Did the Egyptian protests lead to change?
Evidence from Egypt's first free Presidential elections

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Abstract

Did the Egyptian protests lead to political change? I examine the effects of the first and second waves of Egyptian protests that started in 2011, on voting outcomes during Egypt's first free Presidential elections that took place between May and June 2012. I geocoded the "martyrs" - demonstrators who died during the protests - using unique information from the Statistical Database of the Egyptian Revolution and exploited the variation in districts' exposure to the Egyptian protests. Using official elections' results collected from the Supreme Presidential Electoral Commission (SPEC) and controlling for districts' characteristics using Census data, I find suggestive evidence that higher exposure to protests' intensity leads to a higher share of votes for former regime candidates, both during the first and second rounds of Egypt's first presidential elections after the uprisings.

Keywords: Egyptian protests, Presidential elections, voting outcomes, "martyrs".

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1. Introduction

Protesting has long been a mode of political action to express discontent with deteriorating political or economic conditions. The Arab Spring protests were people-led mass demonstrations that erupted in several countries in the Middle East and North Africa, where people were taking to the streets to protest against their longstanding authoritarian regimes. Inspired by the Tunisian revolution, the 25th of January 2011 marks the beginning of the Egyptian revolution. The spark that ignited the Egyptian protests was the death of a 28 years old man, called Khalid Said, after an encounter with the Egyptian police in Alexandria. The story of Khalid Said's murder rapidly spread all over blogs and social media, creating moral outrage that built up to trigger the 25th of January 2011 protests. After 18 days of protests that unfolded all over Egypt, and specifically in the famous *Tahrir,* Liberation, Square, Hosni Mubarak stepped down after 30 years in power.

The Supreme Council of the Armed Forces (SCAF) took power in Egypt after Mubarak's resignation, until elections could be held. Under this transitional phase, a constitutional review committee was formed and on the 19th of March 2011, a constitutional declaration was approved by referendum. A term limit for future presidents, separation of powers and call for judicial oversight of elections were the main constitutional amendments dictated by the transitional context. In May and June 2012 were held Egypt's first free Presidential elections in two rounds, where thirteen candidates were qualified to contest the elections. During the second round, Mohamed Morsi, the Muslim brotherhood candidate and Ahmed Shafik, a former Prime minister under Mubarak, were competing for presidency, setting the stage for the division between Islamist and secular lines, as well as opposition versus support for the old regime elite. Mohamed Morsi, the Muslim brotherhood candidate, won Egypt's first free Presidential elections with 51.7% of votes and became Egypt's first elected Islamist President.

The Egyptian revolutionaries' grievances were motivated primarily by economic reasons as well as, by political and civil freedoms. However, the question remains as to what extent the protests have brought about political change in Egypt. Although, the 2012 elections have been associated with the 2011 demonstrations, this paper examines the relationship between protests and political change in the context of the Arab Spring protests and particularly, in the context of Egypt. The existing literature on the causal effects of protests is very sparse. To my knowledge, very few studies have examined the relationship between protests, on one hand and political change, on the other hand and in the context of the Arab Spring protests, there is no empirical work on the effects of protests on political outcomes. Hence, this paper attempts to fill this gap in the literature and to shed light on an important and yet understudied research question.

In this paper, I examine the effects of the first and second waves of Egyptian protests that started in 2011, on voting outcomes during Egypt's first free Presidential elections. This

setting allows testing the relationship between the 2011 protests and the subsequent 2012 Presidential elections. Using unique information from the Statistical database of the Egyptian revolution, I geocoded the "martyrs" - demonstrators who died during the protests – based on the site of death and exploit the variation in the districts' exposure to the Egyptian protests. In fact, the number of fatalities during a demonstration is a function of two variables: the number of protesters and the type of revolutionary action undertaken by the protesters. A high number of fatalities is more likely to occur when storming a government building, while the latter revolutionary action is likely to happen only when a critical mass of revolutionaries is present at the demonstration. Hence, the number of "martyrs" is considered as a proxy for protests' intensity, as it is correlated with the number of protesters as well as, with a number of other measures of protests' intensity, such as the number of injured or arrested during the protests (El-Mallakh, Maurel and Speciale, 2017).

Why should we care about how the protests impact political change? It is important to understand if the recent waves of revolutions in the Arab World have been effective in bringing political change and more importantly, in achieving the economic, social and political demands of the masses. This paper is linked to the large body of literature on democracy, democratization in developing countries and economic performance (Rodrik and Wacziarg, 2005; Papaioannou and Siourounis, 2008, Rodrik, 1999; Barro, 1996; Tavares and Wacziarg, 2001) and to the literature on the quality of institutions and long-term economic performance (Acemoglu, Johnson and Robinson, 2001; Hall and Jones, 1999). Since political transition paths in the aftermath of revolutions are likely to shape economic policies as well as economic performance, understanding how revolutions are affecting voting outcomes is key to evaluate political transitions and subsequently, economic performance during transition.

The existing empirical literature on the causal effect of protests is very sparse. Exception is Collins and Margo's (2004) empirical work on the labor market effects of the riots following the assassination of Martin Luther King Junior. They use rainfall at the month of April 1968 as an instrument for riot severity and find that the late 1960s riots had lingering effects on the average local income and employment for African Americans up to twenty years later. Madestam, Shoag, Veuger and Yanagizawa-Drott (2013) also exploit variation in rainfall to investigate the impact of the Tea Party movement in the United-States on policy making and political behavior. Using rainfall on the day of these rallies as an exogenous source of variation in attendance, they find that the protests increased public support for Tea Party positions and led to more Republican votes in the 2010 midterm elections.

Using data on the Arab Spring in Egypt, Acemoglu, Hassan and Tahoun (2016) investigate the effects of the recent protests on stock market returns, for firms connected to three groups: elites associated with Mubarak's National Democratic Party (NDP), the military, and the Muslim Brotherhood. They construct a daily estimate of the number of protesters in Tahrir Square as measure of revolution intensity, using information from Egyptian and international print and online media.

Related literature on Egypt includes Elsayyad and Hanafy (2014) who study the main determinants of Islamist versus secular voting of Egypt's first parliamentary elections after

the Arab Spring and find education to be negatively associated with Islamist voting and higher poverty levels to be associated with a lower Islamist vote share. Al Ississ and Atallah (2014) identify the relative impact of patronage versus ideology on voting behavior during Egypt's first Presidential elections after the January 2011 revolution. They find a positive effect of patronage on voting for the status quo through the ability of the incumbent candidate to mobilize voters on elections' day.

This paper contributes to the literature on the effects of protests on political outcomes, namely on voting outcomes in Egypt's first Presidential elections after the January 2011 uprisings. Understanding how protests influence electoral choices is key to evaluating the effectiveness of such modes of political action. Two possible scenarios come to mind: protests could contribute to politicize people who were previously not politically active; but protests could also lead to a conservative backlash among those segments of the population that fear radical political change. Using official elections' results collected from the Supreme Presidential Electoral Commission (SPEC), I examine the effects of exposure to varying-levels of protests intensity on districts' voting behavior.

A key empirical challenge in estimating the effects of the 2011 protests on districts' voting outcomes, is that unobservable characteristics might simultaneously affect the district's voting behavior, as well as the district-level measure of protests' intensity. I address this empirical challenge by using Census data, from Egypt Population, Housing and Establishments Census 2006, to control for a wide-range of pre-revolution district characteristics including demographic, labor market, education, poverty and telecommunications controls and governorate fixed effects to capture all governorate level time-invariant characteristics. Controlling for districts' characteristics using Census data, I find suggestive evidence that higher exposure to protests' intensity leads to a higher share of votes for former regime candidates, both during the first and second rounds of Egypt's first presidential elections. The results are robust to various sensitivity checks, including sensitivity to covariates' inclusion, flexible covariates specification, to outliers' exclusion, correction for spatial dependence and potential spillovers between districts.

The remainder of this paper is organized as follows. Section 2 provides background information on the 2011 Egyptian protests and the subsequent Presidential elections. Section 3 presents the data. Section 4 describes the empirical strategy. Section 5 presents the results as well as robustness and identification checks. Section 6 briefly concludes.

2. Background information: Egyptian protests and the first free Presidential elections

The first wave of the Egyptian revolution began on the 25th of January 2011. Hundreds of thousands of Egyptians rallied against Mubarak's government. This people-led mass protest gathered Egyptians from different ideological and social backgrounds in one of the biggest revolutionary movements in recent years.

The Egyptian revolution was positioned among a series of Arab Spring uprisings that started in Tunisia. These waves of demonstrations spread rapidly throughout the region, in several countries in the Arab World as protesters were taking to the streets to protest against their respective authoritarian regimes. A few weeks of mass demonstrations ultimately forced longtime President Ben Ali in Tunisia and Mubarak in Egypt to resign from office. Several Arab countries - Jordan, Bahrain, Libya, Syria, Iraq, Lebanon, Morocco and Saudi Arabia - have witnessed similar series of revolutionary movements, inspired by the Egyptian and Tunisian protests.

In the immediate aftermath of Mubarak's resignation, the Supreme Council of the Armed Forces (SCAF) took power in Egypt until Egypt's Presidential elections were held in two rounds in May and June 2012. Twenty-three candidates submitted nomination papers to be listed on the ballot. The Supreme Presidential Electoral Commission (SPEC) dismissed the candidacies of ten presidential hopefuls on legal grounds, leaving only thirteen candidates to run for the presidency. These thirteen candidates were ideologically very diverse, along Islamist versus secular lines but also the pro-change versus old regime axis. In the first round, with a voter turnout of 46%, Mohamed Morsi, the Muslim brotherhood candidate and Ahmed Shafik, a former prime minister under Mubarak, won the majority of votes to compete in the second round of the elections. The second round elections set the stage to the two clear divisions that were to follow, along secular and Islamist lines and those supporting and those opposed to the former regime elite. Morsi won his opponent by a small margin 51.7% versus 48.3%.

