage model. Given the considerably greater complexity and nuance of machine-learning approaches, this difference with our models using more standard econometric approaches (e.g., censored probit) is perhaps not surprising. Theoretically we still believe that a two-stage process is the most appropriate framework.}

Our model has a good record of accurately classifying historical cases of genocide. Overall the model was able to correctly classify 82% of onsets, whilst also correctly classifying 79% of non-onsets in an out-of-sample test from 1988-2003.\footnote{By lowering the threshold somewhat, it also classified 91% of genocide onsets correctly while still classifying 69% of non-onset years correctly. The prototype model had special difficulty predicting genocide onsets in the former Yugoslavia, likely due a combination of poor data and the substantial effect of poverty (proxied by a measure of infant mortality) on the risk of both instability and genocide.} We point out that Harff’s forecasts apply only to those countries already undergoing some form of political instability and are in-sample. That is, Harff’s model estimates the effects of explanatory variables on the sample within which the predictions are made. As King and Zeng point out, in-sample predictions run the risk of over-fitting to the data and may not be robust outside the sample.\footnote{Gary King and Langche Zeng (2001) Improving Forecasts of State Failure. World Politics 53(4): 623-658} Our model forecasts for all countries in all years and are out-of-sample – that is, the model does not ‘see’ the data it is trying to predict. Our results are robust to randomly partitioning the data and re-testing the out-of-sample forecasts, and our model classified 7 out of 11 genocide onsets (64%) correctly from 1988-2003 when predicting one year into the future.\footnote{The AUC statistic is 0.8482. The 95% confidence interval around this is 0.7102 to 0.9862.}

Table 1 displays our genocide forecasts for the period 2011-2015. The most useful way to interpret the table is as a roster of those states at the highest risk of experiencing a genocide in the five-year period. The table also includes the values for our six most potent predictors. Most of these represent underlying structural conditions which do not
exhibit high year-on-year variability. In Table 2, we present the values of six of our more time-sensitive variables for each of the fifteen states. The tables are followed by a discussion of three key predictors in the model—previous genocides, state-led discrimination and the ‘human defence burden’—with reference to the 2003 genocide in Darfur. Following this, we reflect on two of the top five states on the list, Chad and Somalia.  

At this stage we also emphasize an important aspect of forecasting models such as ours: their intention is to maximize forecasting power, rather than to assess causal relationships. As such, the predictors listed in Tables 1 and 2 should not be understood as factors necessarily causing genocide onset. Rather, they are better understood as risk indicators somehow associated with an increased likelihood of genocide. An appropriate analogy might be to symptoms of medical conditions. High blood pressure is associated with a higher risk of heart disease, and it is also a cause. But chest pain too is a predictor of heart trouble, although it is not a cause. A good example from the discussions below is the identification of the presence of peacekeeping troops as a predictor of genocide. Of course we do not believe that peacekeepers cause genocide. Rather they are a useful predictor because of an empirical correlation: their presence tends to precede genocide onsets in some cases. The causal story is almost certainly spurious in that the same factors which increase the likelihood of peacekeepers being present also increase the likelihood of genocide onset. But our model points to risk indicators only, rather than directly pointing to causal factors which might be ‘policy targets’. We do make reference to other social scientific evidence in this report, however, which informed the inclusion of factors in our models, and points to causal relationships which we feel are relevant for their policy implications.

Table 1.

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<th>Top 15 At-Risk States for Genocide/Politicide, 2011-15: Most Powerful Predictors</th>
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<tr>
<td><strong>Years Since Previous Genocide / Politicide</strong></td>
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<td>Central African Republic</td>
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<td>Uganda</td>
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<td>Libya</td>
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**Full data set for 2010:**

| Mean | 50.6 | 0.1 | -24.9 | 0.2 | 33.0 | 0.8 |
| Min | 0 | 0 | -96.7 | 0 | 2.1 | 0 |
| Max | 62 | 1 | -2.5 | 1 | 113.7 | 5 |
| Standard Deviation | 13.0 | 0.3 | 12.6 | 0.4 | 30.4 | 1.0 |

