

Human Security: The Challenges of a Globalized Security Paradigm (SPI 403-C1)

Brittany Holom

Preempting Violent Conflict in Turkish Kurdistan

Cyrus Parsa Hatam

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I pledge my honor that I have not violated the Honor Code during this examination.

Introduction

This paper will address the following two-faceted research question: 1) what is the projected future of violence in Turkish Kurdistan, and 2) how can Turks and Kurds leverage psychology-based policy to preempt it? In general terms, the first aspect concerns itself with identifying a concrete problem and the second with applying a scientifically-sound solution.

It is first useful to provide context surrounding whom the labels “Kurds” and “Turks” refer to and where “Turkish Kurdistan” is. The Kurds are a people who have spanned the borders of modern-day Turkey, Iran, Iraq, and Syria¹ since the eleventh century². They never constituted a formal empire but were rather organized into several fragmented principalities³, and in addition to being politically decentralized, they have perpetually faced an uphill battle to gain sovereignty: they were initially under the rule of the Arab Caliphate, annexed by the Seljuk Turks, divided among the Ottomans and Persians,⁴ and ultimately dispersed in the present arrangement following World War I⁵.

¹ “The Kurdish Minority Problem (Ore 71 – 48) – CIA” 3

² Bozarslan et al. 2

³ Bozarslan et al. 2

⁴ Bozarslan et al. 2

⁵ Bozarslan et al. 4

As a consequence of this history, Turkey is home to both Kurdish communities (comprising 19% of the nation's population) and ethnic Turks (70 to 75%).⁶ The majority of Kurds (65.22%) inhabit the eastern and southeastern territories of the country⁷, an area which is denoted as Turkish Kurdistan for the sake of this analysis. Most of the remaining population is located in the city of Istanbul, though Kurdish presence can be found in other western regions as well.⁸ When the Republic of Turkey was established in 1923⁹ under Kemal Ataturk (whose last name fittingly translates to “father of the Turks”)¹⁰, the new government operated under a nationalist philosophy known as Kemalism, which ostracized Kurds by suppressing their culture and stifling the economic prosperity of their municipalities.¹¹

Attempts to erase Turkey's Kurdish identity persisted and evolved thereafter: the government pejoratively referred to Kurds as “mountain Turks” and spread abundant misinformation designating the Kurdish language as a dialect of Turkish.¹² In response to this oppression, the Kurdistan Worker's Party (PKK) under Abdullah Ocalan started to gain political traction in 1973¹³ and formalized itself in 1978¹⁴. On August 15, 1984, the

⁶ “Turkey”

⁷ Mutlu 532

⁸ Mutlu 532

⁹ Ulug et al. 486

¹⁰ Itzkowitz

¹¹ Ulug et al. 486

¹² “Turkey – Linguistic and Ethnic Groups”

¹³ White 17

¹⁴ White 18

PKK initiated violent conflict with the Turkish government by attacking police stations and murdering numerous soldiers.¹⁵

Tit-for-tat violence between the two groups has continued through the present day, resulting in up to 45,000 total deaths¹⁶ (predominantly Kurdish civilians)¹⁷. There have been countless ceasefire attempts since 1984, all of which were promptly violated.¹⁸ The exceptionally long and most promising armistice of 2013 came to an abrupt end in 2015¹⁹, and lives continue to be lost to this day²⁰.

Regarding the human security paradigm (which shifts the focus of security policy from states to individuals)²¹, the aforementioned death counts reflect a dire case of personal insecurity (i.e. the prevalence of physical violence)²² across Turkey and especially within Kurdish-populated provinces. Violence has coincided with and percolated into other dimensions of human insecurity as well: economic insecurity²³ as a result of historical underdevelopment in Turkish Kurdistan and political insecurity²⁴ with regards to disallowing Kurdish language use (among other forms of discrimination)²⁵. Amidst these factors, the internal displacement of Kurds in Turkey is also an issue, as many Kurds

¹⁵ White xii

¹⁶ Ulug et al. 487

¹⁷ Lust-Okar 44

¹⁸ White xiii – xv

¹⁹ “Turkey’s Kurdish Conflict: 2015 – Present”

²⁰ “Conflict Between Turkey and Armed Kurdish Groups”

²¹ “Human Development Report 1994” 3

²² “Human Development Report 1994” 30

²³ “Human Development Report 1994” 25

²⁴ “Human Development Report 1994” 25 – 33

²⁵ “Turkey – Linguistic and Ethnic Groups”

have emigrated from Turkish Kurdistan since the commencement of conflict in 1984²⁶.

