## Online Appendix

Brandsch, Jürgen; Python, André (2020). "Provoking ordinary people. The effects of terrorism on civilian violence," Journal of Conflict Resolution.

## A Descriptive statistics for MWA in main text

Table 1: Type of event: control

|  | n | min | max | mean | sd | median | IRQ |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| urban | 13892 | 0.00 | 1.00 | 0.80 | 0.40 | 1.00 | 0.00 |
| number.of.conflict | 13892 | 0.00 | 298.00 | 10.82 | 24.97 | 3.00 | 12.00 |
| population | 13889 | 0.00 | 11.32 | 5.34 | 2.35 | 5.03 | 3.28 |
| luminosity | 13892 | 0.00 | 63.00 | 30.78 | 18.28 | 40.48 | 33.52 |
| excluded.ethnic.groups | 13892 | 0.00 | 1.00 | 0.07 | 0.25 | 0.00 | 0.00 |
| polity | 13573 | -9.00 | 9.00 | 1.95 | 5.04 | 2.00 | 8.00 |

Table 2: Type of event: treatment

|  | n | $\min$ | $\max$ | mean | sd | median | IRQ |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| urban | 1432 | 0.00 | 1.00 | 0.58 | 0.49 | 1.00 | 1.00 |
| number.of.conflict | 1432 | 0.00 | 84.00 | 9.24 | 13.30 | 4.00 | 13.00 |
| population | 1432 | 0.00 | 10.78 | 5.29 | 2.22 | 4.90 | 3.40 |
| luminosity | 1432 | 0.00 | 63.00 | 19.52 | 20.77 | 9.48 | 41.22 |
| excluded.ethnic.groups | 1432 | 0.00 | 1.00 | 0.10 | 0.30 | 0.00 | 0.00 |
| polity | 1371 | -7.00 | 9.00 | 1.95 | 4.43 | 4.00 | 8.00 |
|  |  |  |  |  |  |  |  |

Table 3: Type of event: dependent

|  | n | $\min$ | $\max$ | mean | sd | median | IRQ |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| urban | 658 | 0.00 | 1.00 | 0.90 | 0.30 | 1.00 | 0.00 |
| number.of.conflict | 658 | 0.00 | 41.00 | 0.37 | 2.30 | 0.00 | 0.00 |
| population | 658 | 0.00 | 10.64 | 7.60 | 2.25 | 7.77 | 2.71 |
| luminosity | 658 | 0.00 | 63.00 | 44.11 | 19.35 | 44.92 | 22.02 |
| excluded.ethnic.groups | 658 | 0.00 | 1.00 | 0.16 | 0.37 | 0.00 | 0.00 |
| polity | 643 | -7.00 | 9.00 | 1.77 | 5.02 | 3.00 | 9.00 |
|  |  |  |  |  |  |  |  |

The tables provide the following summary statistics for the matching variables at observed locations of control (Table 1), treatment (Table 2), and dependent (Table 3) events in our study area (Africa) from 1998 to 2016: number of observations $(n)$, minimum ( $\min$ ) and maximum (max) values, mean (mean), standard deviation ( $s d$ ), median (median), and interquartile (IRQ) range (Q75-Q25). The variables include: binary variable that distinguishes urban from rural areas (urban); number of conflicts within a 50 km radius and that occurred from 3 months before the event (number.of.conflict); number of persons per square kilometer (population); satellite night lights, from 0 (no light) to 63 (maximum light) (luminosity) binary variable that indicates if a politically excluded ethnic group is settled (excluded.ethnic.groups); level of democracy, from -10 (autocracy) to +10 (democracy) (polity).

## B Construction of variables

## B. 1 Treatment event

The treatment variable is supposed to capture indiscriminate terrorism. As a basis for this variable we used the GTD dataset (?). We proceed to several operations on the data to extract indiscriminate terrorism from GTD. First, we only included targets that indicated ordinary civilians (targtype1 equals 6, Airports \& Aircraft, 8, Educational Institutions, 14, Private Citizens \& Property, 15 Religious Figures/Institutions, 19, Transportation other than air). Second, we only took those events into account that led to more than 4 civilians killed or wounded. Since the GTD data gives the absolute number of people killed and the number of terrorists killed as separate variables we subtracted the latter from the former (nkill-nkillter). In the robustness checks the amount of people wounded or killed was varied to 2 and 10 people respectively and restricted the variable to only target type 14 .

## B. 2 Control events

## Non-civilian targets

For the first type of control we used all events that were not targeted at ordinary civilians in the GTD dataset. This means that we used all events where the targtype1 showed other values than $6,8,14,15$ and 19. Here we did not include a restriction on the amount of people killed.

## Selective violence

For the second type of control we used only events that targeted civilians selectively. This means that we used all events where the targtype1 showed values of $6,8,14,15$ and 19 and killed or wounded not more than one person.

## B. 3 Dependent events

## Riots

The basis for the dependent variable for the main analysis is riots within the SCAD dataset (?). This means we identified all events where the etype variable had the values of 3 and 4 and those events that escalated into riots (escalation equals 3 or 4) In addition we excluded events that were directed against the government. Since we are interested in events that target other civilians violence against the government had to be taken out (cgovtarget $\neq 1$ ). Finally, we restricted riots to particular issues that are in line with our theory. For instance, it would be unreasonable to believe that terrorism sparks riots that are linked to the issue of environmental degradation. The following list highlights those issues that were included in our main dependent variable:

- $1=$ elections
- $2=$ economy, jobs
- $3=$ food, water, subsistence
- $4=$ environmental degradation
- $5=$ ethnic discrimination, ethnic issues
- $6=$ religious discrimination, religious issues
- $7=$ education
- $8=$ foreign affairs/relations
- $9=$ domestic war, violence, terrorism
- $10=$ human rights, democracy
- $11=$ pro-government
- $12=$ economic resources/assets
- $13=$ other
- $14=$ unknown, not-specified


## Non-violent anti-government events

As outlined above we expect non-violent anti-government events to be a result of successful coercion through terrorism. Here we identified all events where the etype variable had the values of 1 and 2 (demonstrations) as well as 5 and 6 (strikes). We then excluded all events which were not targeted at a central or a regional government. We also excluded the same issues as for the riots variable.