There are notable differences between our list and two other publicly available genocide watch-lists. First, ours is shorter. This is important because meaningful efforts to attempt to prevent genocide, reduce the risks, or monitor antecedents are likely to be costly. Producing the shortest and most reliable list possible is therefore imperative. Any such list will have more ‘false positives’ than ‘true positives.’ That is, there will be more countries on the list which do not turn out to have a genocide onset in the period in question than those countries that do. This is a function of the relative rarity of genocide, and a part of the difficulty of the forecasting task. But a reliable list will also strive to have a low ‘false-negative’ rate, that is, have as few cases as possible that experience genocide but were not on the list for that period. Second, our list covers a specific multi-year period. Our model was ‘trained’ to forecast over five-year periods, and thus the forecast we produce covers the five years after the last available year of data for the predictors, 2010. We believe this has considerable policy utility because it allows planning over a longer period.

There are differences in the specific at-risk countries. Of the twenty-two countries in the top two categories of the May 2012 Genocide Watch list, only eight overlap with our list (CAR, DRC, Chad, Somalia, Myanmar, Afghanistan, Uganda, and Libya). Of Harff’s twenty included in the Peace and Conflict 2012 volume, there are also eight which overlap with ours (CAR, DRC, Somalia, Myanmar, Sri Lanka, Syria, Cameroon, and Uganda). Of all three watch-lists, ours uniquely identifies Angola, Ecuador, Burundi, and Guinea. As Table 1 shows, if the 2011 events in Libya and the present ongoing repression in Syria are considered to be instances of genocide / politicide, then our model correctly identifies both these cases as well. 37

While we do not discuss each case in depth, it is useful to note some patterns regarding the most potent predictor variables in Table 1. We include the minimum and maximum values for each predictor across the whole dataset for 2010, as well as the mean (average) and standard deviation. States that commit genocide tend to be repeat offenders. This is evident in the cluster of states at the top of our list with a comparatively short interval since the last genocide. However, it should be noted that this variable is counted since the year of independence, so for many newer states, values are lower by virtue of the number of years they have been sovereign members of the international system.38 Only a third of the states at the top of our list were experiencing political instability in 2010, reinforcing our emphasis on incorporating the risk of instability into the model itself, rather than conditioning selection on this factor. The log-transformed indicator for executive constraints in combination with the “human defense burden” is a potent predictor in our models, but also a complex one. It is discussed below with respect to specific cases. Official discrimination against a group within the state, although present in about 20% of states globally in 2010, was evident in 6 of our top 15 at-risk states (40%) and half of the top 10. This is a relatively straightforward predictor – the move from systematic discrimination to systematic murder is quite plausible – and also discussed with reference to specific cases below. The levels of infant mortality and conflicts in neighbouring states are both well above average, and in many cases near maximum values, among our at-risk states, and these are also discussed below.

37 See note 22 regarding the case of Libya.
38 This feature of the variable may be justified due to the risks inherent for new states, and perhaps the common brutality of colonial rule, but it also ‘biases’ the variable towards newer states clustered in Africa, Asia, and the Middle East.
Our model also includes a number of predictors which show considerable variation year-on-year. We expected these to add significantly to the forecasting capability of our model. Although only one highly time-variant factor is among the most potent predictors (conflicts in neighbouring countries), we nevertheless find that each of the others, shown in Table 2, adds to the forecasting power of the models. While most of these are discussed with reference to particular cases below, we here point to two, perhaps unexpected, roles. First, involvement in an interstate war does not appear to be an important risk factor. This may be an artefact of the rarity of such ‘traditional’ international war in recent years: in 2010 only 3% of states were involved in such conflict, while “internationalized” involvement in internal conflicts was both more common and present for some of the states on our at-risk list. Second, the presence of peacekeeping forces does seem to be an important predictor. Of course, as noted, we do not believe that peacekeepers would be a direct cause of the onset of genocide, but rather that their presence indicates other dangerous conditions within the country. Peacekeepers were present for genocides in Bosnia and Rwanda, for example. Some research finds that peacekeepers can reduce the severity of mass killing, but our models suggest that they might not necessarily prevent its onset. 39

Table 2.

