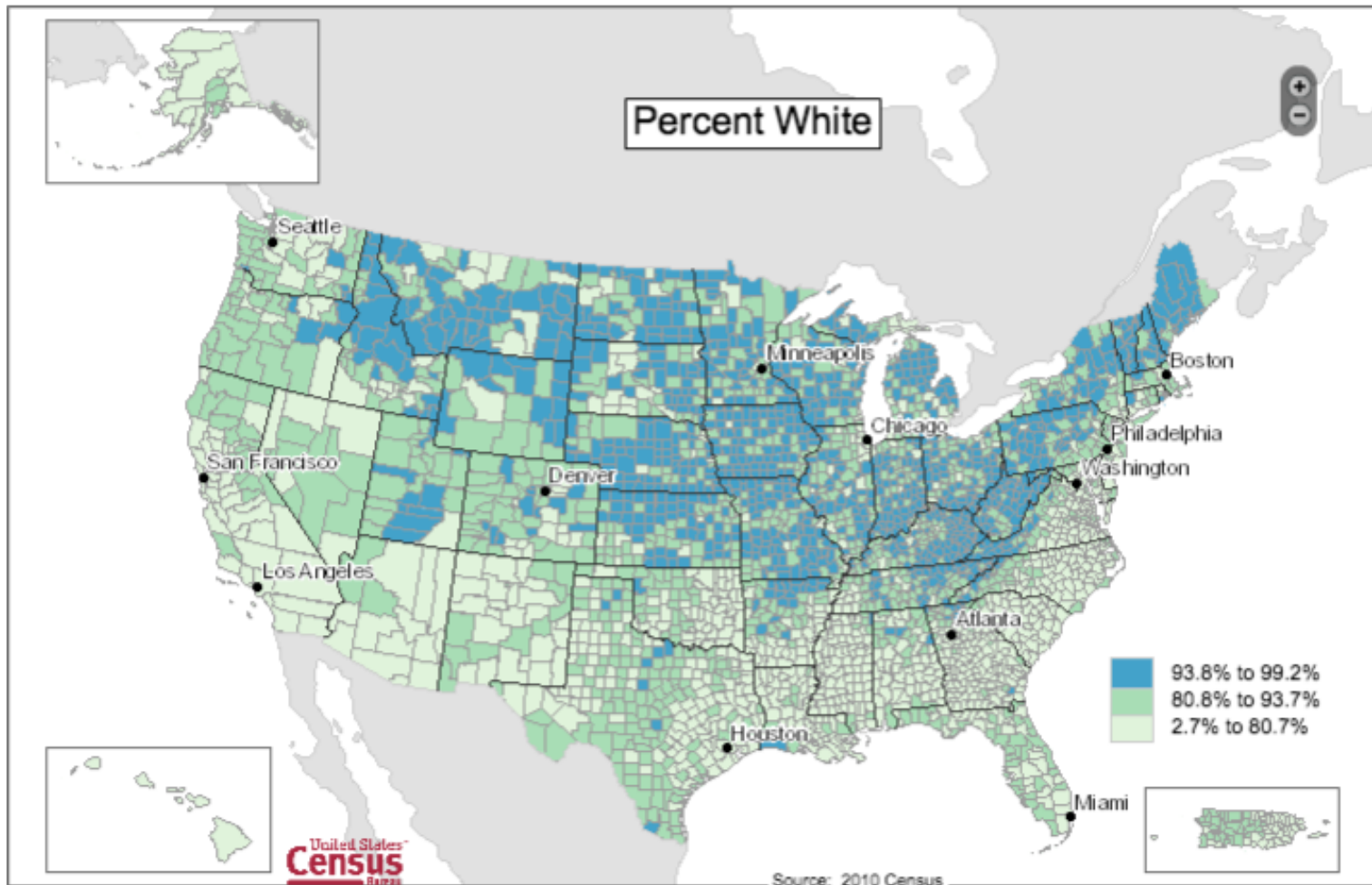


What do we do with sports data?

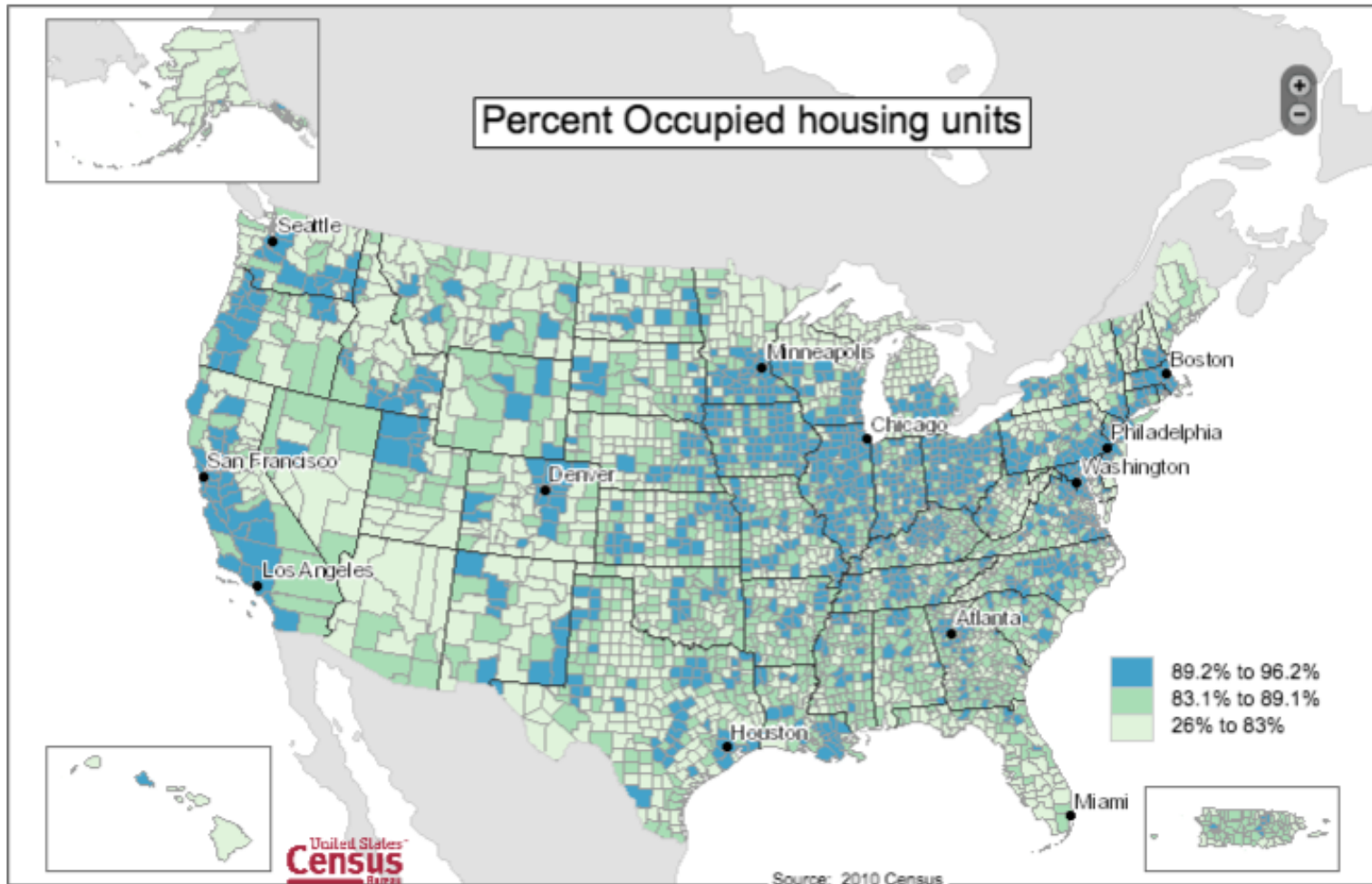
Plus a little review...

Government data

How are people distributed?

