# LESSONS LEARNED FROM THE 2016 ELECTION

IE 561 – Continuous Quality Improvement of Process

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Most of this information comes from the website 538

# Polls are broken

http://www.cbsnews.com/news/why-did-many-polls-seem-to-miss-a-trump-victory/

Are the polls really broken?

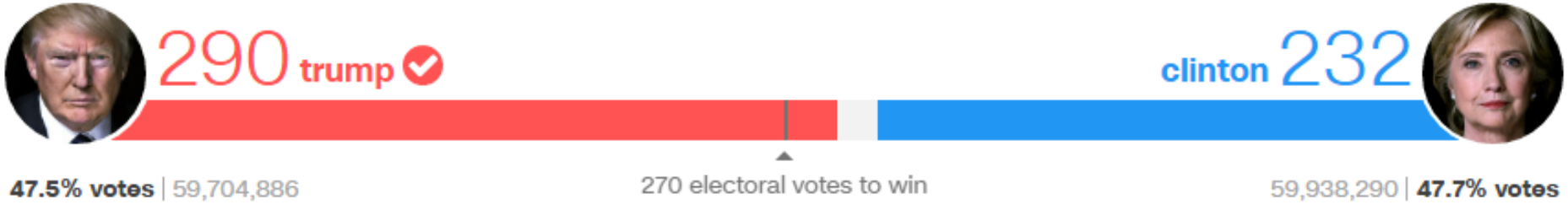
Polls average Clinton +3
But wide range of possibilities
There was a lot of uncertainty in the polls

The pundits assumed certainty but the polls suggested uncertainty

| DATES | POLLSTER | TYPE | GRADE | MARGIN |
|---|---|---|---|---|
| | | .ive telephone | A+ | Clinton +6 |
| | | .ive telephone | A+ | Clinton +3 |
| | | .ive telephone | A+ | Clinton +4 |
| | | .ive telephone | A | Clinton +1 |
| | | .ive telephone | A | Clinton +4 |
| Nov. 3-5 | NBC/ WSJ | Live telephone | A- | Clinton +4 |
| Oct. 31-Nov. 4 | Ipsos | Online | A- | Clinton +4 |
| Nov. 1-4 | Angus Reid | Online | A- | Clinton +4 |
| Nov. 3-6 | IBD/TIPP | Live telephone | A- | Trump +2 |
| Nov. 2-6 | CBS News | Live telephone | A- | Clinton +4 |
| Nov. 1-5 | RKM Research | Live telephone | B+ | Clinton +3 |
| Nov. 4-7 | YouGov | Online | B | Clinton +4 |
| Nov. 1-2 | Gravis Marketing | Automated/online | B- | Clinton +2 |
| Oct. 31 – Nov. 6 | CVOTER International | Online | C+ | Clinton +3 |
| Nov. 2-6 | Rasmussen Reports | Automated/online | C+ | Clinton +2 |
| Oct. 31 – Nov. 6 | SurveyMonkey | Online | C- | Clinton +6 |
| Nov. 4-5 | Morning Consult | Online | — | Clinton +3 |
| Nov. 5-7 | The Times-Picayune/Lucid | Online | — | Clinton +5 |
| Oct. 31 – Nov. 6 | USC Dornsife/LA Times | Online | — | Trump +5 |

# Popular vote

Look who won the popular vote, just as the polls predicted!
Approximately a 2-3 point difference from the average of the polls)