Top 15 At-Risk States for Genocide/Politicide, 2011-15: Time-Variant Predictors

<table>
<thead>
<tr>
<th></th>
<th>International Tactics</th>
<th>International Conflict</th>
<th>Interstate Conflict</th>
<th>Last 3 Years</th>
<th>Assasinations</th>
<th>Election Period</th>
<th>Executive Defense Burden</th>
<th>Peacekeeping Forces</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Central African Republic</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>-0.10</td>
<td>1</td>
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<tr>
<td>2 Dem. Rep. of the Congo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>-0.12</td>
<td>1</td>
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<tr>
<td>3 Chad</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>-0.31</td>
<td>1</td>
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<tr>
<td>4 Somalia</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0.00</td>
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<tr>
<td>5 Angola</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>6 Myanmar</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
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<td>7 Sri Lanka</td>
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<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0.02</td>
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<tr>
<td>8 Ecuador</td>
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<td>0</td>
<td>0</td>
<td>1</td>
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<td>9 Burundi</td>
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<td>0</td>
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<td>1</td>
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<tr>
<td>10 Afghanistan</td>
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<td>11 Syria</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-0.08</td>
<td>0</td>
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<tr>
<td>12 Guinea</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td>1</td>
<td>-0.11</td>
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<tr>
<td>13 Cameroon</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0.09</td>
<td>0</td>
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<tr>
<td>14 Uganda</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>-0.12</td>
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<tr>
<td>15 Libya</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-0.01</td>
<td>0</td>
</tr>
</tbody>
</table>

|                | Mean       | 0.08 | 0.12 | 0.03 | 0.25 | 0.05 | 0.46 | -0.17 | 0.11 |
|                | Min        | 0    | 0    | 0    | -8   | 0    | 0    | -13.63 | 0   |
|                | Max        | 1    | 3    | 1    | 12   | 1    | 1    | 6.76  | 1   |
|                | Std. Dev.  | 0.28 | 0.54 | 0.16 | 2.15 | 0.22 | 0.50 | 1.22  | 0.31 |

Below we discuss one historical case that illustrates the role of four key variables in our model. Then we discuss two unusual cases near the top of our list – Chad and Somalia.
The 2003 genocide in Darfur illustrates the practical usefulness of our model for real-time forecasting along with the role of three key variables: previous genocides, the human defence burden and state-led discrimination. The following section proceeds with a brief description of the genocide in Darfur followed by an outline of how our model performed in predicting this event, and some of the reasons why our model classified Sudan as a high-risk state.

Before South Sudan’s independence in 2012, Sudan straddled the geographic and cultural border between Arab North Africa and the African Sub-Saharan region. Darfur lies in the west of Sudan and Darfuris are typically of black African descent and Islamic faith. Over time there has been significant intermarriage and coexistence between the black African Darfuris, who tend also to be settled agriculturalists, and Arab Darfuris, who tend to be nomadic cattle and camel herders.

Darfur has a history of self-rule. The Sultanate of Darfur exercised de-facto independence during the 19th century, but was conquered and subdued by the British before the First World War. At independence in 1956, Darfur was incorporated as an administrative division into the state of Sudan. Since then, Darfur, along with much of the South was subject to systematic discrimination and deprivation by governments in Khartoum. Restiveness in Darfur was overshadowed for many decades by the devastating and brutal civil war fought between the Southern Peoples Liberation Movement (SPLM) and the military of the Government of Sudan (GoS) over the future of the South – a war that is estimated to have cost up to 2 million lives.

