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Predicting violence within genocide: a model of elite competition and ethnic segregation from Rwanda

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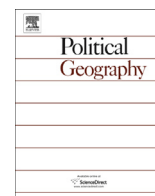
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ABSTRACT

Can we predict when and where violence will likely break out within cases of genocide? I present a theoretical model to help identify areas susceptible and resistant to violence during genocide. The model conceptualizes violence onset as a function of elite competition for control of the state from above and the ethnic segregation of society from below. First, in areas where extremist elite control is weak, violence is delayed or averted because a contest for control between pro-violence elites and anti-violence moderates arises and the competition takes time to resolve. Where control is strong, violence is immediate or early because extremists face little competition and can rapidly deploy the state's coercive resources against targeted groups. Second, in areas where the integration of ethnic groups is high, violence is delayed because it takes time to break existing interethnic bonds and destroy bridging social capital. Cohesive communities resist elite attempts to divide them through interethnic trust and cooperation. I test the model by examining sub-national variation in genocide onset across Rwanda's 145 communes using new data and duration analysis. I additionally explore causal mechanisms by within-case analyses comparing early and late onset in two communes. The findings have implications for international policy makers as they respond to genocides and strategically prioritize limited intervention resources.

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Within cases of genocide, can we predict when and where violence is likely to break out? State-organized violence targeting ethnic and political groups has claimed the lives of somewhere between 12 and 22 million non-combatants in the latter half of the twentieth century alone (Harff, 2003).¹ Events in Darfur and in Syria today already indicate that the twenty-first century will not see an end to such killing. The strong international norm to prevent these enormous losses of life has motivated several systematic macro-level studies in the last two decades to identify risk factors predisposing countries to such violence (Harff, 2003; Krain, 1997; Rummel, 1995; B. Valentino, Huth, & Balch-Lindsay, 2004; Wayman & Tago, 2010). Today, as a result of this important work, we better understand the forces behind the tragedies that befell Bosnia, Rwanda, and Darfur and we can more readily identify those countries vulnerable to such violence in the future.

Yet genocides frequently involve multiple episodes of violence whose occurrence varies in time and space (King, 2004). In contrast with the cross-national research, we know considerably less about the systematic determinants of such sub-national violence. Why did Prijedor municipality become the site of one the largest

massacres during the war in Bosnia–Herzegovina, but Livno municipality escape virtually untouched? In Rwanda, why did the killing begin immediately in Ruhengeri and Gisenyi prefectures, but not until several weeks later in Butare and Gitarama? In Sudan, why did 'Janjaweed' raids on villages initially concentrate in North Darfur state and not escalate in South Darfur until several months later? Is this temporal and spatial variation in violence predictable? If so, what predicts it?

I contend that the onset of such violence is predictable. When and where violence occurs is neither altogether random nor wholly idiosyncratic. I present a non-formal model, comprising two theoretical constructs, to conceptualize the risk of intra-genocide violence: extremist elite control of the state from above and the segregation of society from below. The model predicts that in places where the extremists' control is weak and the social integration of ethnic groups is strong, resistance is high and violence will be delayed or averted. The causal logic is twofold. First, an inter-elite contest for control between pro-violence extremists and anti-violence moderates will arise in weakly-controlled areas and it will take time for this power struggle to resolve. Second, well-integrated communities are more socially cohesive and resist extremist attempts to divide them, and thus require time to overcome interethnic bonds of trust and to destroy social capital.

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Conversely, in places where extremist elite control is strong and social integration is weak, susceptibility is high and violence will occur early on. The causal logic here is first that the absence of any challenge to their control permits extremists to deploy the state's formidable power against the targeted group rapidly and without constraint. Second, extremist entrepreneurs in segregated societies may exploit existing interethnic distrust and readily mobilize communities against targeted groups. Finally, in areas where extremist elite control and social integration are either simultaneously strong or simultaneously weak, the model predicts an intermediate onset of violence. Table 1 summarizes these predictions.

I develop this model and its constituent constructs from extant theoretical and empirical research on comparative genocide and test it with the case of Rwanda's genocide by examining sub-national variation in the onset of violence across the country's 145 administrative communes in 1994. I draw on new meso-level data to do so. Genocidal violence targeting primarily the country's ethnic Tutsi minority began on 6th April 1994, following the assassination of Rwanda's Hutu president, and lasted just over 100 days. Some communes experienced violence almost immediately, but others experienced violence several weeks later. The time until onset was indicative of a community's susceptibility or resistance to violence.

The empirical findings support the theoretical model, deepening our understanding of Rwanda's genocide specifically and yielding several implications for genocides more generally. First, previous research on Rwanda's genocide explained local variation in violence onset primarily in terms of the time needed to mount either an internal challenge or an external incursion for control of the locality by civilian or military forces (Straus, 2006). This paper suggests this explanation is incomplete. It overlooks the deeper social forces from below that bound communities together and accounted for resistance to efforts to divide them. Second, linked to this, the findings suggest the distinction between two competing perspectives in explanations of genocides – elite agency and social structure – should be softened. Forces from above and below can and do operate together to produce violence. Third, the findings reveal dynamic determinants of violence reinforcing the emerging consensus that genocide is better conceptualized as a continuous process than as a discrete event. Both the passage of time and spatial contagion proved dynamic accelerators of this process. Finally, the findings have implications for policy-makers confronted with impending or ongoing genocides but constrained by weak political will. Knowing when and where violence is most and least likely to break out is valuable information for strategically prioritizing limited intervention resources.

The paper proceeds as follows. Section two situates the paper theoretically, setting out the model and additional hypotheses from the extant literature and their operationalization. Section three describes the research design, case selection, and the techniques used. Section four presents the results of both the quantitative and qualitative analyses, and section five elaborates further on the above-mentioned theoretical and policy implications of the findings.

Theoretical framework and hypotheses

The comparative study of genocide has advanced considerably since the first generation of research in the 1970s and 1980s (Straus,

2007). Much of what we know today comes from two methodologically distinct literatures. The first, older body of literature draws predominantly on comparative historical analysis to trace the origins and causes of genocides (Fein, 1993; Horowitz, 1976; Kuper, 1982; Mann, 2005; Melson, 1992; Midlarsky, 2005; Sémelin, 2005). The second corpus of literature, cited previously, relies primarily on quantitative, cross-national analysis to identify predictors of genocide onset or severity. Together, the two approaches have generated a rich set of ideas for how and why genocides occur that present opportunities for systematic hypothesis testing. Broadly, these ideas may be categorized as relating to (i) state development and regime type; (ii) elite survival strategies; (iii) social divisions and cultural differences; (iv) radical ideologies; (v) economic crises causing hardship and deprivation; (vi) political upheavals resulting from civil wars, coups, and revolutions; and (vii) past violence and atrocities.

Yet comparative research on genocide, when focused at the macro level, faces limitations. First, genocide is a rare event. The universe of cases is small and inferences require caution. Second, comparisons across studies are restricted by unit heterogeneity. There is no consensus on the definition of genocide among researchers. In addition, studies have examined overlapping but distinct phenomena such as politicides (Harff, 2003), democides (Rummel, 1995), state-sponsored mass murders (Krain, 1997), and mass killing events (B. Valentino et al., 2004). Third, in the case of quantitative cross-national analyses, exact causal mechanisms are difficult to discern. While correlates of genocide are known with some confidence, why and how they matter is less certain. Fourth, in the case of comparative historical analyses, few vary the dependent variable. Studies of cases where genocide occurred are vulnerable to selection bias because of their exclusion of negative cases.

One promising approach to addressing some of these limitations is through disaggregation. By moving from macro- to meso- or micro-level analysis, a potentially larger set of units to compare becomes available. These units enjoy greater homogeneity and consequently have fewer differences for which to control. Importantly, disaggregation also usually involves variation in the outcome of interest. The last decade has seen the study of social violence take a 'micropolitical turn' (King, 2004) and the call for further disaggregation has been well-sounded (O'Loughlin & Raleigh, 2008). Disaggregation has been especially pronounced in the study of civil wars where spatial analysis has provided valuable insights into the determinants and dynamics of such sub-national violence (Buhaug & Lujala, 2005; Buhaug & Rød, 2006; Raleigh & Hegre, 2009). This paper extends the sub-national approach to the study of genocidal violence and adds to the small but growing body of work in this area (Finkel & Straus, 2012). The sub-national focus minimizes the difficulties in defining genocide that affect cross-national analysis. Micro-level research into genocidal violence, whose unit of analysis is typically the individual, has expanded. This research has provided rich insights into the Rwandan genocide for example (Fujii, 2009; McDoom, 2013b; Verwimp, 2005). To a lesser extent, meso-level research, where the unit of analysis typically comprises places, events, and institutions at the sub-national level, is also increasing. It includes several comparative studies of Holocaust violence (Dumitru & Johnson, 2011; Kopstein & Wittenberg, 2011).

