

Which countries are most likely to suffer onsets of state-led mass killing in 2015?

A STATISTICAL RISK ASSESSMENT

Mass atrocities are rare yet devastating crimes. They are also preventable. Studies of past atrocities show that we can detect early warning signs of atrocities and that if policy makers act on those warnings and develop preventive strategies, we can save lives. Yet despite this awareness, all too often we see warning signs missed and action taken too late, if at all, in response to threats of mass atrocities.

The goal of the Early Warning Project is to help change that. The system seeks to shine a light and spark discussion on those cases where mass atrocities have not started but where risks are detected. This project aims to provide governments, advocacy groups, and at-risks societies with earlier and more reliable warning, and thus more opportunity to take action well before killings occur.

While forecasting political events such as mass atrocities has many challenges, using the best available public data and the most advanced methodologies, we meet this challenge through an innovative two-part system, the first of which is a Statistical Risk Assessment. We cannot claim to anticipate with exacting precision when and where in the world new mass atrocities will occur. Instead, our system is designed to assess a country's general level of relative risk for the onset of future mass killing. Over time, we hope to

learn which models and which indicators are the best at helping anticipate future atrocities to aid in the design and implementation of more targeted and effective preventive strategies.

The Statistical Risk Assessment provides more rigorous estimates of the risk of state-led mass killing (killing of over 1,000 civilians) in countries with populations larger than 500,000. These estimates represent the average of forecasts from three statistical models representing different theories about the causes and precursors of mass atrocities. Our models learn from the past to identify patterns that can help us spot cases at risk of mass killing.

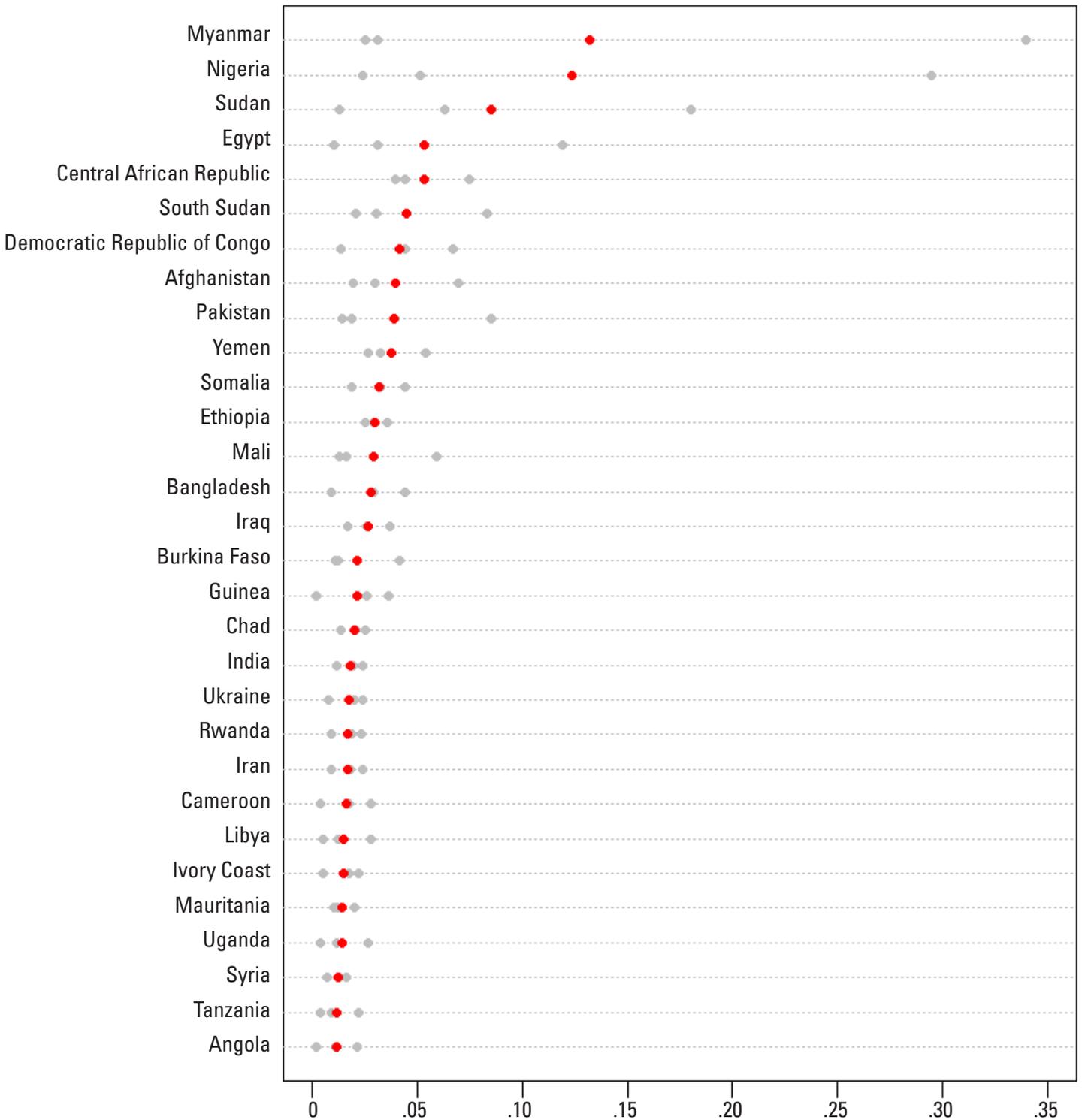
The dot plot on the following page shows the thirty countries our statistical risk assessments identify as the most susceptible, using data describing conditions in those countries—and the 132 others in the world with populations larger than half a million—at the end of 2014. The red dot represents our best estimate, and the grey dots represent the three different forecasts from which that estimate is derived (see the [Technical Details](#) at the end of this report for more information). The estimates described here were produced in May 2015, soon after the last of the sources on which our statistical models depend had posted new data for the