This document seeks to address personal insecurity concerns so as to forestall further loss of life in the region and provide potential solutions to other categories of human (in)security. After so many fruitless ceasefires throughout the past four decades, how can the problem be solved?

The first step is to concretize the problem at hand and the second to administer a tailored and scientific solution based on the problem's specifications. Currently, the root of the problem is somewhat ambiguous: the conflict is often perceived through the lenses of terrorism and counterterrorism, economic underdevelopment, and independence struggle, and some refuse to admit that there is any conflict at all.²⁷ Psychologically, this subjectivity concerning the reality of affairs in Turkish Kurdistan is a result of human behavioral tendencies: people allow variable contexts to alter their judgments and (mis)construe these contexts via subjective interpretation²⁸.

How can we provide more objectivity for both the problem and the solution? While far from perfect, data can shed light on the reality of the Turkish-Kurdish conflict without being corrupted by the noise of human speculation. This analysis seeks to leverage the available statistics regarding historical deaths in Turkish Kurdistan in order to glean a

²⁶ "Turkey – Linguistic and Ethnic Groups"

²⁷ Ulug et al. 487

²⁸ Shafir 2

heightened understanding of the conflict's future via machine learning. This approach offers 1) a convenient quantification of the personal insecurity dynamics in the region and 2) a unique view into the potential future of these dynamics, both of which cannot be achieved with purely qualitative and speculative human intuition. Knowing what the extent and severity of violence will be is greatly advantageous for thwarting it before it occurs via a honed solution. Likewise, this solution ought to be grounded in science because "policies based on bad intuitive psychology are less likely to succeed and can often prove hurtful."²⁹ Therefore, psychology-backed policy is one possible channel through which to terminate the pattern of failed remedies and endless violence in the region. In summary, this paper will analyze data on past violence in order to forecast future violence so that it can be preempted via a targeted and behaviorally-informed policy implementation.

Literature Review

The research question at hand sits at the intersection of three broader topics: 1) machine learning as a means for predictive analysis, 2) psychology as a public policy tool, and 3) the resolution of violent conflict in Turkish Kurdistan. Scholarship currently exists in each (and in some cases, across two) of these areas, but no source has combined all three dimensions as intended through this analysis.

²⁹ Shafir 1

With respect to machine learning, three relevant sources pertain specifically to predicting violent conflict, all of which employ algorithms to better ascertain the nature of the problem so as to pave the way for more effective solutions. The first features a set of models that forecasts the occurrence of battles across the African continent.³⁰ The study employs two prediction methods, naïve Bayes and random forest, and boasts over 98% overall accuracy for both types when the only input variable is historical battles.³¹ While the study offers a unique contribution to the field of conflict foresight, 1) its external validity beyond Africa remains unexplored and 2) it solely pertains to multi-casualty events that are political in nature (or “battles”)³², neglecting the prevalence of smaller-scale tragedies.

Secondly and in a similar vein, another paper conducts analysis on large-scale violence as well but focuses primarily on state-based conflicts and aggregates events by the year and country in which they took place.³³ Only episodes resulting in more than 25 deaths per year are considered³⁴, and several nationwide socioeconomic factors are controlled for³⁵. Vector auto-regression first generates the total forecasted magnitude of international conflict³⁶, and random forest then distributes this figure in a state-wise fashion depending

³⁰ Perry

³¹ Perry 10

³² Perry 4

³³ Chekirou and Hanouti

³⁴ Chekirou and Hanouti 3

³⁵ Chekirou and Hanouti 2 – 3

³⁶ Chekirou and Hanouti 12 – 13

on each nation's estimated conflict propensity³⁷. This analysis demonstrates the ability for machine learning algorithms to foresee high-fatality violent conflicts on a global scale.

A third case of predictive conflict analysis explicitly utilizes individual-level data to anticipate violence on the basis of gender in Spain³⁸. Methodologically, elements of feature selection³⁹ and time-series forecasting⁴⁰ are applied in concert with one another in order to form a prediction based upon several demographic, geospatial, and temporal variables⁴¹. Despite the fact that it offers an individualized use case, the nature of feature selection requires for there to be more than one feature in the data to be selected from, rendering the method of no use for a model that exclusively seeks to ground its projections in past data. Nevertheless, all of these examples are a testament to the success of prior attempts at conflict prognoses, regardless of the scale or multi-variability of the available datasets.