I synthesize theoretical insights from these two methodologically distinct literatures to develop a parsimonious model of intra-genocide violence and to test additional hypotheses on the determinants of genocidal violence at the meso-level. While meso-analysis offers the advantages outlined above, it too has limitations. Notably, it clearly cannot tell us why and under what conditions genocides occur in the first place. As meso-analysis

Table 1
Modelling genocidal violence onset at the sub-national level.

		Extremist elite control	
		Strong	Weak
Social integration	High	Intermediate onset	Late or no onset
	Low	Early onset	Intermediate onset

typically disaggregates a single case of genocide, the generalizability of its findings will potentially also be limited. Moreover, not all the concepts that emerge from the macro-focused literature can be meaningfully operationalized at the meso level. Ideational variables such as purity, modernity, and utopia, for example, are not readily susceptible to systematic disaggregation. Limitations notwithstanding, meso-analysis may tell us why violence within genocides occurs in some places at certain times. This remains valuable information to decision makers contemplating international intervention.

Scope conditions

Genocide is a deeply contested concept. Disagreement exists on almost every definitional element: the victim groups protected, the perpetrating agents recognized, the modes of extermination permitted, and whether specific intention is required, *inter alia*. Although this debate is outside the scope of this paper, I provide a working definition solely to delimit the applicability of the theoretical model proposed. Genocide is violence organized by individuals who control the state deliberately targeting a group they perceive as ethnically distinct. Genocide then requires intentional targeting; the perpetrators do not act in a private capacity; the victim group is ethnically and subjectively defined; and the mode of destruction requires violence. This definition would then for instance include violence in Rwanda (1994), Darfur (2003–), Bosnia (1992–5), Myanmar (1978), Iraq (1988), and Burundi (1988 and 1993). It would, however, exclude South Vietnam (1965–75) because the target was not ethnic, Sri Lanka (1983–2009) because the intention was not extermination, India–Pakistan (1947) because the perpetrators were primarily private citizens, and the Ukraine (1932–33) because the mode of destruction was deliberate starvation, not physical violence.

Theoretical model

Elite control

Elite control of the state is the first of the model's two theoretical constructs. When extremists control the state, they possess the means to turn its formidable power against its citizens and commit genocide. I develop the construct by synthesizing three ideas in extant macro-level research on genocide that highlight separately the role of the modern state, the importance of regime type, and the centrality of elite strategy.

First, it is argued the modern state matters because it possesses the power to harm its civilian population on a scale more massive than almost any other actor. This power comprises both material capabilities and symbolic authority. Genocide scholarship has emphasized the former, noting the state's ability to coordinate, control, and coerce (Sémelin, 2005; B. Valentino et al., 2004). The state can kill using its security apparatus, notably the military and police, or using its civilian apparatus, through policies that forcibly displace, starve, neglect or otherwise harm civilian communities. The state's symbolic authority refers to its power to authorize and legitimize discrimination and violence against targeted groups. Several comparative studies of genocide have emphasized the political development of the modern state and the implied decline in the symbolic authority of traditional bases within society (Levene, 2005; Mann, 2005). The notion is captured in the oft-cited perpetrator defence of 'I was just following orders'. Control of the modern state's redoubtable power then matters for those intent on genocide.

Second, scholars have argued regime type matters because autocracies and democracies impose different constraints on the exercise of the state's massive power (Harff, 2003; Horowitz, 1976;

Rummel, 1995). Institutional and normative causal logics exist. In the institutionalist explanation, autocracies are better able to commit genocide because effective power is often concentrated in a single institution (e.g. the Presidency), whereas in democracies it is often diffused across multiple institutions. In the normative explanation, democracies are less likely to commit genocide because they generally respect human rights and value tolerance, whereas autocracies, especially totalitarian regimes, generally do not. Weaker constraints give the ruling elite stronger control of the state's power.

Lastly, scholarship has highlighted elite strategy because the decision to commit genocide often results from the calculation of the privileged few who control the state's power (B. A. Valentino, 2004). Genocide has for instance been considered a survival strategy or a calculated response to a threat posed to the ruling elite's control of the state's power (Figueiredo & Weingast, 1999). Extreme threats generate extreme responses. Together, these three ideas point to the importance of elite control of the state's power. This control matters not only at the national level, but at the local level too. For in localities where the extremist elite's control is weak, resistance to the pressure for violence will be high.

Hypothesis 1: *The weaker the extremist elite's control at the local level, the later the onset of violence in that locality.*

I distinguish two measures of elite control: political and military. Political control rests on consent to or compliance with the ruling elite's exercise of the state's power. Military control rests on coercion or the use of force in the exercise of this power. To measure political control, I examine the party affiliation of the elite in charge at two local levels: prefectural and communal. Rwanda comprised 11 prefectures and 145 communes in 1994. In 1991, having been a one-party state for most of its post-independence history, Rwanda re-introduced multipartyism. The move created 15 new political parties. In 1993, local elections in a number of Rwanda's administrative communes resulted in the victory of opposition parties in several communes. With assistance from in-house experts at the International Criminal Tribunal for Rwanda (ICTR), I constructed a dataset identifying communes and prefectures headed by loyalist and opposition burgomasters and prefects in 1994. Opposition-controlled localities were coded 1; those held by the ruling party were coded as 0. To measure military control, I adapt Weber's axiomatic definition of the state to define control as possession of the monopoly on force within a territory. I use extant research mapping the territorial advance, day-by-day, of the rebel group, the Rwandan Patriotic Front (RPF) (Davenport & Stam). These micro-data indicate with precision on what day a commune was under either government or rebel military control during the genocide. Government control was coded as 0; rebel control as 1.

Social segregation

Segregation along ethnic lines is the second theoretical construct in the model. Early research on genocide emphasized 'deep divisions' within society (Kuper, 1982). These divisions could be expressed as prejudice and discrimination, and in extreme cases as dehumanization (Charny & Berger, 1988) or exclusion from the moral universe (Fein, 1993). Ethnic outgroups are vulnerable to targeting in deeply-divided or highly-segregated societies.

Yet social divisions have proved difficult both to conceptualize and to measure. Quantitative cross-national research on violent conflict has conventionally focused on ethnic diversity and had mixed findings (Collier & Hoeffler, 2004; Fearon & Laitin, 2003). Originally used to explain poor public good provision and economic

underdevelopment, diversity conceptually emphasized preferences rather than relations. It assumed that co-ethnics had similar preferences and it was this similarity that encouraged trust and cooperation between them (Alesina, Baqir, & Easterly, 1999; Easterly & Levine, 1997). Conversely, individuals of different ethnicity had different preferences. These preferences conflicted, creating distrust and discouraging cooperation. This theoretical logic was extended to explanations of violent conflict, albeit less explicitly, and led to the unconvincing suggestion that more diversity necessarily signified more societal conflict.

Furthermore, the most common measure of heterogeneity, the ethno-linguistic fractionalization index (ELF), which measures the probability that two randomly selected individuals from a community will be of different ethnicity, has three shortcomings as a valid measure of social division. It inadequately captures the significance of group size, ignores the spatial organization of groups, and ignores the intensity of group differences (Posner, 2004). A second measure, the ethnic polarization index, improves upon the ELF by better conceptualizing group size, but does not address the two other validity issues (Reynal-Querol, 2002).

I propose an alternate conceptualization of social divisions. The construct of social segregation emphasizes interpersonal relations rather than individual preferences. I suggest social interaction rather than social differentiation better predicts societal divisions and draw on social capital theory to develop the intuition underlying the construct. Communities with high social capital are well-integrated with multiple, strong bonds between community members. When a community comprises distinct social groups, bonds that bridge these divides build trust, increase cooperation, and generally produce positive intergroup relations. Such a community will resist attempts to divide it along ethnic, racial, or other group lines. Conversely, communities with low social capital are segregated with few or weak interethnic bonds and are characterized by generally negative intergroup relations. Ethnic entrepreneurs readily divide such communities by exploiting existing negative sentiments such as distrust, fear, resentment, hostility, and prejudice between groups.

Hypothesis 2: *The higher the degree of segregation at the local level, the earlier the onset of violence.*

To capture social relations, I construct a segregation index using census micro-data from Rwanda. Sociologists studying racial residential patterns in the United States have developed various measures to capture distinct dimensions of segregation (Massey & Denton, 1988). The relative importance of the main dimensions – exposure, evenness, clustering, concentration, and centralization – remains the subject of debate (Reardon & O'Sullivan, 2004). The dimension, however, that best captures social relations, the mechanism proposed here, is exposure. Conceptually, exposure approximates intergroup interaction spatially by measuring the likelihood that a randomly selected member of one group would live in the same geographic neighbourhood as a randomly selected individual of the other group (Lieberman, 1981). Technically, the exposure index I propose is the minority-weighted average of each geographic neighbourhood's majority proportion, denoted as I here:

$$I = \sum_{i=1}^n [x_i/X][y_i/t_i]$$

where x_i is the minority size (number of Tutsi in Rwanda), y_i is the majority size (the number of Hutu), and t_i is the total population of

the geographic neighbourhood i (the Rwandan 'sector'), and X is the overall minority size in the larger geographic community under comparison (the Rwandan 'commune'). I scale the index from 0 to 100 where a higher score indicates a higher level of integration and control for the differing proportions of Tutsi across communes.

