

DATA VISUALIZATION, UNCERTAINTY, AND MEASUREMENT ERROR

Aaron Hill, Assistant Professor
Parsons School of Design

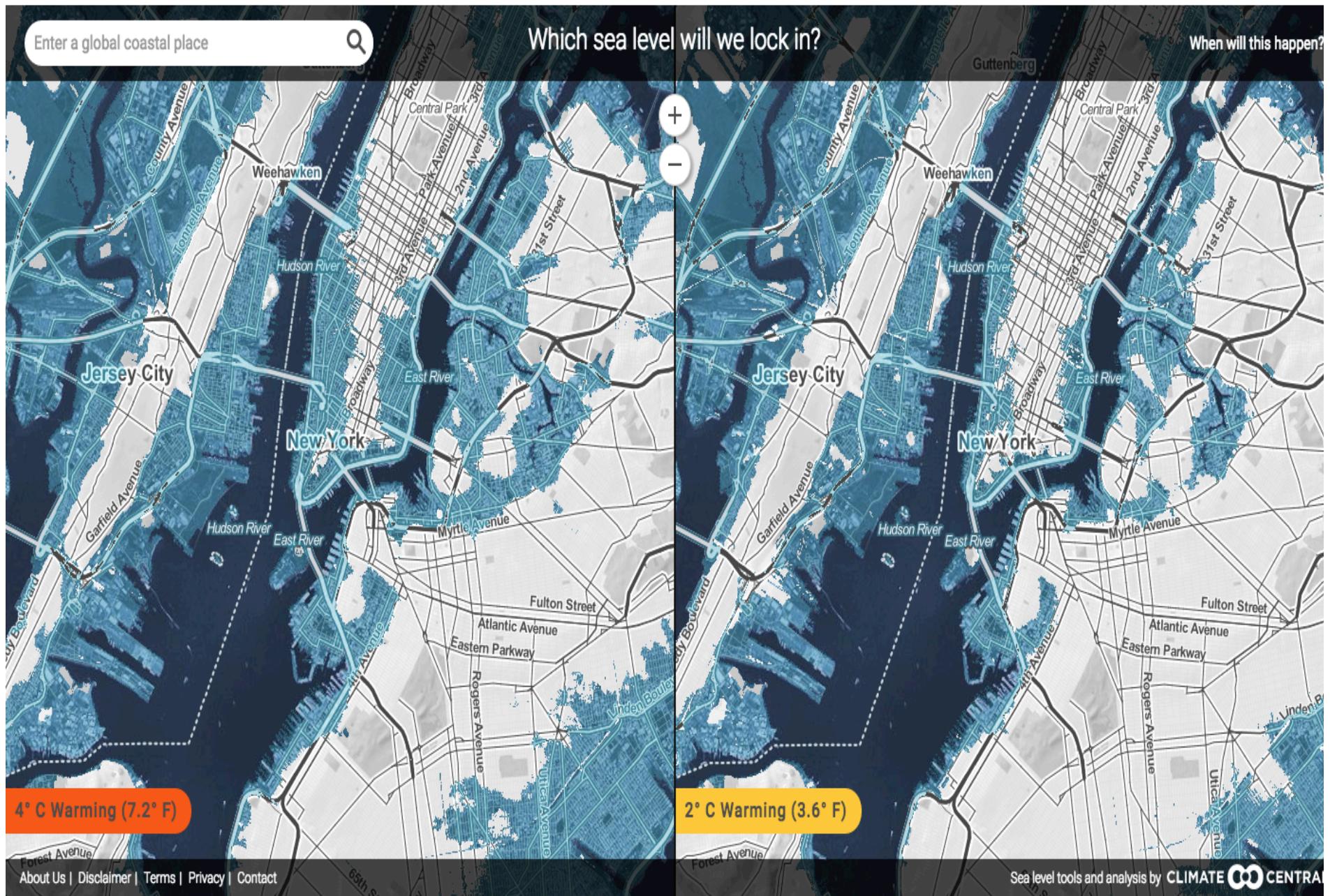
“Papers with more diagrams per page and, to a lesser extent, plots per page tended to be more influential (on average, a paper accrued two more citations for every extra diagram per page, and one more for every extra plot per page). By contrast, including photographs and equations seemed to decrease the chances of a paper being cited by others.”

<http://www.economist.com/news/science-and-technology/21700617-scientific-study-importance-diagrams-science-graphic-details>

 Learn About This Map

Surging Seas MAPPING CHOICES

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New York Braces for Blizzard Amid Warnings of Closings and Hazards

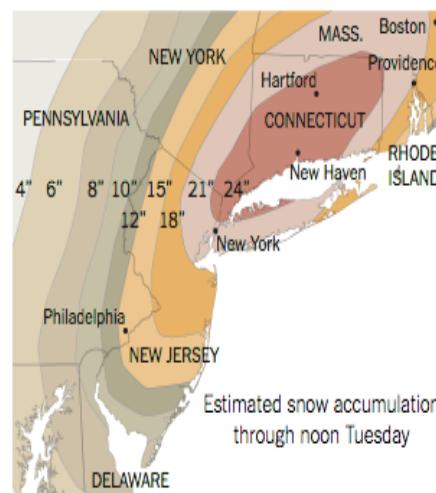
By COLIN MOYNIHAN JAN. 25, 2015



Mayor [Bill de Blasio](#) said on Sunday that the storm approaching on Monday was likely to be one of the biggest to ever strike New York City, and he urged people to stay indoors to avoid powerful winds, low visibility and “treacherous” road conditions.

The [National Weather Service](#), which issued a blizzard warning for the greater New York City area, forecast gusts of wind up to 50 miles per hour and snow accumulation of “at least one to two feet.”