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previous year. We focus the discussion on the top 30 because we are confident that nearly all onsets that might happen in 2015 will come from this group. The limitations of available data and the complexity of the politics that produce state-led

mass killings make it impossible to predict these onsets with precision, but our analysis of historical data shows that we can identify a swathe of most susceptible countries with high confidence.

Risk of Onset of State-Led Mass Killing Episode



For the second year in a row, our statistical assessments identify **Myanmar** as the country most susceptible to the start of a new episode of state-led mass killing. This year’s assessments come at a time when many advocates and other observers are warning loudly about the imminent risk of genocide in Myanmar in response to discriminatory policies targeting the Rohingya minority and spurring many of them to flee the country. Our statistical assessments corroborate those concerns, as do the judgments of participants in our opinion pool who are making forecasts on this topic.

One country that was already in the top 30, **Nigeria**, saw a significant increase in its estimated risk that pushed it all the way to the second spot on our list, just behind Myanmar. For Nigeria, although violent conflict intensified within its borders and in some of its neighbors, there were no dramatic changes to any of its inputs this year. Instead, its climb up the list was driven by a sharp increase in risk as estimated by Random Forests, a machine-learning algorithm we apply to all of the factors used in our two other models, which represent contrasting theories about the origins of mass atrocities. We can’t unpack this algorithm to say exactly why that jump happened, but it is worth noting that historical analysis shows the forecasts from Random Forests to be more accurate than the ones from either of the theory-specific models. It is also worth noting that we already consider two episodes of mass killing to be underway in Nigeria—one perpetrated by Boko Haram, and another by state security forces in their efforts to defeat that insurgency. This new assessment pertains to the risk of a new episode of state-led mass killing targeting a group other than alleged members or supporters of Boko Haram. Note this year’s election in Nigeria took place after the system’s assessment.

Three countries saw significant increases in their assessed risk that pushed them into the top 30 this year:

- **Burkina Faso** moved from just outside the top 30 in 2014 to the sixteenth spot on this year’s list because of a successful coup d’etat in October 2014, an event that some subject-matter experts and our models identify as a risk factor for state-led mass killing.
- **Ukraine** ranked among the many countries worldwide with negligible risk going into 2014, but the abrupt ouster of its president in February and the eventual outbreak and escalation of a civil war in the east pushed it all the way up to twentieth in this year’s assessments.

- **Libya** climbed from approximately ninetieth on last year’s list to twenty-fourth on this year’s as a result of two changes: the intensification of armed conflict within its borders and in nearby states, and the heightened political salience of ruling officials’ communal identity.