Although it overcomes shortcomings in fractionalization measures, the segregation index has two potential limitations. It does not capture differences in spatial patterns *within* the areal unit (White, 1983) and its value may depend upon the size of the particular areal units chosen for comparison (Openshaw, 1983). Nonetheless, the sector is a very small unit, averaging 1000 households, and is comparable to US census tracts, the level at which segregation is typically measured. Furthermore, the commune was the most important unit of political and social organization in Rwanda. It provided public services and recorded demographic change, notably births and deaths, at the local level. Settlement patterns at this level then were likely to be meaningful.

Additional hypotheses

Existing research on comparative genocide has suggested several other determinants of genocide onset. I extract the underlying causal logic of these macro-level predictors to identify those that could potentially also affect onset at the meso-level.

Security threat

A robust finding in the comparative research is that genocides often occur in the context of armed conflicts (Harff, 2003). Theory suggests two causal mechanisms. At the macro-level the mechanism is political opportunity. Breaks in the political opportunity structure created by war—or other upheavals such as revolutions and coups—increase the likelihood of genocide onset (Krain, 1997). Challengers exploiting these opportunities threaten the incumbent elite's position of power and this elite becomes increasingly willing to undertake radical action to counter the threat (Figueiredo & Weingast, 1999). At the micro-level the mechanism is fear. Political upheavals create intense uncertainty for the future. In the case of upheaval through war, it is uncertainty for individual and collective security. In contrast with the strategic, elite-centric focus of the opportunity mechanism, the emphasis here is on non-elite, emotional reactions to threat.

Hypothesis 3: *The greater the security threat at the local level, the earlier the onset of violence.*

As the model examines sub-national variation, I test the operation of the micro-level fear mechanism. I measure the shortest distance from the war's front-lines to the centroid point of each commune to proxy the insecurity felt within communities: the closer to the war, the greater the insecurity. Communities close to the front-lines would experience the direct effects of war firsthand. In Rwanda this included militarization of the area, casualties, refugees, privations, and unworked land for instance.

Hardship and deprivation

Research has also suggested that genocides often occur in times of economic hardship. One such claim relates to the notion of 'difficult living conditions' (Staub, 1989). A more sophisticated claim points to 'structural violence', conceptualized as inequality, exclusion, and the humiliation of poverty (Uvin, 1998). The psychological mechanism implicit in such claims is a frustration-aggression nexus. Individuals deprived of life opportunities experience anger that may be directed towards others.

Hypothesis 4: *The greater the deprivation at the local level, the earlier the onset of the violence.*

I measure hardship and deprivation using three alternate socio-economic indicators. First, I examine educational attainment data. Specifically, I consider sub-national variation in literacy rates. Second, I consider variation in asset ownership at the local level, in particular the value of individual dwelling homes. In rural Africa, poorer homes would be built of freely available wood and mud, whereas wealthier households used baked bricks or concrete blocks that required purchase. Lastly, I consider population density. Rwanda's extraordinarily high demographic density exerted considerable ecological pressure on land and has inspired neo-Malthusian explanations of its violence (André & Platteau, 1998; Verpoorten, 2012). The effects of land scarcity would be particularly acute in an agriculture-dependent society.

Prior violence

The cyclical character of violence has been empirically established in research on civil wars (Walter, 2004) and genocide (Harff, 2003). Communities that have experienced violence in the past are likely to experience violence in the future. Two possible causal logics exist: similar conditions and transformative effects. Violence may recur first because the actors, processes, and other forces involved in earlier violence continue to be present in affected communities. Alternatively, violence may recur because it has transformed communities making them more violence-prone. Individuals may have become habituated to violence; acquired new grievances as a result of violence; or been emboldened by impunity for previous violence.

Hypothesis 5: *Communities that have previously experienced violence are more likely to experience early onset of violence.*

Drawing on detailed international human rights reports from the time, I identify communes that had experienced anti-Tutsi violence in the course of Rwanda's ongoing civil war up until the start of its genocidal phase in April 1994. An average of 200 Tutsi were killed in each of the seven communes affected. Communes that had experienced such violence before 6th April 1994 were coded as 1; those that had not were coded as 0.

Spatial contagion

Civil war violence has had demonstrated spillover effects across national boundaries and escalatory effects within national boundaries (Schutte & Weidmann, 2011). The causal mechanisms behind contagion are potentially varied and complex. I highlight three: (i) linkages: pro-violence individuals in one community influence individuals with whom they have ties in neighbouring communities; (ii) demonstration effect: individuals are inspired to imitate what they observe occurring in a neighbouring community; and (iii) mobility: proximity facilitates the cross-border movement of individuals and resources associated with violence such as combatants, refugees, weapons, and plunder.

Hypothesis 6: *The more communities to have succumbed to violence in a preceding time period, the earlier the onset of violence will be in a neighbouring community.*

To measure contagion I calculate the number of geographically adjacent communes that had experienced violence in a time period prior to the onset of violence in each of Rwanda's 145 communes. Temporal antecedence minimizes the effect of spatial autocorrelation i.e. the explanation that geographically proximate areas would share similar characteristics.

Research design and methods

The research design combines a quantitative duration analysis of violence onset across Rwanda's 145 communes with a within-case comparative analysis of two communes that experienced early and late onset. The selection of a meso-level unit-of-analysis, the commune, provided a reasonable number of units to compare, good unit homogeneity, and the prospect of variation in the dependent variable. Duration analysis estimates the risk of an event occurring to a particular subject in a given time period, the hazard rate (Allison, 1984). Here, the event of interest is the onset of violence and the subjects are Rwanda's 145 communes. Communes with higher hazard rates are at greater risk of violence. Duration analysis has two desirable features for this type of study: it permits the specification of time-varying parameters and it can model the effect of time on the outcome of interest.

The within-case analyses contextualize the quantitative findings and explore possible causal mechanisms at work. I compare two communes: Mukingo (early onset) and Taba (late onset). Fig. 1 situates them geographically. Initial case selection was random but data quality dictated final selection. The ICTR had intensively investigated events in Mukingo and Taba and generated carefully-verified micro-data on the genocide from extensive witness statements and exhibits. The analyses draw on facts judicially established using the evidentiary standard of 'beyond reasonable doubt' in the Prosecutor vs. Akayesu for Taba and the Prosecutor vs. Kajelijeli, the Prosecutor vs. Nizorera, and the Prosecutor vs. Setako for Mukingo. Given purposive selection on the dependent variable, the two cases then are susceptible to selection bias and are not intended to test *a priori* hypotheses or establish causal inferences (Geddes, 1990). The cases, however, are used to illustrate the causal process behind violence onset and thus to understand how and why the determinants identified in the quantitative analysis mattered (D. Collier, Brady, & Seawright, 2010). Fig. 2 traces this process for each commune.

Synopsis of Rwanda's genocide

In April 1994, a small group of ethnic Hutu extremists seized power in Rwanda and initiated a genocidal campaign targeting the ethnic Tutsi minority for extermination. The violence unleashed was remarkable for its intensity, its ambit, and its speed. Starting on 6th April 1994, the violence would spread to almost every commune in Rwanda and, within just over 100 days, would claim the lives of an estimated 500,000 Tutsi and several tens of thousands of the Hutu majority (Des Forges, 1999). Their killers were soldiers, police, militia, and other ordinary Rwandans.