3. Data

3.1 The statistical database of the Egyptian Revolution

This paper takes advantage of a unique dataset: the Statistical database of the Egyptian Revolution, administered by the Egyptian Center for Economic and Social rights.[2] Fatalities, injuries and arrests are all documented during the period of the Egyptian revolution as a result of political and social changes. The data is collected during the first eighteen days of the protests (from the 25th of January 2011 to the 11th of February 2011), during the rule of the Supreme Council of the Armed Forces (SCAF) (from the 11th of February 2011 to June 2012), during former president Mohamed Morsi's rule (from July 2012 till June 2013) and, lastly, most recent data cover the period from July 2013 to May 2014. These individual level data were collected on a daily basis. They document the names of the "martyrs" *i.e.* demonstrators who died during the protests, the injured and the arrested, their place of residence, occupation, marital status, date of birth, the type and the classification of incident leading to the death, injury or arrest, the date of the incident, the governorate where the

[2] The Egyptian center for Economic and Social Rights is a non-governmental organization that carries out research and advocacy projects on economic, social and cultural rights in several countries in the world, in collaboration with local human rights advocates and activists.

incident took place, the site and the cause of death, as well as other relevant data for documentation purposes. [3]

The Statistical Database of the Egyptian Revolution locates the "martyrs" in each of the 27 governorates. Based on the site of death, I geocoded the "martyrs" and further localized each at the *district level* to build a rather disaggregated measure of protests' intensity. I utilized information from the first and second waves of the protests, namely the first eighteen days of the 2011 protests and the second wave of protests till June 2012, under the Supreme Council of Armed Forces rule, to match it with the elections results data that took place between May and June 2012.

Using information from the Statistical Database of the Egyptian Revolution, all locations in Egypt where fatalities occurred during the protests are pinpointed in Figure 1. Each circle represents one death location, which could correspond to one death incidence or many death incidences. Death locations are identified in each of the Egyptian governorates: ranging from one death location in Luxor to 91 different death locations in Cairo. As I identify each site of death by its GPS coordinates, I use this disaggregated information to build a proxy of protests' intensity measure as the district-level number of fatalities per district's inhabitants.

In Figure 2, I present a closer view of Cairo and its neighboring districts to give a glance of the level of disaggregation of the data. In this figure, locations are differentiated by color, according to the number of deaths that occurred in each. Cairo's Tahrir Square, located in *Qism Kasr el-Nil* was the epicenter of the demonstrations and is represented by the large blue dot as the location with the highest number of death incidences during the uprisings, 109 deaths. The second biggest deadly site is represented by the green dot in Figure 2, where 52 deaths were geocoded in Mohamed Mahmoud Street, located in *Qism Abdeen*. This is known as "Mohamed Mahmoud clashes" in media coverage and corresponds to deadly street clashes between protesters and the Central Security Forces (CSF). These clashes lasted for 5 days from the 19th of November to the 24th of November 2011 as protests took place in response to a Central Security Forces' attack on a sit-in in Tahrir Square (Le Monde, 2011).

Other identified death locations in the surroundings of Tahrir Square include the Maspero Television Building neighborhood, located in *Qism Bulaq* where 30 deaths were localized. This is represented by the light green dot close to Tahrir Square, in Figure 2. Clashes broke out between a group of protesters mainly composed by Egyptian Copts and security forces as they were protesting against the demolition of a Coptic church in Upper Egypt (BBC, 2011a).

In *Qism Sayyidah Zaynab*, 25 fatalities were geocoded in the neighborhood of the Ministers' Cabinet. In Figure 2, the Ministers' Cabinet is represented by the yellow dot close to Tahrir Square. Protests spread from Tahrir Square to reach the headquarters of the Ministers' Cabinet and clashes with the security forces occurred, as the demonstrators were protesting against the appointment of Kamal Ganzouri by the military, a former Prime Minister under Mubarak (BBC, 2011b).

[3] See El-Mallakh, Maurel and Speciale (2017) for a detailed discussion of the Statistical Database of the Egyptian revolution and the geocoding.

In Figure 3, I present a histogram showing the number of "martyrs" per districts. Out of the 349 districts in the empirical analysis, 156 districts are untreated. The number of "martyrs" per district varies between 1 and 122 fatalities per district. 69 districts had one "martyr" and 27 districts had 2 "martyrs". Districts with a number of "martyrs" higher than 2 are almost equally distributed over three intervals: those who have a number of "martyrs" equal 3 or 4, those with a number of "martyrs" between 5 and 12 and those with a number of "martyrs" between 13 and 122.

3.2 Elections data

Official elections results are collected from the Supreme Presidential Electoral Commission website for the first and second rounds of the 2012 Egyptian elections. The results of the first round are available at the district level, while the second round's results are available at the polling station level that I aggregate to same level of aggregation, the district level.

We focus on the total number of registered voters, the total valid votes, the total invalid votes and the votes accrued by each candidate during the first and second rounds. For the first round of the 2012 Egypt Presidential elections, there were 13 candidates and I classified candidates as either independent, former regime or Islamist candidates. Independent candidates include: Hamdeen Sabahi, Khaled Ali, Hisham Bastawisy, Abu Al-Izz Al-Hariri and Mahmoud Houssam. Former regime candidates include: Mohamed Fawzi, Amr Moussa, Ahmed Shafik, Houssam Khairallah and Abdullah Alashaal. Islamists candidates include: Mohamed Morsi, Abdel Moneim Aboul Fotouh and Mohammad Salim Al-Awa. For the second round of the 2012 Presidential elections, Mohamed Morsi, the Muslim Brotherhood candidate was competing against Ahmed Shafik, the former Prime minister under Mubarak. The votes are expressed in terms of shares: the valid votes accrued by each divided by the total valid votes. I also focused on the voter turnout rates in both rounds, computed as the share of valid and invalid votes, to the total number of district's registered voters and on the share of spoilt votes, computed as the ratio between the number of invalid votes and the total number of the district's registered voters.

In Table 1, district-level summary statistics for elections outcomes, are summarized by exposure to protests' intensity. Districts are divided into below and above median exposure to violent protests, according to the number of "martyrs" per district number of inhabitants. The median number of martyrs per 1000 inhabitants is equal to 0.003. Districts where the demonstrations were more intense had a significantly higher voter turnout rates in both the first and second rounds of the 2012 Presidential elections by about 6% and 4%, respectively. During the first round, districts that were exposed to higher protests' intensity exhibited a statistically significant higher share of votes for independent candidates and significantly lower share of votes for the Islamist candidates. As for the second round, districts belonging to the above median exposure to protests' intensity category were more likely to vote for Ahmed Shafik, the former regime candidate to the detriment of Mohamed Morsi, the Muslim brotherhood candidate, however, the difference is not statistically significant. Although during the second round the voter turnout rate was still significantly higher among districts where the

protests were the most intense, voter turnout from the first to the second rounds increased more in districts exposed to below median protests' intensity compared to districts exposed to above median protests' intensity: by 13% versus 5%, respectively. The difference in voter turnout rates between the two groups was thus narrower in the second round. Additionally, the share of spoilt votes drastically increased between the two rounds in districts exposed to below and above median protests intensity by 75% and 171%, respectively. The increase being greater in districts where the protests were the most intense could be interpreted as intentional spoiling, as voters were intentionally expressing their disapproval against the two candidates standing in the elections, Mohamed Morsi and Ahmed Shafik, by invalidating their votes.

3.3 Census data

Egypt Population, Housing and Establishments Census 2006 is the most recent Census available in Egypt. It is conducted by the Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt's statistical agency. I derive a wide-range set of covariates from the 2006 Census data to control for potential confounding factors that might simultaneously affect the protests' intensity and electoral outcomes at the district level, including demographic, labor market, poverty, education, and telecommunications controls, presented in details in Section 4.

In Table 2, all pre-revolution district covariates are summarized by districts' exposure to protests' intensity. Districts are split into below and above median number of "martyrs" per district's number of inhabitants. Districts that were exposed to higher protests' intensity are found to have a higher population and population density. They are also found to have a higher share of adult population aged 36 years old and above by about 3%, compared to districts that were exposed to below median protests' intensity. In terms of the share of immigrants and emigrants, there isn't any significant difference between districts that were exposed to below and above median protests' intensity. However, the share of Christians among total population is significantly more important in districts that were exposed to higher protests' intensity, by about 2%. Apart from the above-mentioned demographic characteristics, districts that were exposed to higher protests' intensity have also a 5% higher share of public sector employment, a 1% higher unemployment rate and 3% higher female labor force participation. As proxies for poverty, districts that were exposed to higher protests intensity don't exhibit any statistically significant difference in the share of households having electricity access. However, they have a smaller share of households who aren't connected to sewage disposal system. In terms of education, the incidence of university education is significantly higher in districts that were exposed to the most intense protests and reciprocally the illiteracy rate is also significantly lower in the latter group. As telecommunication infrastructure played a crucial role in mobilizing the protestors during the revolution, districts exposed to higher protests intensity have also significantly higher shares of households with Internet access and computer availability, however, they have a lower share of households with cell-phone availability compared to districts that were exposed to below median protests

intensity. In the regression specification, I control for all these pre-revolution district's covariates to purge any pre-existing differences between districts that are exposed to varying levels of protests' intensity in order to be able to test the effects of the protests on the subsequent 2012 Presidential elections.

4. Empirical strategy and regression specification

4.1 The effects of the protests on voting outcomes

Using official elections results collected from the SPEC and data on the "martyrs" from the Statistical database of the Egyptian Revolution, I examine the effects of the protests on districts' voting behavior, while controlling for a wide-range of districts' characteristics, derived from the Egypt Population, Housing and Establishments Census 2006. Explicitly, I exploit the variation in the districts' exposure to the Egyptian protests and examine the extent to which the latter had affected the subsequent elections, namely the Egypt's first presidential elections, using the following specification:

$$Y_d = \alpha_0 + \alpha_1 martyrs_d + \alpha_2 Z_d + \beta_g + \varepsilon_d$$

Y_d are the different voting outcomes. For the first round of the Presidential elections, candidates are classified as independent, former regime or Islamist candidates.[4] The dependent variables are the district-level share of votes cast to the different groups of candidates, expressed in % of the district's number of valid votes. For the second round of the Presidential elections, the dependent variables are the shares of votes cast to either the Islamist candidate, Mohamed Morsi or the former regime candidate, Ahmed Shafik, also expressed in % of the district's number of valid votes. Along with the shares of votes, voting outcomes also include the voter turnout rate and the share of spoilt votes for the first and second rounds of the Presidential elections. The voter turnout is equal to the total number of votes (valid and invalid votes) divided by the number of registered voters per district and the share of spoilt votes is equal to the number of invalid votes divided by the number of registered voters per district. $martyrs_d$ is the main variable of interest and is equal to the district-level number of "martyrs", expressed in % of a district's population and it captures the districts' differential exposure to protests intensity. Z_d is a vector of pre-determined district covariates derived from the Egypt Population, Housing and Establishments Census 2006. It includes a wide range of covariates to control for demographic, education, poverty, labor market characteristics and telecommunication access. Demographic controls include: the logarithm of a district's population size, the logarithm of population density (number of inhabitants/km^2), the share of a district's population aged less than 36 years old, the share of a district's population aged more than 35 years old, the share of immigrants to district's population, the share of emigrants to district's population (those with overseas migration

[4] For the first round of Presidential elections, candidates are classified as independent, former regime or islamist candidates. Independent candidates include: Hamdeen Sabahi, Khaled Ali, Hisham Bastawisy, Abu Al-Izz Al-Hariri and Mahmoud Houssam. Former regime candidates include: Mohamed Fawzi, Amr Moussa, Ahmed Shafik, Houssam Khairallah and Abdullah Alashaal. Islamists candidates include: Mohamed Morsi, Abdel Moneim Aboul Fotouh and Mohammad Salim Al-Awa.

experience), the share of Muslims to district's population and the share of Christians to district's population. Labor market controls include the share of public sector employment, the unemployment rate and female labor force participation. Poverty measures include the share of households with electricity access and the share of households not connected to sewage disposal system. Educational controls include the share of a district's population above 10 years of age with university education and the share of illiterates in the district's population aged 10 years and above. Telecommunications controls include the share of households with internet access, the share of households with computer availability and the share of households with cell phone availability, in percent. β_g are the governorate fixed effects. Standard errors are clustered at the governorate level to allow for arbitrary within-governorate correlation.