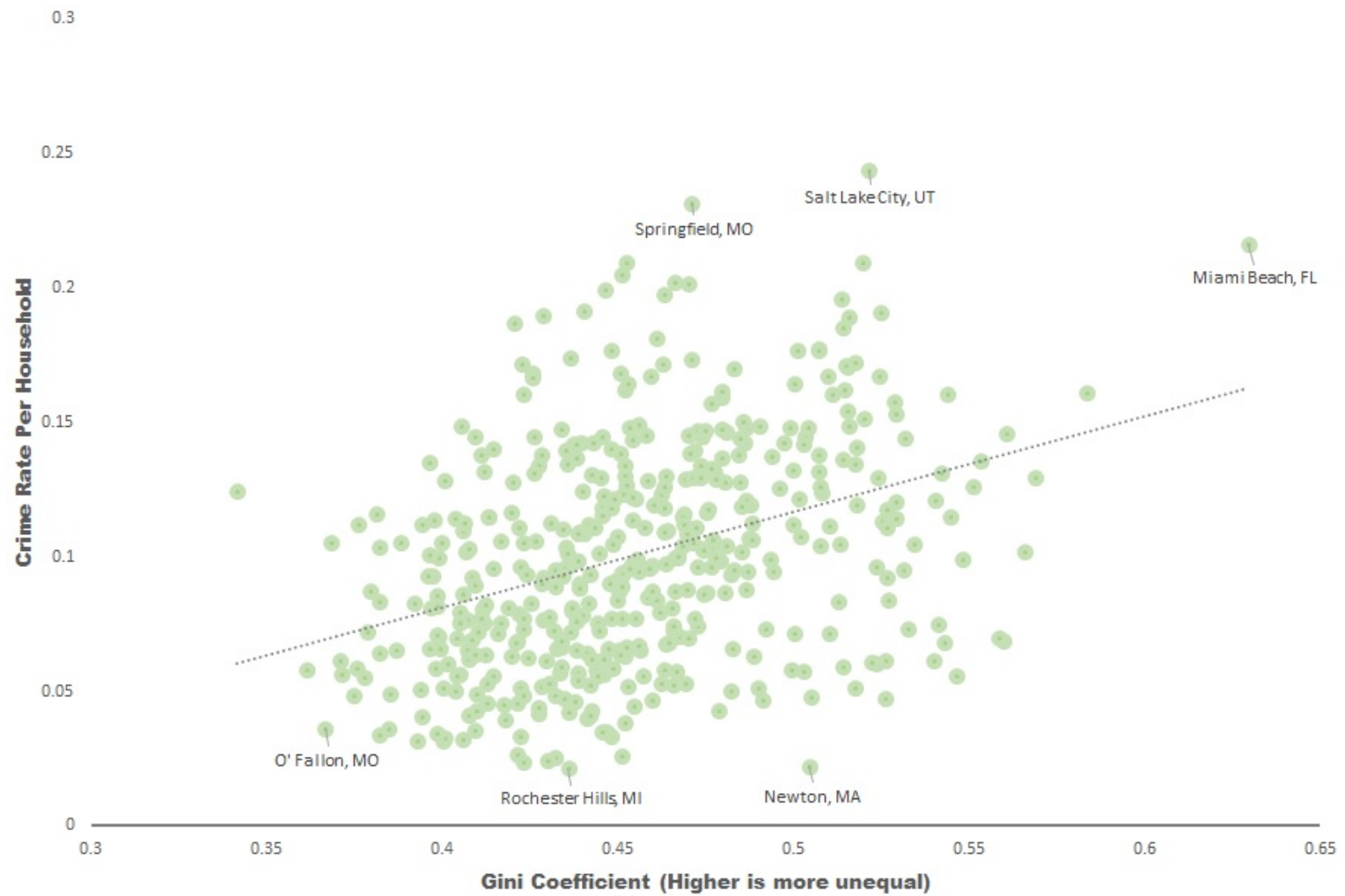


How is income distributed?



How is poverty related to crime,
health, housing, etc?

INCOME INEQUALITY VS CRIME RATE BY CITY

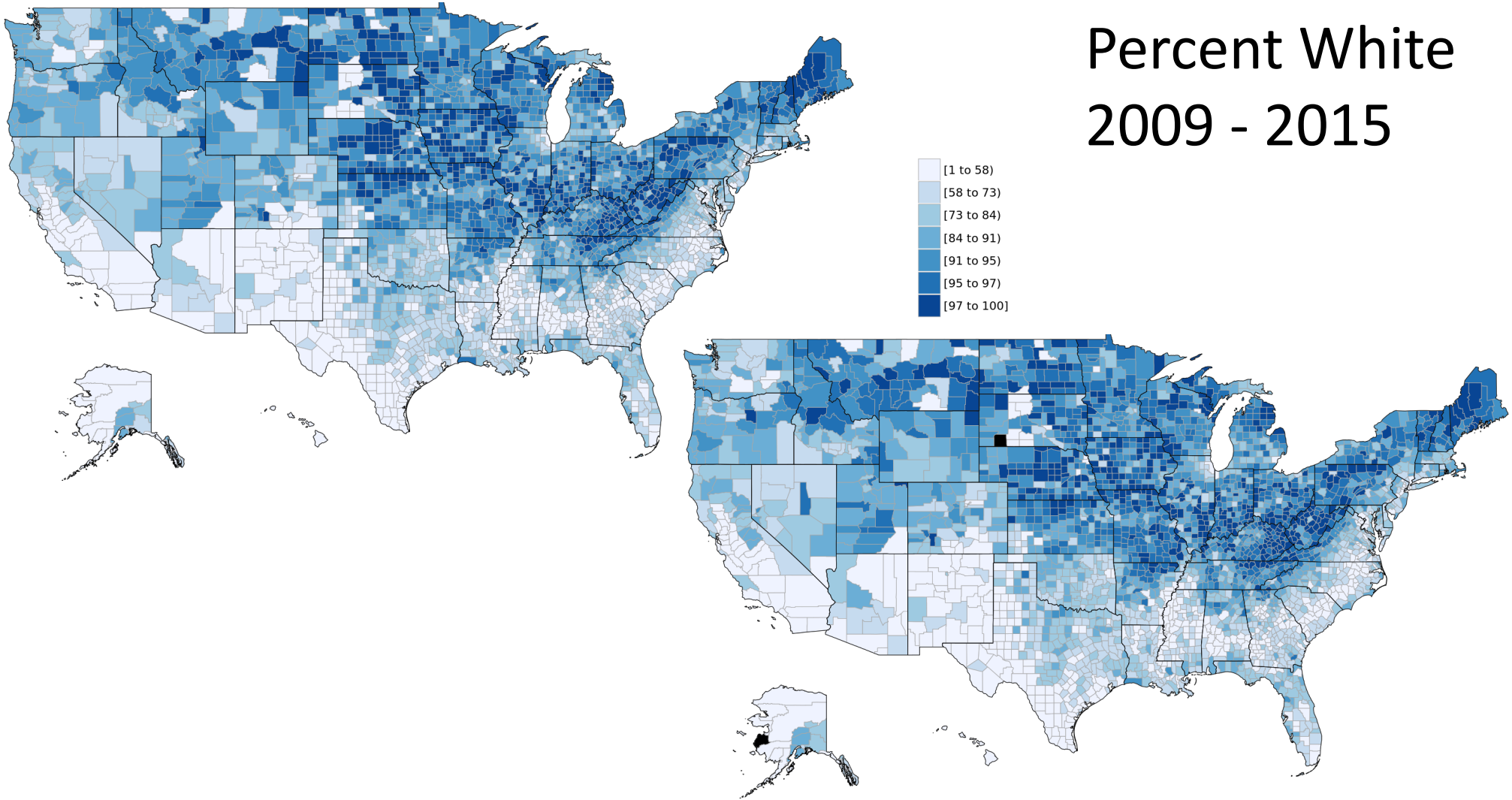


What factors are related to
change in poverty?

What factors correlate with child welfare?

How is racial composition
changing?

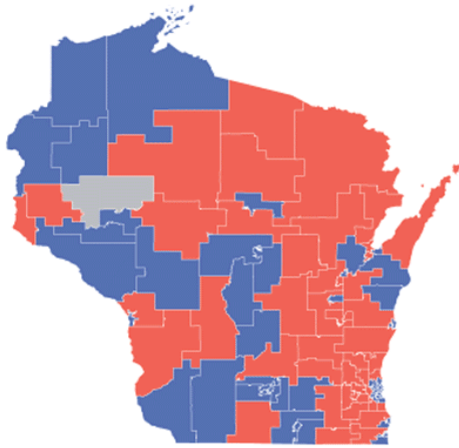
Percent White 2009 - 2015



How do we represent people
given their race, income, and
political leaning?