The genocide was the culmination of a civil war, begun in October 1990 and fought between a mainly-Tutsi rebel army, the Rwandan Patriotic Front, and Rwanda's Hutu-dominated government. The war's roots lay in a revolution, shortly before Rwanda's independence from Belgium in 1962, which toppled the long-standing Tutsi monarchy and installed Rwanda's first Hutu Republic that would exclude Tutsi from political power for the next three decades. The revolution sent hundreds of thousands of Tutsi into exile and these exiles would make several unsuccessful armed attempts in the 1960s to return to Rwanda. However, it was not until the exiles' descendants initiated the civil war in 1990 and the reintroduction of multiparty politics in 1991, that the Hutu monopoly on power would weaken. In August 1993, the international community brokered a peace deal that envisaged power-sharing between the incumbent regime, the newly-formed opposition parties, and the rebel RPF. Hutu hardliners opposed the deal,

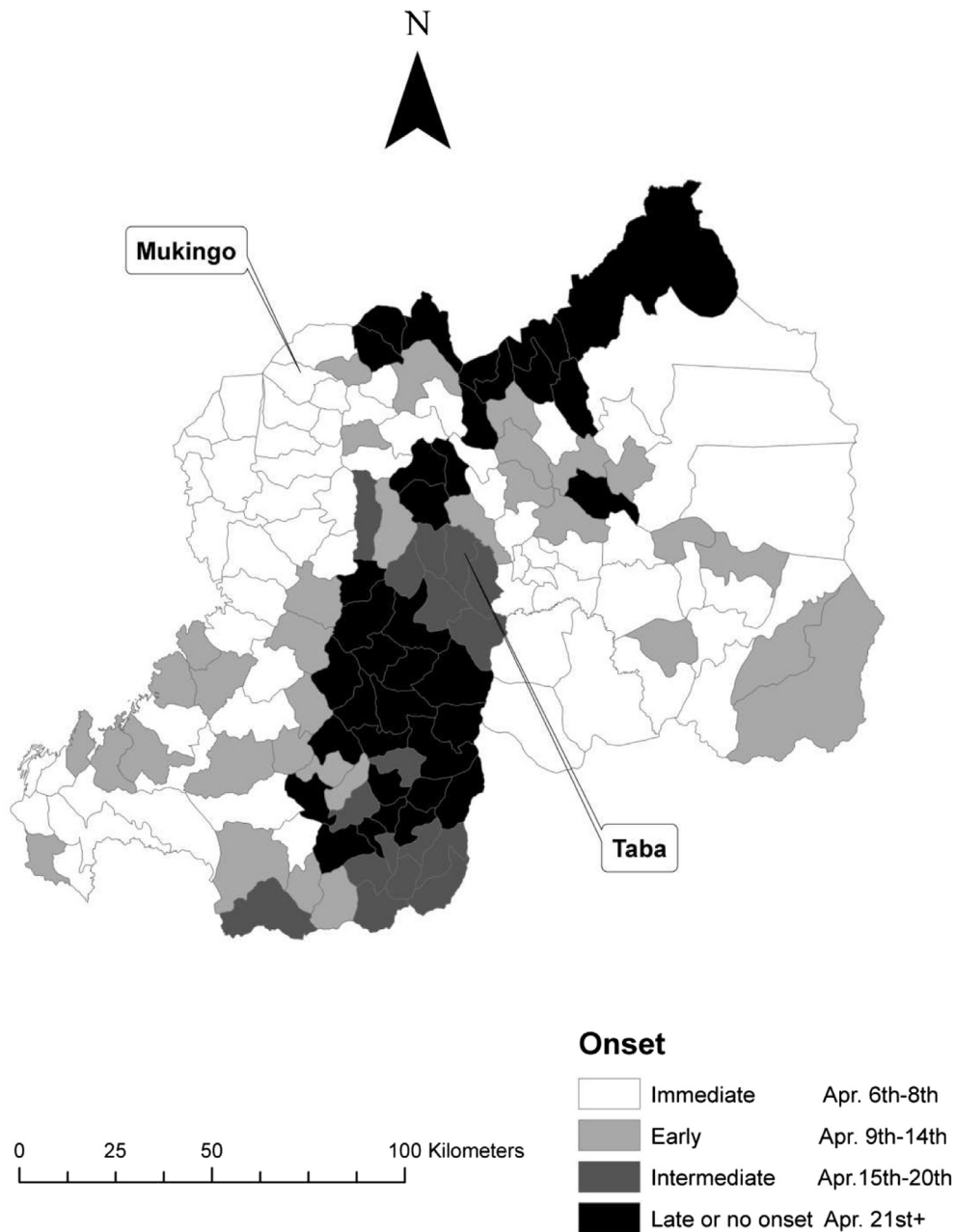


Fig. 1. Onset of genocidal violence in Rwanda 1994.

however, and when Rwanda's Hutu president was assassinated on 6th April 1994 (by assassins still unknown), these hardliners seized the opportunity to take control, re-ignite the civil war, and initiate the genocide. Over the next three weeks violence would break out in almost all of Rwanda's 145 communes. The international community failed to intervene and it was not until the RPF finally defeated the extremist government in July 1994 that the killing would end.

Dependent variable

The dependent variable is violence onset, or more precisely in duration analysis, the rate of violence onset. This may be conceptualized more simply as the speed at which violence occurred in Rwanda. I employ Straus' data on onset that triangulates six distinct sources to reach the best known estimate of when violence first

began in each of Rwanda's communes (Straus, 2006).² Straus defines genocidal violence as 'public and generalized attacks against Tutsi' and identifies seven different time periods, each of three days duration starting from 6th April 1994, in which violence began across Rwanda's communes. Reliance on a third party's coding of violence onset reduces the risk of choosing values for the dependent variable that would support a researcher's prior beliefs.

Results

Quantitative analysis

I present both descriptive statistics (Table 3, Appendix) and findings from the multivariate duration analysis (Table 2). The multivariate analysis comprises results from a proportional odds (logit) model, whose exponentiated coefficients are interpreted as

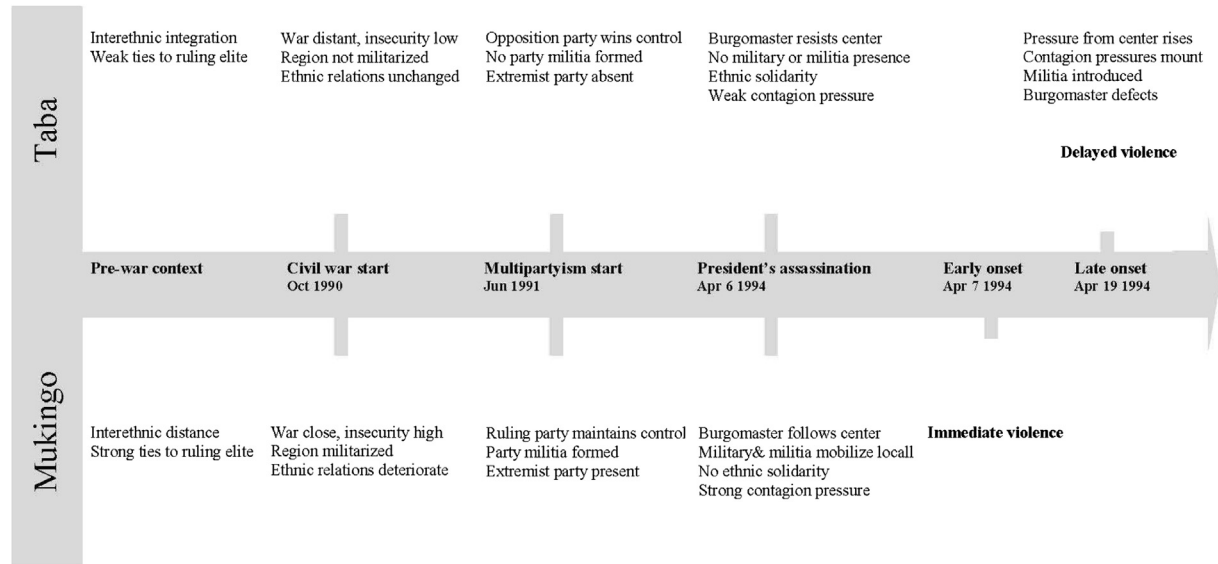


Fig. 2. Tracing process of violence onset in two Rwandan communes.

the odds ratio for the occurrence of violence, and a proportional hazards (complementary log log) model, whose exponentiated coefficients are equivalent to the hazard ratio. The latter model is insensitive to the specification of the time interval and thus useful to estimate given reliance on Straus' data that measures violence onset in three-day intervals. I report two specifications for each model class: a full unrestricted model (models 1 and 3) and a more restricted, parsimonious model (models 2 and 4). To avoid *a priori* assumptions concerning the probability distribution of violence onset, both models are fully non-parametric and include $k - 1$ dummies where k refers to the number of time intervals in the analysis. The full model's specification is derived from theory and tests all hypothesized predictors identified earlier in the theoretical framework simultaneously. I also control for distance to the capital (a proxy for the state's reach), distance to the Burundian border (Burundian Hutu refugees were highly active in the commission of violence during the genocide), and whether the commune contained an urban centre. The parameters of the parsimonious model

were obtained by systematically removing one variable one at a time from the full model using stepwise backward selection. As these were nested models, I tested the relative fit of each model using a likelihood ratio test. I begin with an analysis of the descriptive data on onset, then report the findings of the regression analysis on the hypothesized predictors, and finally describe the robustness checks undertaken.

Onset. The descriptive data on violence onset (Table 4, Appendix) reveal two remarkable features of Rwanda's genocide: its nationwide ambit and its extraordinary speed. Of Rwanda's 145 communes, only 11 did not succumb to anti-Tutsi violence. All but one were communes either controlled by the rebel group or part of the demilitarized zone at the time of the president's assassination. Moreover, the majority of communes that did succumb to violence (58.6 per cent) did so within the first six days (two time periods) following the president's assassination. The violence then ignited rapidly. However, the data also show that nearly one third of

Table 2
Proportional odds and proportional hazards models predicting genocidal onset across Rwanda's communes in 1994.