## C Detailed results for MWA in main text

The following tables show the results for all time (time [days]) and space (space $[k m]$ ) specifications which are significant, with effect size (effect size), $p$-value and the adjusted coefficient of determination (adj. $R^{2}$ ) provided. In addition, \% treat indicates the percentage of the sample that consists of treatment events in comparison to control events. In addition, the table shows several summary statistics after the matching was used. \% SO for "same type of event overlap" (max: $100 \%$ : exact same value ranges for all matching variables in both groups) refers to situations where either the cylinders of two or more treatment or two or more control events overlap. \% MO for "mixed event overlap" refers to situations where treatment and control cylinders overlap. L1 is a multivariate distance metric which indicates the discrepancies (complete dissimilarity: 1 , complete concordance: 0 ) between the joint distributions of the covariates in treatment and control groups (?).

## C. 1 Detailed results for MWA with all attacks on non-civilians as control event

Table C. 1 shows the results of the MWA analysis with all attacks on non-civilians as control events (core specification).

| time [days] | space [km] | effect size | p.value | adj. ${ }^{2}$ | \%treat | L1 | \%supp | \%S0 | \%MO |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 20 | 20 | 0.01 | 0.01 | 0.00 | 16 | 0.87 | 10 | 74 | 16 |
| 20 | 30 | 0.01 | 0.02 | 0.00 | 16 | 0.88 | 8 | 76 | 18 |
| 20 | 60 | 0.02 | 0.00 | 0.00 | 16 | 0.90 | 7 | 80 | 24 |
| 20 | 70 | 0.02 | 0.00 | 0.00 | 16 | 0.90 | 7 | 81 | 24 |
| 30 | 10 | 0.03 | 0.00 | 0.00 | 17 | 0.87 | 8 | 74 | 19 |
| 30 | 20 | 0.03 | 0.00 | 0.00 | 18 | 0.84 | 12 | 77 | 21 |
| 30 | 30 | 0.03 | 0.00 | 0.00 | 17 | 0.89 | 8 | 79 | 23 |
| 30 | 40 | 0.03 | 0.00 | 0.00 | 17 | 0.90 | 7 | 80 | 26 |
| 30 | 50 | 0.03 | 0.00 | 0.00 | 16 | 0.91 | 6 | 82 | 30 |
| 30 | 60 | 0.04 | 0.00 | 0.00 | 16 | 0.91 | 6 | 83 | 31 |
| 30 | 70 | 0.04 | 0.00 | 0.00 | 16 | 0.92 | 5 | 84 | 32 |
| 40 | 10 | 0.03 | 0.00 | 0.02 | 17 | 0.88 | 8 | 76 | 23 |
| 40 | 20 | 0.04 | 0.00 | 0.02 | 17 | 0.89 | 7 | 79 | 25 |
| 40 | 30 | 0.04 | 0.00 | 0.02 | 17 | 0.89 | 8 | 80 | 27 |
| 40 | 40 | 0.03 | 0.00 | 0.02 | 17 | 0.90 | 7 | 82 | 31 |
| 40 | 50 | 0.04 | 0.00 | 0.02 | 17 | 0.91 | 7 | 84 | 35 |
| 40 | 60 | 0.05 | 0.00 | 0.02 | 17 | 0.89 | 9 | 85 | 36 |
| 40 | 70 | 0.05 | 0.00 | 0.02 | 17 | 0.90 | 9 | 86 | 37 |
| 50 | 10 | 0.04 | 0.00 | 0.04 | 17 | 0.89 | 7 | 77 | 26 |
| 50 | 20 | 0.04 | 0.00 | 0.04 | 18 | 0.85 | 12 | 80 | 29 |
| 50 | 30 | 0.04 | 0.00 | 0.03 | 17 | 0.86 | 11 | 82 | 31 |
| 50 | 40 | 0.04 | 0.00 | 0.05 | 17 | 0.87 | 10 | 84 | 34 |
| 50 | 50 | 0.04 | 0.00 | 0.03 | 18 | 0.88 | 9 | 85 | 39 |
| 50 | 60 | 0.06 | 0.00 | 0.03 | 18 | 0.89 | 9 | 86 | 40 |
| 50 | 70 | 0.06 | 0.00 | 0.03 | 18 | 0.90 | 8 | 87 | 41 |
| 60 | 10 | 0.04 | 0.00 | 0.05 | 18 | 0.88 | 8 | 78 | 28 |
| 60 | 20 | 0.04 | 0.00 | 0.04 | 18 | 0.89 | 8 | 81 | 32 |
| 60 | 30 | 0.04 | 0.00 | 0.03 | 18 | 0.90 | 7 | 83 | 34 |
| 60 | 40 | 0.04 | 0.00 | 0.04 | 18 | 0.88 | 9 | 85 | 37 |
| 60 | 50 | 0.04 | 0.00 | 0.03 | 18 | 0.89 | 8 | 86 | 42 |
| 60 | 60 | 0.05 | 0.00 | 0.03 | 18 | 0.90 | 8 | 87 | 43 |
| 60 | 70 | 0.06 | 0.00 | 0.03 | 18 | 0.91 | 7 | 88 | 44 |
| 70 | 10 | 0.04 | 0.00 | 0.04 | 18 | 0.88 | 8 | 79 | 30 |
| 70 | 20 | 0.04 | 0.00 | 0.04 | 18 | 0.89 | 8 | 82 | 34 |
| 70 | 30 | 0.04 | 0.00 | 0.03 | 18 | 0.90 | 7 | 84 | 37 |
| 70 | 40 | 0.04 | 0.00 | 0.02 | 18 | 0.89 | 9 | 86 | 40 |
| 70 | 50 | 0.04 | 0.00 | 0.01 | 18 | 0.89 | 8 | 87 | 45 |
| 70 | 60 | 0.06 | 0.00 | 0.01 | 18 | 0.90 | 8 | 88 | 46 |
| 70 | 70 | 0.06 | 0.00 | 0.01 | 18 | 0.91 | 7 | 89 | 47 |

