Iran's 2018 protests: Spatial diffusion, socio-economics, and climate change

Author: Abolfazi Sotoudeh

2018

Iran's 2018 Protests
Spatial Diffusion, Socio-Economics, and Climate Change

Abolfazl Sotoudeh
Boston College Department of Sociology

BC GIS Contest
2018

ABSTRACT

Iran witnessed one of its largest, most political and geographically diverse waves of protest since the 1979 Revolution at the turn of 2018. The rapid diffusion of these protests in 10 consecutive days to numerous urban settings bewildered the public and academics alike, and several hypotheses emerged on its causes and mechanisms.

Past electoral behavior, unemployment, *youth bulge*, wider spread of higher education without employment prospects, climate change, social networks (satellite TV and the Telegram App®), and inflation were named as possible explaining factors.

Here, I model the occurrence and diffusion of these protests using Survival-Time analysis and I test the first five of the aforementioned hypotheses.

I find number of college students, poverty (through using maternal mortality rate as a proxy), and total population significant predictors of chances of protest.

I also find evidence for a particular pattern of protest with major areas of demonstration moving from northeastern Iran during the first two days to central-to-western regions including major metropolitan areas and slightly moving northward by day 10.

DATA AND METHODS

In this analysis I use original data co-collected for the working paper *What does the geographic spread of Iran protests tell us about its causes?* (Kadivar & Sotoudeh 2018).

Data on time and location of protests came from multiple online news outlets inside and outside Iran with 77 out of 429 counties experiencing at least one protest between December 28, 2017 and January 7, 2018.

Data on rainfall and drought were scraped from Iran Meteorological Organization's online reports. Data on socio-economics, demographics and education were scraped and recorded from Iran General Census Data 2016, accessible through Statistical Center of Iran's online portal.

Data on administrative divisions and corresponding georeferences were obtained from Iran Interior Ministry's online portal. Maternal mortality rate is based on data I collected from Yearbook of Demographic Statistics by Iran's National Office of Registry (2017).

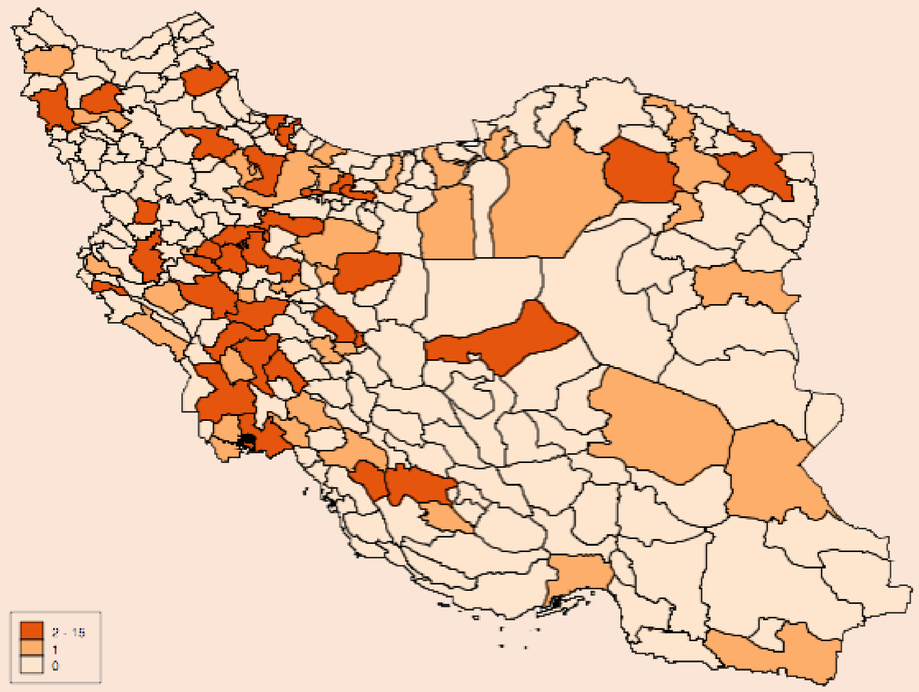
All data have been recorded and analyses carried out with Stata 14. Maps were drawn using spmap Stata package (Pisati 2015).

I model and analyze the data in a two-way random-effects panel logit regression. Following Hedström et all (2000), I calculate a spatial-temporal index of geographic pressure a protest a in county had on other counties based on distance. In other words, I hypothesized that a protest in a county positively associates with chances of protest in other counties, and that this effect would get weaker with distance (ibid). The formula for calculation of such index is (ibid):

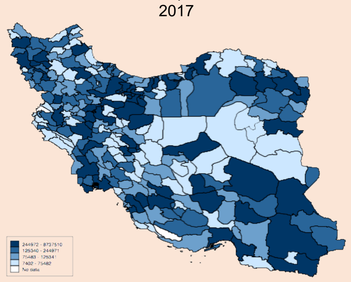
$$GP_{it} = \sum \frac{N_{jt}}{\sqrt{d_{ij}}}$$

where N equals 1 if there was a protest in county j on day t and dij is the distance between each two counties i and j in kilometers. Distance between counties has been calculated using latitude and longitude with geodist Stata package (Pickard 2012).