	Logit models: odds ratio (n = 443)		Comp. log log models: Hazard ratio (n = 443)	
	Model 1 (full)	Model 2 (parsimonious)	Model 3 (full)	Model 4 (parsimonious)
Elite control I (political: commune)	0.46** (0.14)	0.44*** (0.13)	0.54** (0.13)	0.52*** (0.12)
Elite control II (political: prefecture)	0.39*** (0.14)	0.31*** (0.09)	0.53** (0.15)	0.43*** (0.10)
Elite control III (military)	0.07*** (0.04)	0.09*** (0.04)	0.12*** (0.05)	0.15*** (0.05)
Social segregation	0.89** (0.04)	0.91** (0.04)	0.92*** (0.03)	0.93*** (0.02)
Tutsi proportion	0.90** (0.05)	0.91** (0.04)	0.93** (0.03)	0.93** (0.03)
Security threat	0.99 (0.01)		0.99 (0.01)	
Population density	1.10 (0.09)	1.11 (0.08)	1.10 (0.07)	1.11* (0.06)
Literacy	1.03 (0.08)		1.01 (0.06)	
Wealth	0.99 (0.01)		0.99 (0.01)	
Past violence	66.94** (132.42)	76.45** (148.47)	17.89** (25.44)	22.21** (31.60)
Contagion	1.23** (0.12)	1.22** (0.11)	1.16** (0.09)	1.15* (0.09)
Distance to capital	1.01 (0.01)		1.01 (0.01)	
Urban	0.91 (0.42)		0.96 (0.34)	
Distance to Burundian border	0.99 (0.01)		0.99 (0.01)	
Time1	1.26 (0.68)	1.25 (0.66)	1.14 (0.45)	1.14 (0.45)
Time2	1.20 (0.67)	1.14 (0.63)	1.08 (0.44)	1.05 (0.43)
Time3	0.50 (0.31)	0.47 (0.30)	0.52 (0.26)	0.50 (0.25)
Time4	0.31 (0.22)	0.29* (0.21)	0.31* (0.19)	0.30* (0.19)
Time5	1.78 (1.05)	1.71 (0.99)	1.33 (0.57)	1.29 (0.55)
Time6	4.87** (3.02)	4.63** (2.84)	3.00** (1.29)	2.89** (1.23)

Dependent variable is genocidal onset (0 = no onset, 1 = onset). Standard errors in parentheses. */**/***/***Statistical significance at 10%, 5%, and 1%.

communes did not experience violence until two weeks or more after the assassination. As Fig. 1 illustrates the majority were concentrated in the central and southern prefectures of Gitarama and Butare. This seemingly small variation was not, as I will show, random. It was indicative of a region's susceptibility or resistance to violence.

Elite control. Communes and prefectures politically controlled by the ruling elite succumbed to violence sooner than those controlled by opposition parties. Of all communes where violence broke out in the first three days (time period 1), 54 were controlled by the burgomasters loyal to the ruling party and only six by burgomasters belonging to opposition parties. In contrast, of all communes where violence broke out late (time period 6), 12 were controlled by opposition burgomasters and five by burgomasters belonging to the ruling party. The multivariate analysis confirms local political control mattered. Table 2 indicates opposition control at the communal level decreased the odds of violence occurring by 54 per cent and the hazard rate by 46 per cent, and at the prefectural level by 61 per cent and 69 per cent, holding all other variables constant. The within-case analysis to follow suggests the mechanism behind delayed onset was a power struggle between moderates and extremists for control of the prefectures and communes following the president's assassination.

Similarly, communes militarily controlled by the ruling elite also succumbed to violence sooner than those in the demilitarized zone (DMZ) or under rebel control. Formally, extremist military control increased the odds of violence occurring by 93 per cent and the hazard rate by 89 per cent, holding other variables constant. The finding is not trivial. The presence of the DMZ or rebels necessarily signified the absence of government soldiers and militia. The data indicate that in the latter's absence violence was highly unlikely to occur. It suggests then state agents played an important role in inciting or committing violence and the genocide was not simply a spontaneous explosion of popular sentiment from below.

Social segregation. Hutu and Tutsi were, on average, well-integrated in Rwanda. They did not live in geographically distinct regions, but rather side-by-side as neighbours. The segregation index is high with a mean score of 86.7. There was, however, considerable variation in integration levels between communes. Scores ranged from 10.4 to 100.0. The multivariate analysis confirms, consistent with theory, that communes with higher levels of segregation experienced violence sooner than communes that were better integrated. Formally, the segregation index indicates that a one percentage increase in the probability of a randomly selected Tutsi living in the same area as a Hutu decreased the odds of violence occurring by 11 per cent and the hazard rate by nine per cent, holding all other variables constant. As the within-case analysis will suggest, the mechanism is inter-ethnic trust and cooperation. The better-integrated community initially resisted the forces that sought to divide them and produced a display of ethnic solidarity. None of the alternate measures reported in the Appendix – ethnic proportion, fractionalization, or polarization – proved significant. The proportion of Tutsi in the commune was significant but only in conjunction with the segregation variable. Caution then should be exercised in drawing inferences from this.

Contagion effect. The results suggest violence is highly contagious. The data confirm that the greater the number of its neighbouring communes already experiencing violence, the more likely a commune is to succumb to violence. Each additional adjacent commune that succumbs to violence in a previous time period

increases the odds of violence occurring in a commune by 23 per cent and the hazard rate by 22 per cent, *ceteris paribus*.

Past violence. Seven communes in the dataset had experienced significant anti-Tutsi violence prior to April 6th 1994. Table 4 shows that all seven communes descended into genocidal violence immediately following the president's assassination (time period 1). Past violence then perfectly predicted genocidal onset. As a perfect predictor is a problematic estimator with binary data, signifying quasi-separation in the data analysis, I employed a form of penalized likelihood (Zorn, 2005). Nonetheless, caution again should be exercised in drawing inferences given the small number of communes and the large standard errors involved as a consequence.

Time. The passage of time also had an independent effect on onset. Testing for the removal of the six time dummies from the model confirm their collective significance. The non-parametric specification allows us to see that the relationship is non-monotonic. The coefficients initially decline and then rise again. This is also reflected in the hazard function. Fig. 3 in the appendix indicates the function is a U-shape: the likelihood of violence was high at the start, declined, and then increased again. The relationship then is not simply exponential. It instead suggests there exists a tipping or inflection point in resistance to the violence.

Non-significant findings. I found no support for a prediction of violence onset based on literacy, wealth, or population density levels. It is worth noting other research, however, has supported a correlation between population density and violence intensity, though not onset (Verpoorten, 2012). One interpretation is neo-Malthusian: too many people, too little land. Newer research suggests another possible mechanism. Violence spreads quickly in densely-populated areas because of high levels of interpersonal contact (McDoom, 2013a). None of the three distance proxies proved significant. Distance to the war's front lines, distance to the capital, and distance to the Burundian border did not predict onset. It is possible these were poor proxies. Otherwise it suggests insecurity felt, state power, and the presence of Burundian Hutu refugees did not affect a commune's susceptibility to violence.

Robustness checks. The findings are robust to various model specifications. In addition to the four main models in Table 2, an online appendix contains 35 further specifications. I report nested models estimated using stepwise backward selection and tested using likelihood ratio tests. Individual parameters are also tested using Wald tests. I also report 'frailty' models. Frailty refers to characteristics specific to individual communes, uncorrelated with the predictor variables, that may affect susceptibility to violence and is thus the equivalent of testing for random effects. I additionally estimate spatial regression lag models to control for possible spatial auto-correlation that may not be captured in the 'contagion' variable specified in the main models. I also estimate the main models without those communes under rebel control or in the DMZ. Lastly, I report alternate coefficients estimated using techniques to improve the comparability and interpretation of substantive effects across models.

Qualitative analysis

Late onset: Taba commune

In Taba, genocidal violence did not begin until 19th April 1994, almost two weeks after the president's assassination. Interethnic relations in the region were historically strong. Taba was located within Gitarama, one of 11 prefectures comprising Rwanda in 1994.

Situated in the centre of the country, Gitarama was home to an estimated 83,000 Tutsi in April 1994, the third largest number of all Rwanda's prefectures. Historically, the Hutu of the central and southern prefectures of Gitarama and Butare had been closely associated with the Tutsi. The *Abanyanduga*, as the region's inhabitants were known, had participated in the Tutsi king's conquests of the *Abakiga* in the predominantly Hutu north. Politically, Gitarama had weak ties to the ruling MRND party. The prefecture was the birthplace of the MDR-Parmehutu, the forerunner of the opposition MDR party. It was the party that first ruled Rwanda following independence in 1962. Its latterday successor emerged with the reintroduction of multipartyism in 1991 and directed its energies towards attacking the ruling party on its poor governance record. Gitarama was the MDR's stronghold. fourteen of its 17 commune burgomasters and its prefect, Fidèle Uwizeye, were party members.