In addition to the exploitation of machine learning for the purpose of future conflict identification, another scientific discipline has been revolutionizing conducive policy solutions to these conflicts: psychology. In general, there has been a push in recent years toward designing policy that is sensitive to human behavior⁴². A fundamental axiom of

³⁷ Chekirou and Hanouti 13

³⁸ Rodriguez-Rodriguez et al.

³⁹ Rodriguez-Rodriguez et al. 5

⁴⁰ Rodriguez-Rodriguez et al. 6

⁴¹ Rodriguez-Rodriguez et al. 7

⁴² Shafir 2

behavioral science is that people are often oblivious to the prejudices they hold and frequently overemphasize the potency of others' biases⁴³.

Remedies for this “bias blind spot”⁴⁴ have been explored in the context of Turkish Kurdistan through one study that tests the effects of electronic contact between Turks and Kurds on intergroup relations⁴⁵. The results indicated that cross-group communication amongst individuals via online fora can diminish anxiety and amplify mutual trust,⁴⁶ showcasing how policy and psychology can operate hand-in-hand to mediate conflict between Turks and Kurds.

Mitigation of violence by means of intergroup contact not only applies to the case of Turkish Kurdistan but extends to conflict more broadly.⁴⁷ One source identifies the sensitivity of encouraging contact when two groups are of unequal status (as in the case of the Turks and Kurds), stating that such a situation requires additional effort for each side to empathize with the other as opposed to merely interacting⁴⁸.

Outside of facilitating intergroup contact among individuals to terminate conflict, there have been methods of achieving this end on a more macro level via societal reconciliation

⁴³ Shafir 5

⁴⁴ Shafir 5

⁴⁵ Bagci et al. 577

⁴⁶ Bagci et al. 586

⁴⁷ Al Ramiah and Hewstone

⁴⁸ Al Ramiah and Hewstone 538

efforts⁴⁹. The problem posed by these general approaches is that the solutions offered are vague and hardly implementable: for example, one source simply prescribes that powerful third parties take an active role in conflict arbitration⁵⁰ but fails to specify what qualifications these entities ought to meet and how they ought to intervene.

What the existing literature lacks is a large-scale conflict solution that relies on psychological principles in lieu of ill-defined and imprecise recommendations based loosely on empirical evidence or human intuition. Other behavioral phenomena in addition to intergroup contact (such as the tendency for well-liked and democratic leaders to curtail implicit prejudice among a populace)⁵¹ need to be consolidated in order to improve the credibility and success of a comprehensive violence abolition strategy.

With respect to scholarship about Turkish Kurdistan on the whole, the spotlight seems to primarily be on discrimination against the Kurds with a subsequent focus on PKK terrorism. One facet of the conflict that can be a focal point in an integrated policy recommendation is shared religion: while both Turks and Kurds are predominantly Sunni Muslims, this commonality has not precipitated peace because from the Kurdish perspective, the Turkish government is abusing religion for the purposes of ethnic

⁴⁹ Deutsch

⁵⁰ Deutsch 12

⁵¹ Hardin and Banaji 22

segregation⁵². Perhaps homogenizing and emphasizing Sunni Islam in Turkey could yield stronger interethnic likability by virtue of perceived similarity⁵³.

As alluded to previously, another area of concern is the way in which the Turkish government labels its Kurdish populations, who went from being perceived as assimilating Turks in the twentieth century to second-class members of society today⁵⁴. A counter-conflict policy should include this factor in order to improve Kurds' affective (i.e. emotional) sentiments toward the government⁵⁵.

Finally, it is important to note that scholarship surrounding international endeavors to temper the conflict in Turkey is quite limited, perhaps because these endeavors themselves are few and far between. The role of the United States has been complicated in recent years: the Trump administration both provided weaponry for PKK allies in Syria and blatantly supported the Turkish government against the PKK⁵⁶. With international involvement that is often absent and ambiguous when present, literature vis-à-vis implicating other nations and marshaling institutions is required to jump-start action.

