# Brexit, Donald Trump and Car Accidents: Effects of Emotions on Risky Decisions?

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# Effects of Emotions on Risky Choices & Behaviour

**Many laboratory studies have found effects of emotions on various judgments and decisions.**

**<u>Anger</u>** increases preferences for risky options (Lerner & Keltner, 2000, 2001; Leith & Baumeister, 1996; Fessler et al. 2004).

**<u>Fear</u>**     decreases preferences for risky options - (Lerner & Keltner, 2000, 2001)
**<u>Anxiety</u>** decreases risky decisions (Raghunathan & Pham 1999)
**<u>Sadness</u>** decreases risk taking (Chou et al, 2007; Yuen & Lee, 2003; Raghunathan & Pham, 1999).

**<u>Happiness</u>** increases risk taking Chou et al, 2007; Stanton et al, 2014; Au et al., 2003)

***But***

**<u>Happiness</u>** decreases risk taking (Isen and Geva, 1987; Isen & Patrick, 1983; Nygren et al.,1996)

Inconsistent results may result from heterogeneity of emotions and their effects

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**If risky driving decisions cause car accidents, do emotions influence accident rates?**

# Effects of Emotions on Risky Choices & Behaviour

**Field studies of Emotion and Traffic Accidents show happy people have fewer accidents**

Across 37 countries National Wellbeing is negatively correlated with traffic deaths (Kirkcaldy & Furnham, 2000).

Goudie et al (2014). Longitudinal sample of 13,027 Americans.
Lagged subjective wellbeing is negatively predictive of *later* involvement in motor vehicle accidents: subjective wellbeing in the year 2001 predicts self-reported car accidents in 2008.

86.7% of adults who are 'Very satisfied' with their life report always using their seatbelt, but only 77.2% of adults who are 'Very dissatisfied' do so.

**Rational Risk taking?**

Humans who greatly enjoy life have a lot more to lose than people who gain only a small utility premium from life. Thus on an expected utility calculation, less happy people will rationally take greater risks (with their lives), as they will be less willing to pay the costs associated with safety seeking.

# Life satisfaction around Brexit

Powdthavee, N., Plagnol, A., Frijters, P., & Clark, A. (2017). Who Got the Brexit Blues? Using a Quasi-Experiment to Show the Effect of Brexit on Subjective Wellbeing in the UK.

A representative sample of the UK population - with 18,682 observations.
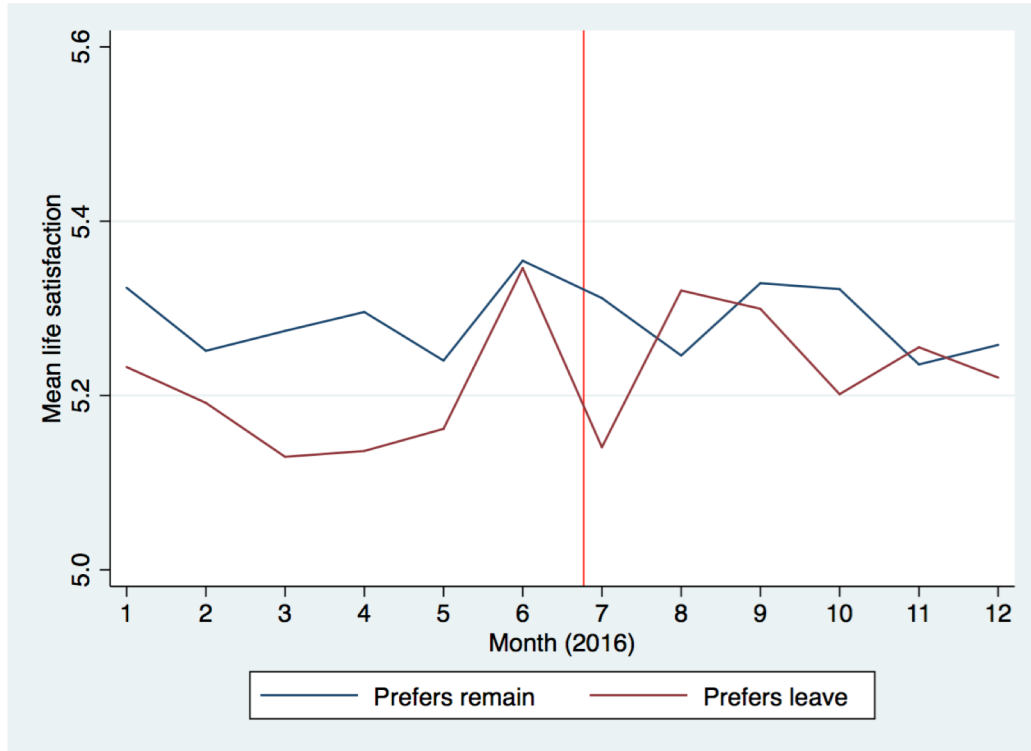


Mean life satisfaction (1-7) by month

Those who prefer to leave the EU were, on average, 0.14 points less satisfied with life prior to the referendum.

The immediate effect of the referendum result was to invert the life satisfaction ranking of Leavers and Remainers.

The referendum outcome produced a windfall satisfaction gain amongst Leavers compared to Remainers that lasted for three months, a wellbeing effect of the same size as around 20% of annual incomes (some £5,000 per person).

**"However, adaptation to the Brexit result appears to be complete three months after the Referendum."**
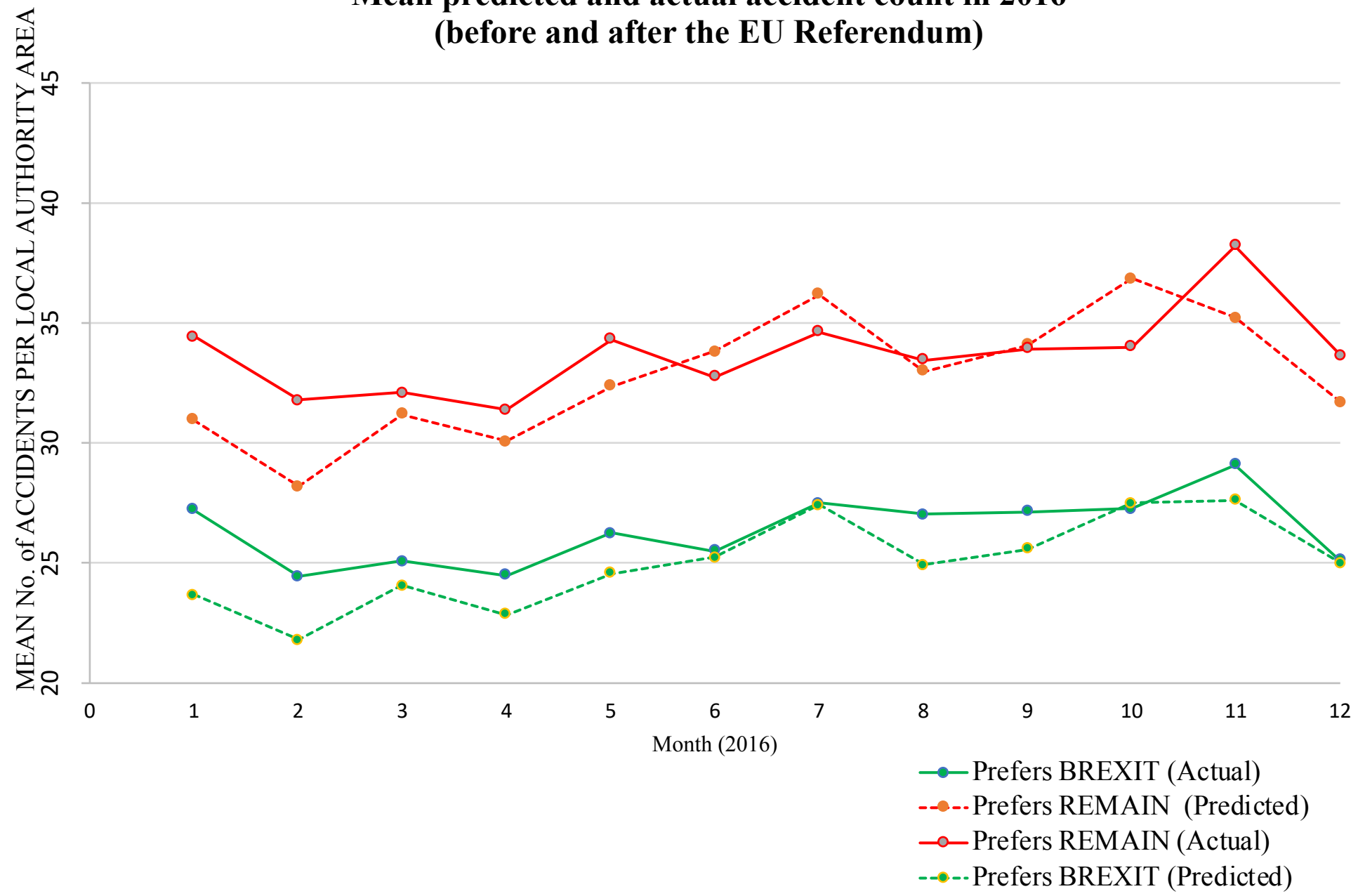
Contains Ordnance Survey data
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BREXIT vote by area in Great Britain June 23rd 2016.