Table 4: Matched wake analysis: summary characteristics (core)

## C. 2 Detailed results for MWA with non-violent anti-government events as dependent variable

Table C. 2 shows the results of the MWA analysis non-violent antigovernment events as dependent variable.

| time [days] | space $[\mathrm{km}]$ | effect size | p.value | adj.R | \%treat | L1 | \%supp | \%S0 | \%MO |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| 20 | 10 | 0.03 | 0.01 | 0.19 | 17 | 0.86 | 10 | 72 | 15 |
| 20 | 20 | 0.02 | 0.03 | 0.21 | 17 | 0.87 | 9 | 74 | 16 |
| 20 | 30 | 0.02 | 0.04 | 0.21 | 16 | 0.88 | 8 | 76 | 18 |
| 20 | 40 | 0.03 | 0.04 | 0.08 | 16 | 0.89 | 7 | 78 | 20 |
| 20 | 60 | 0.03 | 0.04 | 0.08 | 16 | 0.90 | 7 | 80 | 24 |
| 20 | 70 | 0.03 | 0.04 | 0.08 | 16 | 0.91 | 7 | 81 | 24 |
| 30 | 10 | 0.03 | 0.04 | 0.10 | 17 | 0.87 | 8 | 74 | 19 |

Table 5: Matched wake analysis: summary characteristics (coercion)

## Model specifications

 We run a series of models and robustness tests to assess the validity of our results. We provide below a table that provides a summary and points out to the location of the results and plots associated with each model and robustness tests, which are described in further details in the corresponding text.| ID | Model | Assessment goal | Perpetrator | Treatment target | Deaths threshold | Dependent event | Control event | Fixed effect | Section | Figure (Table) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| core | mwa | terrorism provocation mechanisms | terrorism | civilians | $>4$ (or wounded) | riots | non-civilians | no | ?? | ?? |
| coercion | mwa | terrorism coercion mechanisms | terrorism | civilians | $>4$ (or wounded) | nonviolent vs gvt | non-civilians | no | ?? | ?? |
| logregFE | logistic | terrorism provocation mechanisms | terrorism | civilians | various | riots | non-civilians | C | D.1.1 | (7) |
| logreg | logistic | terrorism provocation mechanisms | terrorism | civilians | various | riots | non-civilians | no | D.1.2 | (8) |
| 10kill | mwa | robustness to death threshold | terrorism | civilians | $>9$ (or wounded) | riots | non-civilians | no | D. 2 | 1 |
| 2kill | mwa | robustness to death threshold | terrorism | civilians | $>1$ (or wounded) | riots | non-civilians | no | D. 3 | 2 |
| alterncivil | mwa | robustness to civilian definition | terrorism | priv cat. 14 | $>4$ (or wounded) | riots | non-civilians | no | D. 4 | 3 |
| alternriot | mwa | robustness to riot definition | terrorism | civilian | $>4$ (or wounded) | all riots | non-civilians | no | D. 5 | 4 |
| sutva | mwa | robustness to SUTVA deletion | terrorism | civilians | $>4$ (or wounded) | riots | non-civilians | no | D. 6 | 5 |
| casualty | mwa | robustness to casualty definition | terrorism | civilians | $>4$ (and wounded) | riots | non-civilians | no | D. 7 | 6 |
| country | mwa | robustness to model spec. | terrorism | civilians | $>4$ (or wounded) | riots | non-civilians | C | D. 8 | 7 |
| region | mwa | robustness to model spec. | terrorism | civilians | $>4$ (or wounded) | riots | non-civilians | S | D. 9 | 8 |
| twoFE | mwa | robustness to model spec. | terrorism | civilians | $>4$ (or wounded) | riots | non-civilians | $\mathbf{C + S}$ | D. 10 | 9 |
| misspec1 | mwa | terrorism misspecification any issues | SCAD | civilians | $>4$ (or wounded) | terrorism | demo cat. 9 | no | E | 10 |
| misspec2 | mwa | terrorism misspecification main issue | SCAD | civilians | $>4$ (or wounded) | terrorism | demo cat. 9 | no | E | 11 |

Table 6: Summary of the model specification and robustness tests. The columns provide information on the model identifier (ID); type of model (Model); assessment goal of the model specification (Assessment goal); perpetrator of the treatment events (Perpetrator); target of the events (Treatment target); casualty threshold used to define the treatment events (Death threshold); dependent events (Dependent events); control events (Control events); fixed-effect used in the model (Fixed effect), Section (Section) and (Figure (Table)) of the corresponding results and figures (or table if the value is in parentheses) in the text. The main changes with regard to the main model (id: core) are highlighted in bold. Note that the regression models (regression and regression F.E.) count 12 specifications (3 alternative definitions of the treatment variable and 4 space-time windows) each, which are detailed in the corresponding text in the appendix. Note that GTD (?) is used to extract terrorism data if not specified otherwise. Abbreviations: C: country fixedeffect; S: subcontinental regions in Africa fixed effect; nonviolent vs gvt: non-violent events against government; demo cat.9: SCAD demonstration events of category 9 ; priv cat. 14; GTD private citizens of category 14 only.