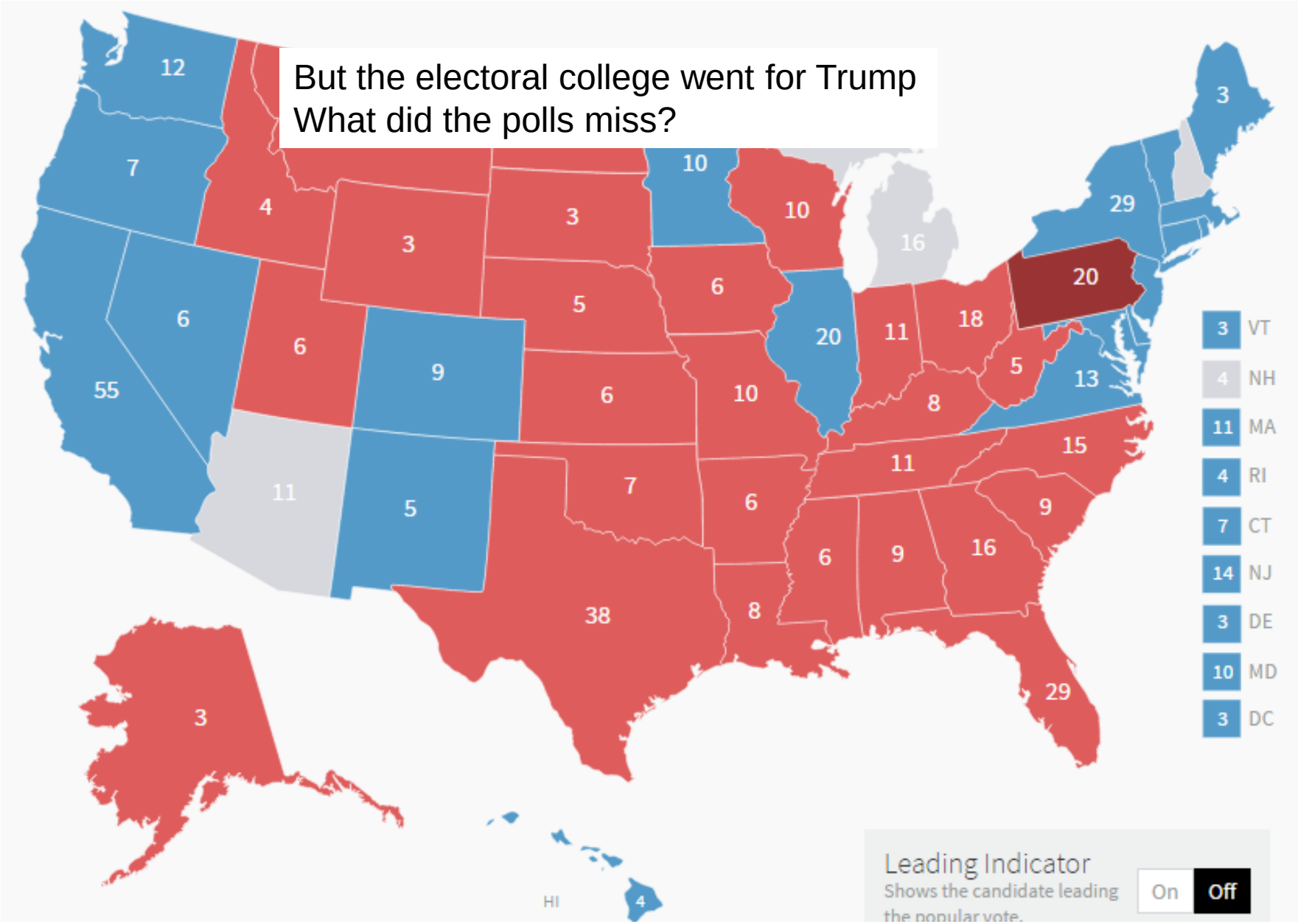

national map | popular vote

**popular vote** — projected winner: **trump**

| candidate | % | votes |
|---|---|---|
| trump | 47.5% | 59,704,886 |
| clinton | 47.7% | 59,938,290 |