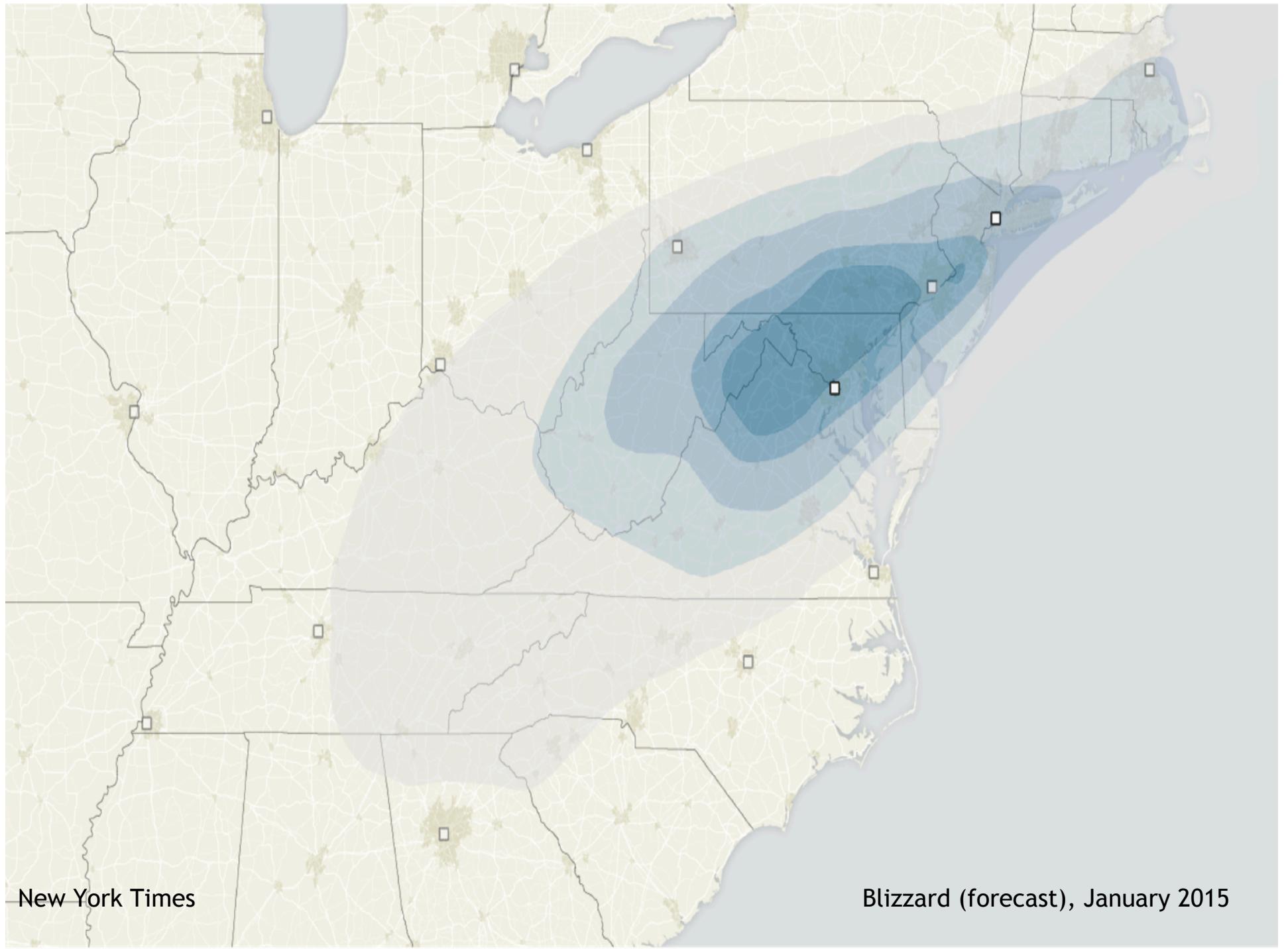
A Big Snowfall in the Forecast

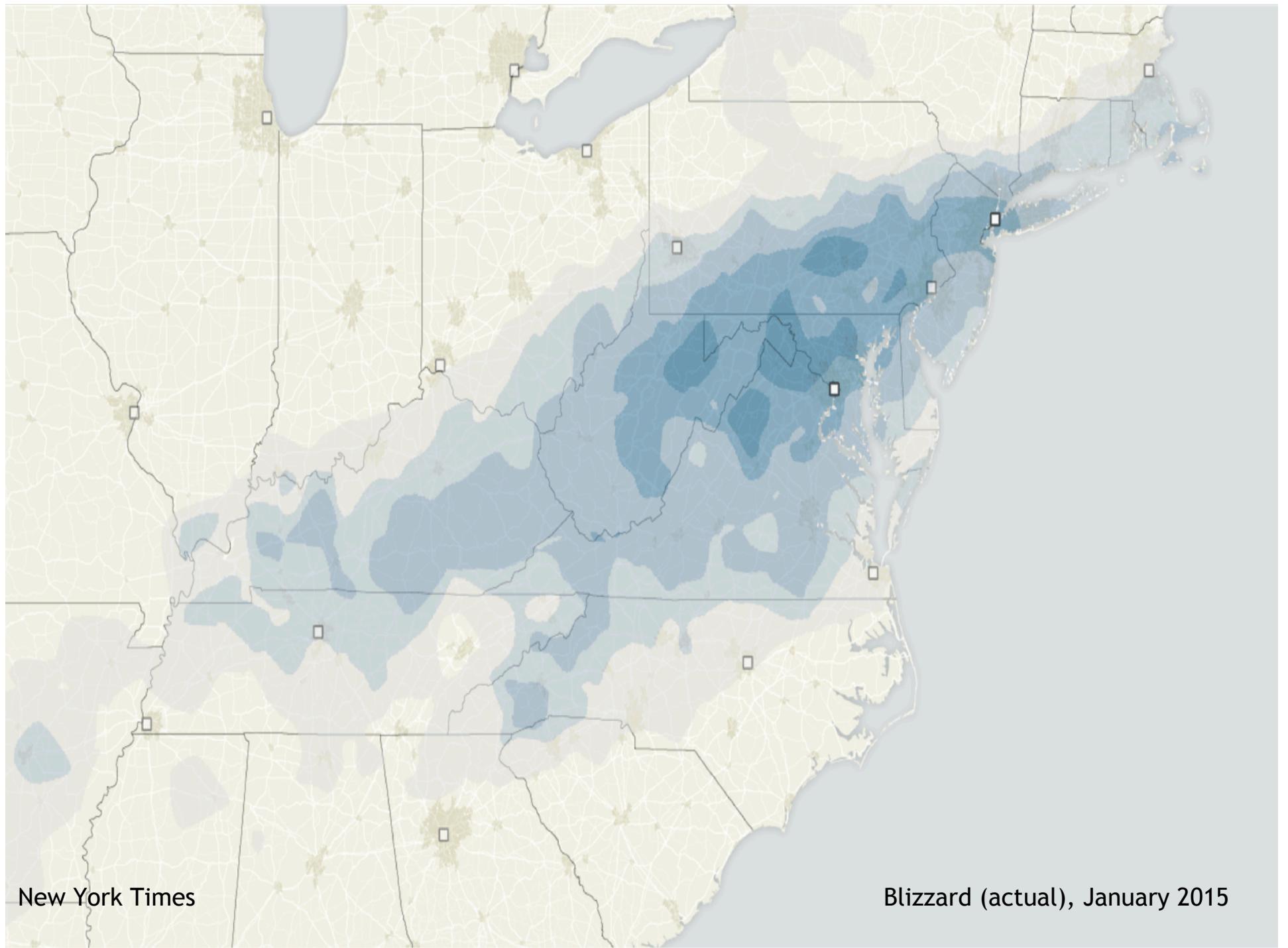


Source: National Weather Service

But Mr. de Blasio said the storm could bring up to three feet of snow, beginning with flurries late Monday morning, and that the heaviest snowfall would probably come Monday night into Tuesday morning.

Schools will be open on Monday but are likely to close on Tuesday, Mr. de Blasio said. Alternate side of the street parking was canceled, along with the city's annual count of the homeless population, which had been scheduled for Monday night.







Sections

Post Nation

The ‘historic’ blizzard missed New York City, and therefore didn’t happen



A man skis north on Central Park West on Tuesday morning in New York City. New York, and much of the Northeast, was hit with heavy overnight snow from Winter Storm Juno. (Photo by Alex Trautwig/Getty Images)

Overnight a blizzard dumped several feet of snow on...not New

Most Read

- 1 A fortress against fear



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- 5 At NIH, one woman says gender bias has blocked promotions



**Henry Blodget**

@hblodget

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There is basically no snow. And the entire city is shut down.
Absurd.

7:04 AM - 27 Jan 2015

[Reply](#) [Retweet](#) 87 [Heart](#) 55**Dr.MargaretMcMenamin**

@DrMcM

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BUST! After all that hype we get a run-of-the-mill snow storm.
NJ closed. Roads closed. School closed. Waste of
time/resources! #Hype #Juno

7:33 AM - 27 Jan 2015

[Reply](#) [Retweet](#) 3 [Heart](#) 5**Drew Kerr**

@DrewKerr

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After NY-based media inundates rest of U.S. with blizzard-
mania, & blizzard becomes bust, no wonder media not trusted &
unwanted.

