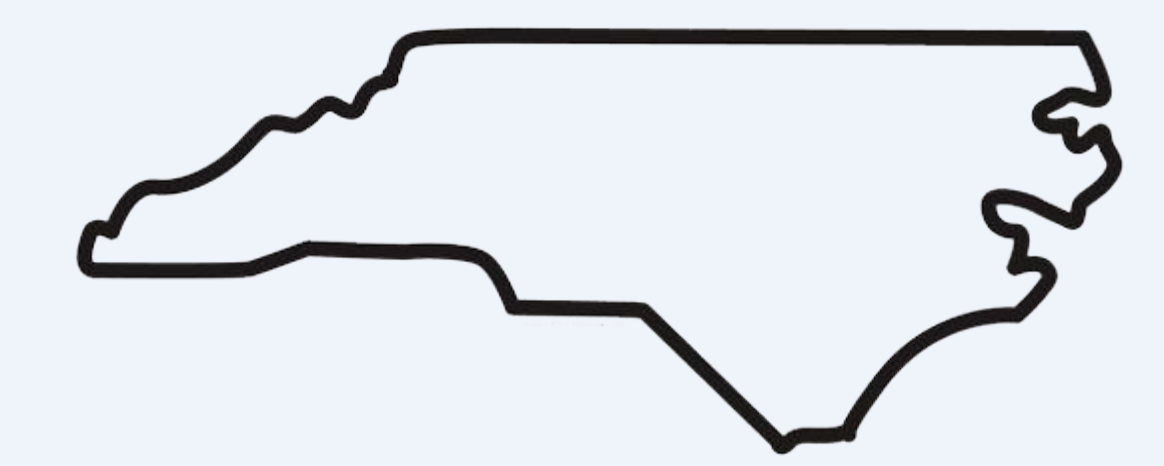# Taking the Worm Away from the Early Bird:
Do Changes in Early Voting Opportunities Impact Voter Turnout?

INTRODUCTION

Across the country there have been waves of voter suppression laws, and North Carolina is part of the latest wave with the law HB 589. Although this law was struck down, some counties took matters into their own hands. Between the 2012 and 2016 elections, 17 counties in North Carolina had significant reductions in the quantity of early voting locations. However, there is not conclusive evidence on how early voting locations ultimately impact voter turnout. Our research analyzes how both overall and early voting turnout at the county level was affected by these changes.

RESEARCH QUESTION:
How did changes in the number of voting locations in the first seven days of North Carolina early voting affect turnout in a county?

HYPOTHESIS:
Null: Changes made to the number of early voting locations in the first week did not have an effect on county-level voter turnout.

Alternative: Changes made to the number of early voting locations in the first week did have an effect on county-level voter turnout.

METHODS

DATA
- County-level turnout data for overall election and early voting was compiled from the North Carolina State Board of Elections.
- Data on county-level median income, racial demograhics and population density were compiled from 2010 census data as covariates since these are factors that might also influence turnout in a county.
- The 17 treatment counties were identified by the InsightUS blog as "super-suppressor" counties.

HYPOTHESIS TESTING
- Used a difference in differences model to see if turnout from 2012 to 2016 in treatment counties changed differently compared to control counties.
- For the regression, treatment and year were codedas dummy variables, control counties "0" and treatment counties "1", then 2012 "0" and 2016 "1".
- Models 1 and 2 look at overall election turnout, whereas models 3 and 4 look at turnout in just the early vote.
- Models 2 and 4 control for income, African American population percentage and population density.