2008

PRIOR DISTRICT PLAN

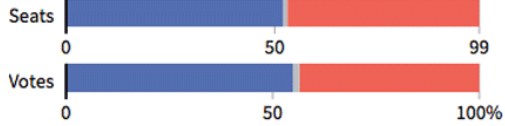


DEMOCRATS

Seats: 52
Votes: 1,478,830

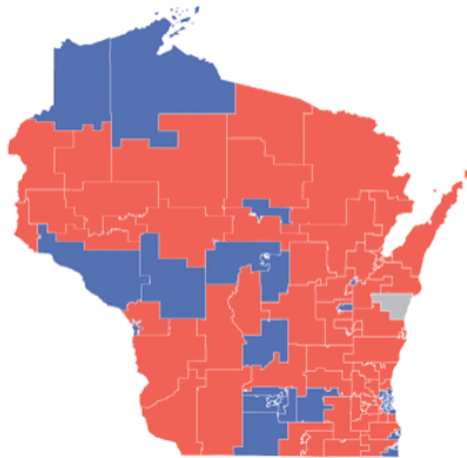
REPUBLICANS

Seats: 46
Votes: 1,172,877



2010

PRIOR DISTRICT PLAN

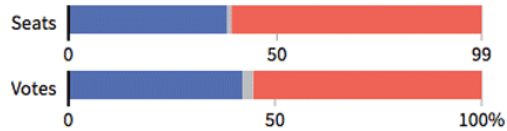


DEMOCRATS

Seats: 38
Votes: 838,208

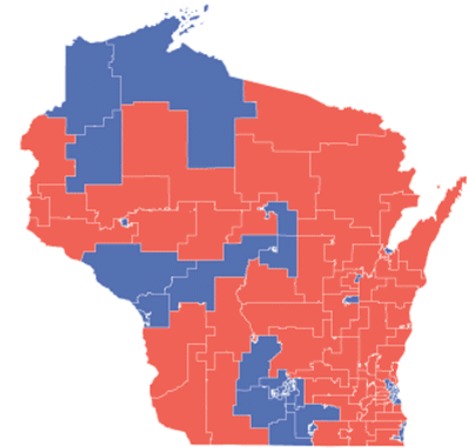
REPUBLICANS

Seats: 60
Votes: 1,102,006



2012

CURRENT DISTRICT PLAN

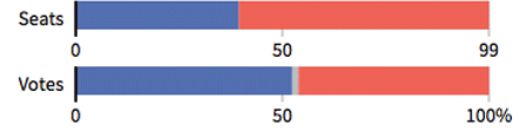


DEMOCRATS

Seats: 39
Votes: 1,417,359

REPUBLICANS

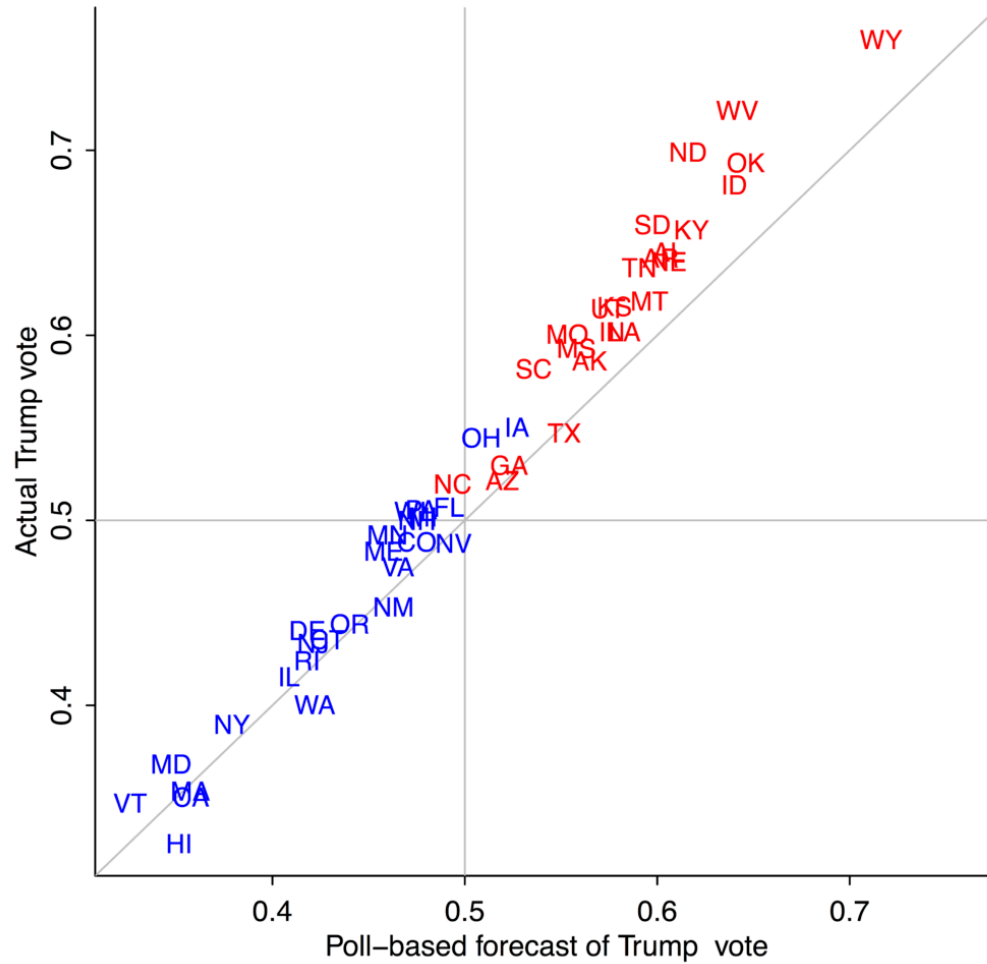
Seats: 60
Votes: 1,249,562



Politics

Do polls predict political
outcome?

Nationally, Trump got 2% more of the vote than predicted



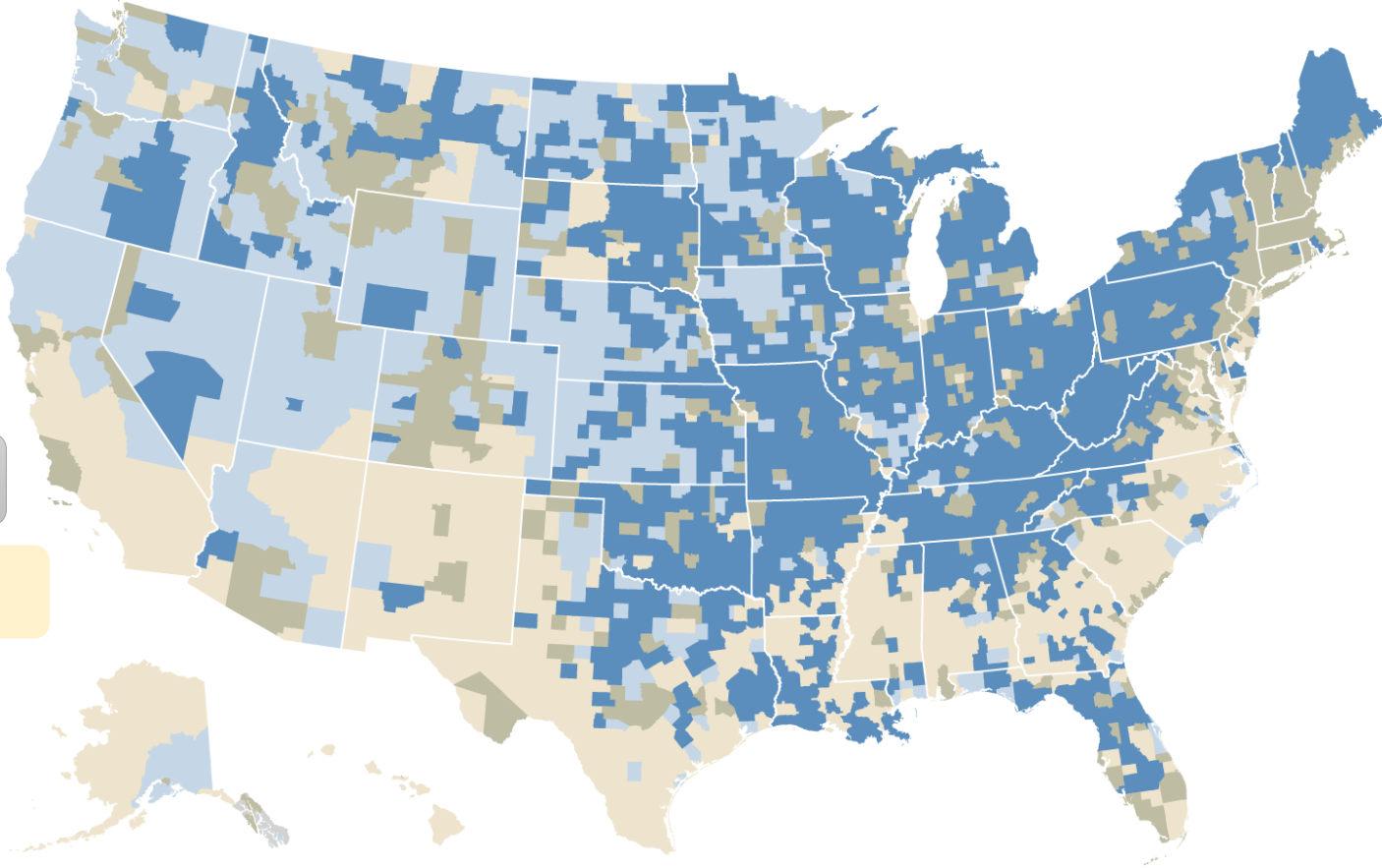
Why are polls wrong in red states?