8:02 AM - 27 Jan 2015

[Reply](#) [Retweet](#) [Heart](#)**Anna Zhang**

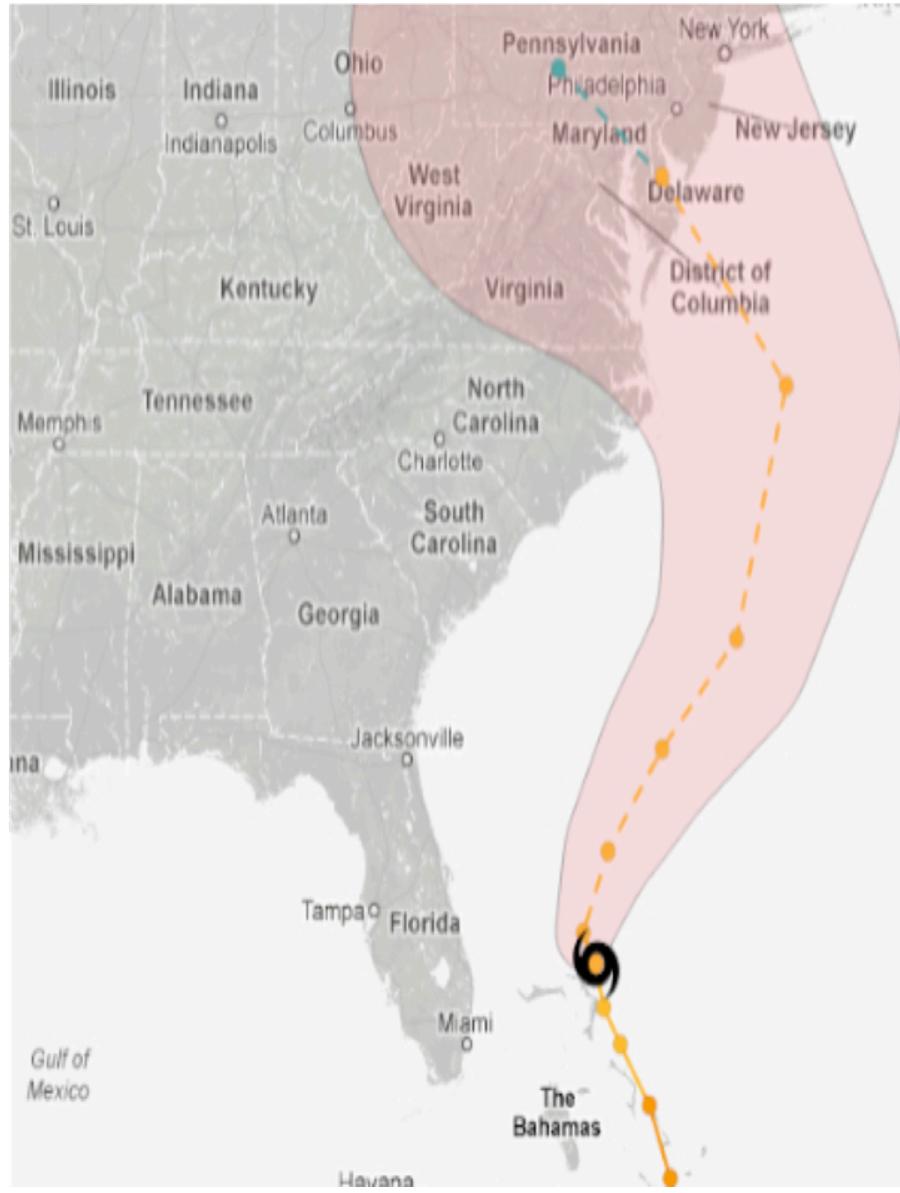
@BanannaZhang

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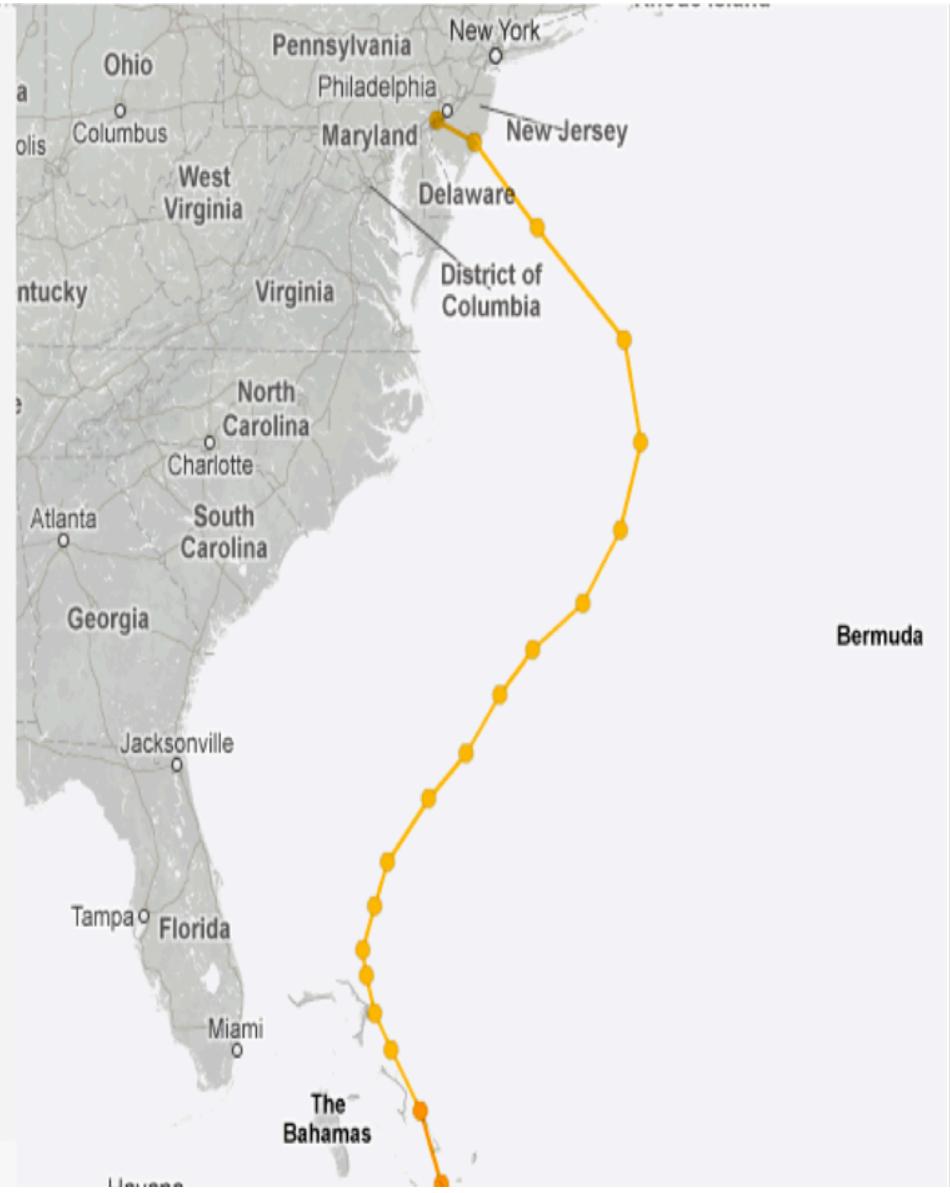
#juno2015 The storm to end all subsequent snow days that my
company will be doling out since this one was such a bust.

8:19 AM - 27 Jan 2015

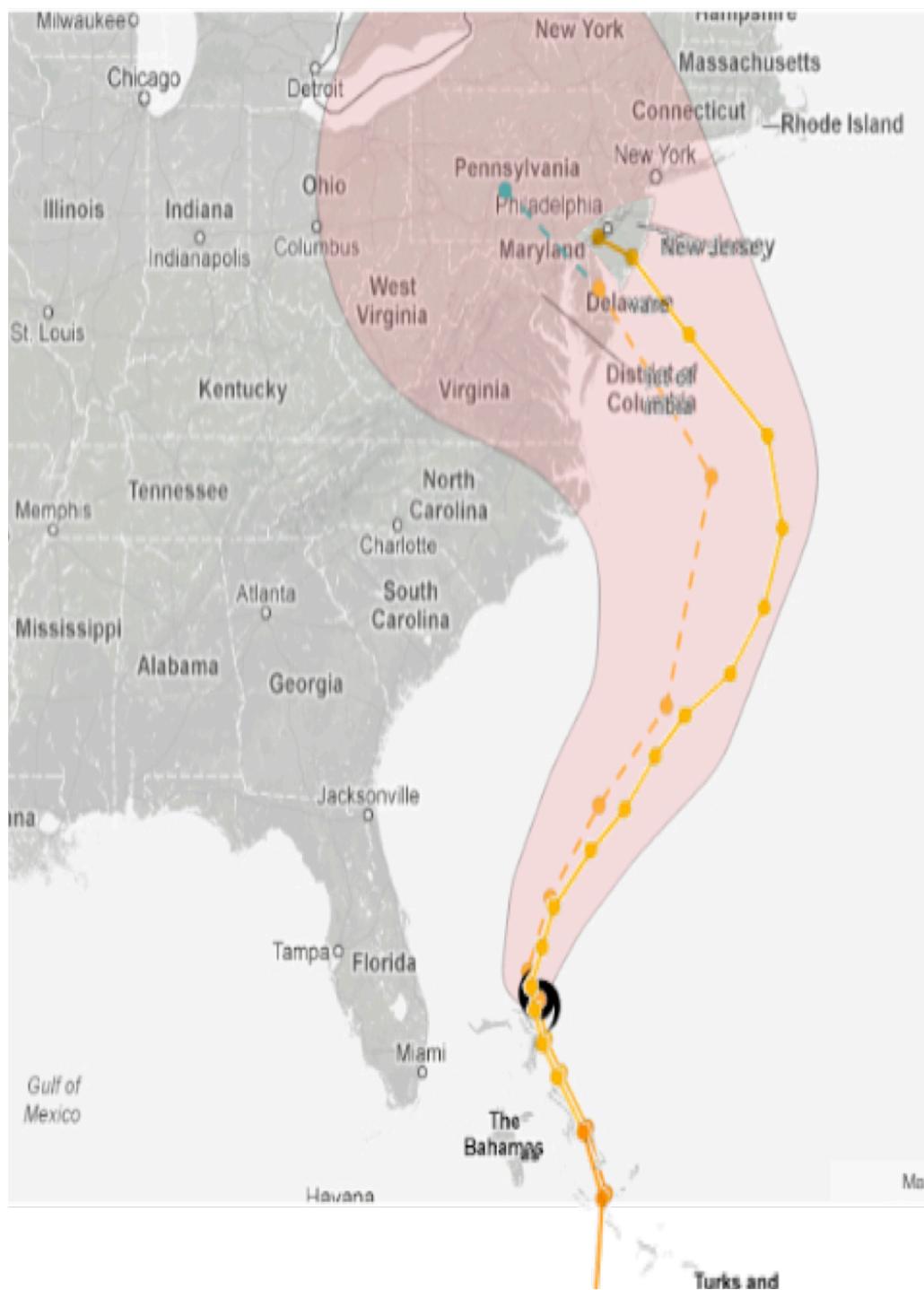
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New York Times