Shading – "Remain" majority
Majority percentage
- 0 – 5
- 5 – 10
- 10 – 15
- 15 – 20
- 20 – 25
- 25 – 30
- 30 – 35
- 35 – 40

Shading – "Leave" majority
Majority percentage
- 0 – 5
- 5 – 10
- 10 – 15
- 15 – 20
- 20 – 25
- 25 – 30
- 30 – 35
- 35 – 40

There are 380 local authority areas in Great Britain (UK excluding Northern Ireland)

We obtained car accident data - numbers of car accidents - in each of 378 Local authority areas for 2005-2016.

We regressed data from 2005-2015 to predict the expected number of accidents in 2016 for each local authority area for each month (12 x 378 = 4536 predictions)

We compared predicted with actual number of accidents in each local authority area for each month in 2016 to measure the 'excess' accidents (actual – predicted).

To view the association between the Brexit vote and road accidents we computed the correlation between 'excess' accidents and the % Brexit vote across the 378 areas for each month.

A positive correlation implies that **excess** accidents occur **relatively** more in Brexit voting areas

Correlation between 'excess' accidents (Actual – Predicted) & Brexit vote in 378 local authority areas

| | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pearson Correlation | 0.035 | -0.092 | -0.014 | 0.04 | -0.036 | 0.035 | .115* | .159** | .127* | .130* | -.124* | -.145** |
| Sig. (2-tailed) | 0.495 | 0.076 | 0.789 | 0.442 | 0.484 | 0.501 | 0.025 | 0.002 | 0.013 | 0.011 | 0.016 | 0.005 |
| N | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 | 378 |

Mean predicted and actual accident count in 2016
(before and after the EU Referendum)

**Mean predicted and actual accident count in 2016
(before and after the EU Referendum)**

Month (2016)

MEAN No. of ACCIDENTS PER LOCAL AUTHORITY AREA
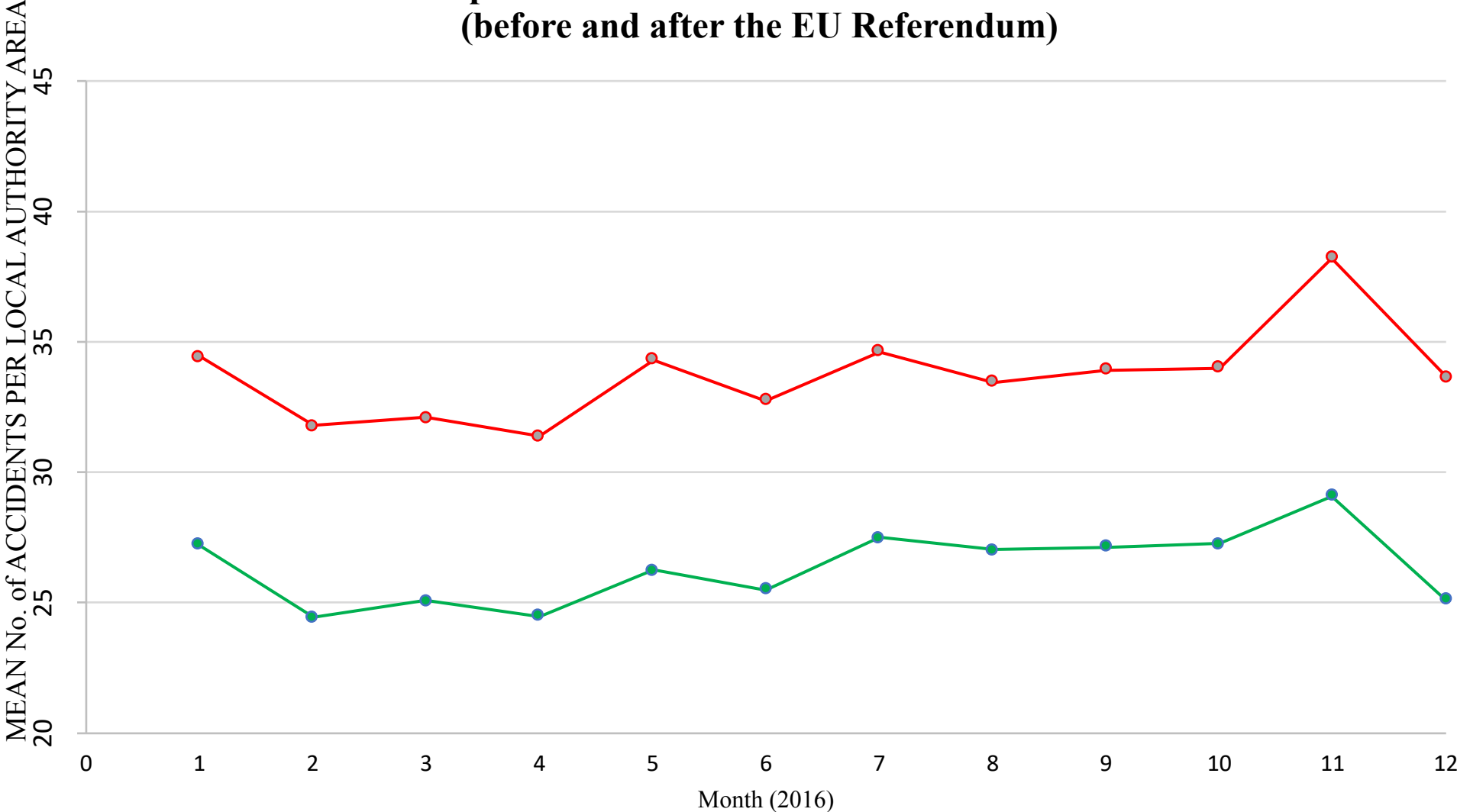
- Prefers BREXIT (Actual)
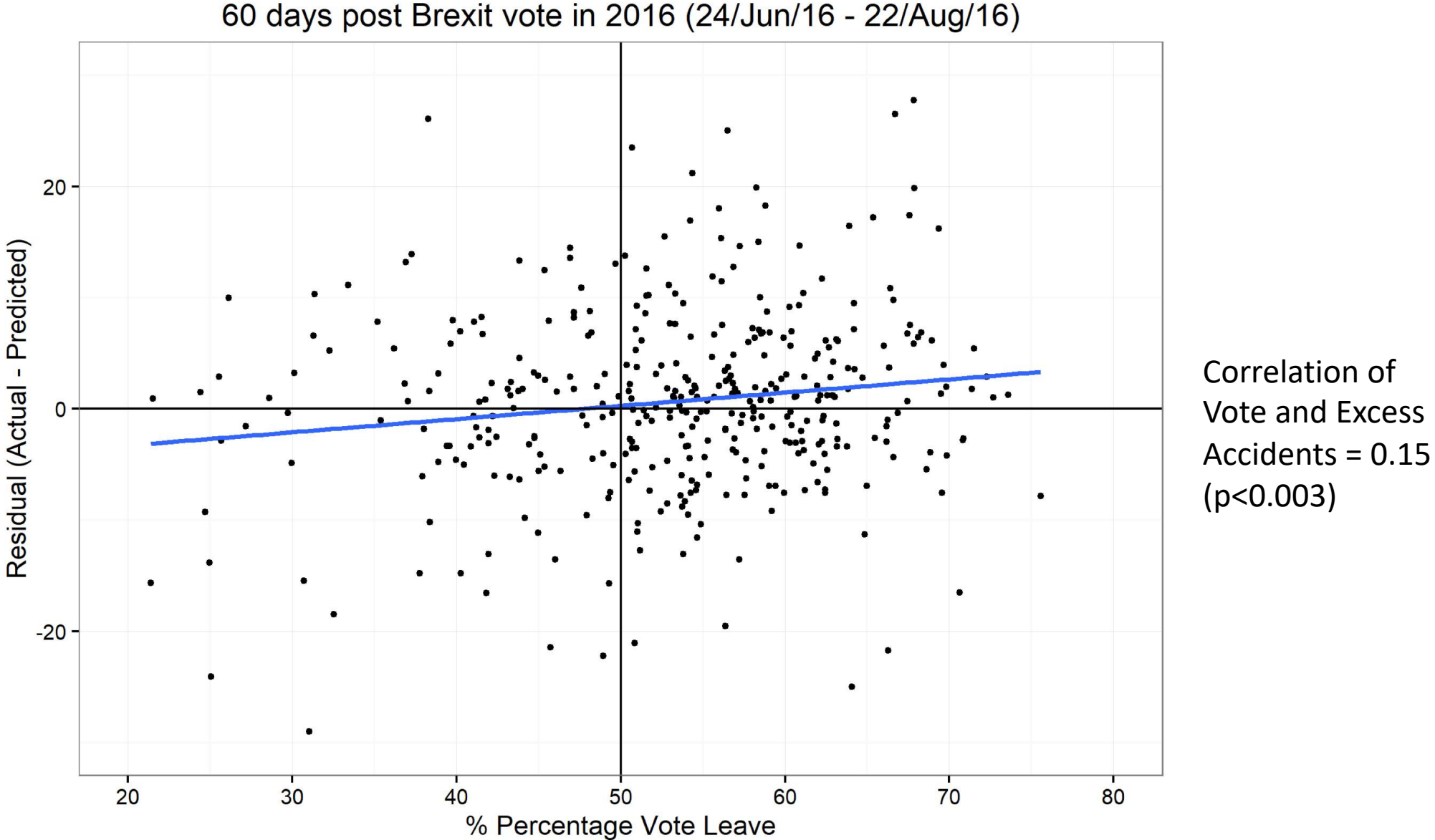- Prefers REMAIN (Predicted)
- Prefers REMAIN (Actual)
- Prefers BREXIT (Predicted)