White, no college

White, some college

White, college degree

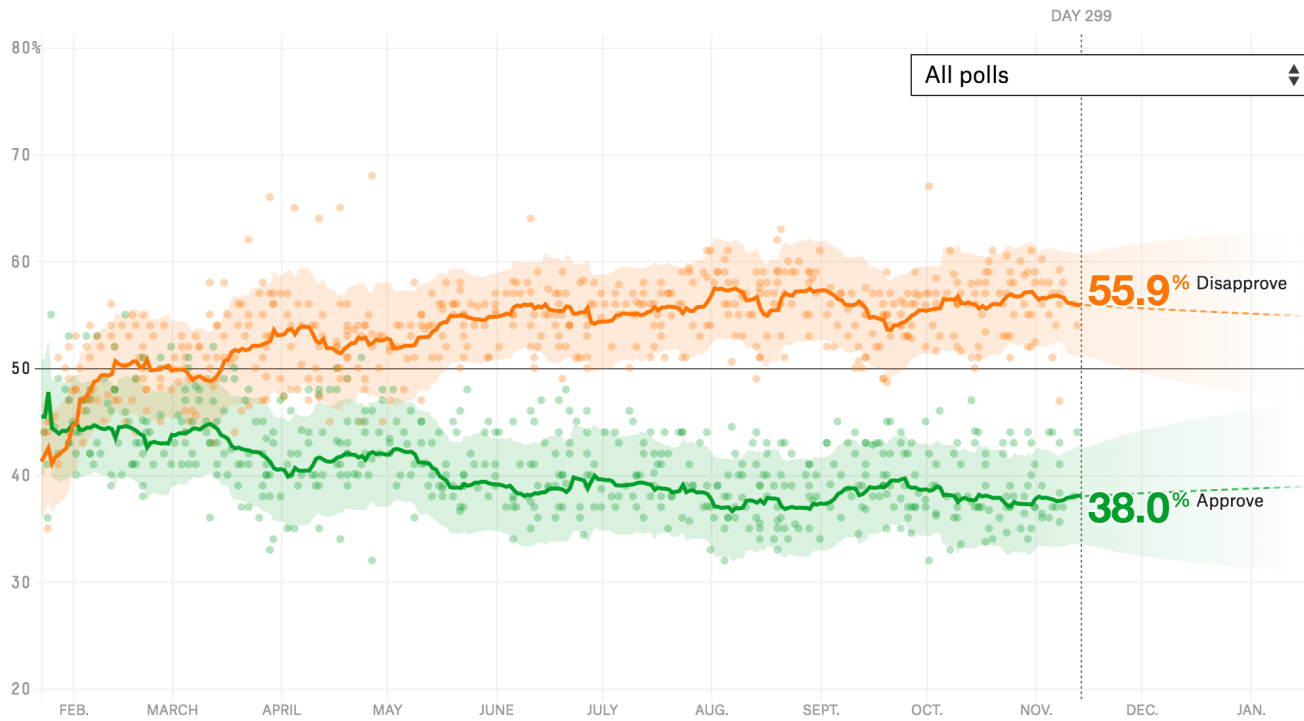
Non-white



When is there error?

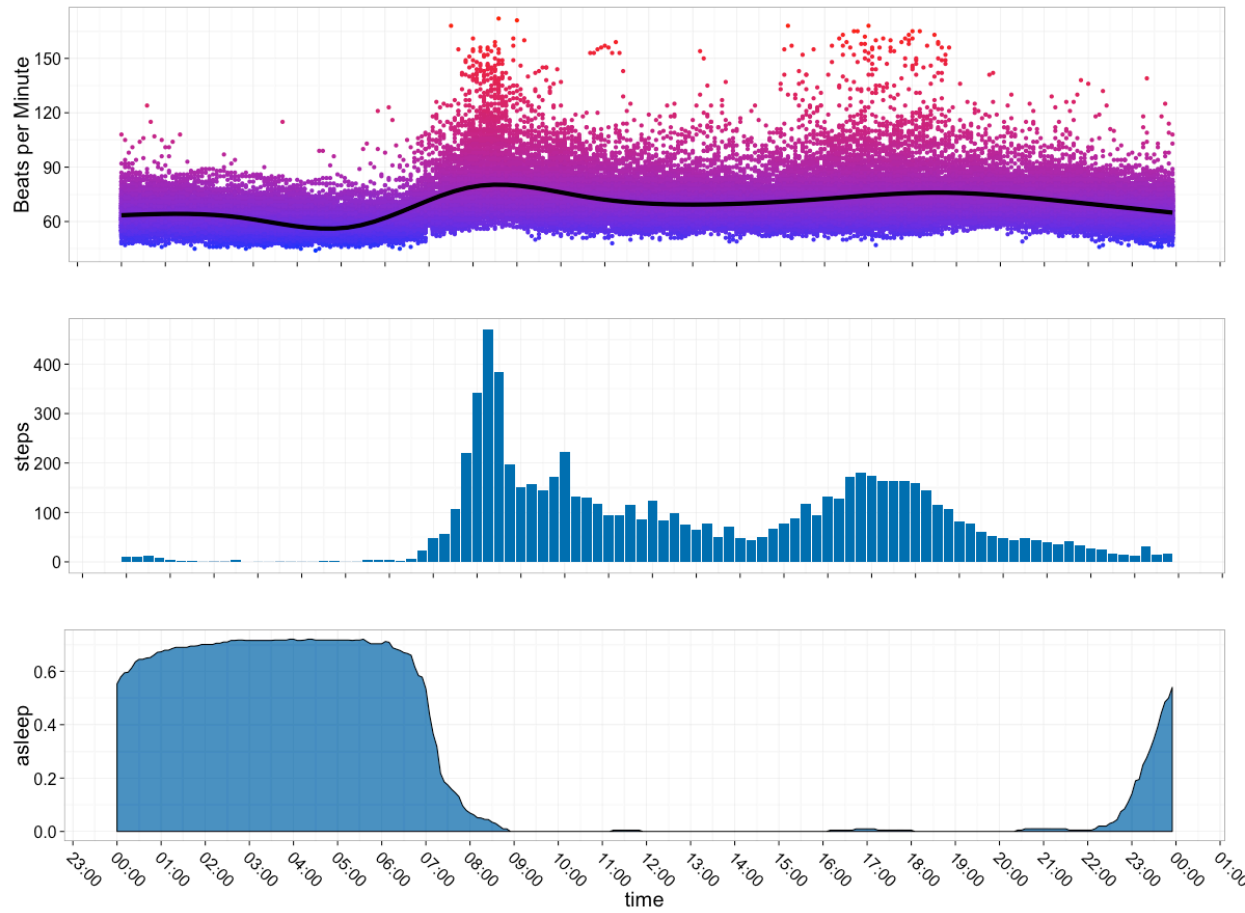
How **unpopular** is Donald Trump?