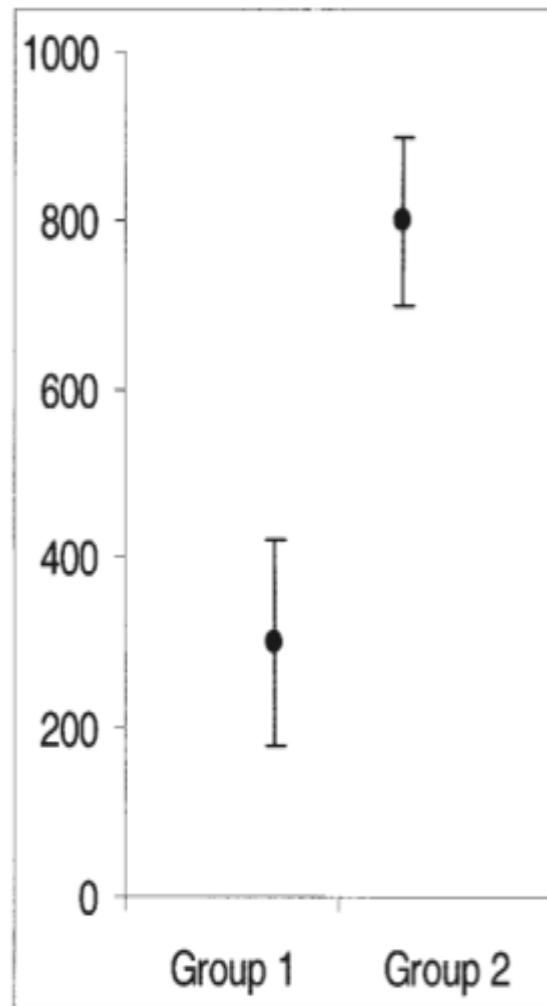
Hurricane Sandy



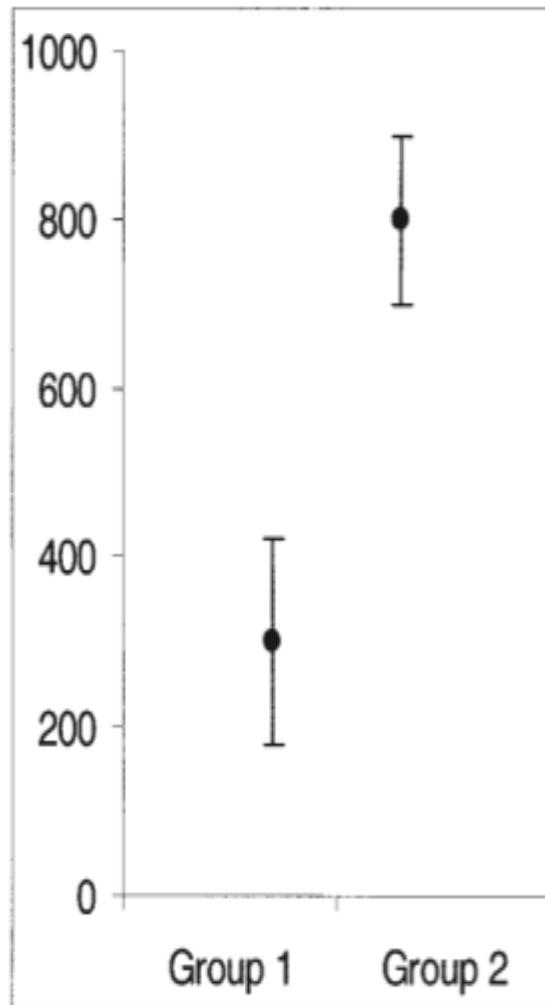
New York Times

Hurricane Sandy

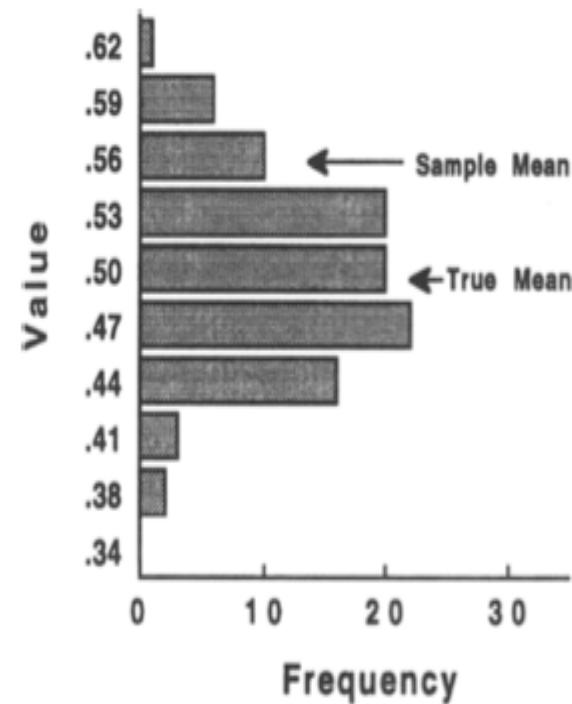




Belia, 2005



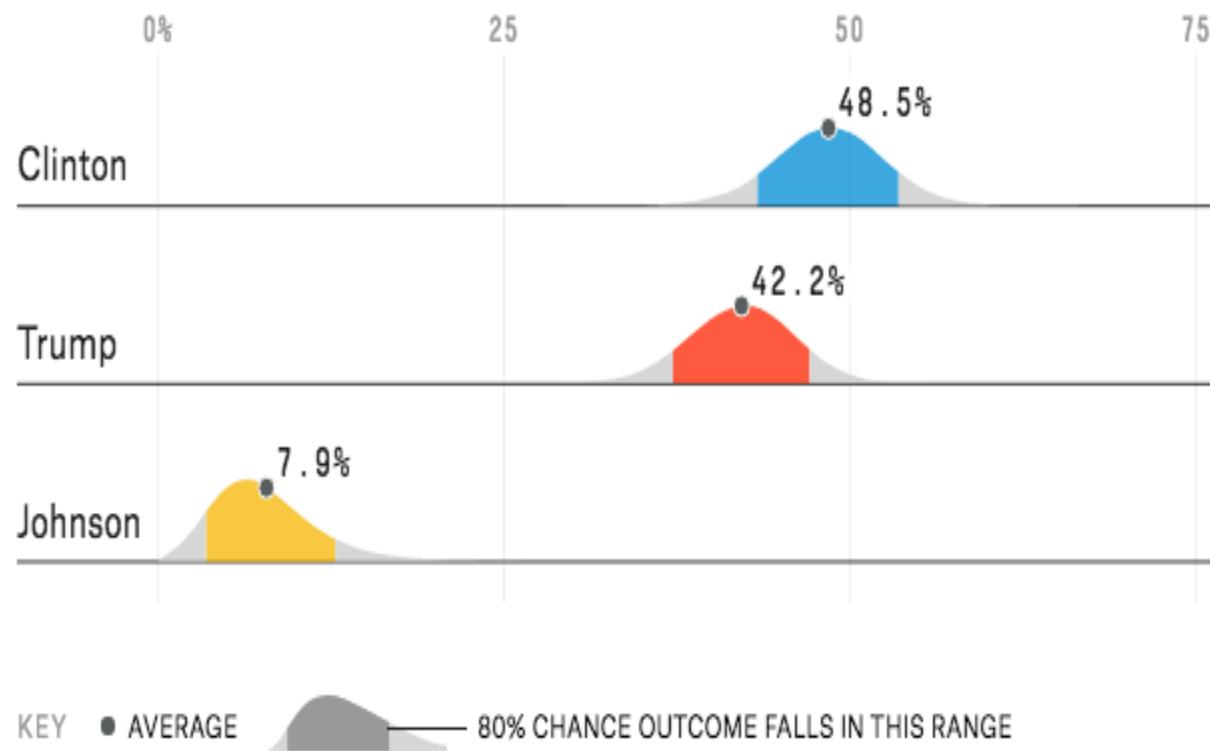
Belia, 2005

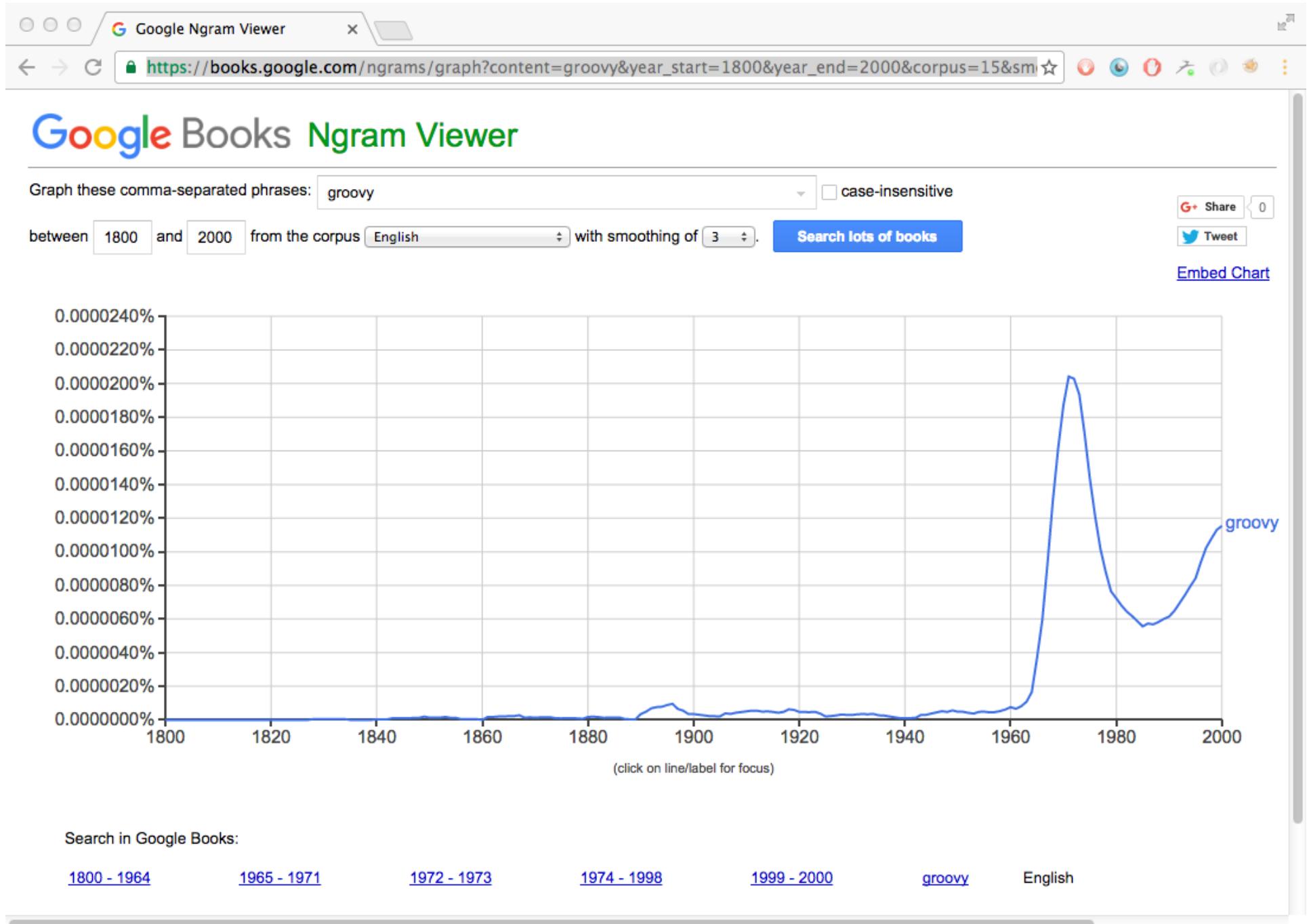


Estes, 1997

Who's winning the popular vote

Our model produces a distribution of outcomes for the national popular vote. The curves will get narrower as the election gets closer and our forecasts become more confident.