RESULTS

Overall Voter Turnout

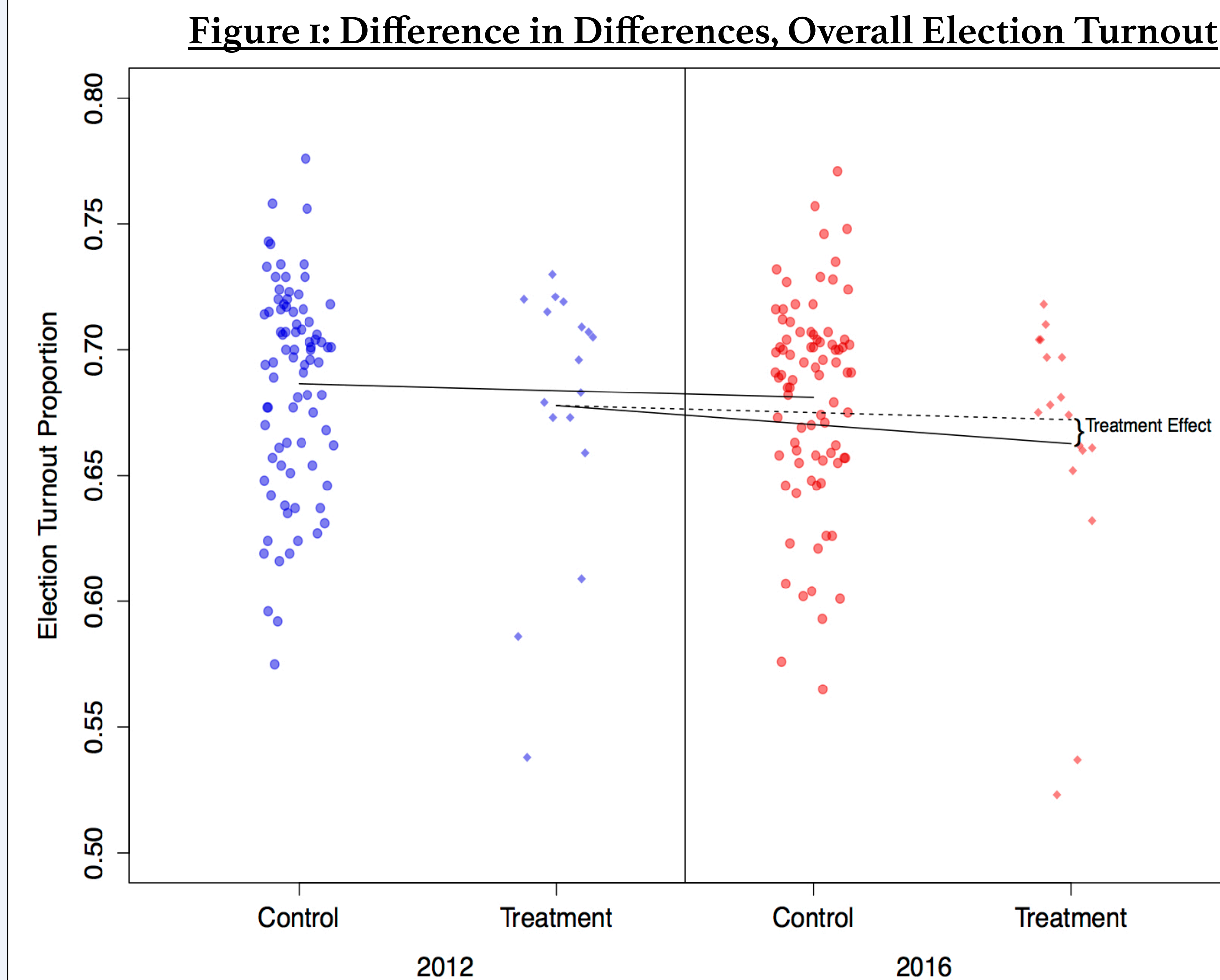**Figure 1: Difference in Differences, Overall Election Turnout**

Table 1: Multivariate regressions for overall voter turnout. Model 2 includes the three covariates. Model 2 is statistically significant, however interaction between Treatment*Year, which indicates the effect of the reduced early voting locations on treatment counties, is not significant in either model.

Figure 1: Difference in differences graph for overall voter turnout. Dashed line indicates the counterfactual, expected 2016 turnout in treatment counties based on change in control counties.

Table 1: Regression table for overall vote turnout

	Model 1 Coefficient (se)	Model 2 Coefficient (se)
Intercept	0.6866*** (0.0047)	0.6175*** (0.0207)
Treatment	-0.0088 (0.0115)	-0.0104 (0.0138)
Year	-0.0056 (0.0067)	-0.0056 (0.0065)
% African American	-	0.0003 (0.0002)
Average Income	-	1.558e-06** (4.791e-07)
Population Density	-	-5.968e-06 (1.385e-05)
Treatment*Year	**-0.0095 (0.0163)**	**-0.0095 (0.0159)**
F-Statistic	1.509	2.967
Adjusted R²	0.0076	0.0560
P-value	0.2134	0.0086
N	100	100