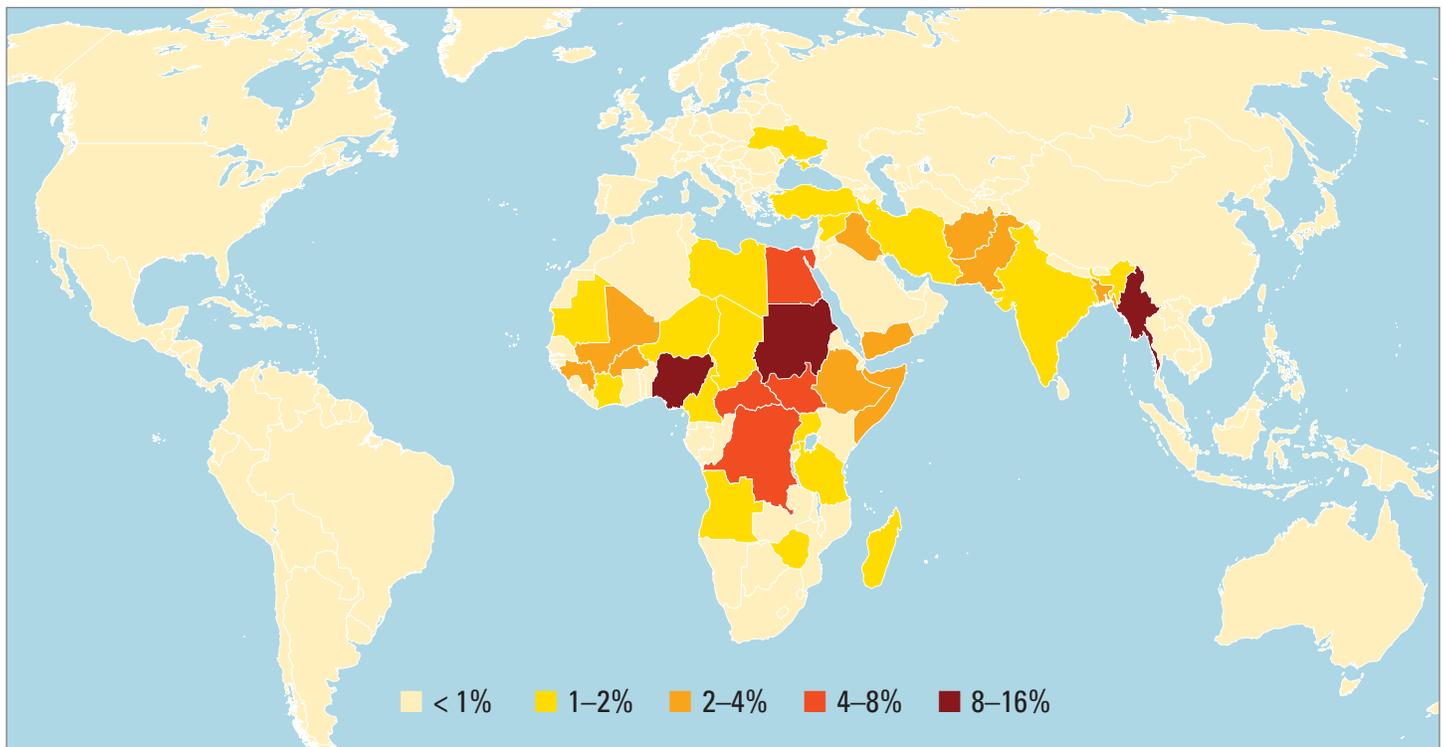
Several countries in the top 20 could be considered surprises, in the sense that they rarely appear on lists or in public conversations about cases at high risk of mass atrocities:

- **Bangladesh** ranks fourteenth in this year’s assessments, essentially unchanged from its position on last year’s list. Bangladesh combines a history of mass killing with weakly democratic institutions, sharp political polarization, and state-led discrimination, all factors that, according to subject-matter experts and our statistical models, predispose it to the kinds of political crises that usually precede mass atrocities.