Decreased Risk

NAME	CONFIDENCE	YOUR RISK	AVG. RISK	COMPARED TO AVERAGE
Prostate Cancer		13.0%	17.8%	0.73x
Psoriasis			X %	0.44x
Restless Legs Syndrome			%	0.74x
Age-related Macular Degeneration			%	0.14x
Exfoliation Glaucoma			%	0.79x
Type 1 Diabetes			%	0.51x
Crohn's Disease			%	0.78x
Ulcerative Colitis			%	0.47x
Esophageal Squamous Cell Carcinoma			%	0.80x
Multiple Sclerosis			%	0.59x
Stomach Cancer (Gastric Cardia Adenocarcinoma)			%	0.77x
Celiac Disease			%	0.44x
Alcohol Dependence				
Atrial Fibrillation: Preliminary Results				
Basal Cell Carcinoma				
Behçet's Disease				

Research Confidence



Established Research. At least two studies examined more than 750 people with the trait or condition and/or the associations are widely accepted in the scientific community. The reports may cover rare conditions or include variants that do not greatly influence a person's absolute lifetime risk for a condition.



Preliminary Research. More than 750 people with the condition were studied, but the findings still need to be confirmed by the scientific community in an independent study of similar size.



Preliminary Research. Fewer than 750 people were studied. Multiple large studies are needed to confirm these findings.



Preliminary Research. Fewer than 100 people were studied. Multiple large studies are needed to confirm these findings.

●●●○ Verizon

11:49 AM



Today

Notifications

Monday,
August 29th

☀ Sunny currently. The high will be 91°. Clear tonight with a low of 70°.

↗ Right now, it would take you about 117 minutes to drive to Barrett.

You have two items scheduled for 6 PM.



Calendar

We think you'll love these!



Learn To Fly Course
(Online) - Private Pilot Test
Prep
Learn To Fly Course
(Online) - Private Pilot Test
Prep

[SHOP NOW »](#)



Cozy Toes Electric Foot
Warmer

[SHOP NOW »](#)



Squirrel Chaser Repellent
(set of 6)

[SHOP NOW »](#)



12 inch Cast Iron Skillet Lid

[SHOP NOW »](#)



Silicone Hot Handle Holder

[SHOP NOW »](#)



Solar Security Light

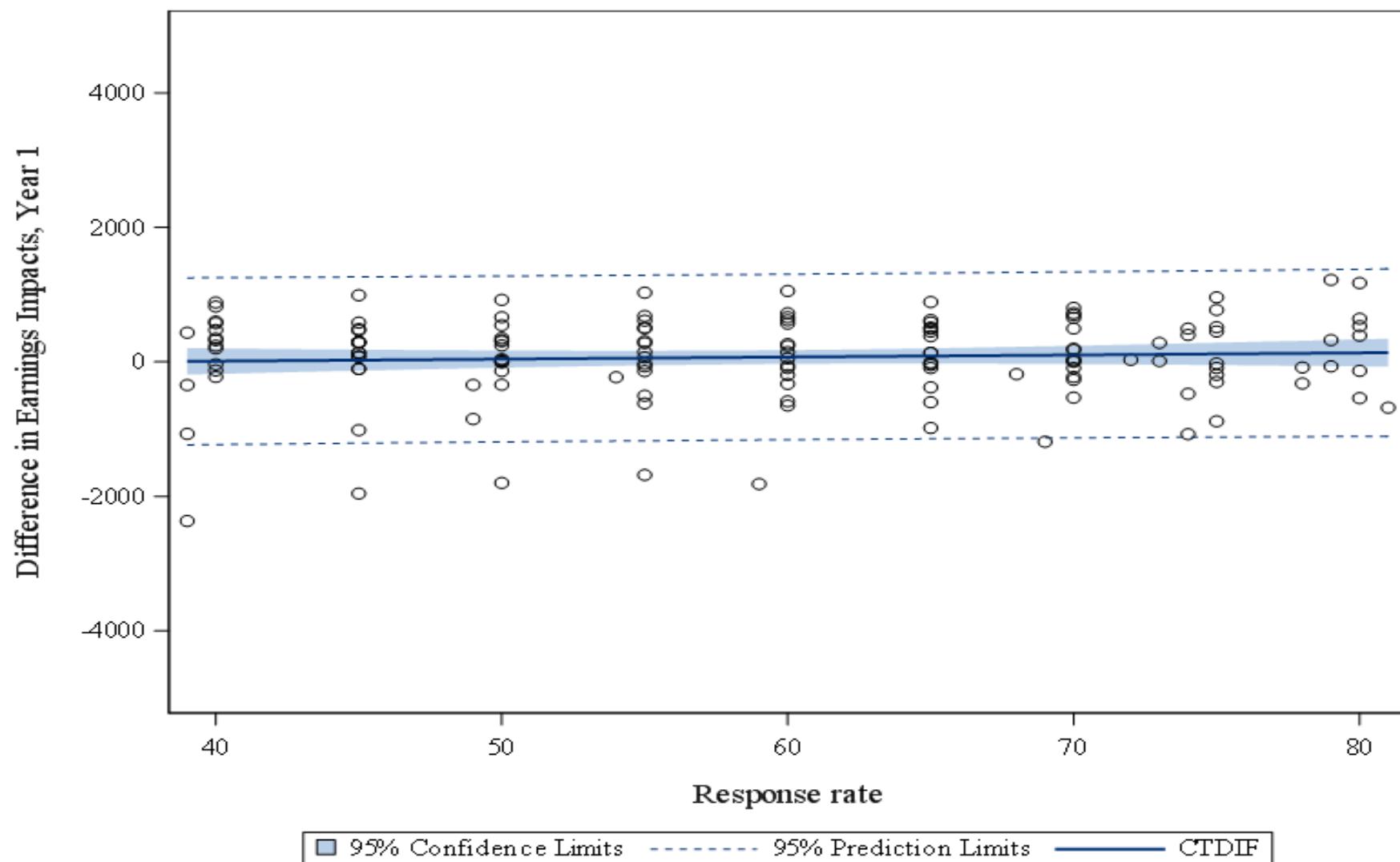
[SHOP NOW »](#)



<https://youtu.be/MrwxE8qOxA>

Appendix Figure 1

Scatterplot of Difference in Earnings Impacts By Site and Response Rate



critique by redesign

Original

From first published to masterpieces

Visualized are the authors of the 100 best English novels of 1900 according to the Modern Library ranking.

Authors are represented through circles showing their life span where their debut novel, their masterpiece(s) according to the ranking are positioned.

Authors' order points out the time-gap between the debut novel and the first published novel selected from the Modern Library ranking (masterpiece).

Debut novel and first masterpiece correspond for the first 22 authors.

Information about authors' hometown and novels' ranking are reported as well.

Sources: biography.com, britannica.com, modernlibrary.com

How to read it?

Authors are ordered from the earliest success to the last one.

color
Asia, North America
Europe, South America

Author name
S: hometown
age at birth
100 years birth
circumference = lifespan

age at debut novel
distance between debut novel and first masterpiece
age at first masterpiece
age at second masterpiece
age at third masterpiece
age at fourth masterpiece

first masterpiece coincide with debut
author still alive
novel published posthumous