est. 92% in
updated 8:35 am ET, Nov. 10

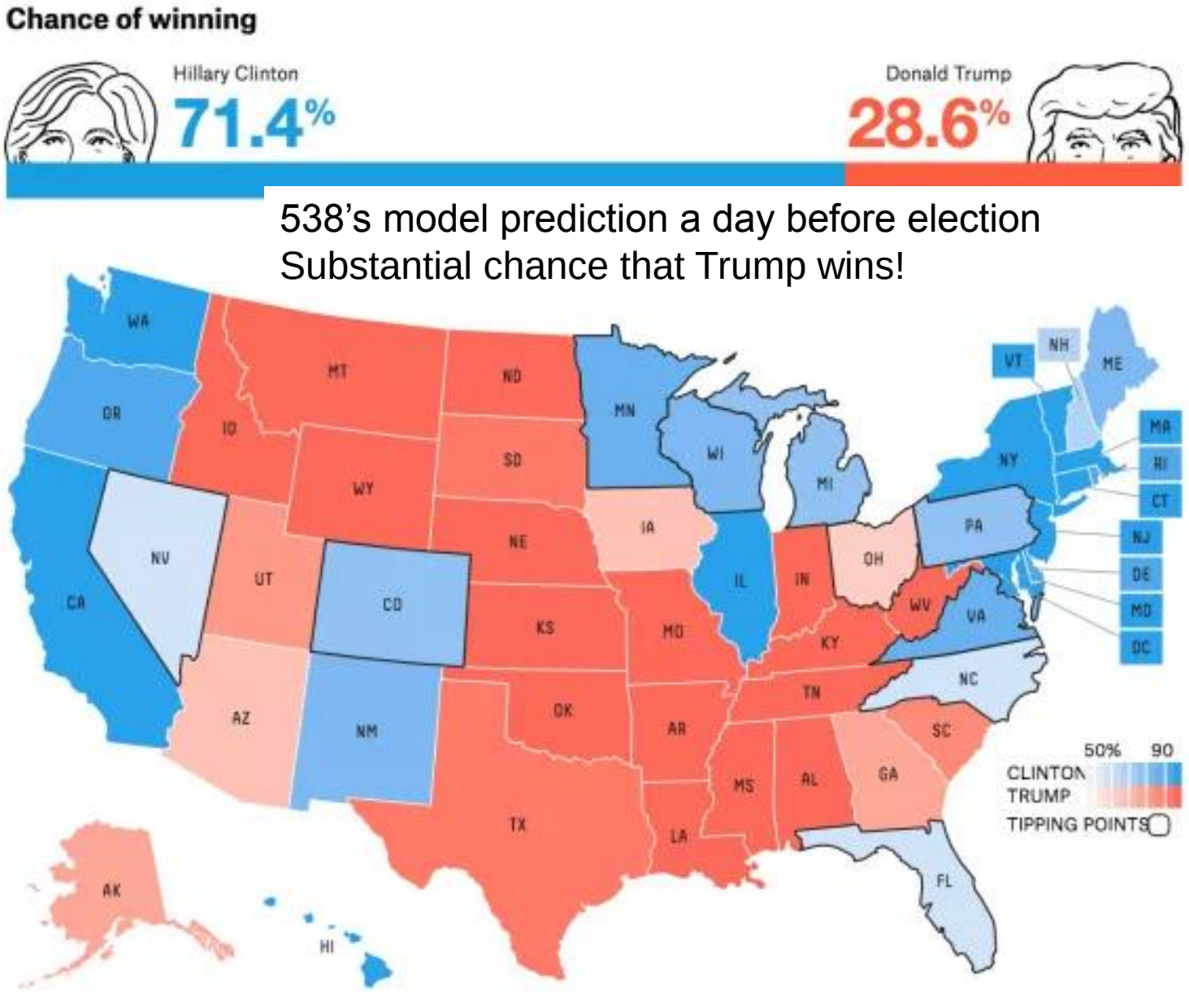
But the electoral college went for Trump
What did the polls miss?



# But what is the current narrative following the election?

- Democrats are in disarray
- Republican party found a new source of political power
- The U.S. is a more divided nation than ever
- Polls were completely wrong


Clinton 307
231 Trump
Electoral college if only 1 out of every 100 people change his/her vote from Trump to Clinton
Then what would have been the narrative?
WA 12
OR 7
CA 55
NV 6
ID 4
MT 3
WY 3
UT 6
AZ 11
CO 9
NM 5
ND 3
SD 3
NE 5
KS 6
OK 7
TX 38
MN 10
IA 6
MO 10
AR 6
LA 8
WI 10
IL 20
MS 6
MI 16
IN 11
KY 8
TN 11
AL 9
OH 18
WV 5
GA 16
FL 29
SC 9
NC 15
VA 13
PA 20
NY 29
VT 3
NH 4
ME 4
AK 3
HI 4
11 MA
4 RI
7 CT
14 NJ
3 DE
10 MD
3 DC
270 TO WIN
Split Electoral Votes
ME 3 1
NE 3 1 1
User-Generated Map
Reset Map
Share Map