⁵² Turkmen 138

⁵³ Sprecher 3

⁵⁴ Yegen 597

⁵⁵ Rottenstreich and Shu 454

⁵⁶ Stewart

Data

To be able to harness the power of machine learning, it is first necessary to have access to quantitative data. The challenge for this project is to turn the abstract concept of violence into numbers fit for analysis, and the Uppsala Conflict Data Programme (UCDP) offers an appropriate solution for this need. The UCDP Geo-Referenced Event Dataset (GED) Global Version 21.1⁵⁷ contains virtually all recorded global incidents of death due to armed conflict from 1989 to 2020 and assigns each instance with a specific corresponding location.

The variables in the dataset which bear relevance to this analysis are the following: 1) violence (defined as any event in which an organized actor directly caused the death of at least one person via armed force and measured in terms of the best available estimate of total death counts for each day in the event)⁵⁸, 2) time (denoted by the date(s) of the event)⁵⁹, and 3) location (marked by the nation and province of the event⁶⁰ and relevant for omitting data points outside of Turkish Kurdistan).

Regarding sampling methods, the data was amassed via a computer program that scanned the Dow Jones Factiva aggregator and pinpointed all media reports pertaining to deaths

⁵⁷ “UCDP Dataset Download Center”

⁵⁸ Sundberg and Melander 525

⁵⁹ Sundberg and Melander 526

⁶⁰ Sundberg and Melander 526

and injuries⁶¹. The program's output was then reviewed by experts in order to ensure correctness and avoid redundancy.⁶² Myriad news sources were compiled, a significant one of which was BBC Monitoring, and there was a mix of international and local data (which was not always in English); historical archives, NGOs, and the UN were also adopted as sources.⁶³ The data collection process prioritized the incorporation of independent sources and focused on channelling primary sources in order to minimize inaccuracies.⁶⁴

In terms of its credibility and overall advantageousness, this dataset is reportedly valuable for both isolating lethally violent events and conducting local-level analysis⁶⁵; it also presents deaths on a per-day basis, allowing for total deaths per day in any given region to be computed. Two additional characteristics make this dataset particularly advantageous: 1) aggregation (in addition to the vast quantity of entries, all the data is mapped by location and pooled into one file) and 2) simplification (deaths serve as a practical proxy for the daily magnitude and effects of violence).

Despite its thorough source-scouring algorithms and renowned utility, the source also includes some limitations, namely the lack of data post-2020 (which proves to be somewhat problematic for evaluating the success of the models) and the disparity

⁶¹ "UCDP Methodology" 1

⁶² "UCDP Methodology" 3

⁶³ "UCDP Methodology" 1

⁶⁴ "UCDP Methodology" 2

⁶⁵ Eck 124

between reported and actual deaths. The specific degree of this disparity is not known, but it is certainly a potential concern given that many deaths may never be officially documented. In addition to being biased toward disclosed events, based on some preliminary data analysis, it is clear that 93.7% of entries are located in the Northern Hemisphere, which demonstrates that the data collection may have been geographically-skewed.

Methods and Analysis

The main machine learning algorithm featured in this study is known as auto-regressive integrated moving average (ARIMA), which can be thought of as a consolidation of two distinct elements: auto-regression (AR) and moving average (MA)⁶⁶. AR refers to the use of past data to predict the future,⁶⁷ and analogously, MA involves utilizing the error terms associated with past data to produce a prediction⁶⁸. The integration aspect opens up the possibility of analyzing the differences between data points as opposed to the data points themselves (with the option of iteratively taking differences of differences as well).⁶⁹ The chief purpose of this integrative component is to fulfill the model's condition that the input data be stationary, meaning that "its statistical properties are all constant over time."⁷⁰ ARIMA takes in three parameters as input: 1) the AR value (delineating how

⁶⁶ Nau

⁶⁷ "14.1 - Autoregressive Models"

⁶⁸ "2.1 Moving Average Models (MA Models)"

⁶⁹ Nau

⁷⁰ Nau

many past data points are employed to predict future points), 2) the differencing value (indicating how many iterations of differencing the model performs on the dataset), and 3) the MA value (designating how many past error values are harnessed). It is beneficial for this analysis because of its seamless synthesis of two effective methods, its relative simplicity and implementability, its general flexibility, and its capacity to project data points beyond the dataset; the final point renders it particularly valuable because it can establish the nature of Turkish-Kurdish violence going into the future and therefore makes room for the application of preventative measures.