Quick redesign

How to read

Masterpiece according to the Modern Library — Death

Place where the author was born

North America Central and South America Asia Europe

Age
10 20 30 40 50 60 70 80 90 100

Normal Mailer

Ernest Hemingway

James Baldwin

Jerome D. Salinger

James Joyce

Iris Murdoch

Elizabeth Bowen

Erskine Caldwell

Jean Rhys

Joseph Heller

David H. Lawrence

Edward M. Forster

Salman Rushdie

Jack Kerouac

Virginia Woolf

Still alive

Age
10 20 30 40 50 60 70 80 90 100

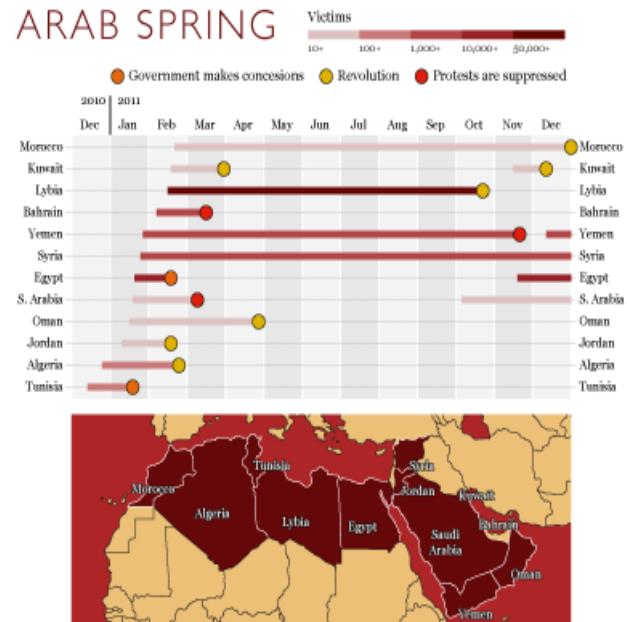
ORIGINAL

ARAB SPRING

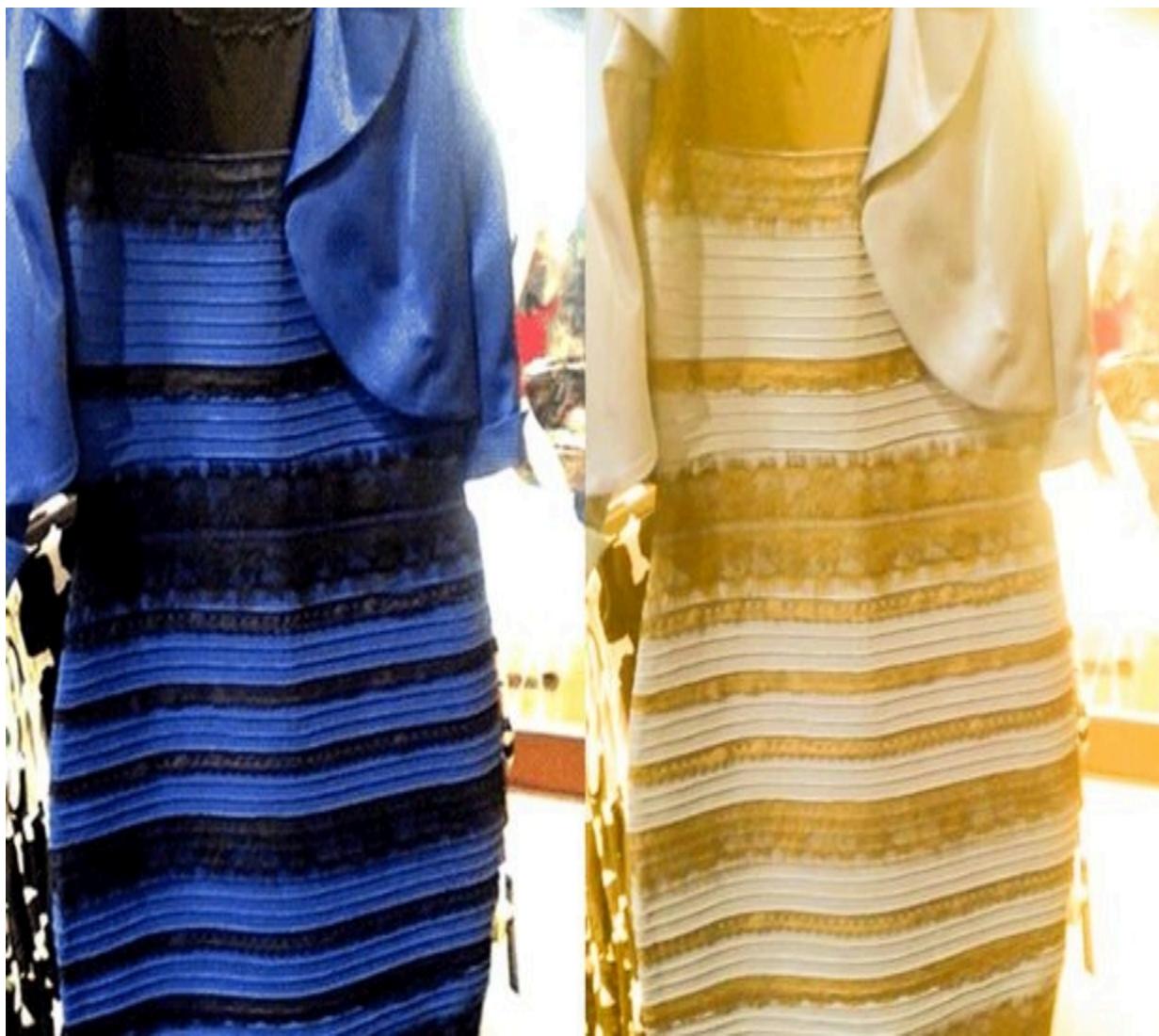


NEW VERSION

ARAB SPRING



measurement of user comprehension:
a new form of critique?



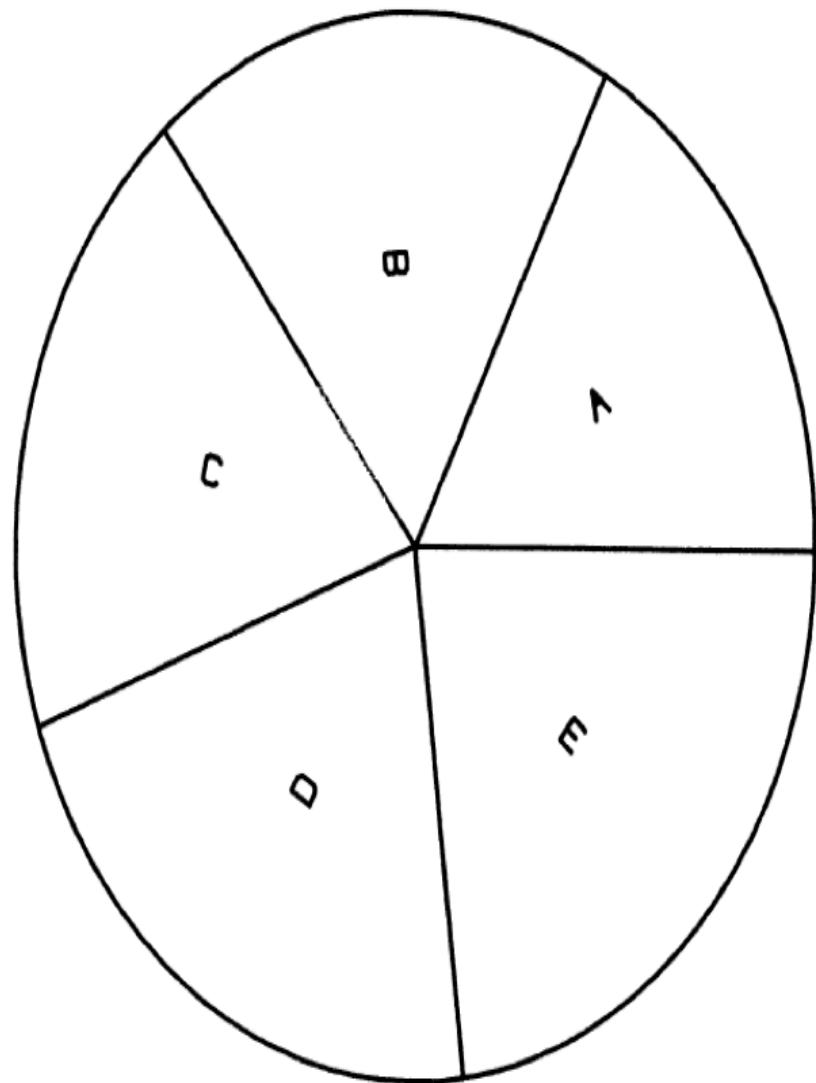


Figure 22. Pie chart.