In 2003, as the GoS and Southern Sudanese factions negotiated for peace, the Sudan Liberation Army/Movement (SLA/M) and the Justice and Equality Movement (JEM) launched a guerrilla campaign in Darfur, demanding that the GoS end years of economic deprivation and physical insecurity. In mid-2003 the conflict exploded into full-scale mass killing. A JEM attack on the El-Fasher airbase on April 25, 2003, killing 30 government soldiers and destroying bombers and combat helicopters on the tarmac was the tipping point. The government-armed Janjaweed

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40 These are three of the top five variables with the greatest capacity to predict past genocides (given that the probability of instability is estimated) from 1956-2010. The five variables, in order of predictive capacity are: State-led Discrimination, Executive constraints multiplied by the Human Defence Burden, time (since 1956) the presence of peacekeeping forces, and the number of previous genocides.
42 The ‘official’ onset of the rebellion occurred in the context of increasing tribal tensions between sedentary pastoralists and camel herders. For much of Sudan’s history, consistent rainfall ensured that herders were able to graze their stock on lands north of those owned by the settled farmers most of the time, and move onto the farmer’s pastures during agreed-upon times of the year. Persistent drought through the 1980s and 1990s drove the camel herders further south onto the agricultural lands of Darfuris earlier than normal and for longer periods of time, exhausting the land and destroying crops. Tensions between the herders and agriculturalists escalated in 1998 and 1999 when hundreds of people were killed in massacres and fighting between farmers and herders. According to many reports, the police did little to protect the villages from these raids. Totten, Samuel (2009) The Darfur Genocide. In: Samuel Totten and William S. Parsons (eds.) Century of Genocide: Critical Essays and Eyewitness Accounts. New York N.Y: Routledge, Pg 62
43 200 Government soldiers were also reportedly executed in this attack. Nyala was also attacked on 25 April. 500 soldiers
militia commenced a devastating scorched earth campaign in Darfur in cooperation with the regular military, especially the air force. Typically, hundreds of militia mounted on camels or four-wheel drives armed with mounted machine guns would attack a village. These assaults were often preceded by aerial bombardment and supported by soldiers of the regular Sudanese army. 44 Since 2003 an estimated 250,000 people have been killed directly by the violence or indirectly through disease and starvation, with, at its peak, nearly 3 million people displaced into refugee camps along the border with Chad. 45 Victims have come primarily from the Fur, Massalit and Zaghawa groups.

Existing quantitative forecasting models might have difficulty predicting the genocide in Darfur because the onset of ‘serious political instability’ (the civil war between the GoS and the SLA/M and JEM) occurred only months before the beginning of genocide. 46 As such, existing models can only provide a lead-time of months and, as discussed, this is much too short for most prevention efforts. Our model places the Sudan at very high risk of genocide onset (or, to be technically correct, a second genocide onset) from 1989 up to the year of onset, 2003.

Three types of variables place Sudan in the high-risk category. The first is a history of using mass killing to deal with internal threats. Twice since independence has the GoS used the mass murder of civilians to deal with insurgencies, first from 1956-1972 during the ‘Anya Nya’ rebellion and second when John Garang, leader of the Southern People’s Liberation Army (SPLA), took up arms to overthrow the government in Khartoum in 1983. According to our forecasting model, this pattern of responding to insurrection with mass-killing makes it more likely that the state will respond to the next threat with mass killing. This is, of course, what happened when the SPLA/M and JEM rebelled in 2003. Indeed, Alex de Walle has labelled the GoS’s campaign in Darfur as ‘genocide by force of habit’. 47 It is also not surprising in such situations to see guerrilla tactics, one of our time-variant factors in Table 2, being used by rebel groups against the state, which was the case for Sudan in 2002.

Second, states that systematically discriminate and repress minority groups are more likely to use genocide when faced with armed threats from within. Put simply, states that institutionalize abuse of their populations are more likely to abuse them on a large scale during periods of instability. 48 Darfur’s African population was neglected and, at times, actively discriminated against prior to the genocide. One probable symptom of this was the infant mortality rate, which, in Western


46 However, if the existence of a separate genocide in Sudan in 2002 is also coded as ‘instability’, as is done by PITF, this would not apply. In our models we drop instances of ongoing genocide from the in-sample data, because the models are trained to forecast the onset of genocide only. But, we do allow forecasts for future years for all states, because we cannot of course know whether a genocide will end or not at some particular point in the future.
Darfur (122.5 boys and 104.2 girls dying per 1000 births) was significantly higher than in Northern Sudan (100.1 for boys and 88.8 for girls). African Darfuris were underrepresented in the police and armed forces, and when agricultural disputes escalated to massacres in 1998 and 1999, the police and judiciary did little to prosecute the offenders. Sudan is coded as practicing state-led discrimination against minority groups from 1982 to 2002, the year preceding onset of genocide in Darfur.