An updating calculation of the president's approval rating, accounting for each poll's quality, recency, sample size and partisan lean. [How this works »](#)



Health

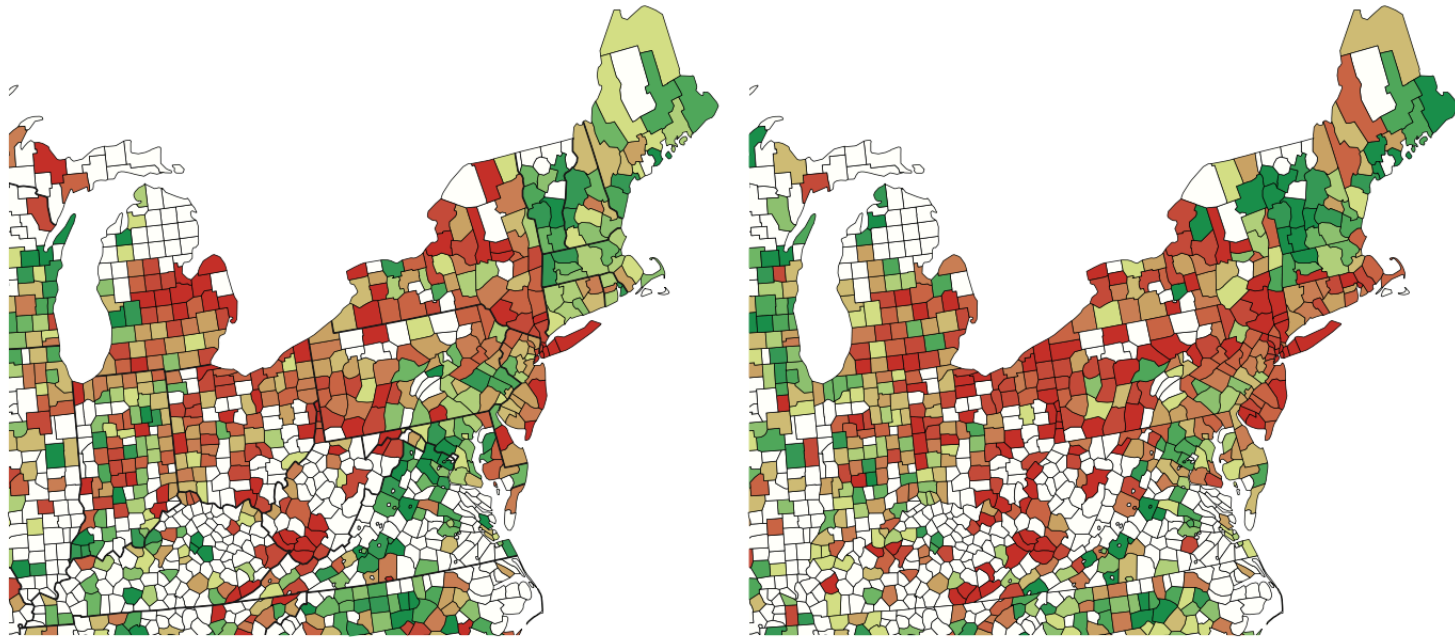
Fitbit – Heart Rate



Heart Disease Rate (based on twitter)

CDC-Reported AHD Mortality

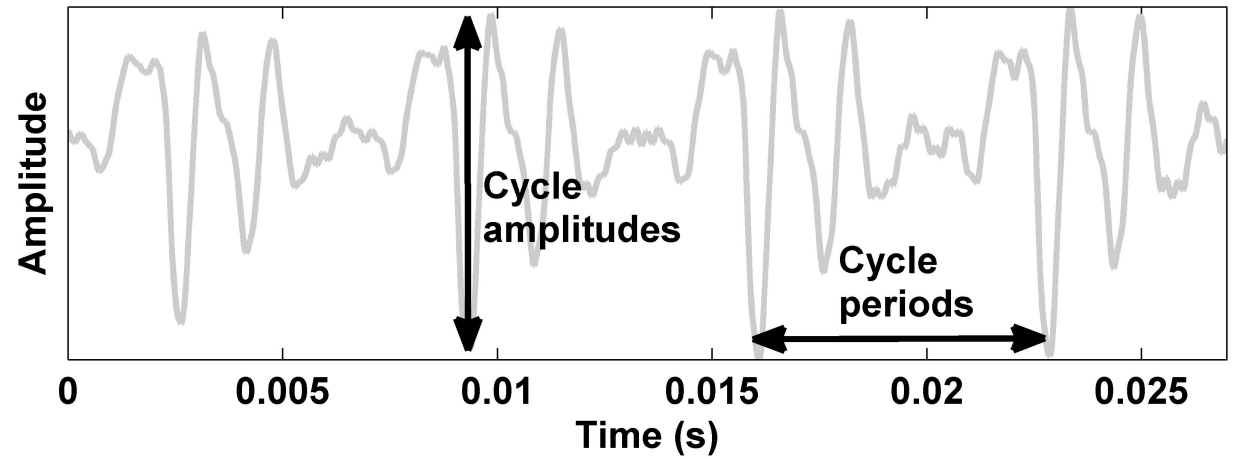
Twitter-Predicted AHD Mortality



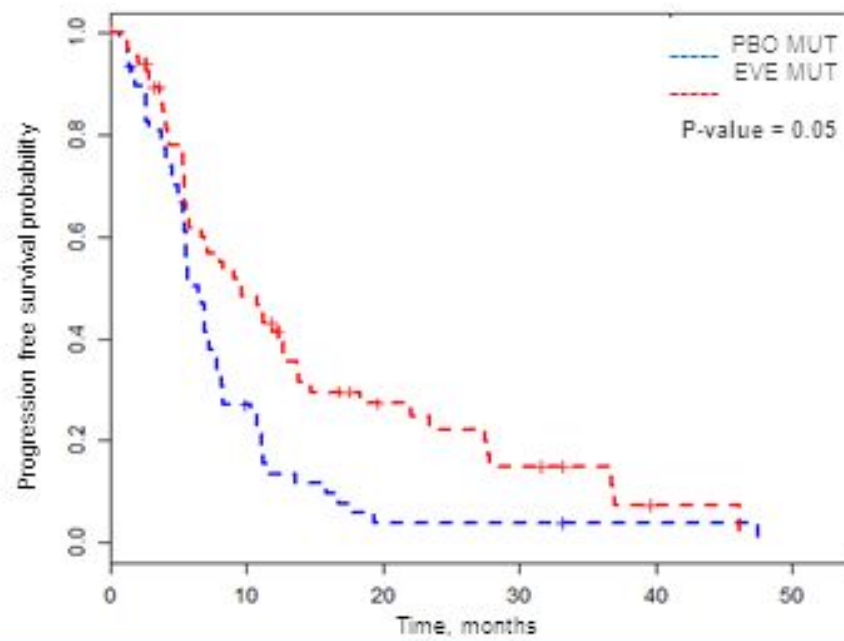
10 20 30 40 50 60 70 80 90

AHD Mortality (Percentile)

Diagnosis by quantifying images / sound



Pooled analysis: KM curve by treatment in the PIK3CA MUT group



BREAST CANCER IN WOMEN: KNOW THE SUBTYPE

It's important for guiding treatment and predicting survival.



KNOW THE SCIENCE



HR = Hormone receptor

HR+ means tumor cells have receptors for the hormones estrogen or progesterone, which can promote the growth of HR+ tumors. Hormone therapies like tamoxifen can be used to treat HR+ tumors.

HER2 = Human epidermal growth factor receptor

HER2+ means tumor cells overexpress (make high levels of) a protein, called HER2/neu, which has been shown to be associated with certain aggressive types of breast cancer. Trastuzumab and some other therapies can target cells that overexpress HER2.

HR+/HER2-> aka "Luminal A"

73% of all breast cancer cases

- Best prognosis
- Most common subtype for every race, age, and poverty level



HR-/HER2-> aka "Triple Negative"

13% of all breast cancer cases

- Worst prognosis
- Non-Hispanic blacks have highest rate of this subtype at every age and poverty level



HR+/HER2+> aka "Luminal B"

10% of all breast cancer cases

- Little geographic variation by state



HR-/HER2+> aka "HER2-enriched"