## D. 1 Logistic regression

We run a logistic regression on riots (dependent variable) with the independent binary variable with value 1 if treatment and 0 if control events (treatment) and covariates: binary covariate that distinguishes urban from rural areas (urban); log number of persons per square kilometer (log.population); log satellite night lights (log.luminosity); number of conflicts within a 50 km radius and that occurred from 3 months before the event (conflict), a binary variable that indicates if a politically excluded ethnic group is settled (excluded.ethnic), and a binary variable that indicates if events occurred before 2012 (before.2012).

There is a total of 12 specifications that include three definitions of events (core, 2nkill, and 10 nkill), two temporal lags ( 30 or 60 days) and two spatial lags ( 50 or 100 km radius) specifications. We run these 12 specifications and present the results separately with country fixed effect added (appendix D.1.1) and without country-fixed effect (appendix D.1.2)

## D.1.1 Logistic regression with country F.E.

We run a logistic regression with riots as dependent binary variable and country fixed effect added in the model. The model specifications are summarized as follows:

| mod.number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| spec | core | 2kill | 10kil | core | 2kill | 10kill | core | 2 kill | 10kill | core | 2kill | 10kill |
| time lag(days) | 30 | 30 | 30 | 60 | 60 | 60 | 30 | 30 | 30 | 60 | 60 | 60 |
| space radius (km) | 50 | 50 | 50 | 50 | 50 | 50 | 100 | 100 | 100 | 100 | 100 | 100 |
| country FE | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |

There is a total of 12 specifications, which combine 3 alternative definitions of the treatment variable (core: $>4$ deaths or $>4$ wounded; 2kill: $>1$ death or $>1$ wounded; 10kill: $>9$ deaths or $>9$ wounded) and 2 temporal ( 30 and 60 days) and 2 spatial ( 50 and 100 km ) windows. All models include a country fixed effect (country FE: yes).
Table 7: Logistic regression with country F.E.