It is important to note that there is no information on wages or household income in the Census data. However, the two poverty proxies vary within urban districts and even within Cairo itself and particularly, the share of households not connected to sewage disposal system is a variable with significant variation. The share of households with electricity access within urban districts varies between 53% and 100%. Districts that belong to the lowest 1% in terms of electricity access have only 53% of the households with electricity access. Districts that belong to the lowest 5%, 10% in terms of electricity access have 93% and 98% of the households with electricity access. As for the share of households not connected to sewage disposal system, it ranges between 0.1% and 97% within urban districts. While on average the share of households in urban districts with electricity access is 98% (standard deviation is equal to 0.056), the mean percentage of household not connected to sewage disposal system is equal to 24% and with higher variance (standard deviation is equal to 0.337). Districts that belong to the highest 10%, 25% of the distribution have 93% and 46% of households not connected to a sewage disposal system, respectively. Even within Cairo, the majority of the districts have almost 100% of households with electricity access (although districts that belong to lowest 1% of the distribution have only 98% of households with electricity access). However, in terms of connection to sewage disposal system, even within Cairo, there is significant variation. The share of households not connected to sewage disposal system within Cairo ranges between 0.1% and 16%.

5. Results and robustness checks

5.1 Did the protests lead to change?

Early evidence provided in Table 3 that features the shares of votes for the former regime candidates for districts belonging to the highest decile in terms of protests intensity, as measured by the number of "martyrs" per 1000 inhabitants suggests that these districts exhibited higher than average shares of votes for the former regime figures, both during the first and second rounds of the 2012 Presidential elections. While the average shares of votes for former regime candidates in the first and second rounds for the full sample are 34% and 46%, respectively, for districts belonging to the highest decile of protests intensity, the average shares of votes for former regime candidates are found to 39% and 57% respectively.

Interestingly, the district *Kasr Al-Nil* in Cairo, where Tahrir Square is located, with the highest share of fatalities to population size and with the highest absolute number of fatalities geocoded, the shares of votes for the former regime candidates goes to 57% in the first round and 75% in the second round. Similarly, *Abdeen* located in Cairo and very close to Tahrir Square, the second highest in terms of fatalities to district's population, exhibits very high shares of votes for former regime figures both during the first and second rounds of elections, 43% and 66% respectively.

I turn to test formally the effects of the protests on districts' voting. Table 4 presents the district level estimates of the effect of the protests on voting outcomes, for the first round of the Egyptian presidential elections, while controlling for governorate time-invariant characteristics and district-level predetermined covariates derived from the 2006 Egypt Census. Results suggest that an increase in the share of "martyrs" to a district's population significantly increases the share of votes cast to former regime candidates and significantly decreases the share of votes for Islamist candidates during the first round, while not significantly affecting the share of votes for independent candidates. One percentage point increase in the share of "martyrs" to a district's population increases the share of votes cast to former regime candidates by about 11 percentage points while decreasing the share of votes cast for Islamist candidates by around 9 percentage points. Evaluating the effects using a standard deviation increase in the share of "martyrs", 0.1 percentage point, leads to an increase in the share of votes to former regime candidates by 1.1 percentage points and a decrease in the share of votes for Islamist candidates by 0.9 percentage point or approximately, an increase of 3% and 2% from a sample mean of 0.345 and 0.453, respectively.[5] These results are substantial, knowing that a district like *Kasr Al-Nil* in Cairo had a share of "martyrs" of 1%, as 122 deaths were geocoded in this neighborhood. *Abdeen* in Cairo also witnessed a share of "martyrs" of 0.2%, as 92 fatalities were also localized. *Al-Manshiyah* in Alexandria and *Bur Fuad 1* in Port-Said had each a share of "martyrs" of 0.1%, as 28 and 73 fatalities were geocoded in these districts, respectively. Unsurprisingly, a higher district-level share of Christians led to a significantly higher share of votes for former regime candidates at the expense of the independent candidates.

When facing a dichotomous choice of voting to either an Islamist candidate, Mohamed Morsi or a former regime candidate, Ahmed Shafik, during the second round of the elections, districts that were exposed to a higher protests' intensity also had a higher share of votes for Ahmed Shafik. In Table 5, regression results are reported for the second round of Presidential elections. An increase in the share of "martyrs" by 0.1 percentage point leads to an increase in the share of votes for Ahmed Shafik, by 0.9 percentage point, equivalent to an increase of 2% from a sample mean of 0.464. Interestingly, when confronted to a former regime candidate and an Islamist candidate during the second round, a higher share of "martyrs" also significantly increased the share of spoilt or invalid votes, which could be intentional spoiling. This is in line with the descriptive statistics provided in Section 3.2. The voters are

[5] In Table A7 in the Appendix, I examine the effects of exposure to protests' intensity on the distribution of votes among the Islamist candidates in the first round. Results suggest that the protests have significantly reduced the share of votes cast for both Abdel Monein Aboul Fotouh and Mohamed Morsi, while it didn't significantly affect the share of votes for Mohamed Salim Al-Awa (who only had 1% of the total votes in the first round).

intentionally expressing their protest or disapproval against the candidates standing in the elections, by invalidating their votes. An increase in the share of "martyrs" by 0.1 percentage point leads to an increase in the share of spoilt votes by 0.05 percentage point, approximately a 3% increase from a sample mean of 0.017. It is also important to note the substantial increase in the share of spoilt votes between the first and the second rounds of the elections as presented in Table 1: the share of spoilt votes increased by 75%, from 0.8% during the first round to 1.4% in the second round for districts exposed to below median protests' intensity and by even, 171% from 0.7% in the first round to 1.9% in the second round in districts exposed to the most intense protests. This suggests more than an accidental spoilt voting.

In Table 7, I investigate the non-linear relationship between the exposure to protests' intensity and elections' outcomes. The "martyrs" variable in Table 7 being standardized, a standard deviation increase in the number of "martyrs" increases the share of votes for former regime candidates by 11% from a sample mean of 0.345, by reducing the shares of votes for both the independent and Islamist candidates in the first round. In the second round, an increase in the share of "martyrs" by one standard deviation, reduces the share of votes for the Islamist candidate Mohamed Morsi (in favor of the former regime candidate, Ahmed Shafik), by 7% from a sample mean of 0.537. In line with previous findings, I also find suggestive evidence that the protests have significantly increased the share of spoilt or invalid votes during the second round by 12%, evaluated at sample mean. Interestingly, the results also suggest that there is a non-linear relationship between exposure to protests' intensity and voting outcomes in the 2012 Egypt's elections. As the number of "martyrs" increases beyond a certain threshold, the share of votes for the former regime candidates declines in favor of the independent candidates in the first round and in favor of the Islamist candidate Mohamed Morsi in the second round. The turning point is found to be approximately 10 "martyrs" per 1000 inhabitants.[6]

5.2 Robustness checks

In this section, a bunch of robustness checks were performed. First, I checked the robustness of the main findings with respect to the covariates included in the regression specification. In Table 8 and Table 9, I present the results for the first and second rounds of the Presidential elections respectively, including the pre-revolution district covariates gradually, one set of covariates at a time and including all the covariates simultaneously as in our preferred specification summarized in Table 6.

As presented earlier, all the covariates are derived from Egypt Population, Housing and Establishments Census 2006 and all the regressions include governorate fixed effects to capture any time-invariant differences between the Egyptian governorates and standard errors are also clustered at the same geographical level. In specification (1), I only include demographic controls. In specification (2), educational control variables are additionally

[6] The turning point is equal to (the linear term/2*the squared term)*(-1)= 9.75 in column (2) and 9 in column (4). Given that this is a standardized variable and that the standard deviation is equal to 0.001. Based on a turning point of 9.75, the non-standardized number of martyrs per district's population is equal to approximately 0.010 (10 per 1000 inhabitants).

included, along with the demographic controls. In specification (3), regressions also include a set of poverty measures, in addition to all the control variables included in (2). In specification (4), I additionally include a set of labor market controls, along with the previously included controls: demographic, educational, poverty controls. Specification (5) is our benchmark specification that includes a full-set of pre-determined districts' controls: demographic, educational, poverty, labor market and telecommunication controls. Our results are consistently robust to the different regression specifications, for both the first and second rounds of Presidential elections. The magnitude of the coefficients is also very stable.[7]

Second, I checked the robustness of the findings to scaling in logarithm the main variable of interest, martyrs as a % of population in Table 10, Panel A. In line with the benchmark specification, a higher share of martyrs to a district's population significantly increased the share of votes for former regime candidates during the first and second rounds of the Presidential elections at the expense of the Islamist candidates. Simultaneously, a higher share of "martyrs" significantly increased the share of spoilt votes during the second round, when confronted to either voting for a former regime or an Islamist candidate.

Additional robustness checks were performed to make sure that outliers in terms of population density do not drive my results. In Table 11, we eliminate outliers in terms of population density, by dropping districts that belong to either the 1st decile of population density (Panel A) or those that belong to the 10th decile of population density (Panel B) or by eliminating simultaneously districts that belong to the lowest or the highest deciles in population density (Panel C). Coefficient estimates remain very stable in magnitude and the main findings highlighted earlier remain unchanged with respect to the different checks.

In Table 10, Panel B, I also checked the robustness of the results to the elimination of the five frontier governorates: Red Sea, New Valley, Matruh, North Sinai and South Sinai. According to Minnesota Population Center (2011), in 2006 no more than 2% of the Egyptian population lived in these border governorates. The main findings of the paper are also robust to eliminating these five frontier governorates.