The first step is to check whether the data is stationary, which can be tested via the augmented Dickey-Fuller (ADF) test.⁷¹ The p-value in support of stationarity (2.82×10^{-12}) is highly significant, so no differencing is necessary to transform the data (though it may prove useful for optimization purposes). Two models are explored: ARIMA(1, 0, 1) and ARIMA(0, 1, 6). The first is effectively the default setting and considers the previous data point and error term using the original data (i.e. no differencing), and the second is the optimized model. Optimization is performed by minimizing Akaike's information criterion (AIC), which is a way of measuring a model's error,⁷² across all possible combinations of AR and MA values from zero through eight and of differencing values from zero through three.

⁷¹ Abugaber

⁷² Shuhua Hu 2

In addition to ARIMA, other algorithms have been experimented with as well, namely random forest and Facebook prophet. Random forest is an algorithm that employs randomization techniques and averages the output of several decision trees.⁷³ On the other hand, Facebook prophet is a cookie-cutter forecasting tool that places a special emphasis on seasonal patterns in the data.⁷⁴ While they are worth considering, both of these methods are less promising than ARIMA, the former because of its inability to predict data points far into the future and the latter because of the lack of seasonality of the data in question.

Results

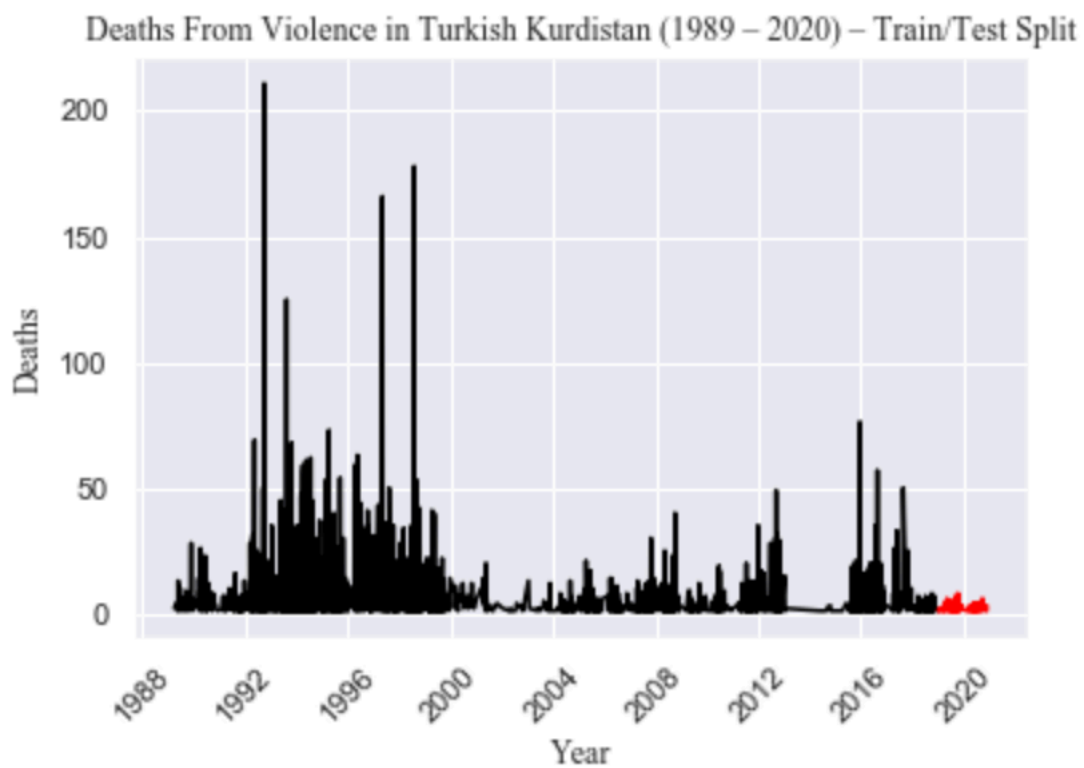
Coding in Python on Jupyter Notebook, the dataset is first cleaned to fit the needs of the analysis: irrelevant variables are discarded and entries are filtered by country (Turkey) and province (the 22 districts constituting Turkish Kurdistan)⁷⁵. Thereafter, selected values are split into two sets: training (the input for the model) and testing (the left-out data points that are later used to check the model's performance on unseen data). Due to the chronological sensitivity of the analysis, it is crucial to create a cutoff date for training and testing data as opposed to randomly assigning entries to each category. This date is somewhat arbitrarily set to January 1, 2019, which induces a training:testing ratio of

⁷³ "Random Forest"

⁷⁴ "Forecasting at Scale"

⁷⁵ Bois et al.