|  | Dependent variable: |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | (1) | (2) | (3) | (4) | (5) | binary.de (6) | dependent <br> (7) | (8) | (9) | (10) | (11) | (12) |
| urban1 | $\begin{gathered} -1.26^{* * *} \\ (0.40) \end{gathered}$ | $\begin{gathered} -1.39^{* * *} \\ \quad(0.36) \end{gathered}$ | $\begin{gathered} -1.26^{* * *} \\ (0.42) \end{gathered}$ | $\begin{gathered} -1.27^{* * *} \\ (0.31) \end{gathered}$ | $\begin{gathered} -1.32^{* * *} \\ (0.29) \end{gathered}$ | $\begin{gathered} -1.32^{* * *} \\ (0.32) \end{gathered}$ | $\begin{gathered} -0.58 \\ (0.52) \end{gathered}$ | $\begin{gathered} -0.51 \\ (0.48) \end{gathered}$ | $\begin{gathered} -0.66 \\ (0.55) \end{gathered}$ | $\begin{gathered} -0.58 \\ (0.40) \end{gathered}$ | $\begin{gathered} -0.51 \\ (0.37) \end{gathered}$ | $\begin{gathered} -0.66 \\ (0.42) \end{gathered}$ |
| conflict1 | $\begin{gathered} -1.05^{* * *} \\ (0.30) \end{gathered}$ | $\begin{gathered} *-1.06^{* * *} \\ (0.28) \end{gathered}$ | $\begin{gathered} -1.07^{* * *} \\ (0.31) \end{gathered}$ | $\begin{gathered} -0.82^{* * *} \\ (0.22) \end{gathered}$ | $\begin{gathered} -0.85^{* * *} \\ (0.22) \end{gathered}$ | $\begin{gathered} -0.81^{* * *} \\ (0.23) \end{gathered}$ | $\begin{gathered} -1.23^{* * *} \\ (0.33) \end{gathered}$ | $\begin{gathered} -1.19^{* * *} \\ (0.31) \end{gathered}$ | $\begin{gathered} -1.29^{* * *} \\ (0.35) \end{gathered}$ | $\begin{gathered} -1.07^{* * *} \\ (0.26) \end{gathered}$ | $\begin{gathered} -1.07^{* * *} \\ (0.25) \end{gathered}$ | $\begin{gathered} -1.08^{* * *} \\ (0.27) \end{gathered}$ |
| log.luminosity | $\begin{aligned} & 0.73^{* * *} \\ & (0.26) \end{aligned}$ | $\begin{aligned} & 0.60^{* * *} \\ & (0.23) \end{aligned}$ | $\begin{aligned} & 0.84^{* * *} \\ & (0.28) \end{aligned}$ | $\begin{aligned} & 0.90^{* * *} \\ & (0.20) \end{aligned}$ | $\begin{gathered} 0.79^{* * *} \\ (0.19) \end{gathered}$ | $\begin{aligned} & 1.05^{* * *} \\ & (0.22) \end{aligned}$ | $\begin{gathered} 0.63^{* *} \\ (0.31) \end{gathered}$ | $\begin{gathered} 0.34 \\ (0.26) \end{gathered}$ | $\begin{aligned} & 0.77^{* *} \\ & (0.34) \end{aligned}$ | $\begin{aligned} & 0.80^{* * *} \\ & (0.25) \end{aligned}$ | $\begin{gathered} 0.55^{* *} \\ (0.22) \end{gathered}$ | $\begin{aligned} & 1.03^{* * *} \\ & (0.28) \end{aligned}$ |
| log.population | $\begin{aligned} & 1.03^{* * *} \\ & (0.25) \end{aligned}$ | $\begin{aligned} & * \quad 1.09^{* * *} \\ & (0.24) \end{aligned}$ | $\begin{aligned} & 0.96^{* * *} \\ & (0.25) \end{aligned}$ | $\begin{aligned} & 0.60^{* * *} \\ & (0.16) \end{aligned}$ | $\begin{aligned} & 0.64^{* * *} \\ & (0.16) \end{aligned}$ | $\begin{aligned} & * \quad 0.56^{* * *} \\ & (0.16) \end{aligned}$ | $\begin{aligned} & 1.11^{* * *} \\ & (0.27) \end{aligned}$ | $\begin{aligned} & 1.11^{* * *} \\ & (0.25) \end{aligned}$ | $\begin{aligned} & * \quad 1.06^{* * *} \\ & (0.28) \end{aligned}$ | $\begin{aligned} & 0.68^{* * *} \\ & (0.18) \end{aligned}$ | $\begin{aligned} & 0.71^{* * *} \\ & (0.18) \end{aligned}$ | $\begin{aligned} & * \quad 0.65^{* * *} \\ & (0.18) \end{aligned}$ |
| excluded.ethnic1 | $\begin{array}{cc} \mathrm{c} 1 & -0.13 \\ & (0.39) \end{array}$ | $\begin{gathered} 0.04 \\ (0.35) \end{gathered}$ | $\begin{gathered} -0.01 \\ (0.40) \end{gathered}$ | $\begin{gathered} 0.08 \\ (0.30) \end{gathered}$ | $\begin{gathered} 0.16 \\ (0.28) \end{gathered}$ | $\begin{gathered} 0.09 \\ (0.32) \end{gathered}$ | $\begin{gathered} -0.66 \\ (0.47) \end{gathered}$ | $\begin{gathered} -0.56 \\ (0.43) \end{gathered}$ | $\begin{gathered} -0.64 \\ (0.49) \end{gathered}$ | $\begin{array}{r} -0.23 \\ (0.37) \end{array}$ | $\begin{gathered} -0.21 \\ (0.34) \end{gathered}$ | $\begin{gathered} -0.31 \\ (0.39) \end{gathered}$ |
| before. 20121 | $\begin{gathered} 0.53 \\ (0.35) \end{gathered}$ | $\begin{gathered} 0.39 \\ (0.32) \end{gathered}$ | $\begin{gathered} 0.54 \\ (0.37) \end{gathered}$ | $\begin{gathered} 0.52^{*} \\ (0.28) \end{gathered}$ | $\begin{gathered} 0.42 \\ (0.26) \end{gathered}$ | $\begin{gathered} 0.56^{*} \\ (0.29) \end{gathered}$ | $\begin{gathered} 0.59 \\ (0.38) \end{gathered}$ | $\begin{gathered} 0.55 \\ (0.35) \end{gathered}$ | $\begin{gathered} 0.69^{*} \\ (0.39) \end{gathered}$ | $\begin{gathered} 0.45 \\ (0.31) \end{gathered}$ | $\begin{gathered} 0.44 \\ (0.30) \end{gathered}$ | $\begin{gathered} 0.55^{*} \\ (0.33) \end{gathered}$ |
| treatment1 | $\begin{aligned} & 0.78^{* * *} \\ & (0.28) \end{aligned}$ | $\begin{gathered} 0.59^{* *} \\ (0.23) \end{gathered}$ | $\begin{aligned} & 1.10^{* * *} \\ & (0.32) \end{aligned}$ | $\begin{aligned} & 0.61^{* * *} \\ & (0.23) \end{aligned}$ | $\begin{gathered} 0.27 \\ (0.20) \end{gathered}$ | $\begin{aligned} & 0.99^{* * *} \\ & (0.27) \end{aligned}$ | $\begin{aligned} & 0.95^{* * *} \\ & (0.29) \end{aligned}$ | $\begin{gathered} 0.62^{* *} \\ (0.25) \end{gathered}$ | $\begin{aligned} & 1.39^{* * *} \\ & (0.33) \end{aligned}$ | $\begin{gathered} 0.65^{* *} \\ (0.25) \end{gathered}$ | $\begin{gathered} 0.23 \\ (0.22) \end{gathered}$ | $\begin{aligned} & 1.09^{* * *} \\ & (0.29) \end{aligned}$ |
| Constant | $\begin{gathered} -20.53 \\ (3,497.01) \end{gathered}$ | $\begin{gathered} -20.31 \\ (3,231.12) \end{gathered}$ | $\begin{gathered} -20.80 \\ (3,797.68) \end{gathered}$ | $\begin{gathered} -18.58 \\ (1,294.69) \end{gathered}$ | $\begin{gathered} -18.29 \\ (1,192.04) \end{gathered}$ | $\begin{gathered} -18.81 \\ (1,400.94) \end{gathered}$ | $\begin{gathered} -20.89 \\ (3,396.81) \end{gathered}$ | $\begin{gathered} -20.80 \\ (3,195.53) \end{gathered}$ | $\begin{gathered} -21.29 \\ (3,684.30) \end{gathered}$ | $\begin{gathered} -19.76 \\ (2,094.98) \end{gathered}$ | $\begin{gathered} -19.58 \\ (1,954.79) \end{gathered}$ | $\begin{gathered} -20.09 \\ (2,251.90) \end{gathered}$ |
| Observations | 8,103 | 8,909 | 8,909 | 7,631 | 7,631 | 8,103 | 8,103 | 8,909 | 8,909 | 7,631 | 7,631 | 8,103 |
| Log Likelihood | -444.36 | -485.55 | -533.81 | -461.35 | -632.55 | -731.65 | -392.20 | -430.07 | -475.97 | -411.15 | -561.26 | -648.24 |
| Akaike Inf. Crit. | it. 986.72 | 1,069.10 | 1,085.62 | 940.70 | 1,361.10 | 1,481.31 | 882.39 | 958.14 | 969.94 | 840.29 | 1,218.53 | 1,314.48 |