To check the robustness of the findings with respect to spatial correlation, following Conley (1999), standard errors corrected for spatial dependence are reported in Table A1 in the Online Appendix. This technique allows for spatial dependence in each spatial dimension (longitude and latitude) to decline in distance between districts' centroids and is equal to zero beyond a maximum distance. Several maximum distances were used for computing the standard errors (the greater the maximum distance, the lower the standard errors). Given the geographical extension of the Egyptian territory, the maximum cutoff points used are 1, 3, 5 and 7 degrees. Standard errors are found to be even lower than the governorate-level clustered standard errors and the results are robust to assuming spatial correlation between districts centroids that declines in distance and is equal zero beyond these cutoff thresholds.

[7] Results were also robust to using a flexible covariates specification following Madestam, Shoag, Veuger and Yanagizawa-Droit (2013), where for each covariate is split into its 9 decile dummies according to the covariate's distribution (one decile being the reference category).

To account for potential spillover between Egyptian districts, as a robustness check, each district is attributed the number of "martyrs" in that district as well as the number of fatalities that occurred in its neighboring districts, sharing a common border in Table A2 in the Online Appendix. The main variable of interest thus becomes the number of martyrs in a specific district and in the neighboring ones normalized by districts' population. Results are also robust to accounting for spillover effects between districts.

Finally in Table A3 in the Online Appendix, I also proceed by eliminating one governorate at a time in order to ensure that my results are not driven by a particular governorate. The results remain robust in terms of both significance and magnitude, with respect to these additional checks. [8] In the Appendix Table A6, I also report results for Cairo only. In line with the main findings in Section 5.1, we find that a higher exposure to protests' intensity leads to a higher share of votes for former regime candidates both during the first and second rounds and also to a significant increase in the share of spoilt votes. Contrasting results on Cairo versus all the other governorates (Table A3, second row), the magnitude of the estimated coefficients for Cairo is greater in terms of magnitude compared to the other governorates. Evaluating the effects in Cairo at sample means, a standard deviation increase in the share of "martyrs" leads to an increase in the share of votes for former regime candidates in the first round by 3.6% and a reduction in the share of votes for Mohamed Morsi (in favor of Ahmed Shafik, the former regime candidate) by 3.3% as well as an increase in the share of spoilt votes in the second round by 4.6%. [9]

With respect to the empirical strategy, I also estimated a conditional mixed process model following Roodman (2011) that fits a simultaneous equation model and allows the error terms of the interrelated equations to be correlated through a multidimensional distribution. In Table A4 in the Appendix, for the first round, I estimated simultaneously the share of votes for independent candidates, former candidates and the share of spoilt votes and for the second round, the share of votes for the former candidate and the share of spoilt votes were estimated simultaneously. Taking into account the potential correlation between the errors terms of the separate equations, results are robust and are in line with the main findings described in Section 5.1.[10]

In the Appendix Table A5, I opt for a different identification strategy through internal migrants. In the Census data, information is available on the current district of residence of an individual as well as his governorate of birth. Hence, one can easily compute the share of internal migrants in a particular district as the share of individuals who were born in a

[8] It is important to note that when eliminating the Matruh governorate, this results in substantial changes in the estimated coefficients (a substantial increase in the share of votes for the former regime candidates in the first and second rounds). This is because Matruh governorate is the greatest supporter for the Muslim brotherhood and Islamist candidates, in the first round the share of votes for the Islamist candidates was to 82% and in the second round, 88% (highest rates among all governorates).

[9] In unreported regressions, I have also examined the heterogeneity of the effects in urban versus rural districts. Results are significant only for urban districts. However, the insignificant results for rural districts are not due to differential treatment effects but because there is not enough variability in the rural sample (the intensity of the protests as measured by the number of "martyrs" in rural areas is almost zero as well as its standard deviation).

[10] In this setting, I am also able to test for cross-equation restrictions; I test whether the variables "martyrs" across all equations (within the two models) are jointly significant. Indeed the "martyrs" variables are jointly significant in Panels A and B.

governorate to which the current district of residence does not belong. The idea here is that internal migrants can spread information from parents and friends living in their governorate of origin. Hence, one can compute the intensity of the protests in a particular district as the weighted average of protests' intensity of internal migrants' governorate of origin. As long as the distribution of internal migrants in one district is orthogonal to district-level unobservables, one could rely on this variable to achieve identification.[11] I report results in Table A5 in the Appendix, in line with the results presented in Section 5.1, I find that a higher exposure to the protests, using the weighted average of protests' intensity in internal migrants' governorates of birth, increases the share of votes for former regime figures both during the first and second rounds of the 2012 presidential elections.

6. Concluding remarks

Did the January 2011 Egyptian protests lead to political change? In this paper, I studied the effects of the January 2011 uprising on Egypt's first free Presidential elections that took place in May and June 2012. Relying on unique information from the Statistical Database of the Egyptian Revolution, I geocoded each "martyr" – demonstrators who died during the uprisings – based on the site of death to exploit the geographical variation in districts' exposure to protests intensity. Combined with official elections results from the Supreme Presidential Electoral Commission (SPEC) and Egypt Census data to control for a wide range of districts' pre-revolution characteristics, I find suggestive evidence that higher exposure to protests' intensity leads to a higher share of votes for former regime candidates, both during the first and second round of Egypt's first free presidential elections. Despite the expectations that the popular protests would increase public support for radical social change, the results suggest that the share of votes for candidates associated with the former regime actually increased in the districts where the demonstrations were most intense. This conservative backlash was fueled by a wave of pessimism and general dissatisfaction that overtook the popular mood in Egypt during the transitional period following the revolution. The protests negatively affected individuals' satisfaction with government performance, including trust in state institutions and public agencies, economic expectations, and perceptions on personal and civil liberties.

[11] This variable could be denoted as x_i and is equal to $x_k = \sum_{i \neq g(k)} w_{ik}^{2006} \, p_i$, where let w_{ik}^{2006} represent the share of individuals born in governorate *i* and residing in district *k* at the time of the census, given that *k* does not belong to governorate *I*, this is the share of internal migrants. p_i is the measure of protest intensity in governorate *i*, which is the governorate of birth of the internal migrants. Since the source of variation is the governorate, these regressions do not include governorate fixed effects to capture this variation in protests' intensity at the governorate level.

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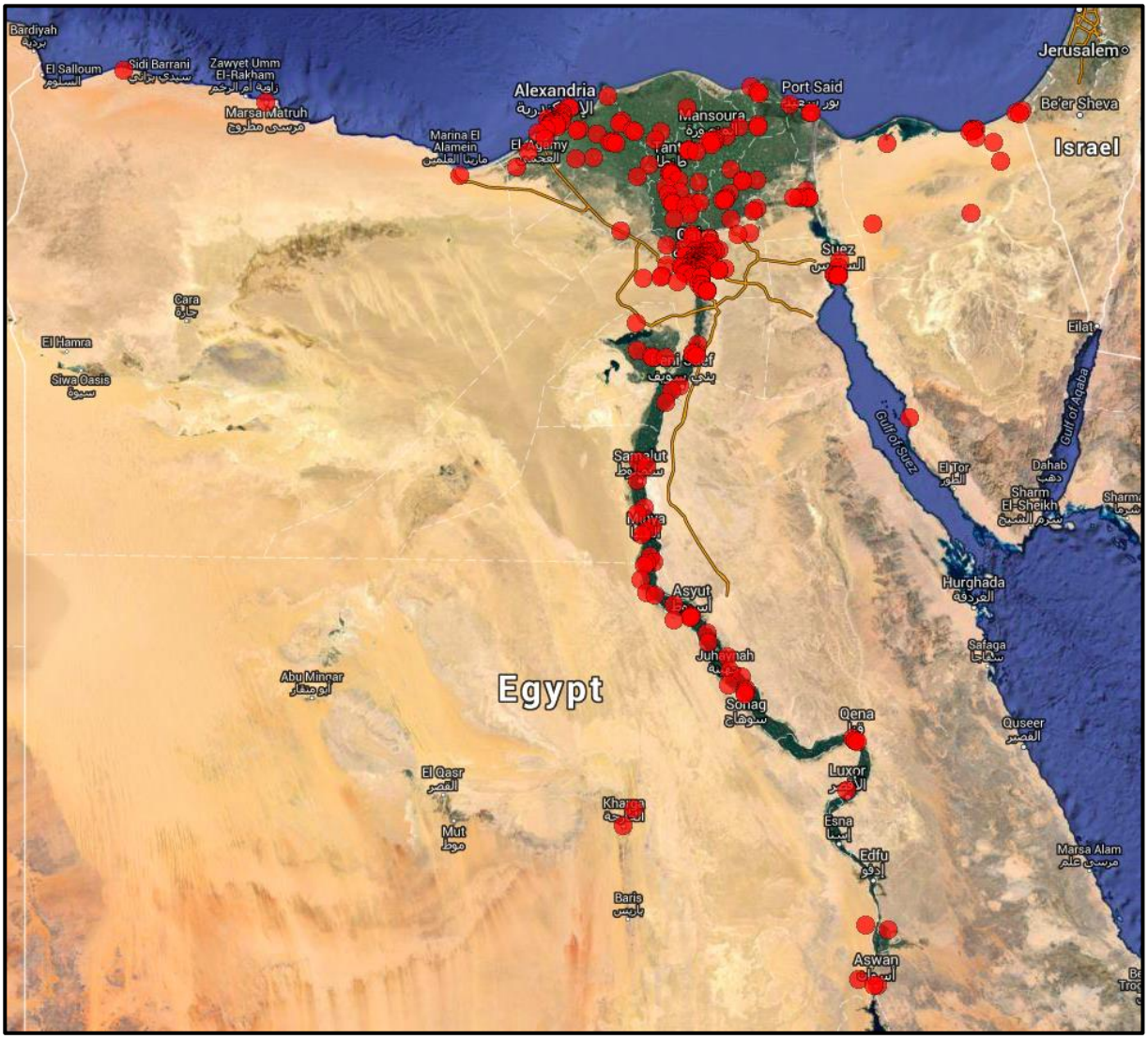

Figure 1. Geocoding the "martyrs".

Notes: The "martyrs" from the 25th of January 2011, till the end of June 2012 are geocoded based on the site of death. Each circle represents a location. Each location corresponds to either one incidence of death or several incidences of death. Identified locations are concentrated along the Nile Valley as the five border governorates: Matruh, New Valley, Red Sea, North Sinai and South Sinai, contain no more than 2% of the Egyptian population in 2006 (Minnesota Population Center, 2015). Sources: Google maps and Statistical Database of the Egyptian Revolution.