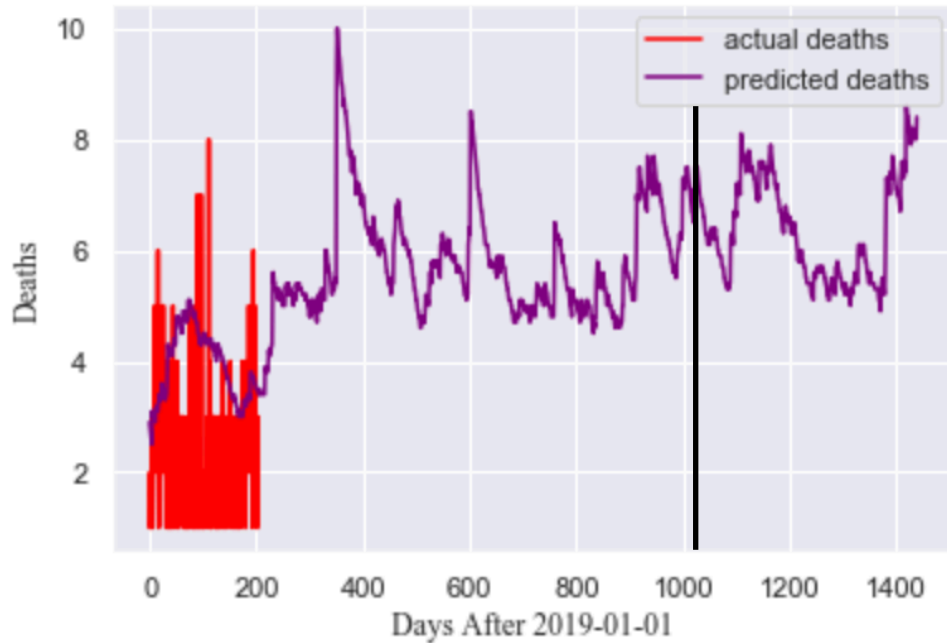
greater than the typical 80:20⁷⁶ but which is nevertheless sensitive to the need for testing on recent data. A graph of daily death counts in Turkish Kurdistan from 1989 to 2020 is shown below, with the training subset depicted in black and testing in red.



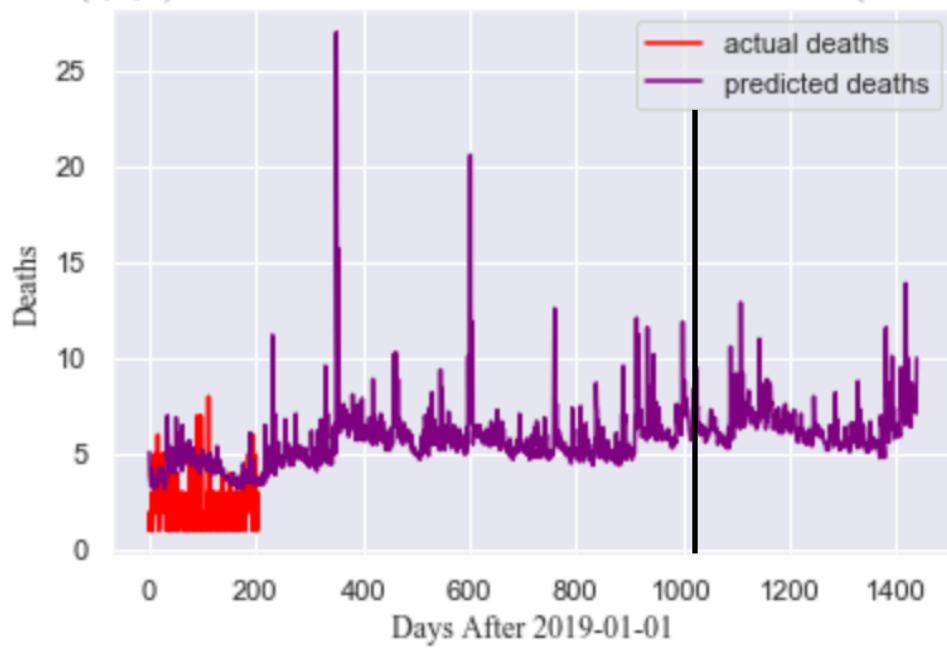
⁷⁶ Ng and Katanforoosh

Below are the results of the two ARIMA models, illustrating the testing data in red and the predictions in purple. The black line represents the present day (January 14, 2021).