5% of all breast cancer cases

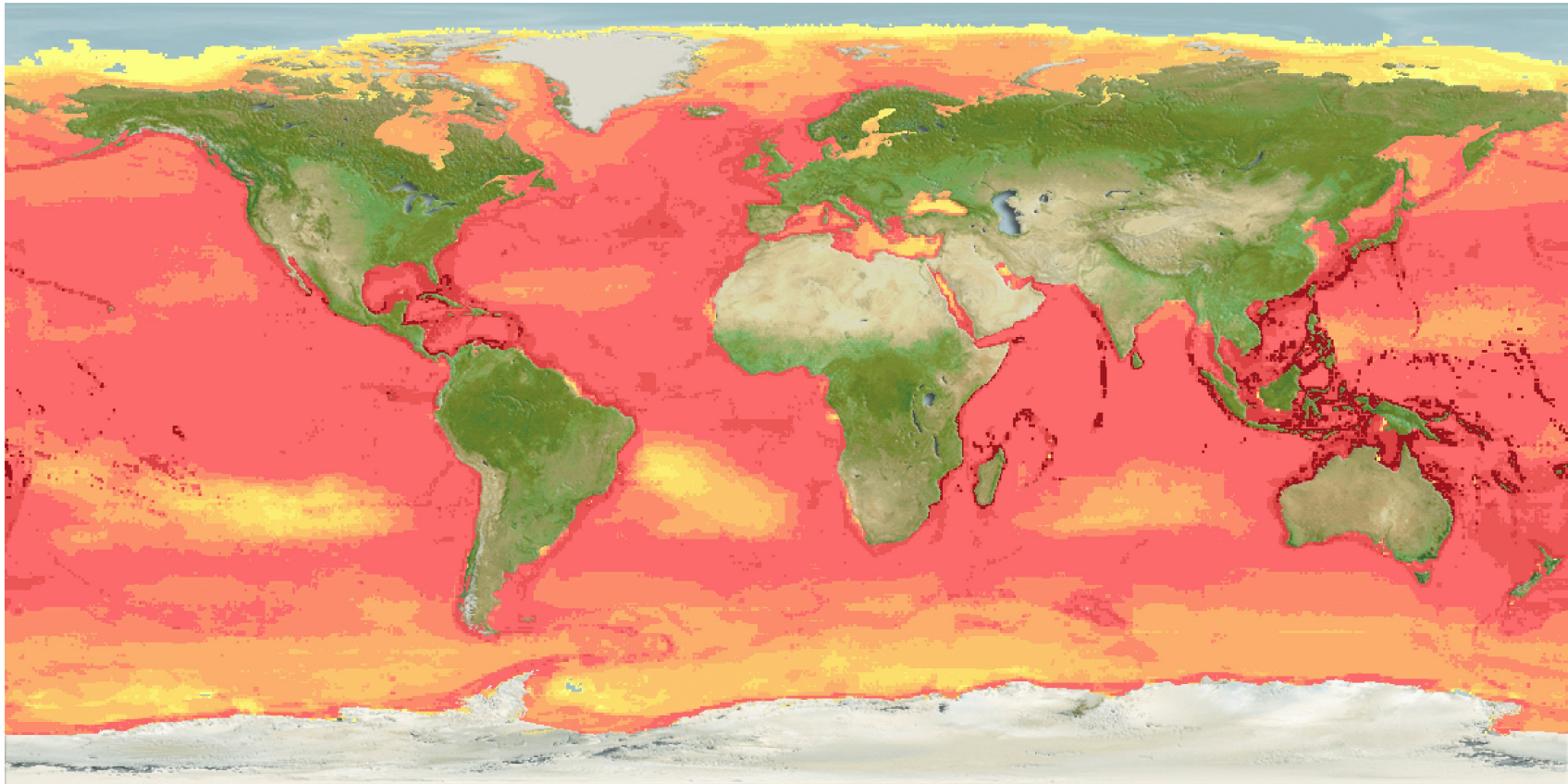
- Lowest rates for all races and ethnicities

www.cancer.gov

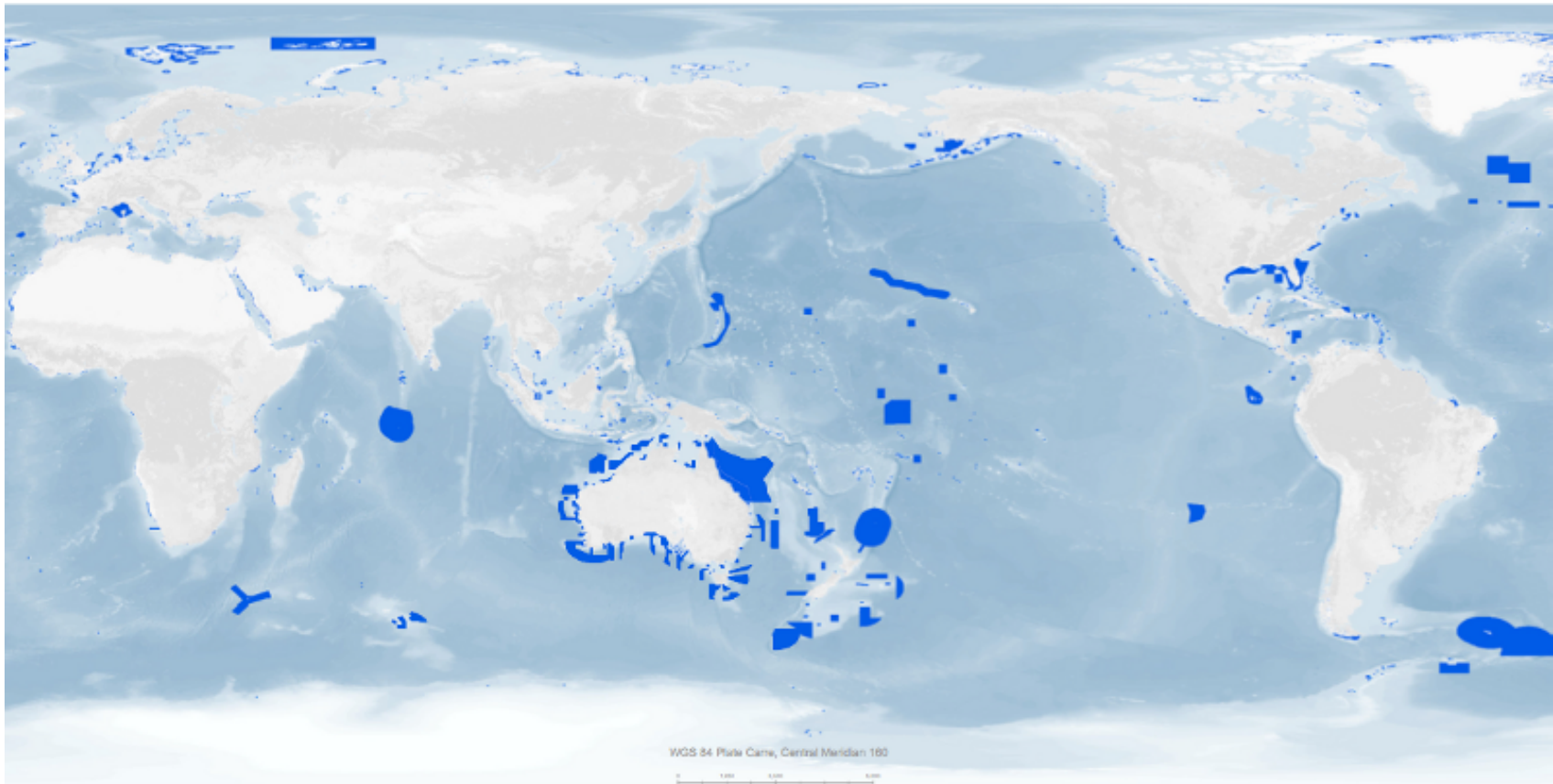
Source: Special section of the Annual Report to the Nation on the Status of Cancer, 1975-2011.

Biodiversity

How many species?