Mean number of car accidents surplus to predictions per local authority area in 2016 (before and after the EU Referendum).
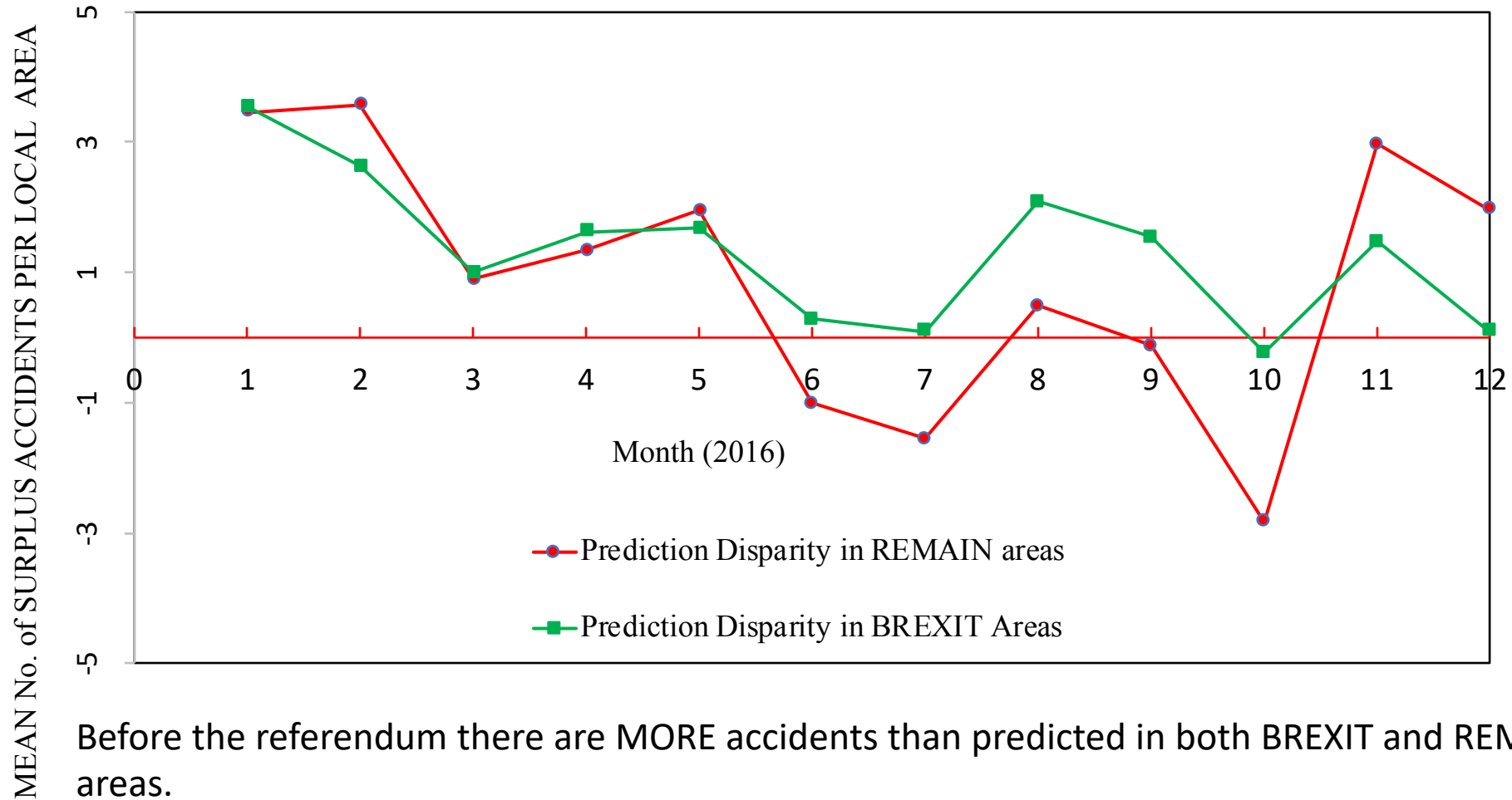
Before the referendum there are MORE accidents than predicted in both BREXIT and REMAIN voting areas.

After the referendum the lines diverge: relatively more accidents than predicted in BREXIT voting areas than in REMAIN voting areas – until November & December….

# A different treatment of the same data – "Excess" accidents for Each Local Authority over 60 post-vote days



60 days post Brexit vote in 2016 (24/Jun/16 - 22/Aug/16)

Correlation of Vote and Excess Accidents = 0.15 (p<0.003)

# A different treatment of the same data – "Excess" accidents for Each Local Authority over 60 Pre-vote days



60 days before Brexit vote in 2016 (24/Apr/16 - 22/Jun/16)
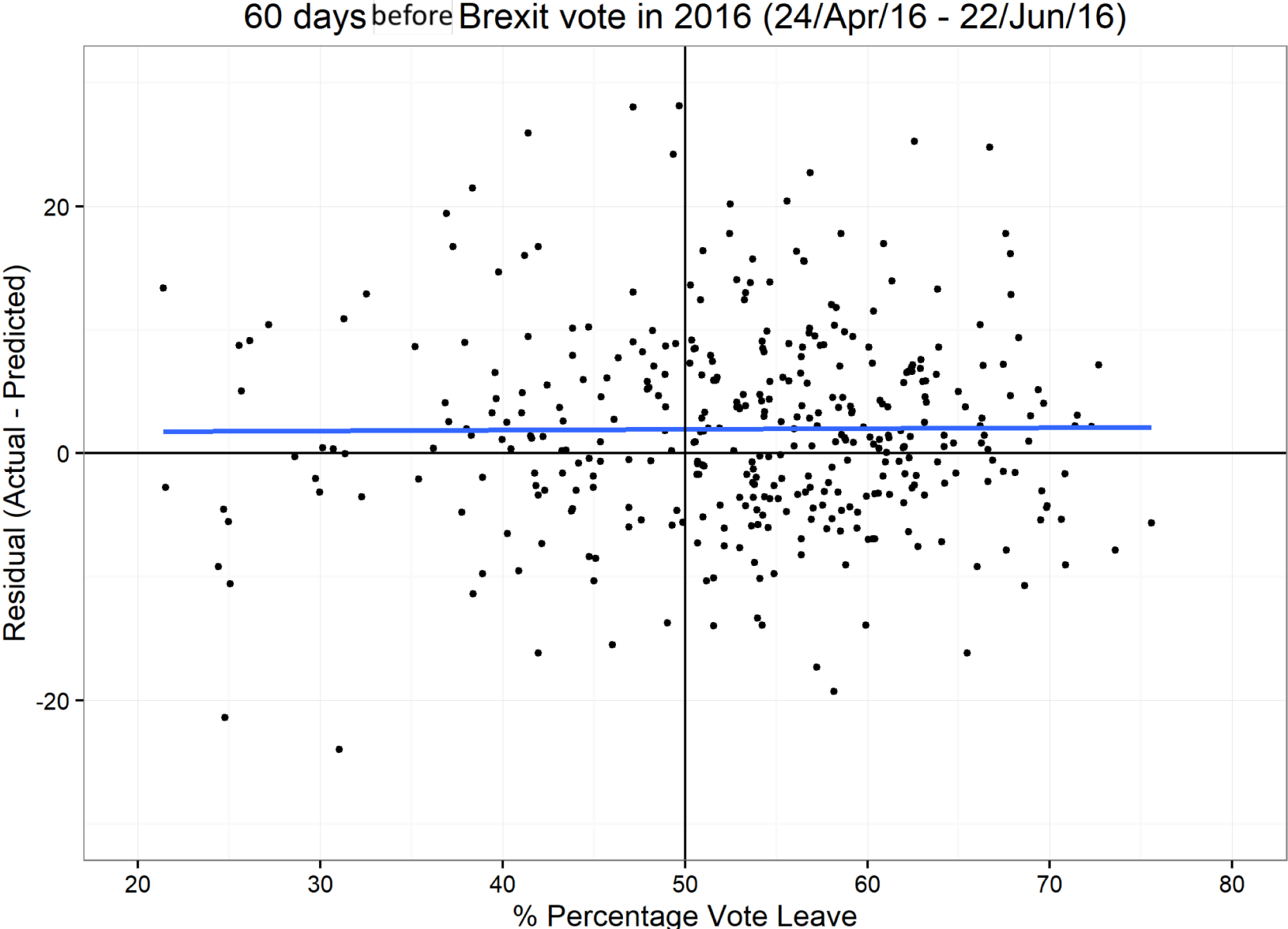
Correlation of Vote and Excess Accidents (p>0.05)

A different treatment of the same data – "Excess" accidents for Each Local Authority over 60 post-vote days