The outbreak of the civil war in October 1990, popularly perceived in ethnic terms, marked a critical juncture in the trajectory towards genocide. However, in Taba, partly due to its distance from the warfront, interethnic relations remained largely unaffected. Taba was home to an estimated 4680 Tutsi in April 1994, just over 8 per cent of the population. The commune experienced no incidents of ethnic violence before April 1994. Its Hutu and Tutsi communities maintained their historically strong ethnic cohesion.

The introduction of multipartyism in Rwanda in June 1991, a second critical juncture, did, however, impact Taba. In March 1993, in an election for the position of burgomaster, the opposition MDR ousted the ruling MRND, which had controlled the commune for nearly two decades. 41 year old Taba native, Jean-Paul Akayesu, became burgomaster. Although Akayesu commanded widespread popular support within the commune, his MRND rival, Silas Kubwimana, persisted in actively opposing him. In the run-up to the genocide, tensions in Taba continued to follow party rather than ethnic lines.

When the president was assassinated on 6th April 1994, Taba's new burgomaster initially resisted the extremist centre and opposed the violence. He created a safe haven for many of the incoming Tutsi refugees at his own commune offices and assigned three of the commune's ten policemen to protect them. He also addressed Taba's population on the importance of standing together. Consistent with their historic ethnic solidarity, Taba's residents heeded their burgomaster. Hutu and Tutsi initially cooperated to organize civilian day and night patrols and to man checkpoints to prevent pro-violence elements from entering Taba. They reported and resisted attempts from outside elements to subvert the commune's peaceful order.

Contagion violence from neighbouring communes was in fact initially weak in Taba. Although it shared its northern border with Kigali-Rural, a prefecture where violence had begun early on, the Nyaborongo river flowed along the frontier. The river created a natural barrier to incursions from Shyorongi and Musasa communes in Kigali-Rural. Moreover, the three other communes adjoining Taba were situated within Gitarama and also opposed the violence. As time passed, however, contagion pressures mounted. The number of Tutsi refugees increased, and so too did the number of outside armed incursions. In two notable incidents, vehicles carrying soldiers and *interahamwe* militia attacked the Tutsi refugees at the commune office and were repelled by the communal policemen stationed there. In other incidents, collaborators from within Taba helped outside attackers enter the commune and target Tutsi homes. Solidarity and resistance were weakening.

With the passage of time, pressure from the centre also mounted. At the prefectural level, prefect Uwizeye struggled to maintain his authority as his fellow party members and his administrative and security staff separated into extremist and moderate factions. Political control of the region effectively passed from moderates to extremists

with the interim extremist government's move on 12th April 1994 from the capital Kigali to Gitarama. 1000 or so *interahamwe* militia also accompanied the relocation and with their arrival, military control of the prefecture also passed to the extremists.

In Taba, the contest for political control ended following a fateful meeting on 18th April 1994 that resulted in burgomaster Akayesu switching sides. Rwanda's new Prime Minister, Jean Kambanda, ordered the meeting to be held in his government's new offices in Gitarama so that he, his new ministers, and extremist party leaders could directly address the prefecture's resistant leaders. The Prime Minister read a prepared statement calling for national unity and then invited extremist party leaders to address and threaten the burgomasters more directly.

The next day, events took a significant turn in Taba. Akayesu addressed several hundred Taba residents and urged them now to unite and hunt down the 'accomplices' of the rebel enemy. This was widely understood to mean the Tutsi. His words presaged the mass killing over the next two days of Taba's Tutsi population. Having previously contested control of Taba with Silas Kubwimana, Akayesu now welcomed his extremist rival who had become an honorary vice-president of the *interahamwe*. The militia and the military occupied Akayesu's commune offices and led attacks, now with the collaboration of Taba residents. The situation continued until June 27th 1994 when Akayesu fled the commune ahead of the rebels' arrival. The burgomaster would be subsequently convicted of inciting and participating directly in the genocidal violence in Taba.

Early onset: Mukingo commune

In Mukingo, violence began in the morning of 7th April 1994, the day following the president's assassination. The commune was located in the northern prefecture of Ruhengeri, a region where Tutsi–Hutu relations had been historically poor. Together with Gisenyi prefecture, Ruhengeri was once the site of nine Hutu principalities whose inhabitants, the *Abakiga*, had resisted annexation by the Tutsi monarchy until the early twentieth century. In 1994, only 0.5 per cent of Ruhengeri's population was Tutsi, the smallest concentration in all Rwanda. Politically, the region had benefited from close connections to the centre. A significant proportion of the ruling party elite and president Habyarimana himself originated from the north. Moreover, all 16 of Ruhengeri's commune burgomasters and its prefect, Sylvester Bariyanga, were longstanding members of the ruling MRND.

When the war began in 1990, Mukingo found itself close to its frontline and the heightened insecurity was accompanied by a rapid deterioration in interethnic relations. Social cohesion was weak. Mukingo was home to just under 600 Tutsi in April 1994, a mere 1.3 per cent of its overall population. The local Hutu elite and ordinary Hutu residents distrusted the Tutsi community whom they suspected of supporting and collaborating with the enemy. Mukingo's burgomaster, Juvénal Kajilijeli, went so far as to draw up lists of Tutsi resident in his commune. Yet Tutsi suffered more than mere suspicion. In reprisal for a rebel attack on Ruhengeri's capital in January 1991, several hundred Bagogwe Tutsi were killed in state-sanctioned massacres in communes across the north, including Mukingo. As a consequence many Tutsi had fled the region long before the genocide began. A second consequence of the war's proximity was the region's rapid militarization. In neighbouring Nkuli commune, an important military camp was established. The camp would not only train the local *interahamwe*, but would also provide the weapons used to eliminate the local Tutsi community during the genocide.

In contrast with the war, the introduction of multipartyism in 1991 changed little in Mukingo. The MRND ruled without challenge and no other party, save the radical anti-Tutsi CDR party, operated openly within the commune or the prefecture. Juvénal Kajilijeli,

Mukingo's burgomaster from 1988 to 93 and during the latter half of the genocide, was an MRND loyalist. Before the genocide, Kajilijeli had personally trained a group of 80 MRND interahamwe whom he would also command during the genocide. These party militia represented a far more powerful force within the commune than the nine state-employed policemen. Kajilijeli, a native of Mukingo, was also a known ethnic extremist. He was removed from office in 1993 at the request of the RPF, during peace negotiations for his alleged involvement in reprisal killings against Tutsi. The suspicious death of his successor, Emmanuel Harerimana, at the start of the genocide, possibly at Kajilijeli's hand, led to Kajilijeli's reinstatement as burgomaster in June 1994.

The ruling party then exercised strong political control over the commune before the genocide. Its influence was principally attributable to another native son, Joseph Nzirorera. Nzirorera held the prominent position of National Secretary of the ruling party and took a strong interest in the fortunes of his native commune. As the civil war escalated, Nzirorera travelled regularly on weekends to Mukingo and chaired meetings with the commune's local elite to discuss Mukingo's role in the MRND's political and military struggle with the RPF. It was alleged, but unproven that these meetings also planned the extermination of the Tutsi in the area. Nzirorera was also the political patron and longstanding friend of burgomaster Kajilijeli, who in part owed his status to his association with Nzirorera. At a time when few communes possessed telephones, Nzirorera was able to communicate his instructions to Kajilijeli, both before and during the genocide, through the line installed in the commune office.

Rwanda's military establishment also exerted influence in Mukingo. The sector commander for Ruhengeri with overall responsibility for the nearby Mukamira camp, Augustin Bizimungu, attended the meetings Nzirorera chaired in Mukingo. Bizimungu would go on to become overall commander of the interim government's forces during the genocide. A second prominent military figure, Lieutenant-Colonel Ephrem Setako, also attended the meetings. A native of neighbouring Nkuli commune, Setako was Head of Legal Affairs within the defence ministry. Like Nzirorera, he too served to link a peripheral commune to the decision-making centre.

When news of the president's assassination reached Mukingo, there was no question of the commune following the centre's directives. Burgomaster Kajilijeli, acting upon Nzirorera's telephoned instructions, called a meeting in a local canteen that same evening. There, the region's local Hutu elite, including Nkuli commune's burgomaster, agreed to execute a plan to eliminate the area's Tutsi population. The next morning, April 7th, Kajilijeli brought weapons from the Mukamira military camp and distributed them to the interahamwe from Nkuli and Mukingo communes. Over the next two days, these interahamwe eliminated the majority of the Tutsi in the two communes. Kajilijeli, in regular communication with Nzirorera, then went on to expand the interahamwe to 600 men drawn from the civilian population. Hutu civilians, who already distrusted their Tutsi neighbours, were readily mobilized and followed instructions on when and where to attack the remaining Tutsi throughout the region.