Third, the ‘human defence burden’ interacted with ‘executive constraints’ consistently predicts genocide over time. The human defence burden measures the proportion of a population in the regular military over a given year. ‘Executive constraints’ measures the extent to which political institutions limit the decision-making autonomy of the executive. Legislatures often fulfil this function, but a nobility or strong judiciary can also check the power of the executive. Michael Colaresi and Sabine Carey have shown that the probability of genocide increases with the proportion of a population under arms, but only in states where the executive faces few constraints upon their decision-making. In our models, it is not only the level of this variable (shown in Table 1) but also the change in the human defence burden from the previous year (shown in Table 2) that have predictive power. In 2002, the GoS commanded 117,000 soldiers and is coded as having ‘unlimited authority’ in this year. Indeed, by 2002 the GoS had extended the declaration of a ‘state of emergency’ and amended the National Security Act to allow arrest and incarceration without judicial review. The 2000 elections were boycotted by all major opposition parties and did not take place in the rebel-held south, where the government continued its campaign of mass killing with impunity, especially, in this year, in the Nuba mountains. This combination of high levels of executive independence and a high and increasing human defence burden is particularly dangerous.


52 In Table 2, ‘fd’ indicates ‘first difference’: the difference between the current and previous years.

53 In 2001, the GoS recruited an additional 13,000 soldiers into the national armed forces. 12,000 of these recruits were to the army itself (as opposed to the navy and air-force). See (2001) Sub-Saharan Africa. The Military Balance 101(1): 246-282 and (2000) Sub-Saharan Africa. The Military Balance 100(1): 252-287. Our data do not capture the effects of recruitment to paramilitary forces. It is likely that rapid recruitment of paramilitary forces in regimes with few executive constraints is also an indicator of impending genocide. The Janjaweed in Darfur are just one example. Others include the Interahamwe in Rwanda, the 13th division in Zimbabwe and the deaths squads in Guatemala. See Alex Alvarez (2006) Militias and Genocide. War Crimes, Genocide and Crimes Against Humanity 2:1-33

Chad is the highest ranked country on our at-risk list for 2011-15 that does not also appear on Barbara Harff’s list of twenty countries at risk of genocide or political in 2012. It is therefore useful to highlight not only as an important case to watch, but as an illustration of the differences in forecasting models. Although Chad does not rank among the highest values of most of the general (Table 1) or time-sensitive (Table 2) predictors in our model, it does have moderately high values across several of them. The predictors on which it has the most risky values for 2010 are the number of conflicts in neighboring states, the occurrence of an election period, and the presence of a peacekeeping mission. These combined with the moderately risky values across other variables propel it to third on our list.

Since independence from France in 1960, Chad has had a history of authoritarian rule, civil war, and foreign intervention. The first president, François Tombalbaye, was removed in a coup and killed in 1975, although this did not put an end to the decade-old civil war. In 1979 the capital fell to rebel groups, but this invited intervention from Libya, which lasted until 1987. With French support, president Hissène Habré forced Libya to withdraw, but his subsequent rule was notable for its brutality, corruption, and favoritism towards the president’s own Daza ethnic group. Habré has been indicted for crimes against humanity in Belgium and faces charges at the International Court of Justice, although his extradition from exile in Senegal remained uncertain in mid-2012. The current Chadian president, Idriss Déby, removed Habré in a 1990 coup. Déby’s initial liberalism has recently drifted towards authoritarian rule.

In 2010 an agreement between Chad and Sudan was reached to respect and monitor each other’s borders, in effect ending Sudanese support for rebel groups in Chad. This was followed by Chad’s agreement to allow the extension of a UN peacekeeping mission, MINURCAT (United Nations Mission in the Central African Republic and Chad), which had taken over from a smaller contingent of European Union peacekeepers in 2009. MINURCAT was mandated to protect refugees and civilians that had gathered along the border regions of Chad, the Sudan and the Central African Republic.