Note: country fixed effect not displayed for the sake of conciseness. Standard errors are provided in parentheses. ${ }^{*} \mathrm{p}<0.1 ;{ }^{* *} \mathrm{p}<0.05 ;{ }^{* * *} \mathrm{p}<0.01$

## D.1.2 Logistic regression without country F.E.

We run a logistic regression with riots as dependent binary variable and without country fixed effect. The model specifications are summarized as follows:

| mod.number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| spec | core | 2kill | 10kill core | 2kill | 10kill core | 2kill | 10kill core | 2kill 10 kill |  |  |  |  |
| time lag(days) | 30 | 30 | 30 | 60 | 60 | 60 | 30 | 30 | 30 | 60 | 60 | 60 |
| space radius (km) | 50 | 50 | 50 | 50 | 50 | 50 | 100 | 100 | 100 | 100 | 100 | 100 |
| country FE | no | no | no | no | no | no | no | no | no | no | no | no |

There is a total of 12 specifications, which combine 3 alternative definitions of the treatment variable (core: $>4$ deaths or $>4$ wounded; 2kill: $>1$ death or $>1$ wounded; 10kill: $>9$ deaths or $>9$ wounded) and 2 temporal ( 30 and 60 days) and 2 spatial ( 50 and 100 km ) windows. The models do not include a country fixed effect (country FE: no).
Table 8: Logistic regression without country F.E.