Excess accidents for the same period in 2015
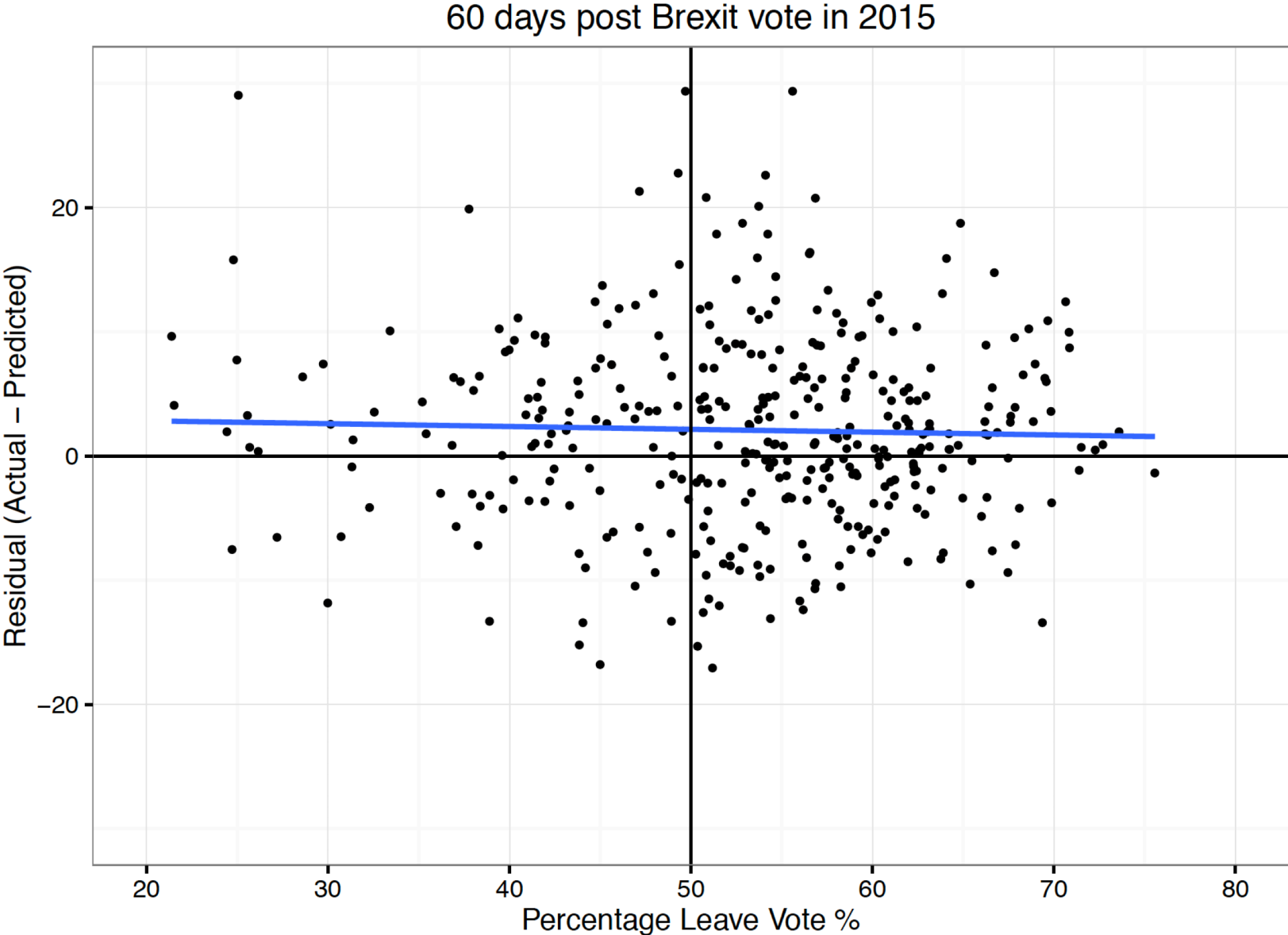
60 days post Brexit vote in 2015

Correlations between the 2016 vote and "Excess" accidents for Each Local Authority over 60 **post**-vote days

Correlations for the same period for Eleven years

60 days post Brexit vote date
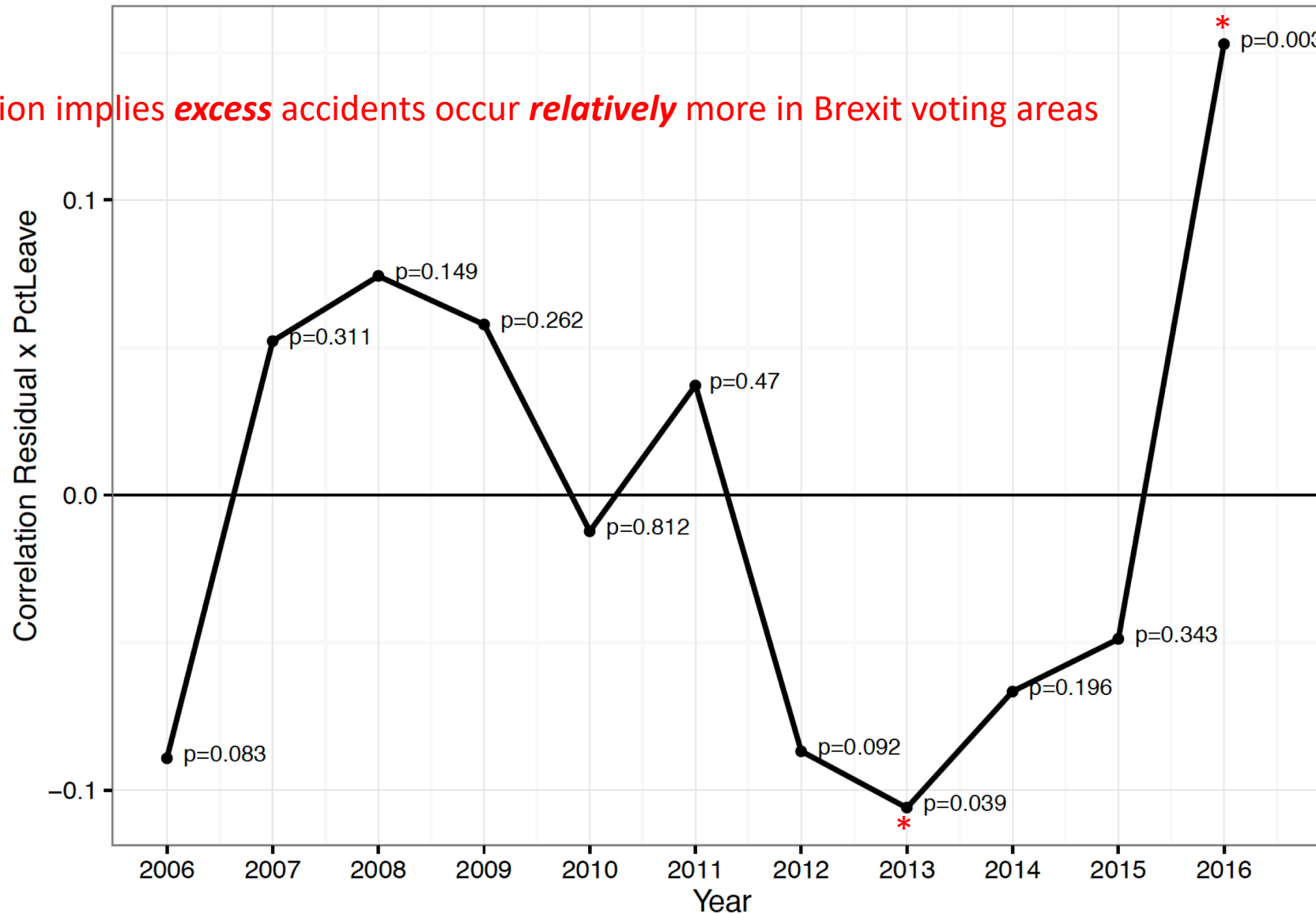
A positive correlation implies *excess* accidents occur *relatively* more in Brexit voting areas

2 of the 11 years show a significant association between the vote in 2016 and "excess" road accidents