ARIMA(1, 0, 1): Predicted Deaths From Violence in Turkish Kurdistan (After 2019-01-01)



ARIMA(0, 1, 6): Predicted Deaths From Violence in Turkish Kurdistan (After 2019-01-01)



Comparing AIC values across the two models, ARIMA(1, 0, 1) has a value of 29,799.64 and ARIMA(0, 1, 6) a value of 29,758.36, suggesting that the estimated predictive error of the latter (optimized) model is less than that of the former (naïve) one. From a purely visual standpoint, there appears to be decent correlation between the testing data and the models' projections: the basic trend of the testing data reflects an average of approximately four or five deaths per day at the beginning of 2019, then experiences a spike ~100 days into the year (about six deaths per day), and closes out the period similarly to how it began, and both models pick up on this pattern.

Regarding the magnitudes of the models' forecasts, ARIMA(0, 1, 6) appears to predict more deaths per day on average (roughly ten) than ARIMA(1, 0, 1)'s mean output (roughly six). The former model is also more volatile than the latter and contains three predicted values of greater than 15 deaths. By and large, however, the scale of projected violence across both models is similar; in both cases, the vast majority of days feature five to ten deaths. Therefore, both models corroborate that the problem at hand is small-scale yet persistent violence as opposed to detrimental massacres.

At first glance, the models may seem to slightly underestimate the deaths that occur in the testing data (particularly the first model). A potential explanation for this phenomenon is the fact that the actual deaths in the testing set are *events*, whereas the predicted deaths are *averages*. Deaths are not reported for every single date in the testing data (which is

shown by the gaps in the red bars but is perhaps not immediately obvious), and the predictions factor in these deathless days, bringing down the average. It is also crucial to note that while five to ten daily deaths may seem minuscule compared to the significantly larger historical numbers, these findings are still important in an absolute sense; as long as violent deaths are commonplace in Turkish Kurdistan, the need for a remedy exists.

Discussion

Based on these results, the task of interest is to holistically preclude persistent cases of low-casualty violence in Turkish Kurdistan. Although not knowing specifically who is perpetrating this violence and who is being victimized by it might superficially appear to be a setback, on the contrary, it may actually prove helpful to do without this information because it can reframe the solution from one which blames one or both groups into one which facilitates inter-group cooperation.

While high-level policies are quite necessary and the Turkish government ought to implement (or be compelled to implement) measures to solve its domestic conflicts, the individualized nature of the predicted violence ordains an inter-group contact approach as well, a strategy which has been proven to curtail inter-group tensions in a highly localized manner and across a wide range of examples^{77 78}. Promoting electronic contact in

⁷⁷ Bagci et al.

⁷⁸ Al Ramiah and Hewstone

particular has been constructive when executed in Turkish Kurdistan,⁷⁹ so the solution ought to build off of this success by opening up opportunities for inter-ethnic digital connections. A caveat to consider is that due to the unequal power dynamics between Turks and Kurds, these online fora require some degree of structure to enable cross-group empathy⁸⁰.

After prioritizing inter-group contact in an effort to inhibit individuals and communities from exhibiting violent behavior, it is essential to also tame the governing forces that endorse this violence. Although no full-blown war or large massacres are predicted in the near future and thus war-directed policies are not suitable, the relentless and systematic nature of the conflict calls for widespread governmental and institutional involvement. Two aspects bear importance with respect to this genre of policy in this particular setting: labels and leaders. Considering that the Turkish government has historically ostracized and silenced its Kurdish populations through demeaning epithets and pursuits of cultural erasure,⁸¹ there ought to be a transformation in the way Kurds are treated and referred to so as to lessen hostility.⁸² Part of such a transformation should manifest itself in leadership, though it is much more practical to coerce Turkish and Kurdish leaders to act cooperatively than it is to do away completely with the counterproductive leaders; in an ideal situation, bad eggs would be replaced with likable and equitable figures, who are

⁷⁹ Bagci et al. 577

⁸⁰ Al Ramiah and Hewstone 538

⁸¹ "Turkey – Linguistic and Ethnic Groups"

⁸² Rottenstreich and Shu 454

proven to abate the biases of those they govern⁸³. Additionally, influential third parties are capable of terminating inter-group clashes;⁸⁴ thus, there is demand for a layered solution that incorporates individuals and communities, governing forces, and the international world at large.