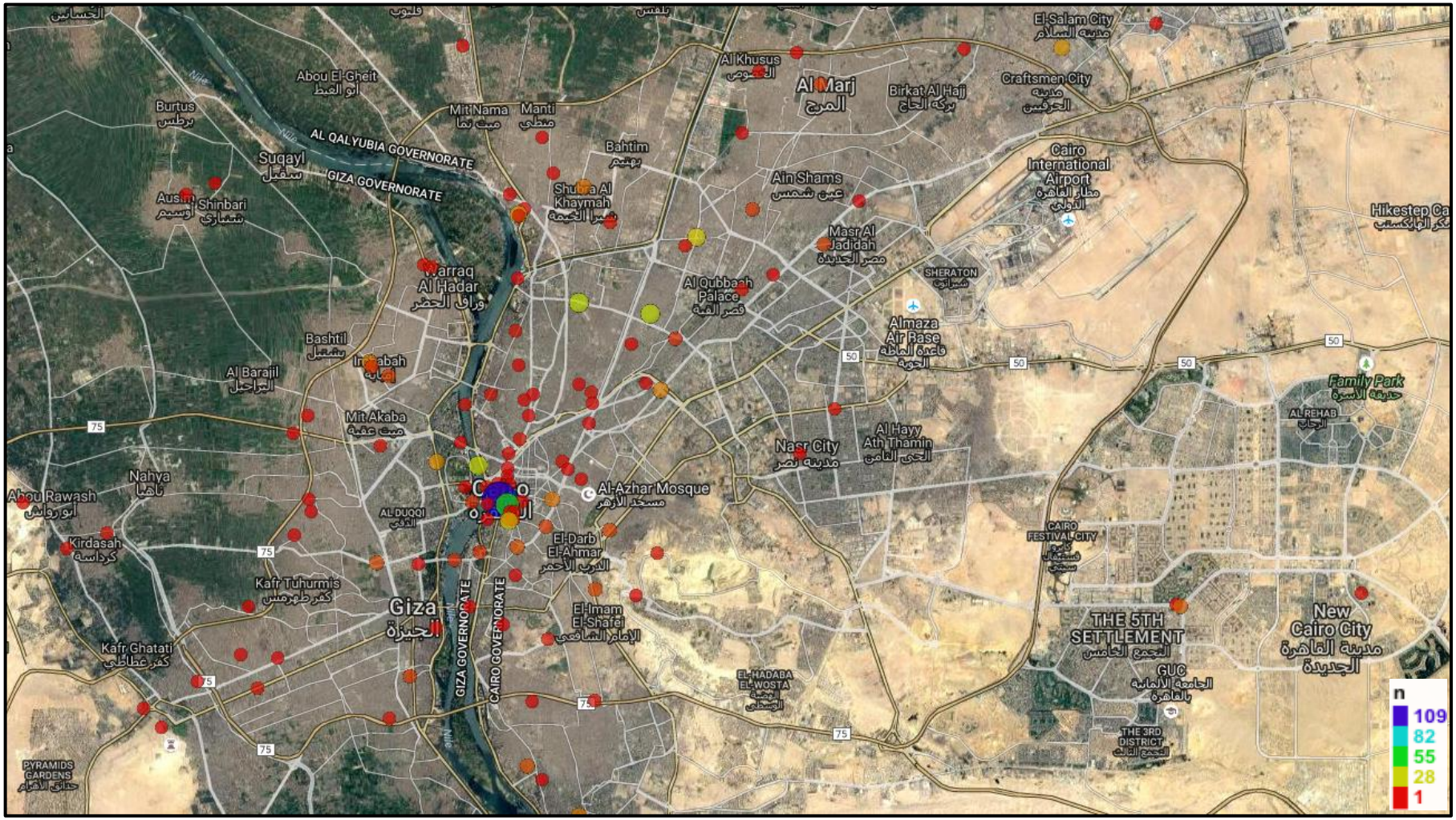

Figure 2. Geocoding the "martyrs" in Cairo and its neighboring districts.

Notes: The "martyrs" from the 25th of January 2011, till the end of June 2012 are geocoded based on the site of death. Each circle represents one location. Circles are differentiated by color, according to the number of deaths that occurred in each location. The location with the highest number of death incidences in Cairo is Tahrir Square (the blue dot). Sources: Google Maps and the Statistical Database of the Egyptian Revolution.

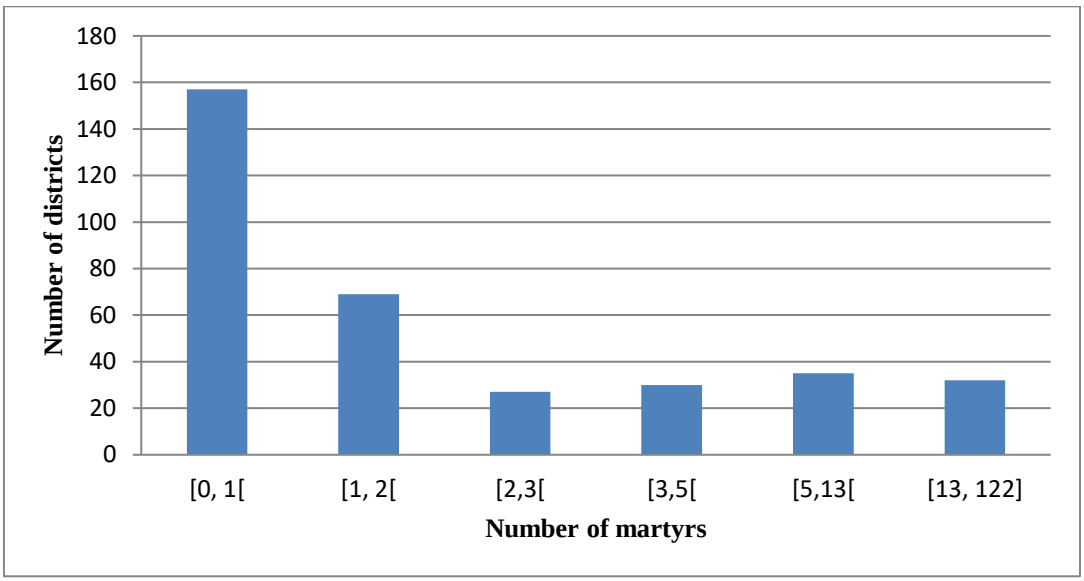

Figure 3. Distribution of the number of "martyrs" per districts.

Notes: The "martyrs" refer to the number of fatalities from the 25th of January 2011, till the end of June 2012 and is represented on the X-axis. On the Y-axis, the number of districts with the corresponding number of "martyrs" is reported.

Table 1: District-level summary statistics for elections outcomes, by exposure to protests

	Below median		Above median		
	(1)	(2)	(3)	(4)	(5)
	Mean	St. Dev.	Mean	St. Dev.	Difference
Panel A: Elections' outcomes					
First round of the 2012 Presidential elections					
Share of votes for independent candidates	0.183	0.141	0.223	0.122	-0.041***
Share of votes for former regime candidates	0.344	0.124	0.343	0.098	0.001
Share of votes for Islamist candidates	0.473	0.151	0.434	0.148	0.039**
Voter turnout	0.436	0.157	0.501	0.152	-0.064***
Share of spoilt votes	0.008	0.004	0.007	0.004	0.000
Second round of the 2012 Presidential elections					
Share of votes for Islamist candidate	0.548	0.149	0.525	0.136	0.024
Share of votes for former regime candidate	0.452	0.149	0.475	0.136	-0.024
Voter turnout	0.491	0.105	0.528	0.083	-0.038***
Share of spoilt votes	0.014	0.007	0.019	0.008	-0.004***

*** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Districts are divided into below and above median exposure to violent protests, according to the number of "martyrs" per district number of inhabitants. The median number of martyrs per 1000 inhabitants is equal to 0.003. Elections results for the first and second rounds of the 2012 first Presidential elections are collected from the Supreme Presidential Electoral Commission (SPEC) website. The shares of votes for independent, former regime and Islamist candidates are computed as the number of votes cast for the candidates divided by the district's number of valid votes. For the first round of Presidential elections, candidates are classified as independent, former regime or Islamist candidates. Independent candidates include: Hamdeen Sabahi, Khaled Ali, Hisham Bastawisy, Abu Al-Izz Al-Hariri and Mahmoud Houssam. Former regime candidates include: Mohamed Fawzi, Amr Moussa, Ahmed Shafik, Houssam Khairallah and Abdullah Alashaal. Islamists candidates include: Mohamed Morsi, Abdel Moneim Aboul Fotouh and Mohammad Salim Al-Awa. Voter turnout is equal to the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. Share of spoilt votes is equal to the number of invalid votes cast divided by the number of registered voters per district. For the second round, the Islamist candidate was Mohamed Morsi and the former regime candidate was Ahmed Shafik. Column (5) is a t-test for whether the difference between the mean of the two groups of districts is statistically significant.

Table 2: District-level summary statistics for predetermined controls, by exposure to protests

	Below median		Above median		
	(1)	(2)	(3)	(4)	(5)
	Mean	St. Dev.	Mean	St. Dev.	Difference
Demographic controls					
Log of population	11.700	1.373	11.970	1.162	-0.271**
Log of population density	6.481	2.314	8.200	2.360	-1.718***
% of population 0-35 years of age	0.731	0.044	0.698	0.068	0.033***
% of population 36-above years of age	0.269	0.044	0.302	0.068	-0.033***
Share of immigrants (% of population)	0.008	0.036	0.006	0.018	0.002
Share of emigrants (% of population)	0.110	0.174	0.132	0.159	-0.022
Share of Muslims (% of population)	0.959	0.058	0.938	0.069	0.020***
Share of Christians (% of population)	0.040	0.056	0.062	0.069	-0.021***
Labor market controls					
Share of public sector employment	0.235	0.117	0.281	0.127	-0.046***
Unemployment rate	0.087	0.044	0.101	0.038	-0.012***
Female labor force participation	0.171	0.105	0.202	0.085	-0.031***
Poverty measures					
Share of households with electricity access	0.970	0.074	0.982	0.065	-0.012
Share of households not connected to sewage disposal system	0.583	0.358	0.312	0.365	0.271***
Educational controls					
University education rate	0.084	0.077	0.132	0.099	-0.048***
Illiteracy rate	0.309	0.116	0.244	0.105	0.065***
Telecommunications controls					
Share of households with Internet access	0.019	0.042	0.039	0.055	-0.019***
Share of households with computer availability	0.060	0.088	0.117	0.113	-0.057***
Share of households with cell phone availability	0.756	0.172	0.662	0.163	0.094***

*** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Districts are divided into below and above median exposure to violent protests, according to the number of "martyrs" per district number of inhabitants. The median number of martyrs per 1000 inhabitants is equal to 0.003. Predetermined controls are derived from the Egypt Population, Housing and Establishments Census 2006, collected by the Central Agency for Public Mobilization and Statistics (CAPMAS). Demographic controls include: the logarithm of a district's population size, population density (number of inhabitants/km^2), the share of a district's population aged less than 36 years old, the share of a district's population aged more than 35 years old, the share of immigrants to district's population, the share of emigrants to district's population (those with overseas migration experience), the share of Muslims to district's population and the share of Christians to district's population. Labor market controls include the share of public sector employment, the unemployment rate and female labor force participation. Poverty measures include the share of households with electricity access and the share of households not connected to sewage disposal system. Educational controls include the share of a district's population above 10 years of age with university education and the share of illiterates in the district's population aged 10 years and above. Telecommunications controls include the share of households with internet access, the share of households with computer availability and the share of households with cell phone availability, in percent. Column (5) is a t-test for whether the difference between the mean of the two groups of districts is statistically significant.