William Cleveland, 1984

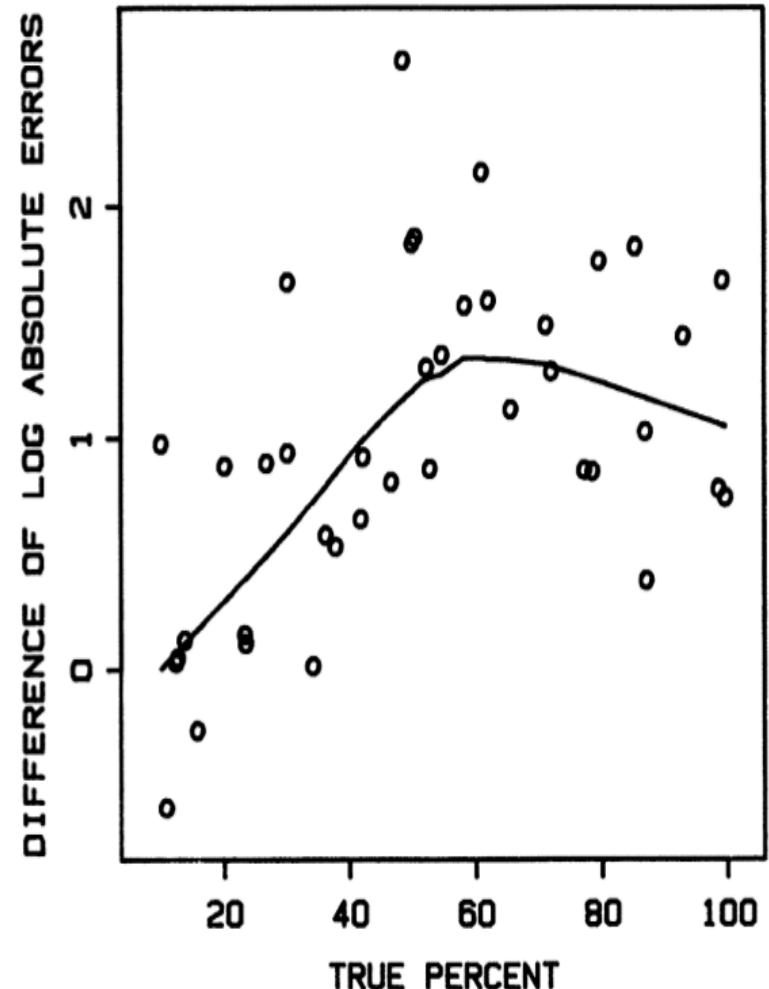
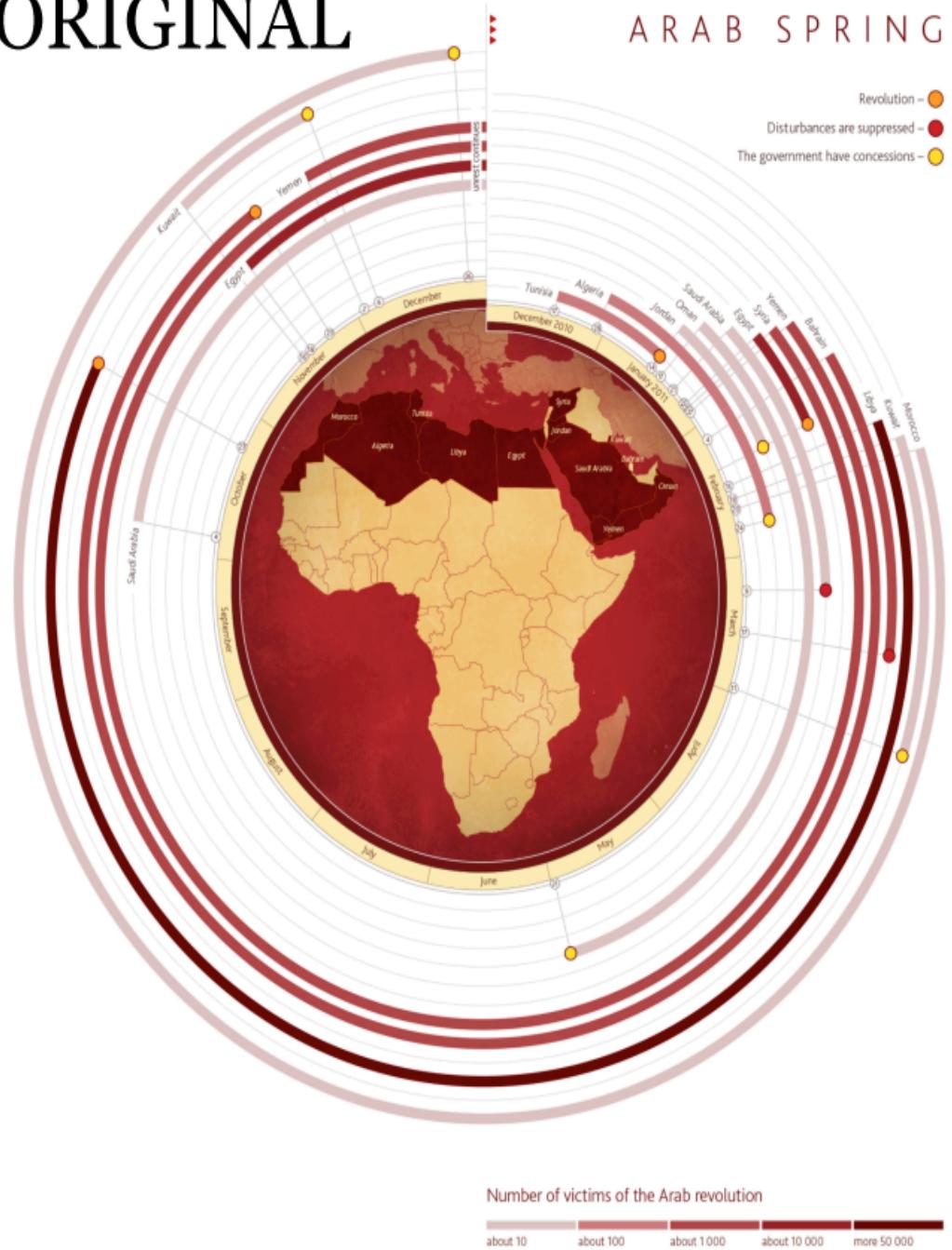


Figure 15. Position-angle experiment: Angle midmeans minus position midmeans against true percentages.

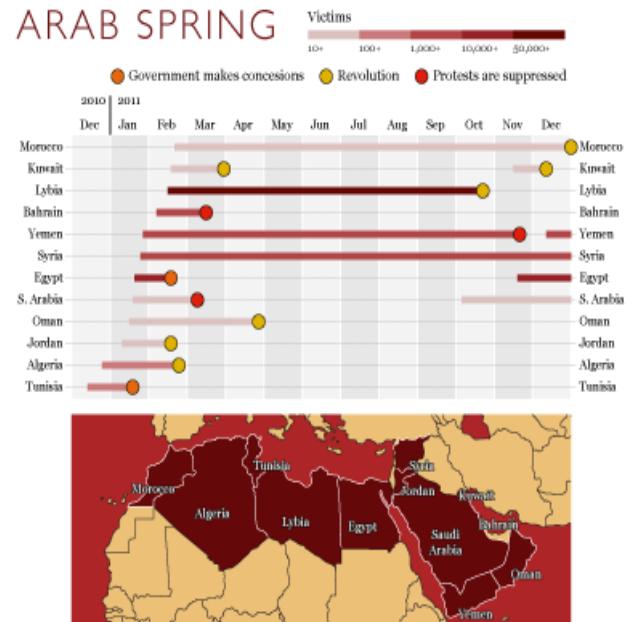
ORIGINAL

ARAB SPRING



NEW VERSION

ARAB SPRING

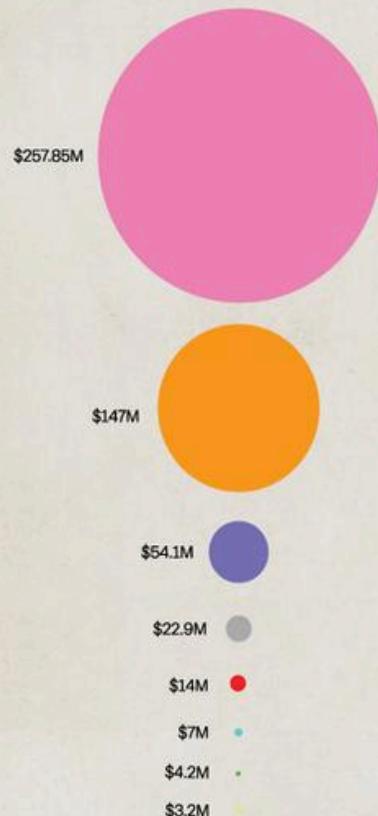


WHERE WE DONATE VS. DISEASES THAT KILL US

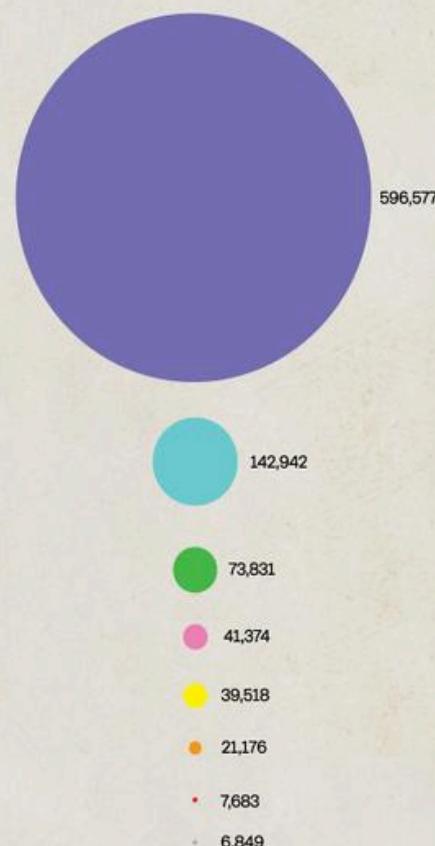
Legend:

- Heart Disease: Jump Rope for Heart (2013)
- Suicide: Out of Darkness Overnight Walk (2014)
- Diabetes: Step Out: Walk to Stop Diabetes (2013)
- HIV / AIDS: Ride to End Aids (2013)
- Breast Cancer: Komen Race for the Cure (2012)
- Motor Neuron Disease (including ALS): ALS Ice Bucket Challenge (2014)
- Chronic Obstructive Pulmonary Disease: Fight for Air Climb (2013)
- Prostate Cancer: Movember (2013)

MONEY RAISED



DEATHS (US)



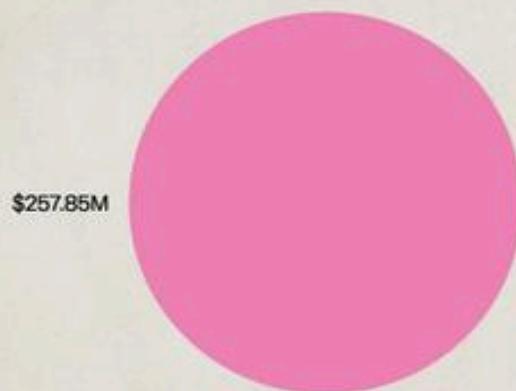
Source: CDC (2011)