|  | Dependent variable: |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | binary.dependent |  |  |  |  |  |  |  |  |  |  |  |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| urban1 | $\begin{gathered} -0.82^{* *} \\ (0.36) \end{gathered}$ | $\begin{gathered} -0.99^{* * *} \\ (0.32) \end{gathered}$ | $\begin{gathered} -0.77^{* *} \\ (0.37) \end{gathered}$ | $\begin{gathered} -0.87^{* * *} \\ (0.27) \end{gathered}$ | $\begin{gathered} -0.96^{* * *} \\ (0.26) \end{gathered}$ | $\begin{gathered} -0.87^{* * *} \\ (0.28) \end{gathered}$ | $\begin{gathered} -0.07 \\ (0.47) \end{gathered}$ | $\begin{gathered} -0.12 \\ (0.42) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.50) \end{gathered}$ | $\begin{gathered} -0.06 \\ (0.36) \end{gathered}$ | $\begin{gathered} -0.08 \\ (0.34) \end{gathered}$ | $\begin{gathered} -0.05 \\ (0.38) \end{gathered}$ |
| conflict1 | $\begin{gathered} -1.81^{* * *} \\ (0.27) \end{gathered}$ | $\begin{gathered} -1.85^{* * *} \\ (0.26) \end{gathered}$ | $\begin{gathered} -1.78^{* * *} \\ (0.28) \end{gathered}$ | $\begin{gathered} -1.63^{* * *} \\ (0.21) \end{gathered}$ | $\begin{gathered} -1.67^{* * *} \\ (0.20) \end{gathered}$ | $\begin{gathered} -1.58^{* * *} \\ (0.21) \end{gathered}$ | $\begin{gathered} -2.15^{* * *} \\ (0.31) \end{gathered}$ | $\begin{gathered} -2.16^{* * *} \\ (0.29) \end{gathered}$ | $\begin{gathered} -2.18^{* * *} \\ (0.33) \end{gathered}$ | $\begin{aligned} & -1.96^{* * *} \\ & (0.24) \end{aligned}$ | $\begin{gathered} -1.99^{* * *} \\ (0.23) \end{gathered}$ | $\begin{gathered} -1.94^{* * *} \\ (0.25) \end{gathered}$ |
| log.luminosity | $\begin{aligned} & 1.18^{* * *} \\ & (0.24) \end{aligned}$ | $\begin{aligned} & 1.07^{* * *} \\ & (0.20) \end{aligned}$ | $\begin{aligned} & 1.24^{* * *} \\ & (0.26) \end{aligned}$ | $\begin{aligned} & 1.35^{* * *} \\ & (0.19) \end{aligned}$ | $\begin{aligned} & 1.26^{* * *} \\ & (0.18) \end{aligned}$ | $\begin{aligned} & 1.47^{* * *} \\ & (0.21) \end{aligned}$ | $\begin{aligned} & 1.09^{* * *} \\ & (0.28) \end{aligned}$ | $\begin{aligned} & 0.82^{* * *} \\ & (0.23) \end{aligned}$ | $\begin{aligned} & 1.14^{* * *} \\ & (0.30) \end{aligned}$ | $\begin{aligned} & 1.28^{* * *} \\ & (0.23) \end{aligned}$ | $\begin{aligned} & 1.05^{* * *} \\ & (0.20) \end{aligned}$ | $\begin{aligned} & 1.44^{* * *} \\ & (0.26) \end{aligned}$ |
| log.population | $\begin{aligned} & 0.36^{* * *} \\ & (0.12) \end{aligned}$ | $\begin{aligned} & 0.43^{* * *} \\ & (0.12) \end{aligned}$ | $\begin{aligned} & 0.34^{* * *} \\ & (0.12) \end{aligned}$ | $\begin{gathered} 0.17^{* *} \\ (0.08) \end{gathered}$ | $\begin{aligned} & 0.21^{* *} \\ & (0.08) \end{aligned}$ | $\begin{gathered} 0.15^{*} \\ (0.09) \end{gathered}$ | $\begin{aligned} & 0.33^{* * *} \\ & (0.12) \end{aligned}$ | $\begin{aligned} & 0.37^{* * *} \\ & (0.12) \end{aligned}$ | $\begin{aligned} & 0.32^{* *} \\ & (0.12) \end{aligned}$ | $\begin{gathered} 0.15^{*} \\ (0.09) \end{gathered}$ | $\begin{aligned} & 0.18^{* *} \\ & (0.09) \end{aligned}$ | $\begin{gathered} 0.14 \\ (0.09) \end{gathered}$ |
| excluded.ethnic1 | $\begin{gathered} 0.15 \\ (0.35) \end{gathered}$ | $\begin{gathered} 0.26 \\ (0.31) \end{gathered}$ | $\begin{gathered} 0.25 \\ (0.35) \end{gathered}$ | $\begin{gathered} 0.35 \\ (0.26) \end{gathered}$ | $\begin{gathered} 0.39 \\ (0.25) \end{gathered}$ | $\begin{gathered} 0.36 \\ (0.27) \end{gathered}$ | $\begin{gathered} -0.21 \\ (0.42) \end{gathered}$ | $\begin{gathered} -0.21 \\ (0.40) \end{gathered}$ | $\begin{gathered} -0.16 \\ (0.43) \end{gathered}$ | $\begin{gathered} 0.12 \\ (0.31) \end{gathered}$ | $\begin{gathered} 0.09 \\ (0.30) \end{gathered}$ | $\begin{gathered} 0.08 \\ (0.33) \end{gathered}$ |
| treatment1 | $\begin{gathered} 0.72^{* * *} \\ (0.26) \end{gathered}$ | $\begin{gathered} 0.53^{* *} \\ (0.22) \end{gathered}$ | $\begin{gathered} 0.99^{* * *} \\ (0.30) \end{gathered}$ | $\begin{gathered} 0.54^{* *} \\ (0.22) \end{gathered}$ | $\begin{gathered} 0.24 \\ (0.19) \end{gathered}$ | $\begin{aligned} & 0.86^{* * *} \\ & (0.25) \end{aligned}$ | $\begin{aligned} & 0.84^{* * *} \\ & (0.27) \end{aligned}$ | $\begin{gathered} 0.54^{* *} \\ (0.24) \end{gathered}$ | $\begin{aligned} & 1.17^{* * *} \\ & (0.31) \end{aligned}$ | $\begin{gathered} 0.54^{* *} \\ (0.24) \end{gathered}$ | $\begin{gathered} 0.18 \\ (0.21) \end{gathered}$ | $\begin{aligned} & 0.87^{* * *} \\ & (0.27) \end{aligned}$ |
| before. 20121 | $\begin{gathered} -0.54^{* *} \\ (0.25) \end{gathered}$ | $\begin{gathered} -0.62^{* *} \\ (0.24) \end{gathered}$ | $\begin{gathered} -0.55^{* *} \\ (0.26) \end{gathered}$ | $\begin{gathered} -0.66^{* * *} \\ (0.20) \end{gathered}$ | $\begin{gathered} -0.69^{* * *} \\ (0.20) \end{gathered}$ | $\begin{gathered} -0.666^{* * *} \\ (0.21) \end{gathered}$ | $\begin{gathered} -0.65^{* *} \\ (0.28) \end{gathered}$ | $\begin{gathered} -0.63^{* *} \\ (0.27) \end{gathered}$ | $\begin{gathered} -0.60^{* *} \\ (0.29) \end{gathered}$ | $\begin{gathered} -0.78^{* * *} \\ (0.23) \end{gathered}$ | $\begin{gathered} -0.74^{* * *} \\ (0.22) \end{gathered}$ | $\begin{gathered} -0.74^{* * *} \\ (0.24) \end{gathered}$ |
| polity2 | $\begin{gathered} -0.03 \\ (0.03) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.03) \end{gathered}$ | $\begin{gathered} -0.04 \\ (0.03) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.02) \end{gathered}$ | $\begin{gathered} -0.02 \\ (0.02) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.02) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.03) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.03) \end{gathered}$ | $\begin{gathered} -0.04 \\ (0.03) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.02) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.02) \end{gathered}$ | $\begin{gathered} -0.03 \\ (0.02) \end{gathered}$ |
| Constant | $\begin{gathered} -3.17^{* * *} \\ (0.31) \end{gathered}$ | $\begin{gathered} -3.02^{* * *} \\ (0.27) \end{gathered}$ | $\begin{gathered} -3.23^{* * *} \\ (0.32) \end{gathered}$ | $\begin{gathered} -2.59^{* * *} \\ (0.24) \end{gathered}$ | $\begin{gathered} -2.51^{* * *} \\ (0.22) \end{gathered}$ | $\begin{gathered} -2.62^{* * *} \\ (0.25) \end{gathered}$ | $\begin{gathered} -3.82^{* * *} \\ (0.41) \end{gathered}$ | $\begin{gathered} -3.66^{* * *} \\ (0.37) \end{gathered}$ | $\begin{gathered} -3.86^{* * *} \\ (0.44) \end{gathered}$ | $\begin{gathered} -3.29^{* * *} \\ (0.32) \end{gathered}$ | $\begin{gathered} -3.18^{* * *} \\ (0.29) \end{gathered}$ | $\begin{gathered} -3.37^{* * *} \\ (0.35) \end{gathered}$ |
| Observations | 8,103 | 8,909 | 7,631 | 8,103 | 8,909 | 7,631 | 8,103 | 8,909 | 7,631 | 8,103 | 8,909 | 7,631 |
| Log Likelihood | -487.81 | -533.81 | -461.35 | -731.65 | -780.47 | -697.63 | -433.93 | -475.97 | -411.15 | -648.24 | -693.17 | -617.80 |
| Akaike Inf. Crit. | 993.62 | 1,085.62 | 940.70 | 1,481.31 | 1,578.95 | 1,413.27 | 885.86 | 969.94 | 840.29 | 1,314.48 | 1,404.34 | 1,253.60 |