Table 3: The share of votes for former regime candidates in the 2012 Presidential elections, for the highest decile in terms of protests intensity

Governorate	District	Former first round	Former second round	Martyrs per 1000 inhabitants
Cairo	Al-Azbakiyah	0.557	0.734	0.071
Gharbia	Tanta 2	0.393	0.640	0.075
Cairo	Shubra	0.630	0.780	0.084
Beheira	Markaz Wadi Al-Natrun	0.343	0.454	0.097
Giza	Imbabah	0.340	0.529	0.104
Cairo	Al-Amiriyah	0.317	0.501	0.105
Cairo	Al-Zawiyah Al-Hamra	0.389	0.562	0.105
Sharqia	Al-Salhiyah Al-Jadidah	0.289	0.440	0.106
Beni Suef	Beni Suef Al-Jadidah	0.327	0.440	0.112
Monufia	Shibin Al-Kawm	0.466	0.660	0.113
Fayoum	Markaz Al-Fayoum	0.169	0.221	0.134
Cairo	Hadaiq Al-Qubbah	0.376	0.564	0.141
Cairo	Al-Waili	0.409	0.628	0.206
Cairo	Al-Maadi	0.325	0.516	0.218
Alexandria	Al-Atarin	0.369	0.559	0.271
Cairo	Al-Sayidah Zaynab	0.398	0.636	0.295
Cairo	Al-Darb Al-Ahmar	0.408	0.647	0.314
Ismailia	Ismailia 1	0.356	0.545	0.376
Cairo	Bulaq	0.437	0.620	0.496
Suez	Al-Suways	0.349	0.471	0.517
Port-Said	Bur Fuad 1	0.287	0.502	1.100
Alexandria	Al-Manshiyah	0.360	0.572	1.186
Cairo	Abdeen	0.428	0.656	2.179
Cairo	Kasr Al-Nil	0.568	0.753	12.157
Mean of highest decile		0.387	0.568	0.857
Mean of full sample		0.344	0.464	0.0001

Notes. The unit of analysis is the district. The shares of votes for former regime candidates are computed as the number of votes cast for the candidates divided by the district's number of valid votes, both during the first and second rounds of the 2012 Presidential elections. Districts featured in this table are those who belong to the highest decile in terms of protests intensity (the number of "martyrs" per 1000 inhabitants), excluding the five frontier governorates. At the bottom of the table, means are reported for the subsample of districts belonging to the highest decile of protests intensity and for the full sample of districts.

Table 4: Estimating the effect of exposure to protests, First round of Presidential elections

VARIABLES	(1) Independent	(2) Former	(3) Islamist	(4) Turnout	(5) Spoilt
Martyrs, % of population	-1.425	10.593***	-9.167***	-4.381	0.079
	[2.915]	[3.590]	[2.126]	[2.751]	[0.090]
Cell-phone availability	-0.190***	0.091	0.099	-0.192**	0.004
	[0.053]	[0.137]	[0.148]	[0.088]	[0.003]
Computer availability	0.204	-0.274	0.070	-0.072	-0.009
	[0.202]	[0.360]	[0.365]	[0.410]	[0.008]
Internet access	-0.416*	0.142	0.274	-0.607**	0.002
	[0.216]	[0.425]	[0.521]	[0.287]	[0.011]
Unemployment rate	0.178	0.009	-0.187	0.146	-0.002
	[0.141]	[0.128]	[0.195]	[0.152]	[0.005]
Female labor force participation	0.070	-0.033	-0.037	0.079	0.001
	[0.060]	[0.118]	[0.124]	[0.096]	[0.004]
Public sector employment	-0.140*	0.036	0.104	-0.008	-0.003
	[0.080]	[0.062]	[0.083]	[0.101]	[0.003]
Electricity access	-0.035	0.057	-0.022	0.248*	0.003
	[0.052]	[0.107]	[0.084]	[0.135]	[0.003]
No sewage disposal system	-0.038	0.000	0.037	-0.100*	-0.001
	[0.026]	[0.021]	[0.027]	[0.058]	[0.002]
University education	-0.231	0.340	-0.109	0.701	0.006
	[0.199]	[0.202]	[0.219]	[0.564]	[0.014]
Illiteracy rate	-0.173*	0.124	0.049	-0.041	0.004
	[0.087]	[0.174]	[0.224]	[0.225]	[0.006]
Population less than 35 years old	-0.482**	-0.566***	1.048***	0.362	-0.009
	[0.191]	[0.161]	[0.265]	[0.264]	[0.007]
Immigrants' share	0.193*	-0.286	0.092	-0.409*	-0.011*
	[0.111]	[0.266]	[0.237]	[0.227]	[0.006]
Christians' share	-0.362***	0.502***	-0.140	-0.021	-0.005
	[0.089]	[0.078]	[0.122]	[0.114]	[0.003]
Emigrants' share	-0.017	-0.020	0.038	-0.070	0.001
	[0.036]	[0.062]	[0.069]	[0.088]	[0.002]
Log of population	-0.002	0.009	-0.007	-0.022*	0.000
	[0.004]	[0.006]	[0.007]	[0.012]	[0.000]
Log of population density	0.008**	-0.000	-0.008	-0.008	-0.000
	[0.004]	[0.007]	[0.008]	[0.005]	[0.000]
Observations	349	349	349	349	349
R-squared	0.895	0.695	0.788	0.547	0.422
Governorate FE	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27
Dependent variable mean	0.203	0.345	0.453	0.468	0.008

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variable in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (4) is the voter turnout and is equal to the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variable in column (5) is the share of spoilt votes and is equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

Table 5: Estimating the effect of exposure to protests, Second round of Presidential elections

VARIABLES	(1) Islamist	(2) Former	(3) Turnout	(4) Spoilt
Martyrs, % of population	-8.588**	8.660**	-2.795	0.502***
	[3.926]	[3.928]	[1.791]	[0.169]
Cell-phone availability	-0.015	0.011	0.004	-0.003
	[0.164]	[0.164]	[0.050]	[0.006]
Computer availability	0.436	-0.427	-0.071	0.056**
	[0.419]	[0.418]	[0.220]	[0.023]
Internet access	0.058	-0.055	-0.330	-0.095**
	[0.562]	[0.559]	[0.195]	[0.045]
Unemployment rate	-0.050	0.034	0.013	-0.002
	[0.180]	[0.179]	[0.100]	[0.009]
Female labor force participation	-0.047	0.053	0.066	-0.000
	[0.163]	[0.163]	[0.058]	[0.006]
Public sector employment	-0.005	0.018	0.083	0.001
	[0.086]	[0.086]	[0.071]	[0.006]
Electricity access	-0.086	0.092	0.303**	0.009**
	[0.120]	[0.120]	[0.117]	[0.004]
No sewage disposal system	0.035	-0.036	-0.035**	-0.004**
	[0.024]	[0.024]	[0.015]	[0.002]
University education	-0.619**	0.599**	0.462*	0.059***
	[0.224]	[0.224]	[0.261]	[0.020]
Illiteracy rate	-0.128	0.142	-0.165	0.020**
	[0.247]	[0.246]	[0.105]	[0.009]
Population less than 35 years old	0.805***	-0.813***	0.462***	0.005
	[0.251]	[0.250]	[0.163]	[0.019]
Immigrants' share	0.197	-0.215	-0.373**	-0.004
	[0.275]	[0.276]	[0.137]	[0.012]
Christians' share	-0.355***	0.351***	0.231***	-0.014
	[0.122]	[0.122]	[0.046]	[0.012]
Emigrants' share	0.041	-0.037	-0.025	-0.004
	[0.082]	[0.082]	[0.049]	[0.003]
Log of population	-0.007	0.008	-0.011	-0.000
	[0.008]	[0.008]	[0.007]	[0.000]
Log of population density	-0.005	0.005	-0.008**	-0.000
	[0.009]	[0.009]	[0.003]	[0.000]
Observations	349	349	349	349
R-squared	0.744	0.744	0.778	0.733
Governorate FE	YES	YES	YES	YES
Number of clusters	27	27	27	27
Dependent variable mean	0.537	0.464	0.510	0.017

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variable in column (1), column (2) are the shares of votes for Islamist and former regime candidates, Mohamed Morsi and Ahmed Shafik respectively, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variable in column (3) is the voter turnout and is equal to the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variable in column (4) is the share of spoilt votes and is equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

Table 6: Summarizing the effects of exposure to protests on elections' outcomes

	(1)	(2)	(3)	(4)	(5)
		First round			*Second round*
VARIABLES	Independent	Former	Islamist	Islamist	Spoilt
Martyrs, % of population	-1.425	10.593***	-9.167***	-8.588**	0.502***
	[2.915]	[3.590]	[2.126]	[3.926]	[0.169]
Observations	349	349	349	349	349
R-squared	0.895	0.695	0.788	0.744	0.733
Predetermined district controls	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27
Dependent variable mean	0.203	0.345	0.453	0.537	0.017

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variable in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (4) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variable in column (5) is the share of spoilt votes for the second round of the 2012 Presidential elections and is equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

Table 7: Investigating non-linearity in exposure to protests on elections' outcomes

	(1)	(2)	(3)	(4)	(5)
		First round		*Second round*	
VARIABLES	Independent	Former	Islamist	Islamist	Spoilt
Martyrs, % of population	-0.020***	0.039***	-0.020***	-0.036***	0.002**
	[0.006]	[0.006]	[0.005]	[0.007]	[0.001]
Martyrs, % of population, squared	0.001***	-0.002***	0.001	0.002***	-0.000
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]
Observations	349	349	349	349	349
R-squared	0.895	0.697	0.789	0.746	0.734
Predetermined district controls	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27
Dependent variable mean	0.203	0.345	0.453	0.537	0.017

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variable in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (4) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variable in column (5) is the share of spoilt votes for the second round of the 2012 Presidential elections and is equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs" and its squared term, expressed a % of district's population, standardized. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

Table 8: First round presidential elections, sensitivity checks to covariates' inclusion