A Trump Effect on Road Accidents?
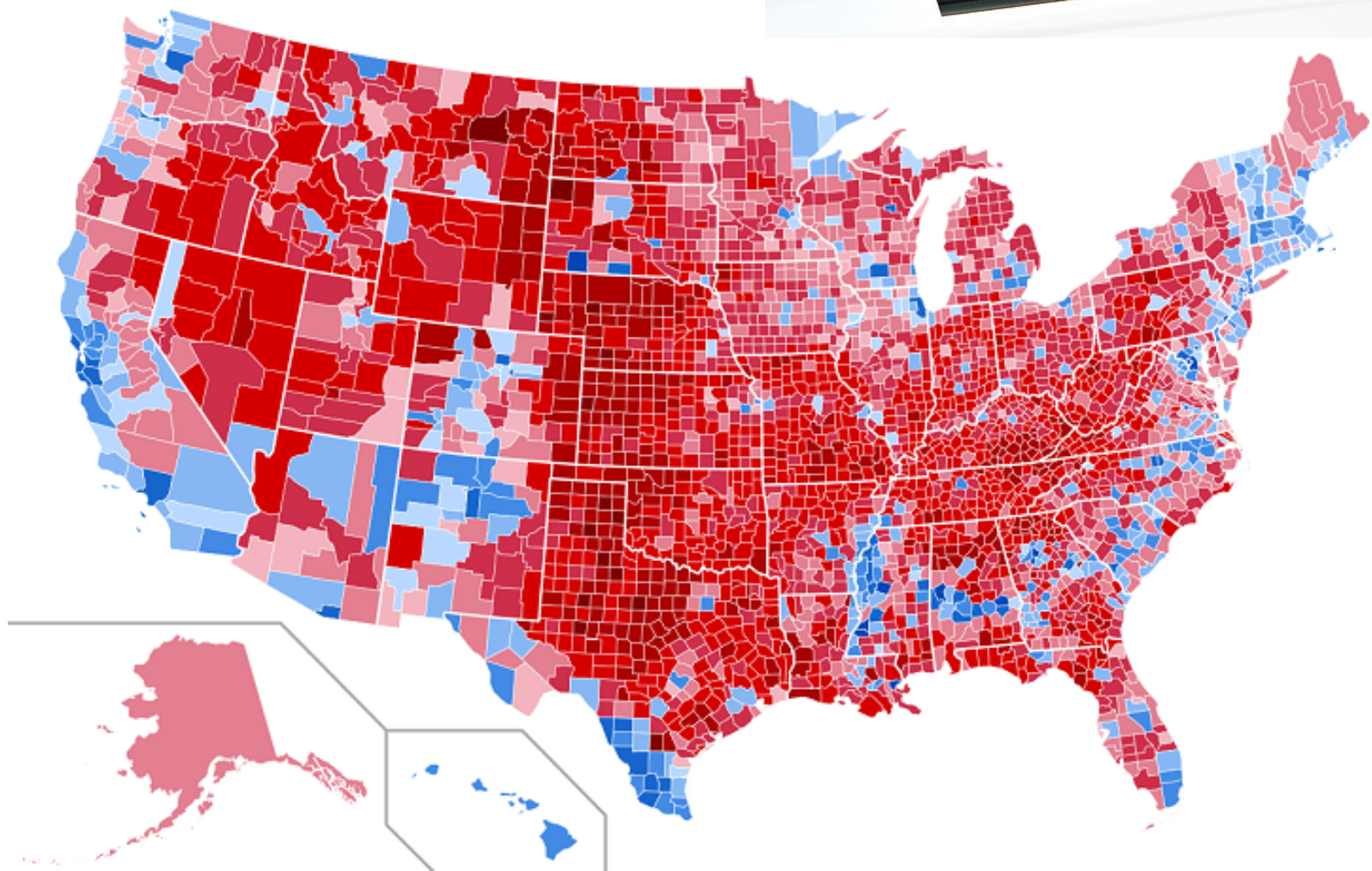
# Effects of 2016 USA Presidential Election on subjective well-being

Lench, H. C., Levine, L. J., Perez, K. A., Carpenter, Z. K., Carlson, S. J., & Tibbett, T. (2018). Changes in subjective well-being following the US Presidential election of 2016. Emotion.

*Multilevel model with General Happiness Predicted by Time since Election and Political Preference*

At each time point, participants reported the extent to which they were generally feeling happy, angry, and scared, and their current life satisfaction.

General happiness is calculated by taking happiness ratings and subtracting out mean negative emotion ratings (Diener, Diener, & Diener, 1995; Kahneman & Krueger, 2006).
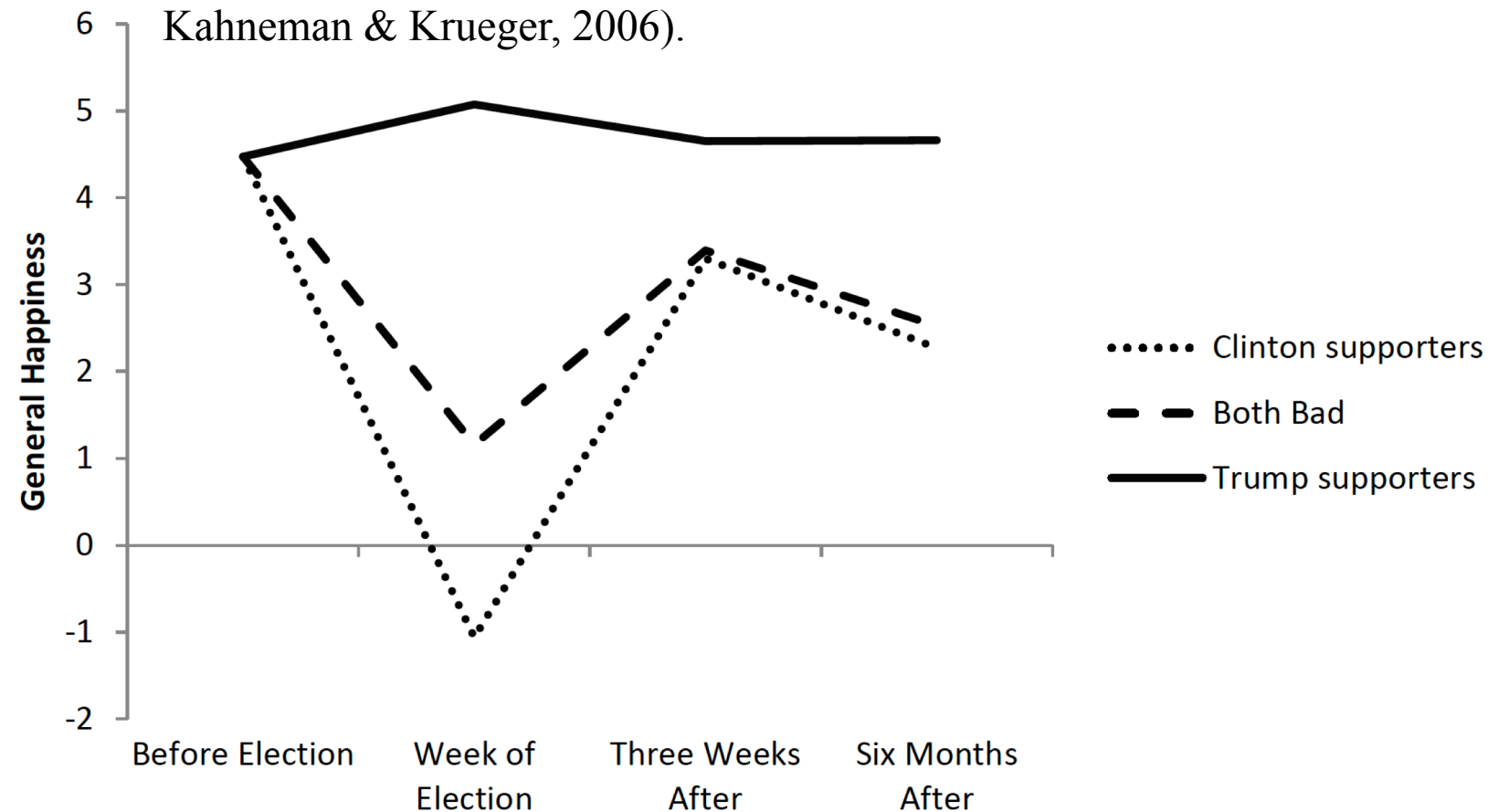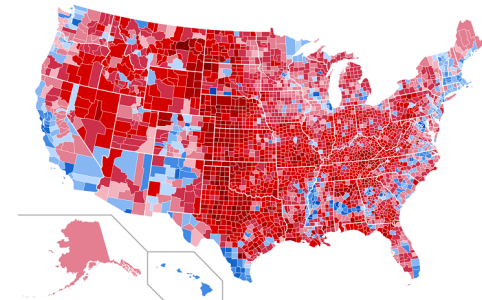
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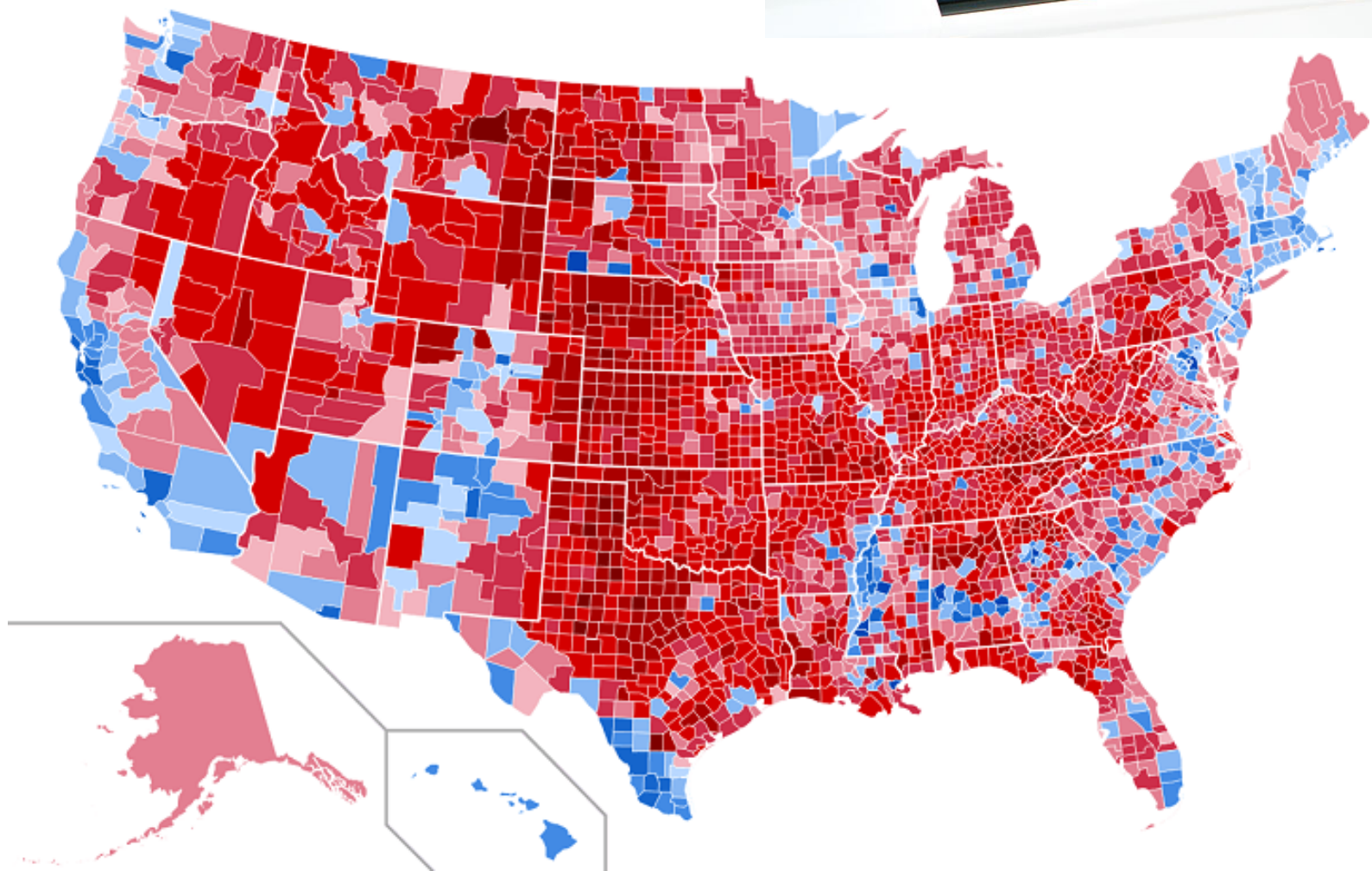
A Trump Effect on Road Accidents?