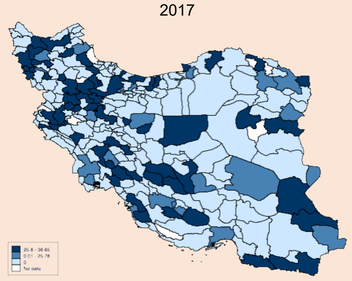
Total Number of Protests
December 28, 2017-January 7, 2018



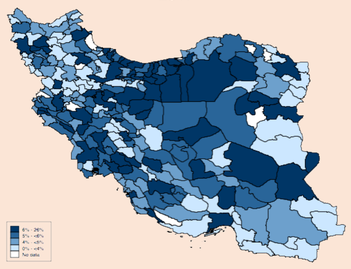
Total Population
2017



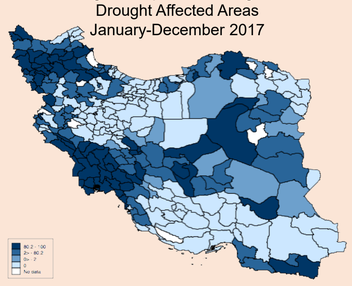
Maternal Mortality per 100,000 Births
2017



Percentage of College Students
2017



Percentage of Population Living in Severe Drought Affected Areas
January-December 2017



DISCUSSION AND CONCLUSION

The model below shows variables that are significantly associated with higher chances of protest. Larger counties with higher population and higher number of college students per capita are found to be at higher risk of protest.

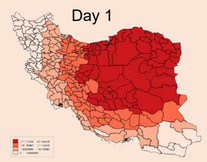
I also find the index of geographic pressure a positive contributor to chances of protest. Put differently, it shows how protest diffuses geographically.

Logit Regression Model

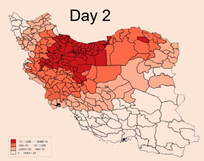
Protest (Dependent Variable	Coef.	Robust Std. Err.	T-value	P>z	[95% Conf.	Interval]
Day	-0.25	0.07	-3.38	0.00	-0.39	-0.10
Total Population (Logged)	1.46	0.20	7.14	0.00	1.06	1.86
Urban Population (%)	0.00	0.01	0.50	0.62	-0.01	0.02
% Population Living in Drought Affected Areas	0.00	0.00	1.02	0.09	0.00	0.01
Graduate Employes (%)	-1.46	2.55	-0.57	0.57	-6.45	3.54
College Students (%)	3.46	0.66	5.25	0.00	2.17	4.75
Vote Rouhani 2013	-0.03	0.01	-3.23	0.00	-0.04	-0.01
Reformist MP's Voted for 2017	-0.57	0.35	-1.62	0.11	-1.25	0.12
Maternal Mortality (per 100k)	9.34	4.05	2.31	0.02	1.41	17.28
Geographic Pressure	1.54	0.22	7.07	0.00	1.12	1.97
Constant	-27.02	3.17	-8.53	0.00	-33.22	-20.81
/lnsig2u	-10.56	2937.45			-5767.86	5746.74
sigma_u	0.01	7.47			0.00	
rho	0.00	0.02			0.00	

Another interesting finding is three major pools of protest that differ across time. This reinforces the hypothesis that the first day of protests was green-lighted by Hassan Rouhani's conservative opposition in the northeastern region of the country. This, however, stands at odds with major areas of protest over later days, and is mainly concentrated in the north-central and western parts of the country.

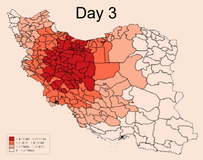
Day 1



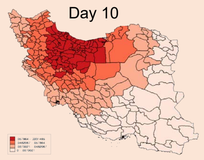
Day 2



Day 3



Day 10



REFERENCES

Hedström, P., Sandell, R., & Stern, C. (2000). Mesolevel networks and the diffusion of social movements: The case of the Swedish Social Democratic Party. *American journal of sociology*, *106*(1), 145-172.
Kadivar, M. Ali and Abolfazl Sotoudeh (2018 working paper) What does the geographic spread of Iran protests tell us about its causes?
Pickard, Robert (2012) Geodist Stata Package, SSC
Pisati, Maurizio (2015) Spmap Stata package, SSC

ACKNOWLEDGEMENT

I am grateful for the support and feedback from Dr M. Ali Kadivar and Francesca V. Paranzino.