Implications

Having gauged the essence of the problem and outlined the criteria for a multifaceted solution, how should the solution play out specifically? Foremost, appropriate platforms for inter-group e-contact should be instituted that enable individual people to share their life experiences with one another; however, creating Facebook groups or encouraging run-of-the-mill social media use is likely to backfire due to the interethnic inequities at play. A possible work-around is to set up a digital pen pal service for which Turks and Kurds can sign up and become paired individually with one another (perhaps through a popular app such as WhatsApp). Fostering individualized contact in lieu of social media may lessen people's abuse of the network by limiting opportunities for propaganda and hate speech. Another idea to ensure success is to have a verification process for members and to automatically block all attempts to share sensitive personal information. Upon enrolling and being assigned a counterpart, each member can see their partner's bio and can kickstart the conversation thereafter. A more advanced version would employ an

⁸³ Hardin and Banaji 22

⁸⁴ Deutsch 12

algorithm to match similar Turks and Kurds based on survey results. An additional option is to underscore religious parallels by framing the initiative as a chance for Sunnis to connect with someone of their own faith.

The Turkish government ought to properly refer to Kurds as well, rejecting belittling and generalizing labels such as “mountain Turks” and “terrorists” and adopting new terms such as “Kurds” or “Turkish Kurds.” By formally acknowledging Kurdish identity (which is distinct from acknowledging Kurdish independence), Kurds will likely experience a positive affective response and feel accepted as members of Turkish society. Beyond labels, there are essentially two choices for the Turkish regime: 1) integrate Kurds into the Turkish system and pursue economic development of Kurdish regions (all the while respecting and preserving Kurdish identity) or 2) accept quasi-independence as Iraq did in 1974⁸⁵ and welcome a semi-autonomous Kurdish territory. The combination of deprivation and denied sovereignty can no longer be tolerated, and the government ought to be forced to make a decision.

How should the international community step in to enforce these proposals? Firstly, the United Nations should involve itself as an arbitrator and orchestrate negotiations between Turkey and the PKK. The goal of these negotiations would be to establish the direction of Turkish policy toward Turkish Kurds, culminating in a firm commitment to either

⁸⁵ “Kurdistan”

integration or liberation. Both sides reaching a compromise and laying out clear expectations for the future is a prerequisite for the United Nations to be able to evaluate each entity's actions and respond appropriately.

Concerning shortcomings, one of the key limitations of this study is that there is no way to compare the models' projections with actual figures from 2021 because the dataset does not yet contain these entries; it would be beneficial to observe how the models performed on this data in order to confirm their predictive power. Secondly, Turkish Kurdistan is not precisely defined: some of the provinces within the region are more densely populated with Kurds than others and borders are inexact. In a similar vein, it would have been ideal to generate a heat map of Turkish Kurdistan highlighting exactly where and to what extent violence is predicted. The data also lacks nuance, disclosing no information about the perpetrators and victims of the deaths and relying solely on past data. Incorporating other variables as controls would provide fascinating insight into what factors may be correlated with violent activity in the region. Another concern that was stated previously is that reported death counts and occurrences are certainly below the actual values, which brings into question the accuracy and representativeness of the data.

These roadblocks induce some plausible counterarguments to the study's conclusions: for example, what if large-scale violence is indeed expected, but the models fail to account for it? High-magnitude incidents of this nature are often too uncommon or unpredictable

to be accounted for anyway, and the policies employed to solve them presumably differ from the present framework (e.g. weapons control). Furthermore, how can predictions be reliable 1,000 or more days in advance? The short answer is that accuracy decreases over the length of the forecasting period because each predicted point is based on a prior predicted point, leading to an increased propensity for error as predictions are continually layered atop one another. These forecasts are still useful, however, because they reflect an extension of the status quo; they portray what is expected to happen given the baseline set by the training data and can thus provide insight into what would happen down the line were the present to carry on.

This study and the methods underlying it are potentially applicable to the analysis and mitigation of other violent conflicts, regardless of location or scale. Perhaps it can serve as a basis for future scholarship to predict violence through ARIMA or another machine learning technique in order to craft a specific and psychologically-sound set of policies.

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