Analytical insights

The contrasting case studies offer some insight into the causal mechanisms behind several of the correlates of onset identified in the quantitative analysis. First, the burgomasters' and prefects' party affiliation mattered because it determined how quickly political control could be established at the local level. In Taba, a power struggle arose between the moderate opposition burgomaster on one side, and local and national level extremists on the other. The contest was resolved only after the cooptation of the

burgomaster through extremist threats. In Mukingo, extremist elite control was assured because the burgomaster was an MRND loyalist networked to the centre through his clientelist friendship with a senior party member. Second, military control mattered because it ensured the material means to enforce extremist authority and to implement violence. In Mukingo, a military camp trained the local interahamwe and supplied them with weapons. In Taba, the commune police enforced the burgomaster's peace until the arrival of interahamwe from outside overwhelmed them numerically. Third, social cohesion mattered because it took time to divide well-integrated communities and overcome communal bonds. In Taba, Hutu and Tutsi initially cooperated for several days following the president's assassination before separating. In Mukingo, ethnic solidarity was absent because interethnic distrust was already high following the outbreak of war. The extant divide facilitated the mobilization of Hutu residents as local interahamwe. Lastly, contagion mattered because pro-violence individuals could move across borders to commit and encourage violence in adjacent communities. In Taba, the contagion effect was weak because the Nyabarongo river limited such incursions and because neighbouring communes were also anti-violence. In Mukingo, pro-violence military and militia were present in neighbouring Nkuli commune and faced no constraint to enter and commit violence next door.

Discussion and conclusion

This paper has presented a theoretical model for conceptualizing a locality's vulnerability to violence comprising two constructs: extremist elite control and social segregation at the local level. Neither factor explains why genocides arise. They merely help predict when and where violence may occur *within* genocide. As it is a predictive, not causal model, it remains possible that unobserved factors underlie ethnic segregation and elite control. While theory informed the selection of these two variables and the accompanying controls, the possibility of an alternative explanation must be acknowledged.

How generalizable are these findings? The model requires systematic analysis of precise micro-data to test fully its external validity in other contexts. However, preliminary investigation suggests its applicability elsewhere. In Sudan the ruling party countered an insurgency in Darfur by recruiting self-identified Arab militia to attack non-Arab villages in coordination with regular security forces. Preliminary evidence suggests the onset of violence across Darfur's three states and 36 counties was correlated with intercommunal relations and ruling party control, consistent with the theoretical model presented. The counties of North Darfur experienced the most concentrated violence when the rebellion first began in 2003 (US Government, 2011). The state was the site of longstanding communal competition over land use between non-Arab farmers (primarily the Zaghawa) and land-poor Arab camel-herders (the Abbala tribes). The ruling elite in Khartoum used these tensions to establish informal connections with the Arab tribal leadership, including the head of the influential Mahamid clan, and thereby recruited an Arab militia to assert military control in the state (Flint & De Waal, 2008). The ruling elite also established political control by using their formal power of appointment to replace the moderate state governor with a loyal party bigwig in 2003. In contrast in South Darfur, competition over land was minimal and the land-secure Arab Baggara tribes consequently maintained historically good relations with their 'African' Fur neighbours. The prominent Madibu clan of the Arab Rizeigat tribe for instance remained neutral during the war. Cross-ethnic cooperation extended to some southern Arab groups even collaborating

with the Darfuri rebels. Violence did not escalate in South Darfur until 2004.

Evidence from Bosnia is also suggestive. Ethnic Serbs, Croats, and Bosniaks competed for control of the territory's 109 municipalities, initially through multiparty elections in November 1990 and then through war between March 1992 and December 1995. A non-systematic examination of the most serious episodes of violence against civilians suggests their timing and location were linked to municipal control (Research and Documentation Center, 2007). For example, Prijedor municipality, through a bloodless political takeover, and Foča and Višegrad municipalities, through military conquest, fell to Bosnian Serb control in spring 1992. Each municipality was the site of well-known mass killings that also began in spring 1992. In contrast, the genocidal massacre in Srebrenica, an enclave under UN control, did not occur until July 1995 when Serbs finally re-captured the territory. Furthermore, research has shown that high ethnic polarization, a measure related to social cohesion, increased the intensity of violence in municipalities located close to the Serbian border where violence began early on (Weidmann, 2011). Although their specific empirical operationalization may vary, the preliminary analysis suggests then that the theoretical constructs of elite control and social cohesion may travel to other cases.

The findings also hold several broader theoretical and policy implications. Theoretically, the findings suggest first that the ideas of violence from above and violence from below should be thought of less as competing and more as complementary explanations (Weidmann, 2011). Elite agency and social structure operated together in Rwanda to produce violence. It is important to note, however, that no communes where extremists were in control and cohesion was high failed to experience violence. High social cohesion delayed but did not prevent killing. This would suggest structural forces from below constrain or facilitate elite behaviour from above, but these forces do not, by themselves, determine violence.

Second, the disaggregated approach has suggested the existence of dynamic determinants of violence within genocide. Specifically, it pointed to the operation of temporal and feedback dynamics. The passage of time had an independent effect on violence onset. The violence began quickly, then decelerated, and finally accelerated. The complex distributional form time took suggests genocide and perhaps other aggregated violent phenomena merit further diachronic analysis. Violence is also highly contagious or, put differently, violence is endogenous to itself. Feedback dynamics in violent phenomena such as ethnic warfare have already been recognized (Kaufman, 2001). This paper, however, refines this observation. It finds (temporally antecedent) violence begets violence in *spatially adjacent areas*. This finding may account then in part for two remarkable features of Rwanda's violence: its speed and geographic ambit. The violence spread in just over 100 days to almost every commune in the country. In the fourth smallest and most densely-populated country in Africa, it is unsurprising that contagion effects from spatial adjacency are likely to be amplified.

Finally, the findings have potential policy implications for decision makers at the international level on when and where limited intervention resources could be applied to prevent or stop violence. In the simplest scenario, peacekeepers could be deployed to regions most vulnerable to violence. The aim would be to prevent violence or stop it in earliest stages. However, as in Rwanda, it is possible the violence is too rapid to prevent its occurrence or the resources too few to stop determined killers. In this scenario, it may be strategically expedient to target regions less vulnerable to violence instead. The delay to the violence in these communities would provide the time needed to deploy peacekeepers preventatively. Peacekeepers would then face the easier challenge of a peace to keep rather than a conflict to end. The presence of peacekeepers would also strengthen extant local resistance from moderate elites

and cohesive communities opposed to violence. Together, international peacekeepers and cooperative local communities could help turn areas within resistant regions into safe havens for resident civilians and for refugees from more vulnerable regions. It is evidently easier to protect several well-delimited areas than an entire country.

Deciding when and where to deploy intervention resources raises complex strategic and ethical questions. I have described only two simple scenarios. In Rwanda, it has been convincingly argued that relatively few additional lives could have been saved through external intervention because the true nature and scale of the violence were not known at the outset and because the violence occurred too rapidly to deploy the resources needed to stop it (Kuperman, 2000). Today, the proliferation of technologies to disseminate information rapidly and widely means it is unlikely a knowledge gap would represent as significant an impediment to intervention. However, the arguments concerning the speed of the violence and the limited intervention resources available remain. The UN Force Commander on the ground commanded just over 2500 peacekeepers, a number subsequently reduced to 454, to protect hundreds of thousands of civilians dispersed across over 26,000 km². This paper suggests nonetheless that something more could have been done had better information on when and where violence would break out been available. There existed a window between 6 and 20 April 1994 in the central and southern prefectures of Gitarama and Butare where peacekeepers could have been deployed before the violence began to reinforce the resistant communities there. Their presence may have delayed violence yet further and possibly have bought enough time to establish a corridor for civilians to cross Rwanda's southern border into Burundi. The potential upside was not insignificant. The two prefectures were home to nearly one third of Rwanda's Tutsi population in 1994 and had drawn many more Tutsi from other prefectures who saw Butare and Gitarama as places of final refuge during the bloodshed. Scepticism regarding humanitarian intervention in Rwanda is well-founded but should be softened.

One outcome of the State Failure Task Force in the 1990s was a list of countries, a global map, identifying those at greatest risk of genocide and politicicide (Harff, 2003). The challenge for the next generation of research is perhaps to construct maps showing 'violence flashpoints' or potential 'safe havens' *within* these identified countries. Armed in advance with this information, international decision makers may deploy limited intervention resources more effectively and more quickly to prevent or to stop killing once it has begun.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.polgeo.2014.05.006>.

Endnotes

¹ The estimates are for genocides and politicicides occurring between 1945 and 2001. The figures rise if the broader concepts of democide (Rummel, 1995) and mass killing events (B. Valentino et al., 2004) are considered.