V

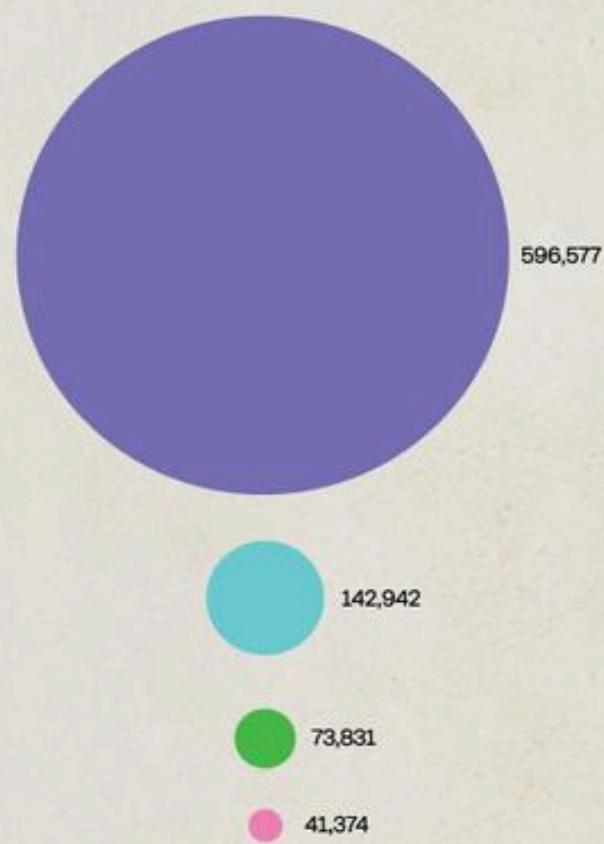
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MONEY RAISED



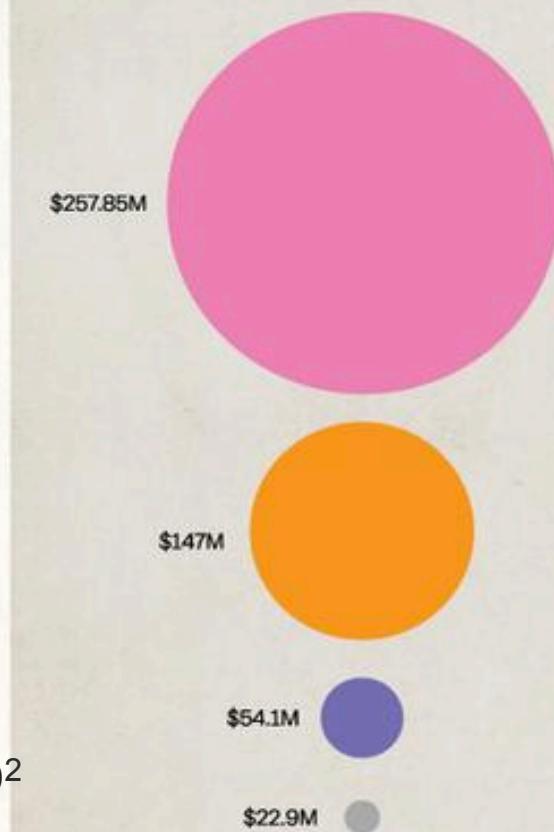
DEATHS (US)



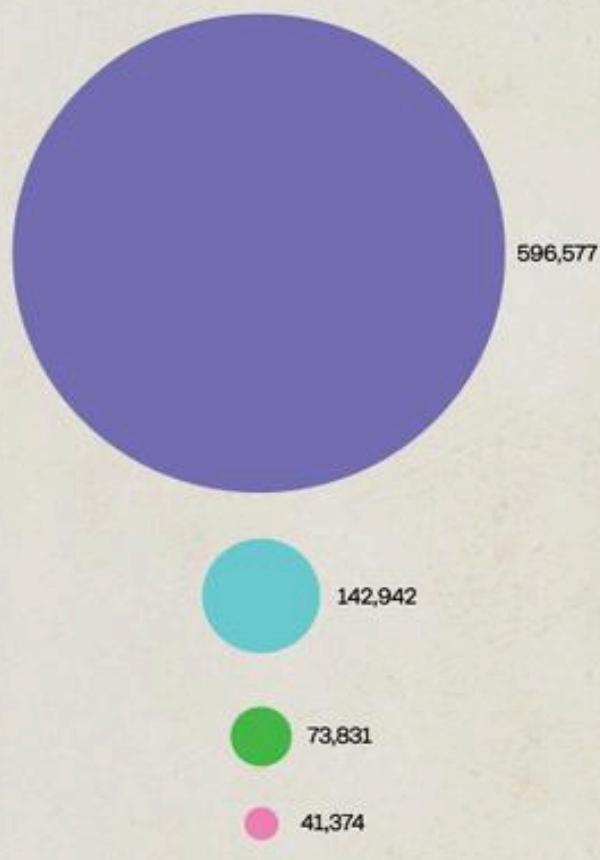
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MONEY RAISED



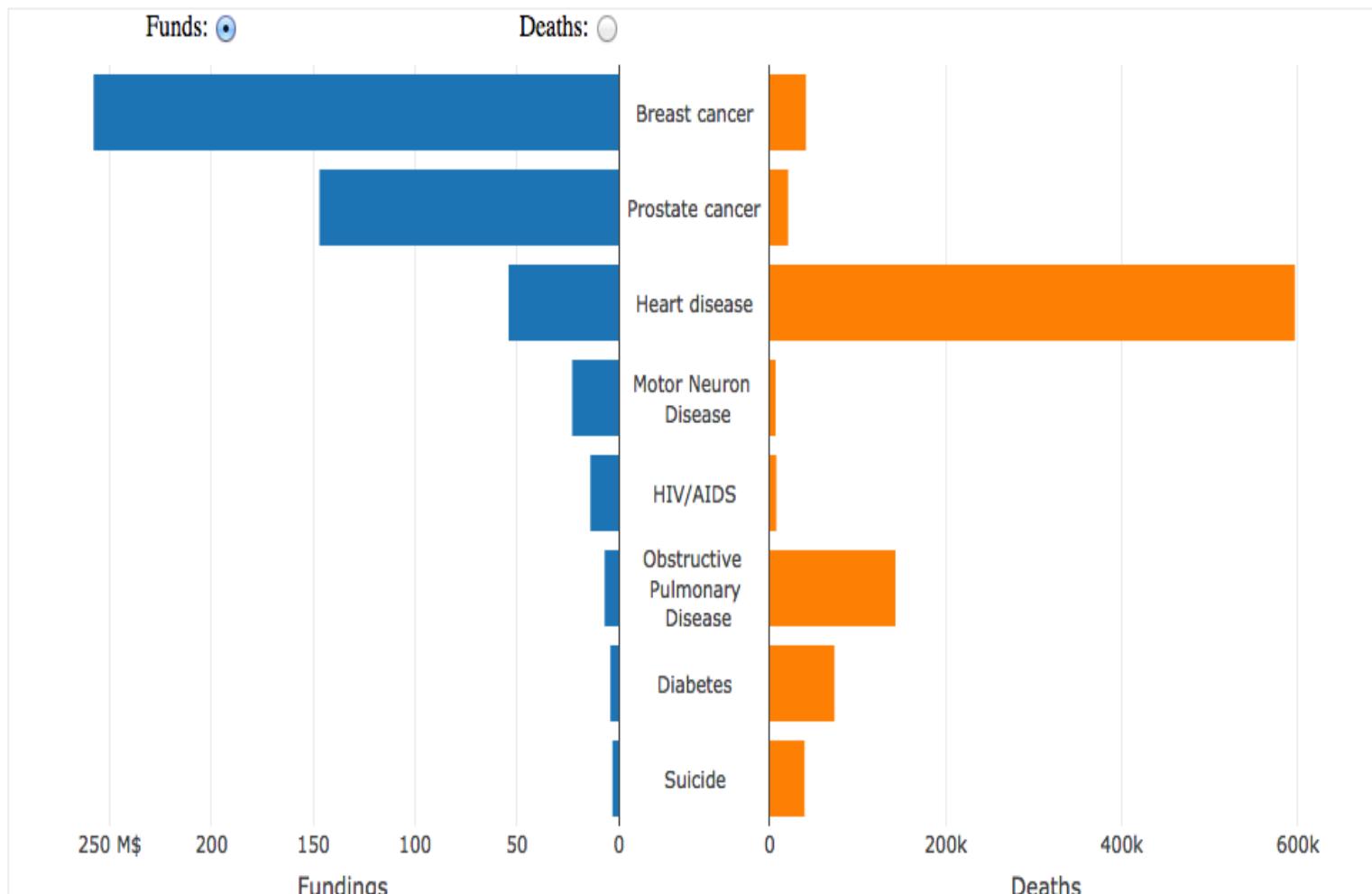
DEATHS (US)



$$A = (\pi/4) \times D^2$$



Where we donate vs. Diseases that kill us



AS A DISCIPLINE...

- can we develop a new visual language and set of standards to express “error?”
- can we develop a standardized methodology for measuring perception and user comprehension?

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