Twenty Biggest Increases

Country	Difference	New Rank
Ukraine	71	20
Thailand	43	42
Libya	35	24
Gambia	33	45
Russia	29	44
Malaysia	27	60
Mauritania	23	26
Timor Leste	23	65
Fiji	20	105
Kenya	18	64
United Kingdom	18	123
Burkina Faso	17	16
Senegal	17	67
China	15	41
Ivory Coast	15	25
Kyrgyzstan	15	39
Singapore	14	135
Vietnam	14	86
Belarus	13	138
Niger	13	34

Risk Assessment Map



- **Guinea** moved from tenth last year to seventeenth this year, but that apparent slippage really resulted from changes in other countries' forecasts; Guinea's risk profile remained essentially unchanged. This country nearly had a state-led mass killing a few years ago, and our models suggest that it remains at relatively high risk of coup attempts and civil violence. Presidential elections are scheduled for October.
- Conventional wisdom holds that democracies don't perpetrate mass killings, but **India's** past actions in Kashmir make it a historical exception, and our statistical assessments indicate that it remains a case of concern. Hindu-Muslim tensions in Gujarat, an ongoing Maoist insurgency in the country's east, and persistent frustrations in Kashmir represent three plausible flash points.

Many of the other countries near the top of this year's list—including **Sudan, South Sudan, Iraq, Afghanistan, Pakistan, Central African Republic, and Ethiopia**—are ones that have landed there in each of the three years we have done this process and will probably continue to do so remain there for the foreseeable future. Almost all of those are countries that conventional wisdom in the atrocities-prevention community also would also identify as higher-risk cases, and some of them already have ongoing episodes of state-led mass killing. This is as it

should be. Many people who study or work on this problem at the regional or global level often have a good sense which countries are perennially susceptible to mass atrocities, and if our statistical analysis is well designed, it should confirm most of those judgments. That these assessments are considered common knowledge should not diminish the attention directed at these relatively high-risk cases.

A handful of other countries moved into or out of the tail end of the top 30 in 2015 as the cumulative result of small changes in their inputs and the ones for other countries with similar risk profiles. This kind of churn among countries that are riskier than most of the world but not quite as susceptible as the top 15 or 20 is not especially meaningful, as the changes in the underlying forecasts are too small to interpret with confidence. Countries in this set include **Cote d'Ivoire** and **Mauritania**, which both slipped into the top 30 this year, and **Mozambique**, which slipped out.

Finally, our statistical assessments see lower-than-expected risk in at least a few countries:

- Many observers will be surprised to see that **Burundi** again lands well outside our top 30, this time ranking in the high fifties. This assessment considers the basic fragility of domestic politics, the not-so-distant history of violent

conflict, and the prior occurrence of mass killing. Because the inputs represent conditions at the end of the previous year, however, it does not account for the failed coup attempt that occurred in May 2015 or the (still-modest) escalation of civil violence that has ensued so far. If we update the assessment to incorporate information about this year's failed coup, Burundi would still only rank in the high thirties. If, however, we also revise our sources' categorization of its form of government from democracy to mixed leaning authoritarian—a label that many country experts would argue is more appropriate in light of President Pierre Nkurunziza's decision to run for a third term while stifling his challengers—then Burundi would jump into our top 20, between **Chad** and India.

- **Zimbabwe** is another country that often comes up in conversations about places at risk of mass atrocities but does not land in our top 30. A thin veneer of procedural democracy fails to conceal a long-lived authoritarian regime that has avoided coup attempts and large-scale civil violence and continues to coopt and suppress its chief domestic rivals. This assessment is unlikely to change until Zimbabwe's politics start to move more visibly, something that could happen when longtime president Robert Mugabe steps aside or otherwise leaves office, as he is expected to do in the next year or two.
- The government of **China** has perpetrated several mass killings in the past half-century, and some activists and observers are voicing concern about the risk of new atrocities in Tibet and Xinjiang today. Our statistical assessments don't identify China as one of the world's highest-risk countries, but they don't exactly assuage those concerns, either. In each of the three years we have produced them, our assessments have ranked China in the forties, suggesting that change in the riskier direction on any of our model's more influential inputs could tip it into the highest-risk group. It is also possible that, in countries as large and heterogeneous as China, national-level measures could obscure regional structures or trends that could lead to mass killing at the scale we track.

We expect to update these assessments again in the spring of 2016, when the public data sources on which they depend post their takes on conditions in 2015. In the meantime, we will use our opinion pool to find out what subject-matter and area experts think about where the highest risks are, and how they are changing over the course of the year. Within the next few weeks, we also plan to update our public

repository with the data and code we used to generate this year's assessments so interested researchers can get a better feel for the analytical process, check our math, and help us search for ways to do this even better.