	(1)		(2)		(3)		(4)		(5)	
VARIABLES	Former	Islamist	Former	Islamist	Former	Islamist	Former	Islamist	Former	Islamist
Martyrs, % of population	10.648***	-8.692***	10.924***	-8.525***	10.607***	-8.757***	10.491***	-8.881***	10.593***	-9.167***
	[3.829]	[1.927]	[3.730]	[2.068]	[3.717]	[2.009]	[3.657]	[2.082]	[3.590]	[2.126]
Observations	349	349	349	349	349	349	349	349	349	349
R-squared	0.685	0.781	0.689	0.783	0.690	0.785	0.691	0.787	0.695	0.788
Demographic controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Education controls			YES	YES	YES	YES	YES	YES	YES	YES
Poverty controls					YES	YES	YES	YES	YES	YES
Labor market controls							YES	YES	YES	YES
Telecommunications controls									YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27	27	27	27	27	27
Dependent variable mean	0.345	0.453	0.345	0.453	0.345	0.453	0.345	0.453	0.345	0.453

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variables are the shares of votes for former regime and Islamist candidates, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The main variable of interest is the number of "martyrs", expressed a % of district's population. In the regressions, we include gradually a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4, as sensitivity checks. In specification (1), only include demographic controls are included. In specification (2), educational control variables are additionally included, along with the demographic controls. In specification (3), regressions also include a set of poverty measures, in addition to the demographic and educational controls. In specification (4), a set of labor market controls is additionally included, along with the previously included controls: demographic, educational, poverty controls. Specification (5) is the preferred specification that includes a full-set of predetermined districts' controls: demographic, educational, poverty, labor market and telecommunication controls. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

Table 9: Second round presidential elections, sensitivity checks to covariates' inclusion

	(1)		(2)		(3)		(4)		(5)	
VARIABLES	Islamist	Spoilt	Islamist	Spoilt	Islamist	Spoilt	Islamist	Spoilt	Islamist	Spoilt
Martyrs, % of population	-8.494**	0.607***	-8.399**	0.487***	-8.223**	0.476***	-8.184**	0.477***	-8.588**	0.502***
	[3.584]	[0.149]	[3.706]	[0.134]	[3.950]	[0.146]	[3.966]	[0.151]	[3.926]	[0.169]
Observations	349	349	349	349	349	349	349	349	349	349
R-squared	0.737	0.618	0.738	0.710	0.740	0.719	0.741	0.720	0.744	0.733
Demographic controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Education controls			YES	YES	YES	YES	YES	YES	YES	YES
Poverty controls					YES	YES	YES	YES	YES	YES
Labor market controls							YES	YES	YES	YES
Telecommunications controls									YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27	27	27	27	27	27
Dependent variable mean	0.537	0.017	0.537	0.017	0.537	0.017	0.537	0.017	0.537	0.017

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variables are the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes and the share of spoilt votes which is equal to the number of invalid votes cast divided by the number of registered voters per district, for the second round of the 2012 Presidential elections. The main variable of interest is the number of "martyrs", expressed a % of district's population. In the regressions, we include gradually a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4, as sensitivity checks. In specification (1), only include demographic controls are included. In specification (2), educational control variables are additionally included, along with the demographic controls. In specification (3), regressions also include a set of poverty measures, in addition to the demographic and educational controls. In specification (4), a set of labor market controls is additionally included, along with the previously included controls: demographic, educational, poverty controls. Specification (5) is the preferred specification that includes a full-set of predetermined districts' controls: demographic, educational, poverty, labor market and telecommunication controls. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

Table 10: Robustness checks, scaling the martyrs in log and eliminating frontier governorates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		First round				*Second round*		
VARIABLES	Independent	Former	Islamist	Turnout	Spoilt	Islamist	Turnout	Spoilt
Panel A: Scaling in log the martyrs, % of population								
Log martyrs, % of population	-1.444	10.692***	-9.248***	-4.419	0.079	-8.670**	-2.821	0.506***
	[2.941]	[3.614]	[2.141]	[2.773]	[0.091]	[3.954]	[1.804]	[0.170]
Observations	349	349	349	349	349	349	349	349
R-squared	0.895	0.695	0.788	0.547	0.422	0.744	0.778	0.733
Panel B: Eliminating the frontier governorates								
Martyrs, % of population	-6.950***	20.671***	-13.721***	-3.958*	-0.027	-20.355***	-3.415**	0.808***
	[1.303]	[1.880]	[1.795]	[1.990]	[0.067]	[2.584]	[1.363]	[0.152]
Observations	311	311	311	311	311	311	311	311
R-squared	0.899	0.735	0.790	0.522	0.452	0.747	0.796	0.721
Predetermined district controls	YES	YES	YES	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27	27	27	27
Dependent variable mean	0.203	0.345	0.453	0.468	0.008	0.537	0.510	0.017

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. In Panel A, the main variable of interest is scaled in log, the number of martyrs per district's population. In Panel B, the 5 frontier governorates: Red Sea, New Valley, Matruh, North Sinai and South Sinai are eliminated. The dependent variables for columns (1) to (5) correspond to voting outcomes for the first round of the 2012 Egyptian Presidential elections. The dependent variables in columns (6) to (8) correspond to voting outcomes during the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (6) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (4) and column (7) correspond to voter turnout and are computed as the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variables in column (5) and column (8) correspond to the share of spoilt votes and are equal to the number of invalid votes cast divided by the number of registered voters per. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

Table 11: Robustness checks, eliminating outliers in terms of population density

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			First round				*Second round*	
VARIABLES	Independent	Former	Islamist	Turnout	Spoilt	Islamist	Turnout	Spoilt
Panel A: Eliminating districts belonging to the 1st decile of population density								
Martyrs, % of population	-7.212***	21.173***	-13.961***	-3.547	-0.033	-20.804***	-3.199**	0.806***
	[1.505]	[2.407]	[2.216]	[2.116]	[0.073]	[3.139]	[1.444]	[0.161]
Observations	314	314	314	314	314	314	314	314
R-squared	0.902	0.738	0.798	0.524	0.457	0.757	0.778	0.729
Panel B: Eliminating districts belonging to the 10th decile of population density								
Martyrs, % of population	-1.744	11.231***	-9.487***	-4.025	0.100	-8.852**	-2.552	0.512***
	[2.778]	[3.724]	[2.566]	[2.933]	[0.092]	[4.210]	[1.969]	[0.179]
Observations	315	315	315	315	315	315	315	315
R-squared	0.894	0.693	0.777	0.542	0.420	0.737	0.781	0.732
Panel C: Eliminating districts belonging to the 1st and 10th deciles of population density								
Martyrs, % of population	-6.678***	20.638***	-13.960***	-3.982*	-0.052	-19.990***	-3.482**	0.780***
	[1.892]	[2.291]	[2.334]	[1.963]	[0.086]	[2.924]	[1.528]	[0.177]
Observations	280	280	280	280	280	280	280	280
R-squared	0.902	0.735	0.788	0.521	0.457	0.751	0.785	0.731
Predetermined district controls	YES	YES	YES	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27	27	27	27
Dependent variable mean	0.203	0.345	0.453	0.468	0.008	0.537	0.510	0.017

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. In Panel A, districts that belong to the 1st decile of population density are eliminated, in Panel B, districts that belong to the 10th decile of population density are eliminated and in Panel C, districts that belong to either the 1st decile or the 10th decile of population density are eliminated. The dependent variables for columns (1) to (5) correspond to voting outcomes for the first round of the 2012 Egyptian Presidential elections. The dependent variables in columns (6) to (8) correspond to voting outcomes during the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (6) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (4) and column (7) correspond to voter turnout and are computed as the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variables in column (5) and column (8) correspond to the share of spoilt votes and are equal to the number of invalid votes cast divided by the number of registered voters per. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

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Table A1: Robustness checks, Conley's standard errors correction for spatial dependence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			First round				*Second round*	
VARIABLES	Independent	Former	Islamist	Turnout	Spoilt	Islamist	Turnout	Spoilt
Martyrs, % of population	-1.425	10.593	-9.167	-4.381	0.079	-8.588	-2.795	0.502
Governorate clustered standard errors	[2.915]	[3.590]***	[2.126]***	[2.751]	[0.090]	[3.926]**	[1.791]	[0.169]***
Spatial dependence <1 degree	[2.487]	[2.905]***	[2.052]***	[2.642]*	[0.079]	[3.198]***	[2.094]	[0.145]***
Spatial dependence <3 degrees	[2.287]	[2.716]***	[1.642]***	[2.624]*	[0.078]	[3.092]***	[2.123]	[0.175]***
Spatial dependence <5 degrees	[1.974]	[2.322]***	[1.524]***	[2.395]*	[0.062]	[2.531]***	[1.886]	[0.163]***
Spatial dependence <7 degrees	[1.822]	[2.060]***	[1.318]***	[2.158]**	[0.049]	[2.176]***	[1.682]	[0.143]***
Observations	349	349	349	349	349	349	349	349
Predetermined district controls	YES	YES	YES	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES
Dependent variable mean	0.203	0.345	0.453	0.468	0.008	0.537	0.510	0.017

Standard errors are reported between brackets. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. In the first row, coefficient estimates using OLS regression are reported. In the second row, governorate clustered standard errors are reported, as in the benchmark specification. In the third to the sixth rows, standard errors are adjusted for spatial dependence following Conley (1999), using different cutoff points: 1 degree, 3 degrees, 5 degrees and 7 degrees. In each spatial dimension (longitude and latitude), spatial dependence declines in distance between districts' centroids and is equal zero beyond a maximum distance (the different cutoff points). The dependent variables for columns (1) to (5) correspond to voting outcomes for the first round of the 2012 Egyptian Presidential elections. The dependent variables in columns (6) to (8) correspond to voting outcomes during the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (6) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (4) and column (7) correspond to voter turnout and are computed as the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variables in column (5) and column (8) correspond to the share of spoilt votes and are equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

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Table A2: Robustness checks, accounting for spillover between districts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		First round				*Second round*		
VARIABLES	Independent	Former	Islamist	Turnout	Spoilt	Islamist	Turnout	Spoilt
Martyrs neighboring districts, % population	-3.385	13.911***	-10.526**	-4.071	-0.087	-13.655***	2.640	0.530*
	[4.028]	[4.646]	[4.378]	[6.748]	[0.162]	[4.173]	[4.821]	[0.288]
Observations	350	350	350	350	350	350	350	350
R-squared	0.895	0.691	0.788	0.547	0.423	0.744	0.777	0.731
Predetermined district controls	YES	YES	YES	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES
Number of clusters	27	27	27	27	27	27	27	27
Dependent variable mean	0.203	0.345	0.453	0.468	0.008	0.537	0.510	0.017

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. A district is attributed the number of martyrs in that district and in its neighboring districts, sharing a common border. The main variable of interest is the number of "martyrs" in specific district and its neighboring districts, expressed a % of these districts' population (expressed in dozens). The dependent variables for columns (1) to (5) correspond to voting outcomes for the first round of the 2012 Egyptian Presidential elections. The dependent variables in columns (6) to (8) correspond to voting outcomes during the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (6) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (4) and column (7) correspond to voter turnout and are computed as the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variables in column (5) and column (8) correspond to the share of spoilt votes and are equal to the number of invalid votes cast divided by the number of registered voters per. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.