Making conservation decisions

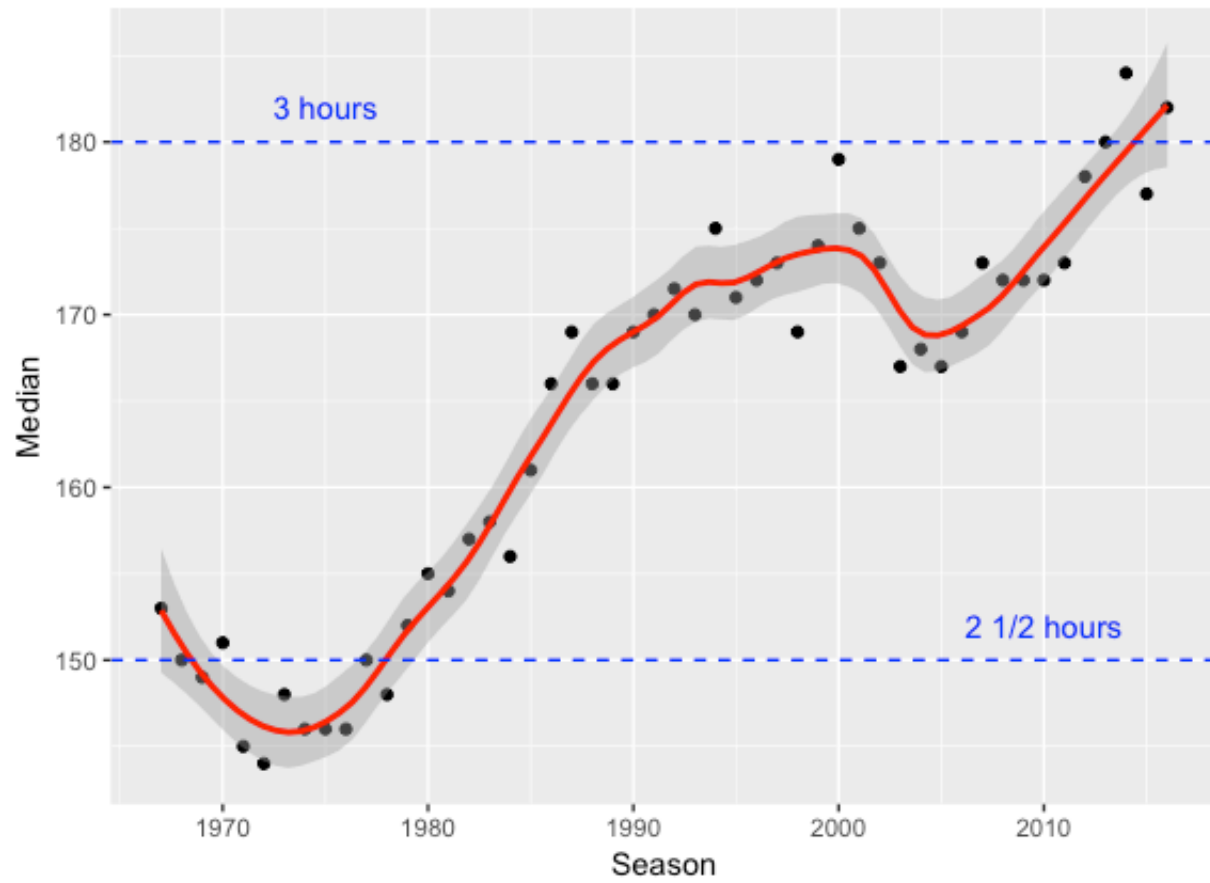


Sports

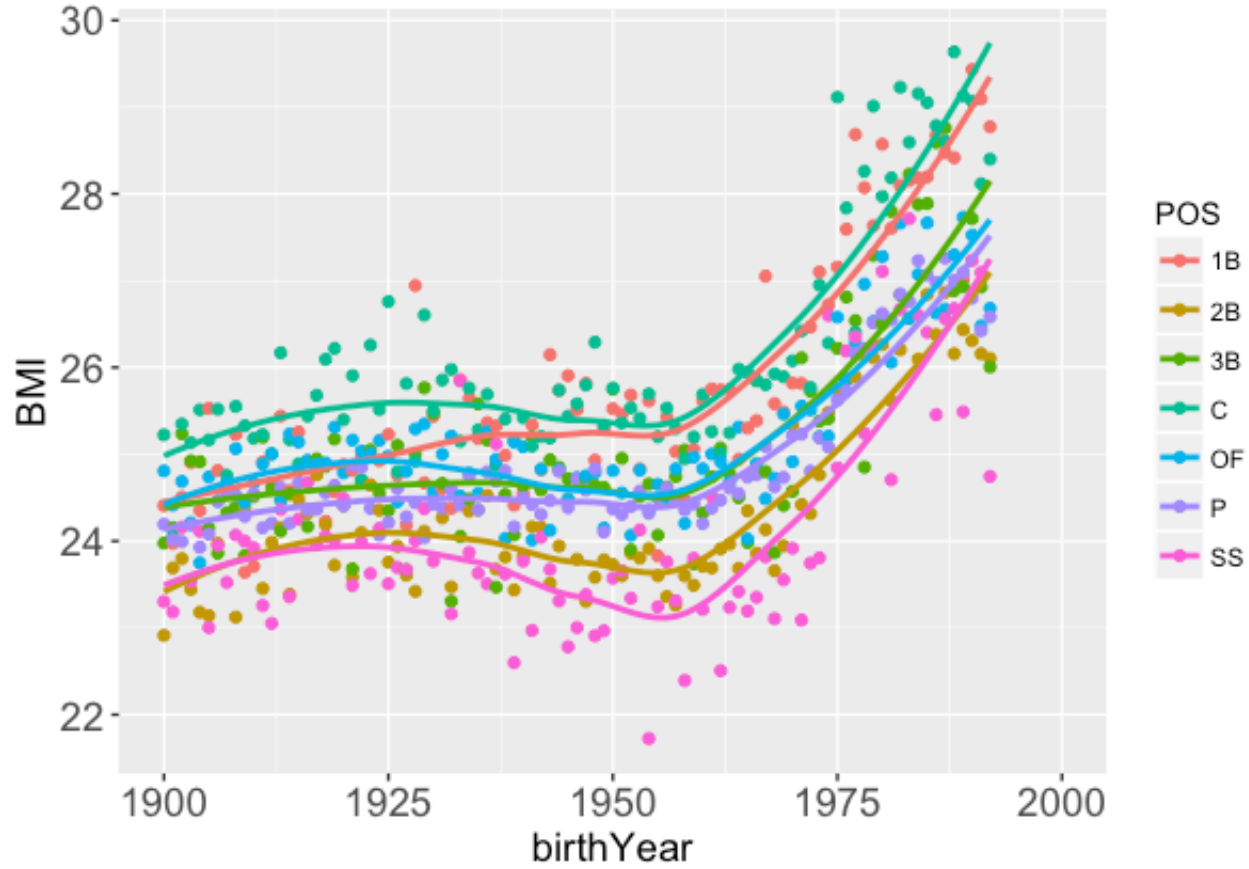
Data

- Velocity, movement, release point, spin, and pitch location for every pitch thrown in baseball
 - How many fastballs did Justin Verlander throw up and in to righties in 2-2 counts from July to September at home?
- Batted ball location and the strike zone
- A hitter's tendencies against certain types of pitches in certain counts

Median Game Duration: 1967:2016



Mean BMI of MLB Players



What is this player going to contribute to the club?

Does a basketball player's defense contribute?

Does a basketball player's defense contribute?

TIM DUNCAN
DEFENSIVE SHOT CHART

Players defended by Tim Duncan exhibit increased midrange efficiency, but Duncan...

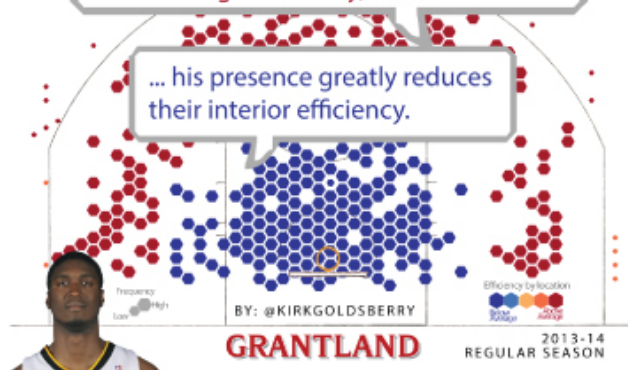
... DISRUPTS PAINT SHOTS!



ROY HIBBERT
DEFENSIVE SHOT CHART

Players defended by Roy Hibbert exhibit increases in both midrange activity and midrange efficiency, but...

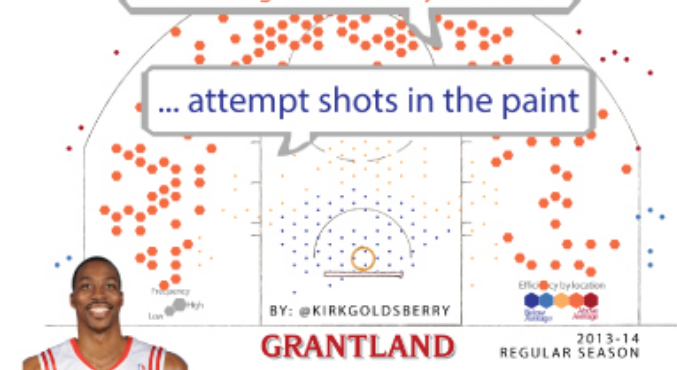
... his presence greatly reduces their interior efficiency.