² Straus' data are missing onset dates for 21 communes for which I used my own dates obtained through fieldwork in 2009 that drew on information from Rwanda's community justice process, *gacaca*.

References

- Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic divisions. *Quarterly Journal of Economics*, 114(4), 1243–1284.
- Allison, P. D. (1984). *Event history analysis: Regression for longitudinal event data*. Beverly Hills: Sage Publications.
- André, C., & Platteau, J.-P. (1998). Land relations under unbearable stress: Rwanda caught in the Malthusian trap. *Journal of Economic Behavior & Organization*, 34(1), 1–47.
- Buhaug, H., & Lujala, P. (2005). Accounting for scale: measuring geography in quantitative studies of civil war. *Political Geography*, 24(4), 399–418.
- Buhaug, H., & Rod, J. K. (2006). Local determinants of African civil wars, 1970–2001. *Political Geography*, 25(3), 315–335.
- Charny, I. W., & Berger, A. L. (1988). *Genocide: A critical bibliographic review*. New York, N.Y.: Facts on File Publications.
- Collier, D., Brady, H. E., & Seawright, J. (2010). Outdated views of qualitative methods: time to move on. *Political Analysis*, 18(4), 506–513.
- Collier, P., & Hoeffler, A. (2004). Greed and grievance in civil war. *Oxford Economic Papers*, 56(4), 563–595.
- Davenport, C., & Stam, A. Genodynamics. Retrieved 10.01.13 <http://www.genodynamics.com>.
- Des Forges, A. (1999). *Leave none to tell the story: Genocide in Rwanda: Human rights watch*. International Federation of Human Rights.
- Dumitru, D., & Johnson, C. (2011). Constraining interethnic conflict and cooperation: why some people harmed Jews and others helped them during the Holocaust in Romania. *World Politics*, 63(1), 1–42.
- Easterly, W., & Levine, R. (1997). Africa's growth tragedy: policies and ethnic divisions. *The Quarterly Journal of Economics*, 112(4), 1203–1250.
- Fearon, J. D., & Laitin, D. D. (2003). Ethnicity, insurgency, and civil war. *American Political Science Review*, 97(1), 75–90.
- Fein, H. (1993). *Genocide, a sociological perspective*. London, UK; Newbury Park, CA, US: Sage Publications.
- Figueiredo, R. D., & Weingast, B. (1999). The rationality of fear: political opportunism and ethnic conflict. In Walter & Snyder (Eds.), *Civil wars, insecurity, and intervention* (pp. 261–302). New York: Columbia University Press.
- Finkel, E., & Straus, S. (2012). Macro, meso, and micro research on genocide: gains, shortcomings, and future areas of inquiry. *Genocide Studies and Prevention*, 7(1), 56–67.
- Flint, J., & De Waal, A. (2008). *Darfur: A new history of a long war*. Zed Books.
- Fujii, L. A. (2009). *Killing neighbors: Webs of violence in Rwanda*. Ithaca, N.Y.: Cornell University Press.
- Geddes, B. (1990). How the cases you choose affect the answers you get: selection bias in comparative politics. *Political Analysis*, 2(1), 131–150.
- Harff, B. (2003). No lessons learned from the Holocaust? Assessing risks of genocide and political mass murder since 1955. *American Political Science Review*, 97(1), 57–73.
- Horowitz, I. L. (1976). *Genocide: State power and mass murder*. New Brunswick, N.J. Kaufman, S. J. (2001). *Modern hatreds: The symbolic politics of ethnic war*. New York: Cornell University Press.
- King, C. (2004). The micropolitics of social violence. *World Politics*, 56(3), 431–455.
- Kopstein, J. S., & Wittenberg, J. (2011). Deadly communities: local political milieus and the persecution of Jews in occupied Poland. *Comparative Political Studies*, 44(3), 259–283.
- Krain, M. (1997). State-sponsored mass murder: the onset and severity of genocides and politicides. *The Journal of Conflict Resolution*, 41(3), 331–360.
- Kuper, L. (1982). *Genocide: Its political use in the twentieth century*. New Haven; London: Yale University Press.
- Kuperman, A. J. (2000). Rwanda in retrospect. *Foreign Affairs*, 79(1), 94–118.
- Levene, M. (2005). *The meaning of genocide*. In *Genocide in the age of the nation-state* (Vol. 1). London; New York: I.B. Tauris.
- Lieberman, S. (1981). An asymmetrical approach to segregation. In C. Peach, V. Robinson, & S. Smith (Eds.), *Ethnic segregation in cities* (pp. 61–82). Croom Helm.
- Mann, M. (2005). *The dark side of democracy: Explaining ethnic cleansing*. Cambridge: Cambridge University Press.
- Massey, D. S., & Denton, N. A. (1988). The dimensions of residential segregation. *Social Forces*, 67(2), 281–315.
- McDoom, O. S. (2013a). Antisocial capital: a profile of Rwandan genocide perpetrators' social networks. *Journal of Conflict Resolution*.
- McDoom, O. S. (2013b). Who killed in Rwanda's genocide? Micro-space, social influence and individual participation in intergroup violence. *Journal of Peace Research*, 50(4), 453–467.
- Melson, R. (1992). *Revolution and genocide: On the origins of the Armenian genocide and the Holocaust*. Chicago; London: University of Chicago Press.
- Midlarsky, M. I. (2005). *The killing trap: Genocide in the twentieth century*. Cambridge: Cambridge University Press.
- Openshaw, S. (1983). *The modifiable areal unit problem*. Norwick: Geo Books.
- O'Loughlin, J., & Raleigh, C. (2008). Spatial analysis of civil war violence. In K. Cox, M. Low, & J. Robinson (Eds.), *A handbook of political geography* (pp. 493–508). Thousand Oaks, CA: Sage.
- Posner, D. N. (2004). Measuring ethnic fractionalization in Africa. *American Journal of Political Science*, 48(4), 849–863.
- Raleigh, C., & Hegre, H. (2009). Population size, concentration, and civil war. A geographically disaggregated analysis. *Political Geography*, 28(4), 224–238.
- Reardon, S. F., & O'Sullivan, D. (2004). Measures of spatial segregation. *Sociological Methodology*, 34(1), 121–162.
- Research and Documentation Center. (2007). *The Bosnian book of the dead*. Sarajevo.
- Reynal-Querol, M. (2002). Ethnicity, political systems, and civil wars. *Journal of Conflict Resolution*, 46(1), 29.
- Rummel, R. J. (1995). Democracy, power, genocide, and mass murder. *Journal of Conflict Resolution*, 39(1), 3–26.
- Schutte, S., & Weidmann, N. B. (2011). Diffusion patterns of violence in civil wars. *Political Geography*, 30(3), 143–152.
- Sémelin, J. (2005). *Purifier et détruire: Usages politiques des massacres et génocides*. Paris: Seuil.
- Staub, E. (1989). *The roots of evil: The origins of genocide and other group violence*. Cambridge: Cambridge University Press.
- Straus, S. (2006). *The order of genocide: Race, power, and war in Rwanda*. Ithaca: Cornell University Press.
- Straus, S. (2007). Second-generation comparative research on genocide. *World Politics*, 59(3), 476–501.
- US Government. (2011). *Darfur damaged and destroyed villages geo-data*. Washington, DC: State Department Humanitarian Information Unit.
- Uvin, P. (1998). *Aiding violence: The development enterprise in Rwanda*. West Hartford, CT: Kumarian Press.
- Valentino, B. A. (2004). *Final solutions: Mass killing and genocide in the twentieth century*. Ithaca, N.Y.: Cornell University Press.
- Valentino, B., Huth, P., & Balch-Lindsay, D. (2004). "Draining the sea": mass killing and guerrilla warfare. *International Organization*, 58(2), 375–407.
- Verpoorten, M. (2012). Leave none to claim the land: a Malthusian catastrophe in Rwanda? *Journal of Peace Research*, 49(4), 547–563.
- Verwimp, P. (2005). An economic profile of peasant perpetrators of genocide – micro-level evidence from Rwanda. *Journal of Development Economics*, 77(2), 297–323.
- Walter, B. F. (2004). Does conflict beget conflict? Explaining recurring civil war. *Journal of Peace Research*, 41(3), 371–388.
- Wayman, F. W., & Tago, A. (2010). Explaining the onset of mass killing, 1949–87. *Journal of Peace Research*, 47(1), 3–13.
- Weidmann, N. B. (2011). Violence "from above" or "from below"? The role of ethnicity in Bosnia's civil war. *The Journal of Politics*, 73(4), 1178–1190.
- White, M. J. (1983). The measurement of spatial segregation. *American Journal of Sociology*, 88(5), 1008–1018.
- Zorn, C. (2005). A solution to separation in binary response models. *Political Analysis*, 13(2), 157–170.