[^0]
## D. 2 Indiscriminate violence with 10 or more deaths

Figure 1: Contour plot of before-and-after average treatment effect of terrorist attacks against civilians targets with more than 9 deaths (or more than 9 wounded) on riots (with control group: terrorist attacks on non-civilian targets). Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 3 Indiscriminate violence with 2 or more deaths

Figure 2: Contour plot of before-and-after average treatment effect of terrorist attacks against civilians targets with more than 1 death (or more than 1 wounded) on riots (with control group: terrorist attacks on non-civilian targets). Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 4 Indiscriminate violence with only attacks against private citizens (category 14 in GTD)

Figure 3: Contour plot of before-and-after average treatment effect of terrorist attacks against private civilians targets with more than 4 deaths (or more than 4 wounded) on riots (with control group: terrorist attacks on non-civilian targets). Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 5 Indiscriminate violence with alternative riot specification (no restriction on issues involved)

Figure 4: Contour plot of before-and-after average treatment effect of terrorist attacks against civilians targets with more than 4 deaths (or more than 4 wounded) on alternative riots (with control group: terrorist attacks on non-civilian targets). Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 6 Activation of option "delete SUTVA" to reduce \%MO

Figure 5: Contour plot of before-and-after average treatment effect of terrorist attacks against civilians targets with more than 4 deaths (or more than 4 wounded) on riots (with control group: terrorist attacks on non-civilian targets). The option "delete SUTVA" is activated which reduces \%MO completely. Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 7 Indiscriminate violence defined as sum of wounded and deaths greater than 4

Figure 6: Contour plot of before-and-after average treatment effect of terrorist attacks against civilians targets if the sum of deaths and wounded (all in all) is above 4 deaths (with control group: terrorist attacks on non-civilian targets). Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 8 Indiscriminate violence with country matching variable

Figure 7: Contour plot of before-and-after average treatment effect of terrorist attacks against private civilians targets with more than 4 deaths (or more than 4 wounded) on riots (with control group: terrorist attacks on non-civilian targets). The model uses country as matching variable. Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 9 Indiscriminate violence with sub-continent fixed effect

Figure 8: Contour plot of before-and-after average treatment effect of terrorist attacks against private civilians targets with more than 4 deaths (or more than 4 wounded) on riots (with control group: terrorist attacks on non-civilian targets). The model uses five regions (North, South, East, Central, and West Africa) as fixed effect. Space-time windows (rectangles) with x-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## D. 10 Indiscriminate violence with sub-continent fixed effect and country matching variable

Figure 9: Contour plot of before-and-after average treatment effect of terrorist attacks against private civilians targets with more than 4 deaths (or more than 4 wounded) on riots (with control group: terrorist attacks on non-civilian targets). The model uses five regions (North, South, East, Central, and West Africa) as fixed effect and country matching variable. Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$-axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


## E Assessing potential risk of mislabeling terrorist events

As a robustness test, we test if SCAD events labeled "category 9" (cat.9) can predict terrorist attacks (GTD "core" specification). We run a MWA with the treatment variable set as SCAD events cat. 9 with two possible specifications: (1) event are selected if any issues is labeled cat. 9 (Figure 10) or (2) only the main issue is labeled cat. 9 (Figure 11). The dependent variable is defined as GTD terrorist attacks (core) and SCAD demonstrations is used as control events.

Figure 10: Contour plot of before-and-after average treatment effect of SCAD events category 9 (any issues) on terrorist attacks against private civilians targets with more than 4 deaths (or 4 wounded) riots (with control group: SCAD demonstrations events). Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$ axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


Figure 11: Contour plot of before-and-after average treatment effect of SCAD events category 9 (main issue only) on terrorist attacks against private civilians targets with more than 4 deaths (or 4 wounded) riots (with control group: SCAD demonstrations events). Space-time windows (rectangles) with $x$-axis: 10 km to 70 km and $y$ axis: 10 days to 70 days. For each rectangle, the average effect is illustrated by gray shades (low values: dark, high values: light) and significance levels: hachured with solid lines ( p -value $>0.1$ ), dashed lines ( $0.05>\mathrm{p}$-value $<0.1$ ), and no hachure ( p -value $<0.05$ ).


Both specifications (Figures 10 and 11) show no significant spacetime windows. As an additional test, we checked for potential overlap between SCAD cat. 9 and GTD terrorist attacks (core) at various space-time windows. Using a space-time window of 3 km and 1 day, as suggested in ?, we found no overlap between GTD (core) and SCAD cat. 9. We extended the test to 10 km and 3 days, which led to an absence of overlap between events. These results suggest that SCAD cat. 9 are not likely to represent mislabeled GTD terrorist attacks (core).


[^0]:    Note: Standard errors are provided in parentheses. ${ }^{*} \mathrm{p}<0.1 ;{ }^{* *} \mathrm{p}<0.05 ;{ }^{* * *} \mathrm{p}<0.01$