We obtained (*fatal*) road accident data for 3141 of 3,142 counties and county-equivalents in the USA for 2006-2015.

We used 3141 regression models to predict the expected number of accidents in each of 378 local authority areas for the period following the US election on November 8th 2016.

We then compared the predictions with the actual number of accidents in each county for November 9- December 31$^{st}$ 2016 to measure the 'excess' accidents (actual – predicted).

We computed the correlation between 'excess' accidents and the % Trump vote across 3141 counties.

A Trump Effect on Road Accidents?

Number of Excess (*fatal*) road accidents for 3141 US counties and county-equivalents in the USA Nov 9-Dec 31 2016.
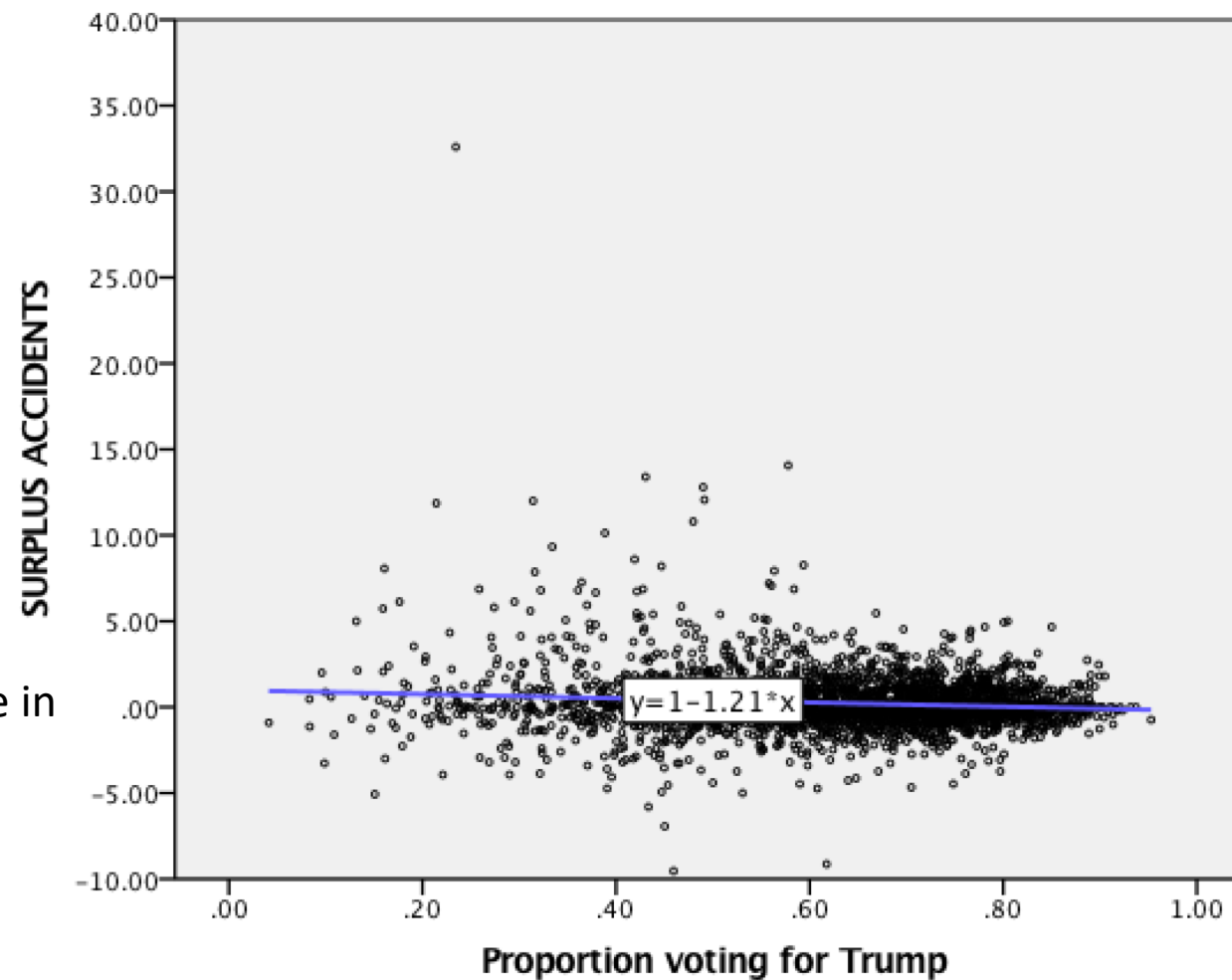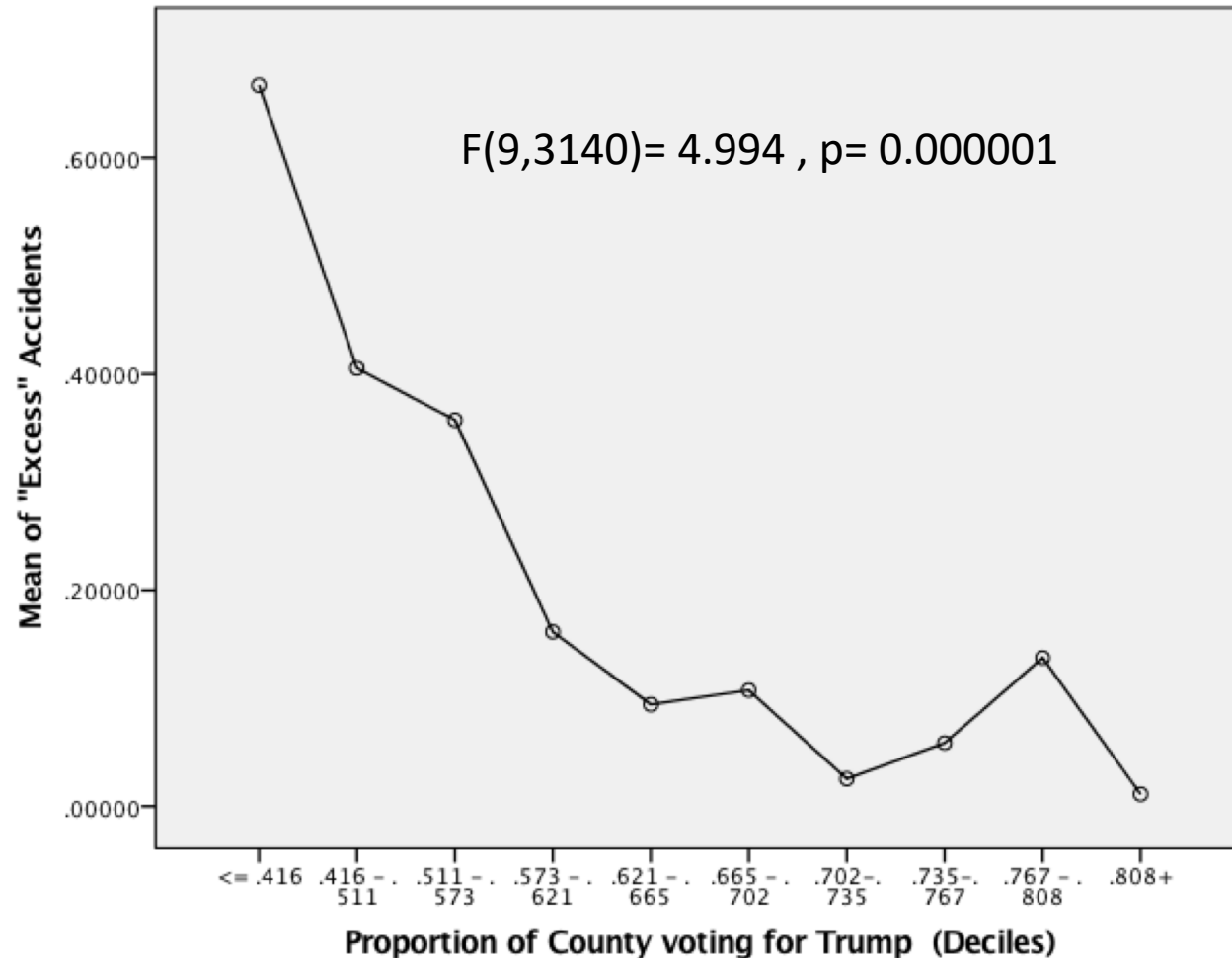
**Correlation**: Pearson's r = -0.115, p<0.00001 - excess accidents decrease in counties with greater Trump vote



Scatterplot: SURPLUS ACCIDENTS (y-axis, -10.00 to 40.00) vs Proportion voting for Trump (x-axis, .00 to 1.00). Regression line: y=1-1.21*x

A Trump Effect on Road Accidents?