In the 2011 presidential election, widely seen as neither free nor fair, and boycotted by opposition parties, Déby received over 83% of the votes. A frustrated set of opposition groups with a history of armed revolt and foreign support places Chad at risk of escalating instability in the form of a coup or civil war outbreak. Chad’s national army battled a small rebel group in the east (the Population Front for National Resistance) in 2010. Although it is not a factor in our models due to a lack of data for all states and years, it is worth noting that President Déby is a member of the Zaghawa ethnic minority in Chad, as is most of the military command.

55 Uppsala Conflict Data Program (Date of retrieval: 2012/07/27) UCDP Conflict Encyclopedia: www.ucdp.uu.se/database, Uppsala University.
Although there are around 200 ethnic groups in Chad. Domination by an ethnic minority is sometimes hypothesized to increase the risk of genocide, as appeared to be the case in Rwanda.

Bordering Libya, Sudan, the Central African Republic, Cameroon, Nigeria, and Niger, Chad is in a rough neighborhood. Sudan and Libya have histories of intervention in Chad, but given the region’s porous borders and overlapping ethnic identities, current and recent conflicts in any of these countries could plausibly lead to instability and mass violence in Chad.

Somalia

Somalia might appear to be an odd country to appear on a list of states at a high risk of genocide. In 2010 – the year of data used to make these forecasts - Somalia’s Transitional Federal Government (TFG) was largely confined to the suburbs of Mogadishu and was dependent for its survival upon the support of 7,200 Ugandan and Burundian soldiers deployed under the auspices of the African Union (AU). This situation eased in 2011 as more AU soldiers were deployed and US logistical, intelligence and financial support helped the TFG to expel Al-Shabaab insurgents from the capital. It seems unlikely that the TFG or the AU soldiers had the material capability to undertake a widespread campaign of mass-killing in 2010.
Somalia, however, exhibits structural characteristics that increase the risk of genocide in the medium-term. First, the TFG faced, and continues to face, widespread armed opposition and is fighting a counter-insurgency campaign, facing guerrilla tactics, on numerous fronts. So long as this war continues, the risks of genocide remain appreciable. Second, Somalia has experienced a previous genocide. During the 1980s, members of the Issaq clan in Northern Somalia organised to challenge the rule of Somalia’s dictator, Siad Barre. In May 1988 the Somali National Movement (SNM) captured two of the three main northern towns, Buarto and Hargeisa. Barre’s government obliterated both cities with aerial bombardment. Government soldiers then moved into the north and exacted severe punishment on the northern Issaqs with a campaign of murder, rape and destruction of water wells and grazing lands (the means of subsistence). An estimated 50,000 people were killed in this campaign.57

Third, and perhaps most importantly, there are a host of military organisations in Somalia that control substantial portions of territory with few institutional constraints upon the use of force. The TFG’s constitution empowers a 275-member federal parliament to elect a president and pass laws. Although the president appoints the Prime Minister and Cabinet, he or she cannot dissolve the government and the judiciary is explicitly independent of the legislative and executive branch.58 There is, however, no guarantee that the constitution will continue to

57 The 1988 bombings, however, led to mass defections from the Somali army, and by 1991 Barre could only control a few suburbs of Mogadishu. He was ousted that year, precipitating the humanitarian crisis that drew the United States to Somalia in 1992.
be adhered to, and perhaps the greatest check on the president’s power is the TFG’s dependence upon the AU for soldiers and the international community (especially the US and EU) for finance. Indeed, this scenario played out in 2010 when the then President Sharif unconstitutionally dissolved the cabinet and government, only to revoke the move in the face of a US threat to withdraw support for the regime, which had few other means of funding itself. As such, the AU and international community exercise substantial leverage over political decision-making, but there remain few guarantees that any future increase in the military capabilities of the TFG will not be used to brutalise parts of the population. Amnest International noted in 2010 that the TFG already has a record of human rights abuse that could escalate with greater capabilities and the Africa Research Bulletin warned that US-supported arms shipments to the TFG ‘were made despite substantial risks that such types of weapons could be used in indiscriminate attacks by TFG forces’. Human Rights Watch reported that the TFG’s human rights record was ‘dismal’ and that ‘its forces have been repeatedly implicated in indiscriminate attacks on civilians, arbitrary arrests, and repression of civil and political rights’. Previous regimes in Somalia have a history of discriminating and repressing clan-groupings perceived as presenting a threat to the incumbent. The genocide of Issaqs in the late 1980s was an extreme manifestation of what has been a persistent feature of recent Somali politics.