Significance Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

Early Voter Turnout

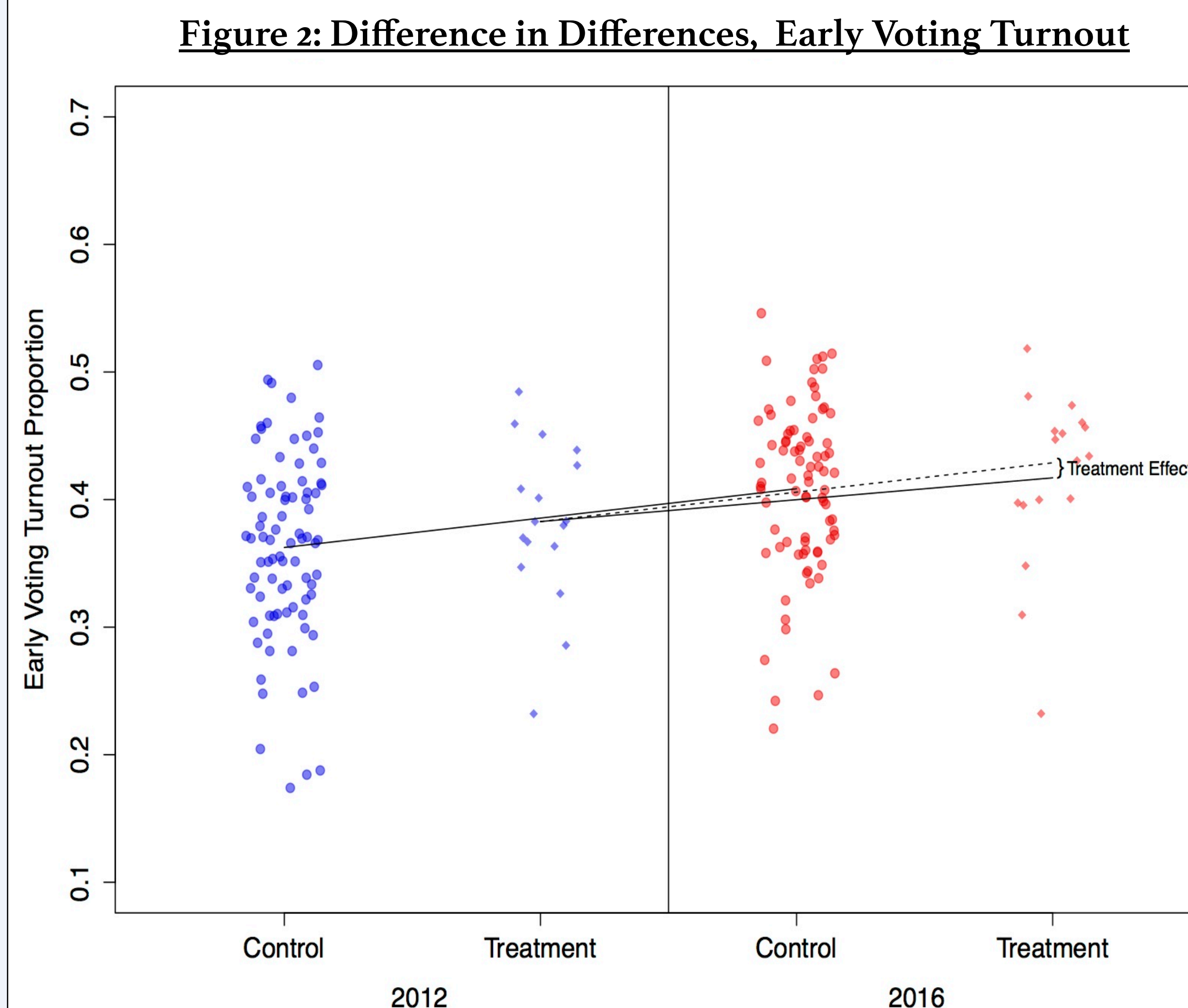**Figure 2: Difference in Differences, Early Voting Turnout**

Table 1: Multivariate regressions for early voter turnout. Model 4 includes the three covariates. Both models are statistically significant, however interaction between Treatment*Year is not significant in either model.

Figure 2: Difference in differences graph for early voter turnout. Dashed line indicates the counterfactual.

Table 2: Regression table for early vote turnout

	Model 3 Coefficient (se)	Model 4 Coefficient (se)
Intercept	0.3624*** (0.0075)	0.2810*** (0.0329)
Treatment	0.0203 (0.0182)	0.0134 (0.0180)
Year	0.0461*** (0.0106)	0.0461*** (0.0104)
% African American	-	0.0006* (0.0003)
Average Income	-	1.558e-06* (7.593e-07)
Population Density	-	2.487e-05 (2.195e-05)
Treatment*Year	**-0.0118 (0.0258)**	**-0.0118 (0.0252)**
F-Statistic	7.377	6.125
Adjusted R²	0.0877	0.1339
P-value	0.0001	6.774e-06
N	100	100

Significance Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1

CONCLUSION

Although the change in turnout in treatment counties from 2012 to 2016 is slightly different than expectation from the control counties , it was not significant and we failed to reject the null hypothesis at α-level = 0.05 for both the overal turnout (p-value=0.560) and early voting turnout (p-value=0.649). Even when including covariates in the model, there was no significant difference (overall turnout p-value=0.550, early turnout p-value = 0.641) . While the covariates succeeding in increasing the R², they did not make the treatment*year interaction significant.

Even though changes in early voting locations did not have a significant impact on voter turnout within the context of our treatment counties, the notion that there is no correlation between these factors should not be generalized to other precincts nationwide due to various limitations. However, if our results were true it would indicate that motivated voters will participate in elections whether or not restrictions are placed on the number of early voting locations available. Perhaps voters in North Carolina are more determined to vote than previously thought.

LIMITATIONS

Although we did not find significant results, we suspect some significant limitations played a role and should be taken into account for future studies:
- We were unable to get precinct-level data, which may offer further insight into the effects of changes to early voting as well as provide a larger sample size for greater statistical power.
- Our sample is small (n=17 for the treatment) so it is difficult to detect small changes.
- Weather is a confounding variable that we did not control for, Hurricane Matthew hit during the early voting period which could have impacted turnout differently in different counties.
- It is possible that since these 17 counties were identified before early voting was over, extra attention was paid to them to help people vote early.
- The 2016 election was a very unique election and we should be careful in generalizing any conclusion derived from data on it.

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