TECHNICAL DETAILS

We consider a state-led mass killing to have occurred if the deliberate actions of state agents or other groups acting at their behest result in the deaths of at least 1,000 noncombatant civilians within their own country over a period of one year or less.

- *State-led* refers to cases in which the relevant violence is carried out by uniformed troops, police, or other agents of state security, or by other groups acting at the behest of government officials. In cases where the state's role is ambiguous, we look for evidence of government encouragement of violence or coordination with state policies or military operations.
- A *noncombatant civilian* is any person who is not a current member of a formal or irregular military organization and who does not apparently pose an immediate threat to the life, physical safety, or property of other people.
- The reference to *deliberate* actions distinguishes mass killing from deaths caused by natural disasters, infectious diseases, the accidental killing of civilians during war, or the unanticipated consequences of other government policies. Fatalities should be considered intentional if they result from actions designed to compel or coerce civilian populations to change their behavior against their will, as long as the perpetrators could have reasonably expected that these actions would result in widespread death among the affected populations. Note that this definition also covers deaths caused by other state actions, if, in our judgment, perpetrators enacted policies/actions designed to coerce civilian population and could have expected that these policies/actions would lead to large numbers of civilian fatalities. Examples of such actions include, but are not limited to: mass starvation or disease-related deaths resulting from the intentional confiscation or destruction of medicines or other healthcare supplies; and deaths occurring during forced relocation or forced labor.
- To distinguish mass killing from large numbers of unrelated civilian fatalities, the victims of mass killing must appear to be perceived by the perpetrators as belonging to a discrete group. That group may be defined

communally (e.g., ethnic or religious), politically (e.g., partisan or ideological), socio-economically (e.g., class or professional), or geographically (e.g., residents of specific villages or regions). In this way, apparently unrelated executions by police or other state agents would not qualify as mass killing, but capital punishment directed against members of a specific political or communal group would.

Countries can experience more than one episode of state-led mass killing at the same time, if and when the state targets more than one discrete group in distinct conflicts. Sudan is a contemporary example, with ongoing episodes of state-led mass killing in Darfur and South Kordofan. Consequently, all states are theoretically at risk of a mass-killing onset every year, even if they already have one or more episodes of mass killing ongoing. Because all states are theoretically at risk of an onset all the time, all country-years are included in the statistical analysis.

Of course, rebel groups and other non-state actors also kill civilians, and sometimes on a scale that also meets our definition of mass killing. Our statistical risk assessments only consider state-led mass killing, however, because they are produced by models that have to be “trained” on historical data, and at present we only have deep and reliable data on mass killings carried out by states. If and when we are able to produce or obtain comparable data on mass killings perpetrated by non-state groups, we will expand our statistical modeling to incorporate them as well.

Our statistical risk assessments are an average of forecasts from three models representing some different ideas about the origins of mass atrocities or how to assess them. All of these models are developed from and applied to publicly available data from reputable sources.

- Drawing on work by Barbara Harff and the Political Instability Task Force, the first model emphasizes features

of countries’ national politics that hint at a predilection to commit genocide or “politicide,” especially in the context of political instability. Key risk factors in Harff’s model include authoritarian rule, the political salience of elite ethnicity, evidence of an exclusionary elite ideology, and international isolation as measured by trade openness.

- The second model takes a more instrumental view of mass killing. It uses statistical forecasts of future coup attempts and new civil wars as proxy measures of things that could either spur incumbent rulers to lash out against threats to their power or usher in an insecure new regime that might do the same.
- The third model is really not a model but a machine-learning process called Random Forests applied to the risk factors identified by the other two models. The resulting algorithm is an amalgamation of theory and induction that takes experts’ beliefs about the origins of mass killing as its jumping-off point but also leaves more room for inductive discovery of contingent effects.

All of these models are estimated from historical data that compares cases where state-led mass killings occurred to ones cases where they didn’t. In essence, we look to the past to identify patterns that will help us spot cases at high risk of mass killing now and in the future.

To get our single-best risk assessment, we average the forecasts from these three models. We prefer the average to a single model’s output because we know from work in many fields—including meteorology and elections forecasting—that this “ensemble” approach generally produces more accurate assessments than we could expect to get from any one model alone. By combining forecasts, we learn from all three perspectives while hedging against the biases of any one of them.

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