Of course, the risk of genocide extends to the many rebel groups and alternative administrations operating in Somalia, few of which have the kinds of institutionalised constraints on executive power that reduce the chances of genocide. Indeed the TFG itself is in alliance with Ahlu Sunna wal Jamma and Ras Kamboni along with other, Kenyan sponsored, militia, groups that face few, if any, of the institutional constraints upon the use of the force that the TFG does. The rebel groups, Al-Shabbab and Hizbul Islam control substantial portions of Southern and Western Somalia, but are, in essence, military organisations with few institutional checks on how violence will be utilised. Human Rights Watch has documented how, in 2010, Al-Shabbab militants have used torture, public execution, the denial of food, water and medical aid and forced recruitment to repress and control those under its territorial control. Somaliland and Puntland have established political systems similar to the TFG and are potentially more stable, especially in Somaliland where a presidential election on June 26th 2010 peacefully replaced a sitting president.

The forecasts presented in this report are based on a methodology demonstrating reasonably reliable forecasting performance in out-of-sample testing. Of course, they should be understood as ranked risk assessments, not infallible predictions. We also emphasize that there is room for improvement in these forecasts in terms of variables considered, data, and method. The forecasts should also be considered as complementary to other existing quantitative and qualitative assessments and watch lists – to be used in conjunction with other sources rather than considered as a substitute. We believe, however, that the forecasts presented in this report are an important addition to the available tools, and an important step forward in several ways. Our statistical model produces a systematic and data-driven assessment of genocide risk and, we believe, our two-stage approach emphasizing time-sensitive predictors is a theoretically informed way of capturing the processes that lead to genocide onset. Our model is tailored as an early warning tool of use to policy-makers and, to this end, can produce 5-year risk assessments for all countries in the world. Most importantly, when tested upon past events, the model has a good record of correctly identifying states that experienced an onset of genocide. In combination with other existing watch lists and more finely grained monitoring efforts, such as those undertaken by NGOs, at academic institutions and government departments, the model presented in this report can significantly enhance our capacity to prevent genocide in the long and short-term.

Conclusion
We believe it is important to discuss definitional issues relating to genocide and potential extensions of our model. The definition of genocide used in this report also includes politicide – the mass killing of individuals based upon their identification (or perceived identification) with a political group or view. One objection to this move, and one potential objection to the findings of this study, is that genocide and politicide are distinct phenomena with different causal pathways. It could be argued that the archetypal genocide – the Holocaust – is qualitatively different in the nature and objectives of the ruling group than the campaigns of political killing in Guatemala or El Salvador during the 1980s. We believe, however, that this is unlikely to be the case. Genocide and politicide are difficult to distinguish in practice. Ethnicity is regularly used by genocidal regimes as a proxy for political beliefs or affiliations.

Even in the two extreme cases of genocide and politicide since the end of World War Two, in Rwanda and Cambodia respectively, there was significant admixture between killing based upon political identity and killing based upon political identity. In Rwanda, both politically moderate Hutu and Tutsi were murdered and the Tutsi were murdered in part because extremists in government were able to cast the Tutsi as supporting the insurrection of the Rwandan Patriotic Front (RPF). There was, therefore, both an ethnic and a political element to the genocide. Cambodia is cast as an archetypal politicide; people were murdered because of their perceived political beliefs, especially urban-dwellers and those with education. However, Ben Kiernan argues that there was an important racial and religious element to the killing in Cambodia. Vietnamese (the largest ethnic minority group in Cambodia prior to 1970) were targeted as they were seen to be contaminating the ‘pure’ Cambodian ‘race’. Nearly 100,000 Cham Muslims were massacred in 1975. Buddhists were almost completely eradicated from 1975-1979. The blending of genocide and politicide in practice makes it extremely difficult to separate the two phenomena and so long as actors that perpetrate genocide continue to use ethnicity or race to infer political beliefs, it is questionable whether this will ever be possible. It also suggests that the causal process underpinning both genocide and politicide is similar enough for these to be considered parts of the same phenomena.