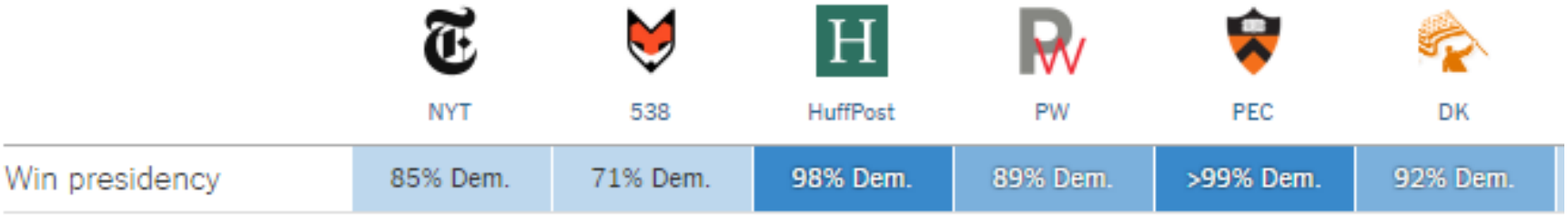

Chance of winning
Hillary Clinton
71.4%
Donald Trump
28.6%
538's model prediction a day before election
Substantial chance that Trump wins!
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
VT
NH
ME
MA
RI
CT
NJ
DE
MD
DC
AK
HI
50%
90
CLINTON
TRUMP
TIPPING POINTS

# 538's cautionary tale (before the election)

1. Clinton's lead within the polling error
2. Number of undecided and third party voters is much higher
3. Clinton's coalition—educated voters and Hispanics—are less likely to live in swing states (e.g., Ohio, Pennsylvania, Michigan)

# But how do the pundits interpret polls?

- Other models



| | NYT | 538 | HuffPost | PW | PEC | DK |
|---|---|---|---|---|---|---|
| Win presidency | 85% Dem. | 71% Dem. | 98% Dem. | 89% Dem. | >99% Dem. | 92% Dem. |

- 538 is giving too high of a chance to Trump winning

Conclusion: Clinton is going to win easily
Many people interpreted 70-80% as certainty

# Trump's path to victory (before election)

Trump had to win

- Ohio
- Florida
- North Carolina
- Pennsylvania
- Michigan

Probability that Trump wins all those states is really, really low if the states are independent

But states are not independent → it is much more likely that Trumps win all 5 states if he wins Ohio by a lot

Models should account for that dependency / correlation (538's model does; I am not sure about the other models)

But what happens if I tell you that Trump wins Ohio by 9% points?

# What did the polls miss?

- Systematic (correlated) error of 2-3 percentage points: if you have correlated or dependent errors, taking more samples does not help
- People not willing to admit they voted for Trump?
- Trump polled late support from undecided and third-party voters

# Polls are models

- Based on a model of how the voting population will be
  - Gender, race
  - Who voted last election
- These are assumptions!!!
- Modeling human behavior is really, really difficult

# Look for disconfirming evidence (a few days before election)

- Iowa polls
  - Trump +7
  - Trump +3
  - Clinton +1
- Wisconsin polls
  - Clinton +8
  - Clinton +6
  - Clinton +6

Are Iowa and Wisconsin really that much different?

Berwood Yost of Franklin & Marshall College said he wants to see polling get more comfortable with uncertainty. “The incentives now favor offering a single number that looks similar to other polls instead of really trying to report on the many possible campaign elements that could affect the outcome,” Yost said. “Certainty is rewarded, it seems.”

Quoted in Bialik and Entent, 2016, “The polls missed Trump. We asked pollsters why. *FiveThirtyEight*. Nov. 9. http://fivethirtyeight.com/features/the-polls-missed-trump-we-asked-pollsters-why/

# Lessons learned

- Mathematical models have uncertainty, especially when talking about the future
- Beware of overconfidence!
- Models are based on assumptions → question the assumptions
- Look for evidence that disconfirms the narrative / explanation
- Should we use mathematical models?

Yes, I think we still should because mathematical models still give us a very good way to analyze a problem