DWIGHT HOWARD
DEFENSIVE SHOT CHART

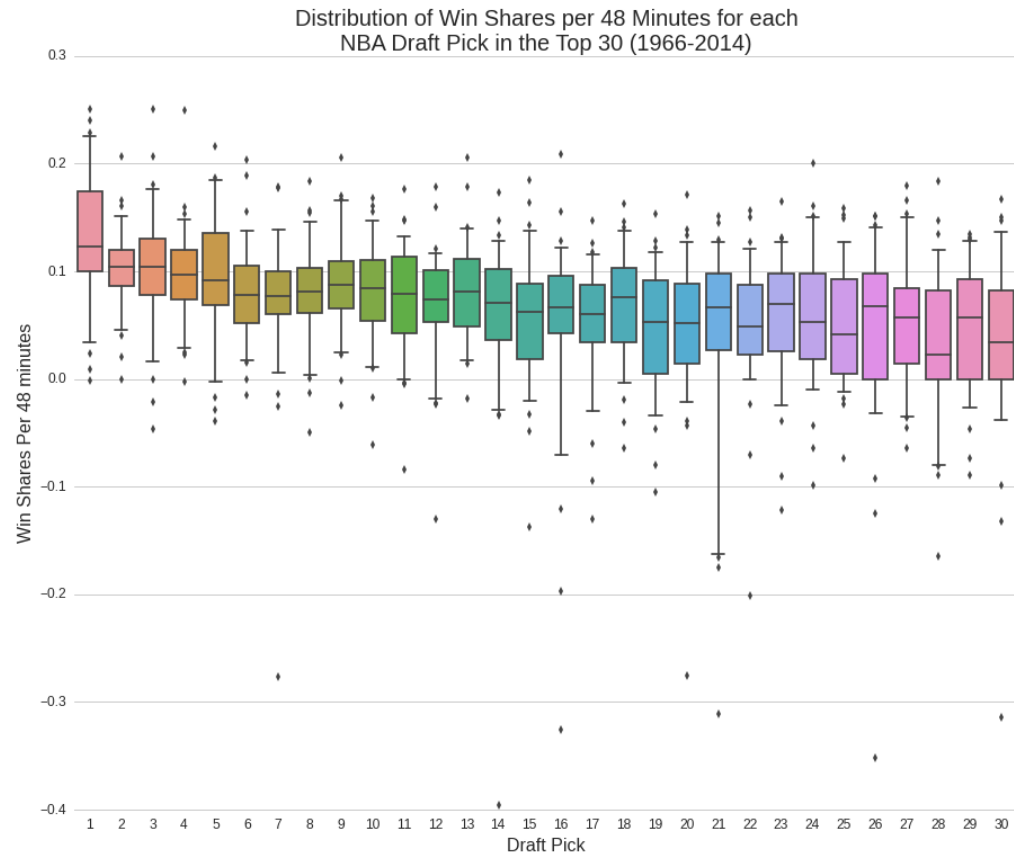
Players defended by Dwight Howard exhibit increased midrange activity, but his assignments hardly ever even...

... attempt shots in the paint



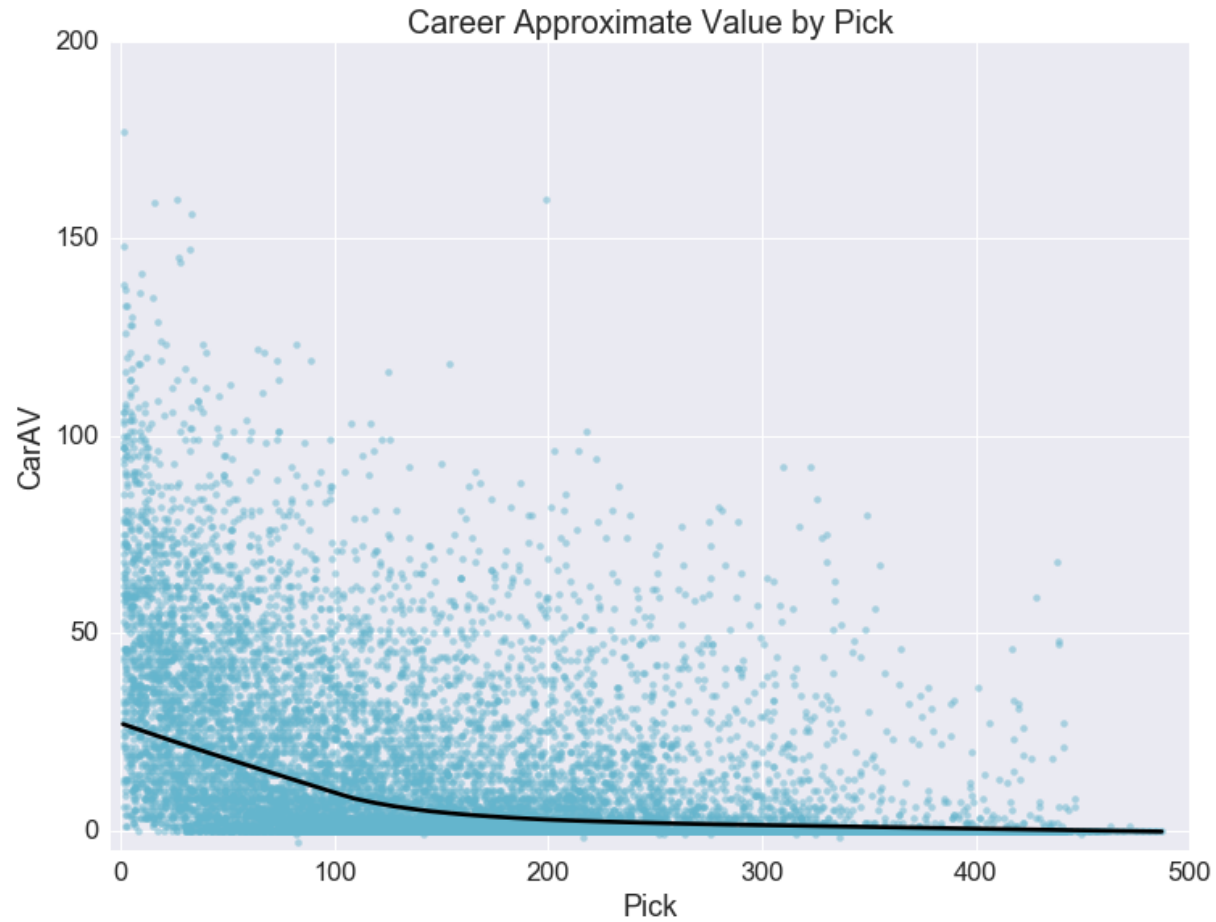
Does a number 1 draft pick contribute to wins?

Does a number 1 draft pick contribute to wins?



Data source: <http://www.basketball-reference.com/draft/>
Author: Savvas Tjortoglou (savvastjortoglou.com)
Note: Whiskers represent the 5th and 95th percentiles

Does a number 1 draft pick contribute to wins?



What insights can improve performance?

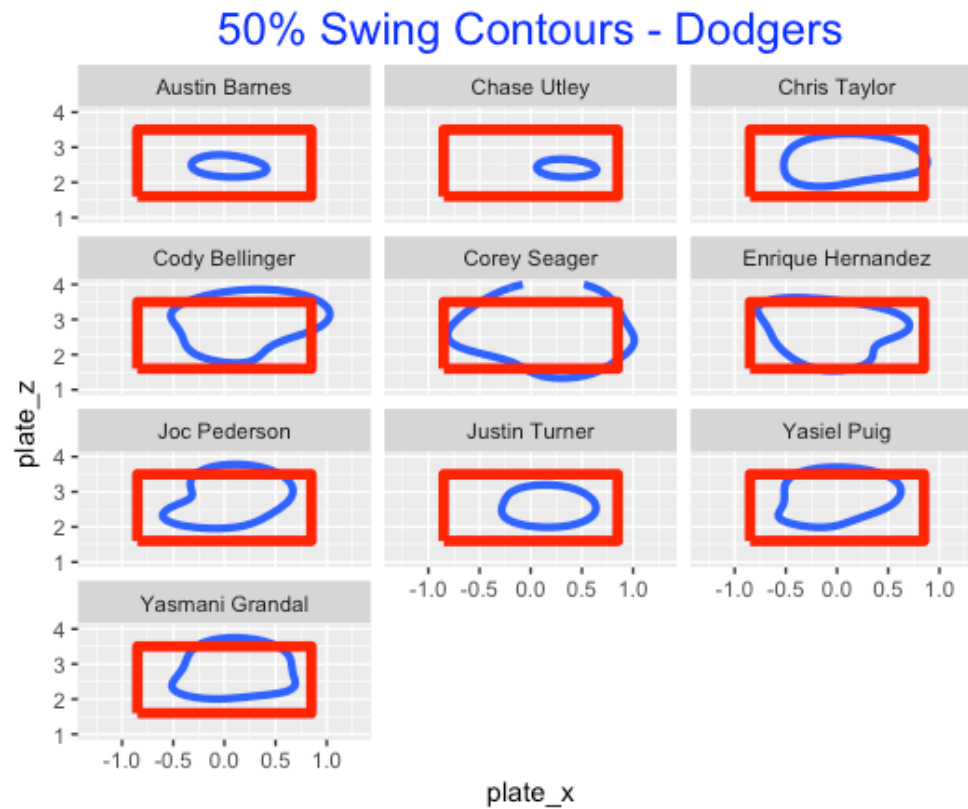
How can a coach alter strategies?

How can a coach alter strategies?



How do we pitch to a particular batter?

How do we pitch to a particular batter?



Does a fast fastball indicate a good game?

Does a fast fastball indicate a good game?