**Correlation**: Pearson's r = -0.115, p<0.00001 - excess accidents increase in counties with greater Clinton vote

Relatively more accidents – relative to predictions – in areas with more voters on the losing side – the opposite of the Brexit effect.
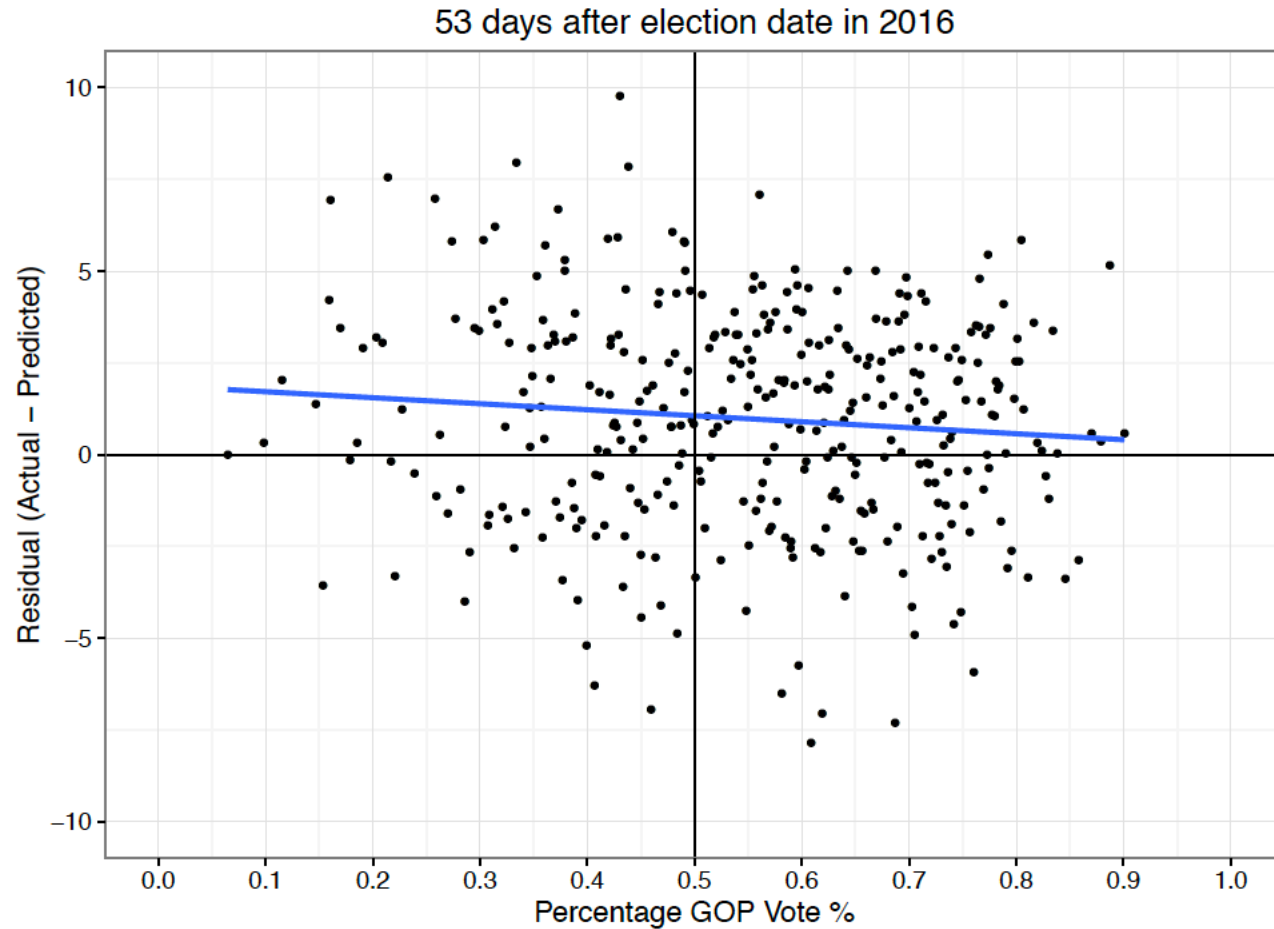


Mean Number of 'Excess' Accidents November 9–December 31 2016 p
County by Trump Vote

$F_{(9,3140)}= 4.994$ , p= 0.000001

Mean of "Excess" Accidents

Proportion of County voting for Trump (Deciles)

**A different treatment of the same data – "Excess" accidents for Each region over 53 post-vote days**

Number of Excess (*fatal*) road accidents for 361 "aggregated counties" in the USA Nov 9-Dec 31 2016.

Aggregated counties create regions with >10 accidents each in 2016, sorted by %GOP vote)



Correlation
r= -0.12, P=0.016

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53 days after election date in 2015
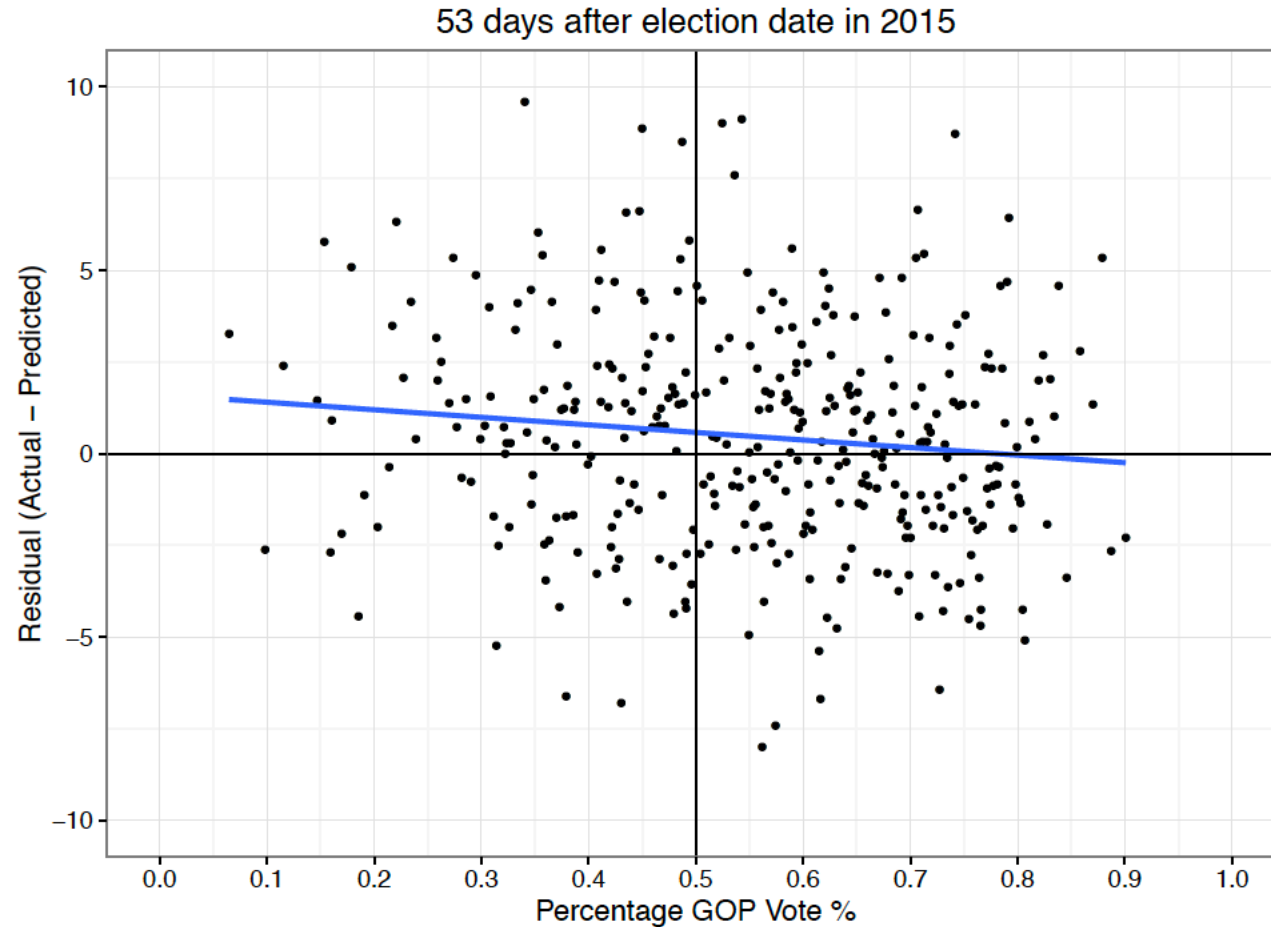
Correlation
r= -0.16, P=0.003