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Table A3: Robustness checks, eliminating one governorate at a time

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		First round				*Second round*		
	Indepedent	Former	Islamist	Turnout	Spoilt	Islamist	Turnout	Spoilt
Full sample	-1.425	10.593***	-9.167***	-4.381	0.079	-8.588**	-2.795	0.502***
Cairo	0.613	6.873***	-7.486***	-4.751	0.123	-5.100*	-2.747	0.361*
Alexandria	-1.376	10.996***	-9.619***	-4.470	0.079	-9.014**	-2.849	0.538***
Port-Said	-1.535	10.899***	-9.364***	-4.339	0.074	-8.956**	-2.671	0.482***
Suez	-1.408	10.601***	-9.193***	-4.410	0.078	-8.593**	-2.830	0.503***
Damietta	-1.415	10.681***	-9.265***	-4.693	0.079	-8.701**	-3.074	0.497***
Dakahlia	-1.550	11.048***	-9.498***	-4.887	0.084	-8.697**	-3.223	0.415**
Sharqia	-1.199	9.241***	-8.041***	-4.805	0.080	-6.903*	-3.368*	0.495***
Qalyubia	-1.481	11.222***	-9.741***	-5.713**	0.051	-9.173**	-2.912	0.492***
Kafr El-Sheikh	-1.699	10.724***	-9.026***	-4.308	0.083	-8.518**	-2.718	0.501***
Gharbia	-1.388	10.456***	-9.069***	-4.389	0.080	-8.418**	-2.818	0.504***
Monufia	-1.518	10.527***	-9.009***	-3.395	0.110	-8.611**	-2.842	0.497***
Beheira	-1.330	10.834***	-9.504***	-4.457	0.080	-8.982**	-2.868	0.486***
Ismailia	-1.463	10.613***	-9.151***	-4.395	0.079	-8.640**	-2.787	0.502***
Giza	-1.933	11.008***	-9.075***	-3.898	0.103	-8.657*	-2.712	0.524***
Beni Suef	-1.255	10.752***	-9.497***	-4.099	0.053	-8.872**	-2.623	0.499***
Faiyum	-1.427	10.573***	-9.146***	-4.393	0.079	-8.562**	-2.790	0.499***
Minya	-0.640	10.676***	-10.036***	-2.991	0.030	-9.305**	-1.927	0.503***
Asyut	-1.485	10.577***	-9.093***	-4.449	0.079	-8.487**	-2.841	0.508***
Sohag	-1.253	10.627***	-9.374***	-3.262	0.052	-9.305**	-1.683	0.589***
Qena	-1.482	10.495***	-9.013***	-4.425	0.081	-8.490**	-2.819	0.497***
Aswan	-0.953	10.557***	-9.604***	-4.445	0.113	-8.620**	-3.146*	0.542***
Luxor	-1.489	10.490***	-9.001***	-4.446	0.078	-8.386**	-2.852	0.501***
Red Sea	-1.534	11.326***	-9.792***	-4.323	0.073	-9.259**	-2.714	0.502***
New Valley	-1.264	10.541***	-9.277***	-4.264	0.083	-8.661**	-2.709	0.514***
Matruh	-7.365***	18.083***	-10.718***	-4.459**	0.070	-15.758***	-3.042**	0.751***
North Sinai	-1.570	10.789***	-9.219***	-4.054	0.079	-8.687**	-2.344	0.501***
South Sinai	-1.370	10.013***	-8.642***	-4.456	0.063	-8.271**	-2.949	0.496***

Standard errors are clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The first row reports coefficient estimates using the full sample of districts. Subsequently, we eliminate one governorate at a time, as a robustness check and report corresponding coefficient estimates. For example, the second row reports coefficient estimates when we eliminate Cairo governorate. The dependent variables for columns (1) to (5) correspond to voting outcomes for the first round of the 2012 Egyptian Presidential elections. The dependent variables in columns (6) to (8) correspond to voting outcomes during the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (6) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (4) and column (7) correspond to voter turnout and are computed as the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variables in column (5) and column (8) correspond to the share of spoilt votes and are equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects.

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Table A4: Estimating a system of equations

Panel A: First round			
	(1)	(2)	(3)
VARIABLES	Independent	Former	Spolit
Martyrs, % of population	-1.425	10.593***	0.079
	[2.725]	[3.356]	[0.085]
Observations	349	349	349
Predetermined district controls	YES	YES	YES
Governorate fixed effects	YES	YES	YES
Number of clusters	27	27	27
Dependent variable mean	0.203	0.345	0.008
lnsig	-3.162***	-2.811***	-5.808***
	[0.110]	[0.063]	[0.183]
atanhrho_12		-0.183*	
		[0.097]	
atanhrho_13		-0.185***	
		[0.072]	
atanhrho_23		-0.088	
		[0.079]	

Panel B: Second round		
	(1)	(2)
VARIABLES	Former	Spoilt
Martyrs, % of population	8.660**	0.502***
	[3.671]	[0.158]
Observations	349	349
Predetermined district controls	YES	YES
Governorate fixed effects	YES	YES
Number of clusters	27	27
Dependent variable mean	0.464	0.017
lnsig	-2.652***	-5.493***
	[0.054]	[0.090]
atanhrho_12	-0.089	
	[0.067]	

Robust standard errors in brackets, clustered at the governorate level.
*** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Results are reported using a conditional mixed process estimator, following Roodman (2011) to estimate a simultaneous equation model. In Panels A and B, results are reported for the first and second rounds respectively. In Panel A, equations (1), (2) and (3) are estimated simultaneously and in Panel B, equations (1) and (2) are estimated simultaneously. In Panel A, the dependent variables in column (1) and column (2) are the shares of votes for independent and former candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (3) correspond to the share of spoilt votes in the first round and is equal to the number of invalid votes cast divided by the number of registered voters per district. In Panel A, the dependent variable in column (1) is the share of votes for the former regime candidate Ahmed Shafik, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variable in column (2) is the share of spoilt votes for the second round of the 2012 Presidential elections and is equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in each panel.

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Table A5: Identification through internal migrants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		First round				*Second round*		
VARIABLES	Independent	Former	Islamist	Turnout	Spoilt	Islamist	Turnout	Spoilt
Protests, internal migrants	-0.214	0.537***	-0.323**	0.039	0.003	-0.390**	-0.125	-0.027***
	[0.140]	[0.144]	[0.160]	[0.255]	[0.007]	[0.158]	[0.125]	[0.010]
Observations	349	349	349	349	349	349	349	349
R-squared	0.455	0.241	0.544	0.428	0.243	0.457	0.530	0.661
Predetermined district controls	YES	YES	YES	YES	YES	YES	YES	YES
Dependent variable mean	0.203	0.345	0.453	0.468	0.008	0.537	0.510	0.017

Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variables for columns (1) to (5) correspond to voting outcomes for the first round of the 2012 Egyptian Presidential elections. The dependent variables in columns (6) to (8) correspond to voting outcomes during the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (6) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (4) and column (7) correspond to voter turnout and are computed as the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variables in column (5) and column (8) correspond to the share of spoilt votes and are equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the weighted average of protests intensity in the governorate of birth of internal migrants living in a particular district. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. The dependent variables' means are reported in the last row.

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Table A6: Estimating the effects of exposure to protests' intensity on voting outcomes, Cairo only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		First round				*Second round*		
VARIABLES	Independent	Former	Islamist	Turnout	Spoilt	Islamist	Turnout	Spoilt
Martyrs, % of population	-3.115	13.547***	-10.433**	-0.202	-0.193	-14.168**	-3.421	1.150**
	[1.985]	[4.346]	[4.316]	[4.589]	[0.125]	[5.219]	[3.102]	[0.462]
Observations	43	43	43	43	43	43	43	43
R-squared	0.788	0.935	0.918	0.837	0.557	0.915	0.852	0.763
Predetermined district controls	YES	YES	YES	YES	YES	YES	YES	YES
Dependent variable mean	0.290	0.378	0.333	0.567	0.007	0.434	0.554	0.025

Standard errors are reported between brackets. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variables for columns (1) to (5) correspond to voting outcomes for the first round of the 2012 Egyptian Presidential elections. The dependent variables in columns (6) to (8) correspond to voting outcomes during the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (1), column (2) and column (3) are the shares of votes for independent, former and Islamist candidates, respectively, expressed in % of valid votes, in the first round of the 2012 Egyptian Presidential elections. The dependent variable in column (6) is the share of votes for the Islamist candidate Mohamed Morsi, expressed in % of valid votes, in the second round of the 2012 Egyptian Presidential elections. The dependent variables in column (4) and column (7) correspond to voter turnout and are computed as the number of votes cast (valid and invalid votes) divided by the number of registered voters per district. The dependent variables in column (5) and column (8) correspond to the share of spoilt votes and are equal to the number of invalid votes cast divided by the number of registered voters per district. The main variable of interest is the number of "martyrs", expressed a % of district's population.Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. The dependent variables' means (for Cairo) are reported in the last row.

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Table A7: Exposure to protests and the distribution of votes among Islamist candidates, first round of Presidential elections

VARIABLES	(1) Fotouh	(2) Al-Awa	(3) Morsi
Martyrs, % of population	-5.099***	-0.216	-3.853*
	[1.007]	[0.156]	[1.914]
Observations	349	349	349
R-squared	0.788	0.591	0.722
Predetermined district controls	YES	YES	YES
Governorate FE	YES	YES	YES
Number of clusters	27	27	27
Dependent variable mean	0.186	0.010	0.257

Robust standard errors in brackets, clustered at the governorate level. *** p<0.01, ** p<0.05, * p<0.1

Notes. The unit of analysis is the district. Each cell represents a coefficient estimate using OLS regression. The dependent variables in column (1) and (2) and (3) are the shares of votes for Abdel Moneim Aboul Fotouh, Mohammad Salim Al-Awa and Mohamed Morsi expressed in % of valid votes, respectively, in the first round of the 2012 Egyptian Presidential elections. The main variable of interest is the number of "martyrs", expressed a % of district's population. Regressions include a set of predetermined district controls derived from the Egypt Population, Housing and Establishments Census 2006, described in Section 4. Regressions also include governorate fixed effects. The dependent variables' means are reported in the last row.