The main alternative definition to ‘genocide’ in the literature is ‘mass killing’. Ulfelder and Valentino code mass killing when ‘the actions of state agents result in the intentional deaths of at least 1000 non-combatants from a discrete group in a period of sustained violence’.

The 1000 deaths can be accumulated over the course of an episode and an episode ends when the killing drops below 100 deaths per year for three years. Ulfedler and Valentino’s definition certainly corrects some problems with Harff’s definition of genocide/politicide. The threshold

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of 1000 deaths, while arbitrary, relieves some of the uncertainty associated with identifying what a ‘substantial portion’ of a communal or political group is. It is not clear how a ‘substantial portion’ is measured in Harff’s study and, therefore, it is not clear how this list would be replicated.

Ulfelder and Valentino also claim that their definition does away with the difficulties of identifying political or communal groups, especially given that political identification is a very fluid and subjective characteristic. However, by loosening the definition to include ‘discrete groups’ (that is, ethnic, political, social, communal or geographic groups, such as individual villages) and lowering the death threshold to just 100 per year, the authors may solve one problem by creating a bigger one. Ulfelder and Valentino’s definition is potentially so broad, that it could become unclear what the difference between mass killing and state repression is. Scholars interested in ‘mass killing’ and ‘mass atrocity’ are usually interested in understanding and predicting episodes where large numbers of non-combatants are murdered with high intensity as distinct from lower levels of government oppression that may persist for many years. Some cases are included in the Ulfelder and Valentino data that might be the result of very different causal processes than other mass-killing incidents. These include South Africa from 1976 to 1994, Malawi from 1964-1994 and Haiti from 1958-1986. In addition, the inability to distinguish between instances of high intensity mass killing and persistent repression means that a number of episodes of ‘mass killing’ endure for extraordinarily long periods of time. Iraq is coded as experiencing a period of mass killing for 40 continuous years from 1963-2003, Ethiopia from 1961-1991, Iran from 1979-2008 and Uganda from 1986-2008. Such inclusiveness means that a forecasting model using country-years as a unit of analysis could not distinguish between the more serious cases of mass murder that occurred in Iraq between 1963 and 1975 and 1988-1991 from Hussein’s oppressive style of rule. In addition, the genocide in Rwanda is indistinguishable from the civil war that began in 1990 by this definition of mass-killing. We believe that raising the death threshold might alleviate some of these problems, but that would require going back over the coded cases and changing the start and end dates to indicate periods of higher intensity. For the above reasons, we think that the Harff definition and universe of cases is the closest to what we are interested in an analytical sense, the types of crime that we are most interested in predicting and preventing, and the episodes that policy-makers are most interested in obtaining forewarning of.

65 These aspects cast some doubt over the findings in Ulfelder and Valentino’s 2008 paper. For example, the finding that 77% of mass killing episodes begin in the first year of instability might reflect the inability to distinguish repression from mass killing. Unsurprisingly, many governments violently crack down on segments of their population when faced with internal armed resistance.
Appendix 2: List of Variables and Data Sources

We use annual time-series data for all (available) countries in the world in each year. The time period covered is 1974-2010 for the independent variables and 1975-2011 for the outcome variables. In some instances, missing data have been imputed to allow for a fuller set of countries and years to be included (for example, some data for the first years of the newly independent state of the former Yugoslavia, and data for military personnel for years after 2008, were not available from our data sources). In addition, for some variables listed, the main data source is given while other data sources were also used to supplement missing observations or years. Details of imputation procedures and supplementary datasets are available in the academic studies which underpin this report, listed at: http://sydney.edu.au/arts/research/r2pforecasting.

Outcome Variables (Stages 1 and 2)


Independent Variables


Dataset,” *The Institutions and Elections Project, Binghamton University* (http://www2.binghamton.edu/political-science/pdf/IAEPusersmanual.pdf).