# Correlations between the 2016 vote and "Excess" accidents across 361 Aggregated areas over 53 post-vote days



53 days after election date
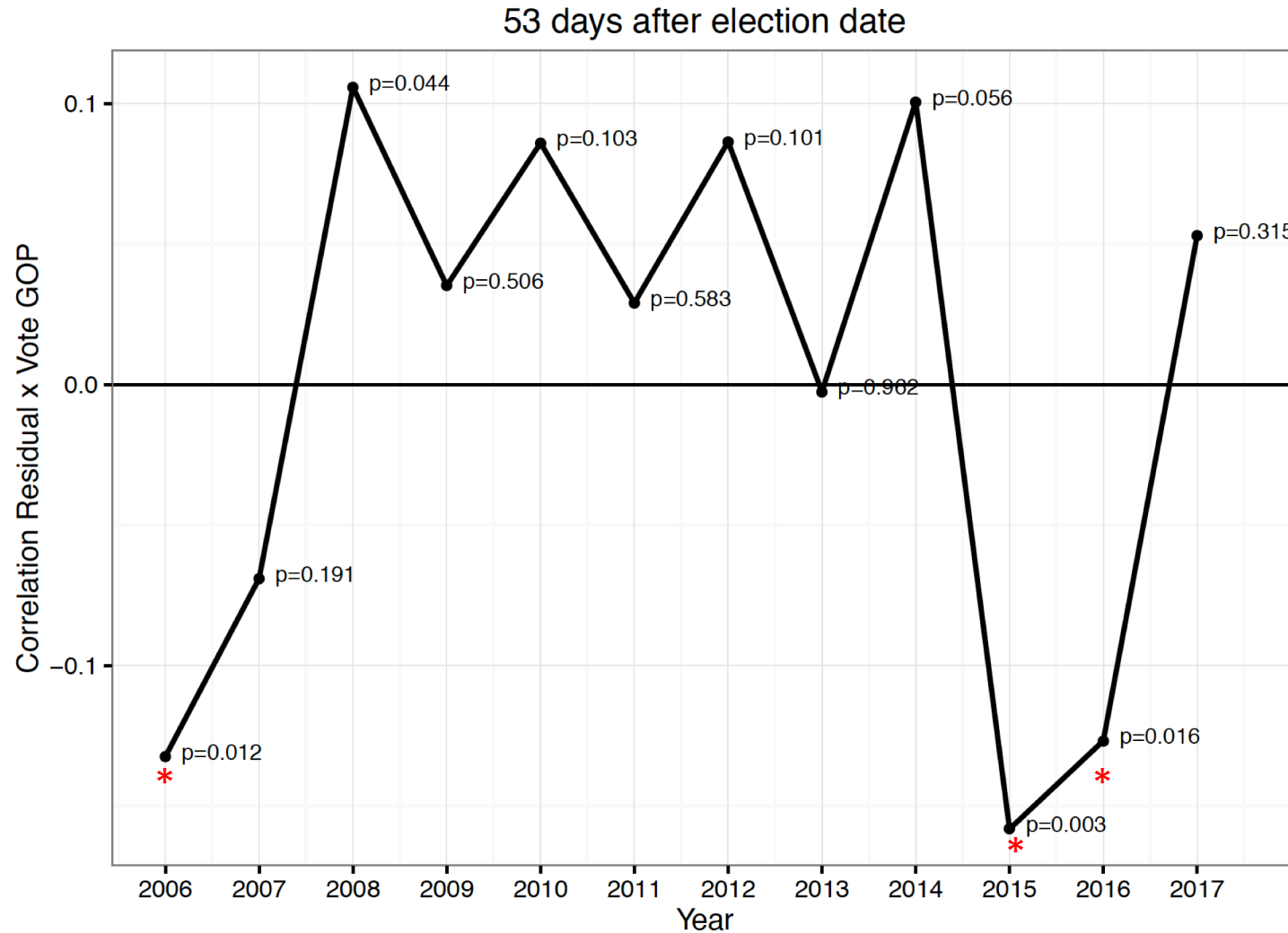
3 of the last 12 years show a significant association between the vote in 2016 and "excess" road accidents

# Correlations between the 2016 vote and "Excess" accidents across 361 Aggregated areas over 53 Pre-vote days



53 days before US election date (16/Sep-7/Nov)
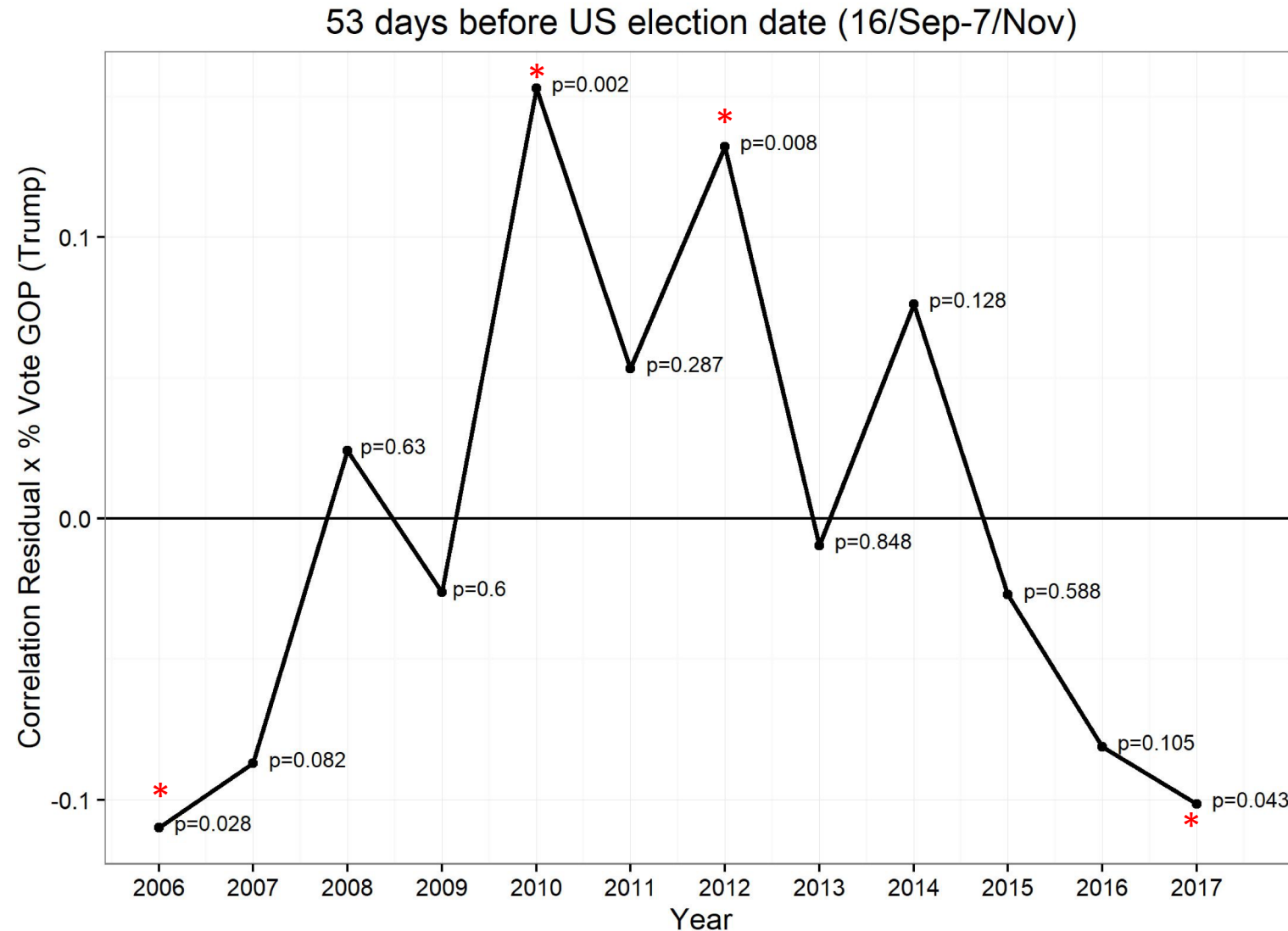
4 of the last 12 years show a significant association between the vote in 2016 and "excess" road accidents in the 53 days BEFORE the election

# Conclusion

Do election results influence traffic accident rates?

Do emotions affect people's driving decisions?

It's field data – good (Real effects); but correlational – bad (question mark over causality).

These studies suggest an effect of emotions on driver behavior and accident propensity.

**BUT** unlike as in many experiments people are not randomly allocated to emotional states.

Some of the variation in propensity for accidents  might be due to complex psycho-geographic factors (e.g. primary psychological causes of accidents in rural areas may be different from those in more urban areas. **Psycho-geography**: Rural and urban areas are also psychologically different.

If we are observing effects of emotion on risk it seems extraordinary that such heterogeneous influences of emotions co-ordinate to influence driving accidents.

"Some circumstantial evidence is very strong, as when you find a trout in the milk." (Henry David Thoreau)