

WRITING FOR NEWSPAPERS, MAGAZINES, COMICS AND MORE

Regina Nuzzo, Ph.D.

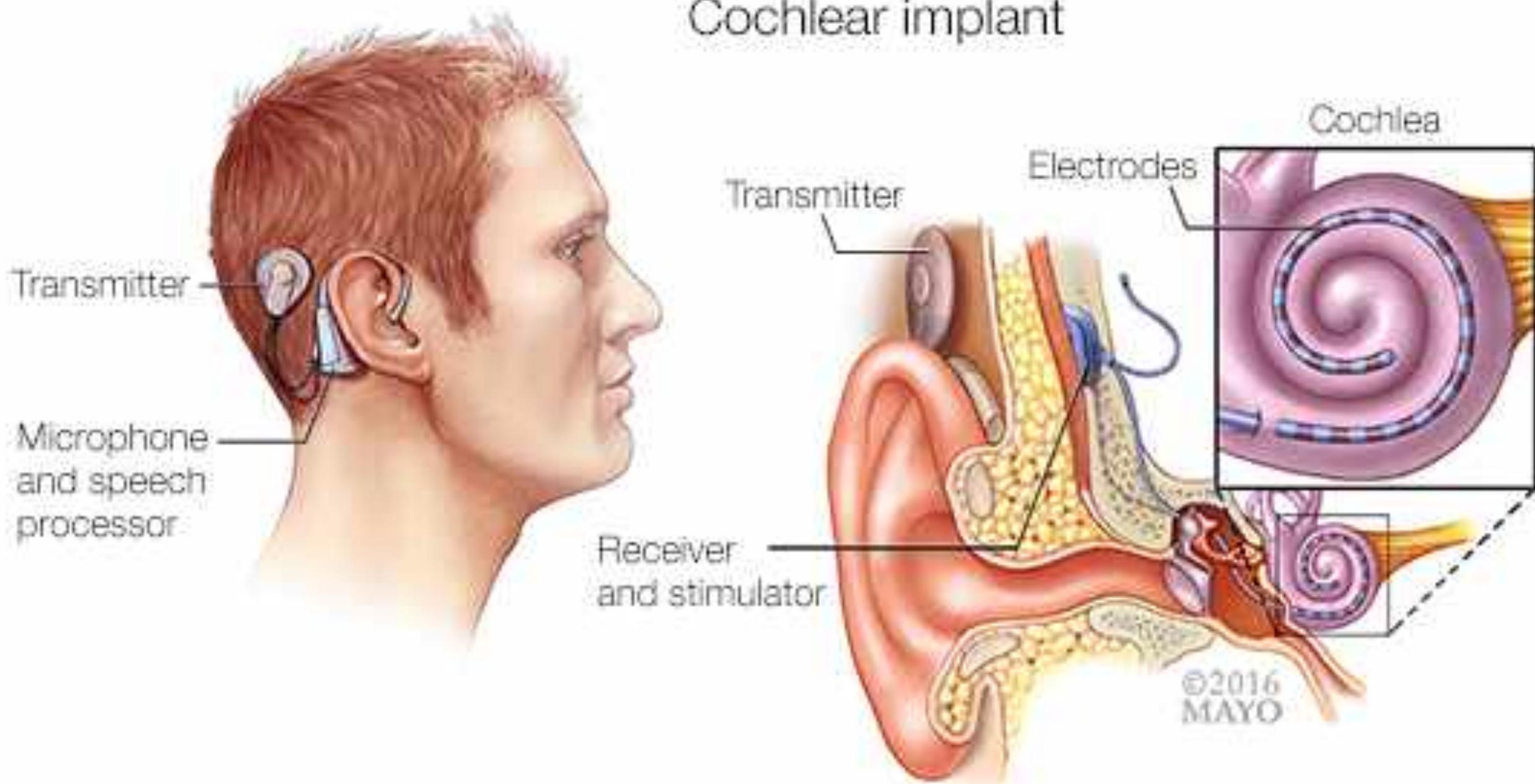
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American Statistical Association

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JSM 2019



Cochlear implant



UGH, PEOPLE ARE MAD AT ME AGAIN
BECAUSE THEY DON'T READ CAREFULLY.

I
I'M BEING PERFECTLY CLEAR.
IT'S NOT MY FAULT IF EVERYONE
MISINTERPRETS WHAT I SAY.

WOW, SOUNDS LIKE YOU'RE
GREAT AT COMMUNICATING,
AN ACTIVITY THAT FAMOUSLY
INVOLVES JUST ONE PERSON.



WRITING TYPES AND TOPICS



CRC Press
Taylor & Francis Group
CHAPMAN & HALL

ASATM
AMERICAN STATISTICAL ASSOCIATION
Promoting the Practice and Profession of Statistics®

ASA-CRC Series on Statistical Reasoning in Science and Society

CHAITRA H. NAGARAJA



MEASURING
SOCIETY

SHARON L. LOHR



MEASURING
CRIME
Behind the Statistics

TAHIR EKIN



STATISTICS AND
HEALTH CARE FRAUD
How to Save Billions

TOM ADAMS



IMPROVING YOUR
NCAA® BRACKET
WITH STATISTICS

ROBERT GRANT



DATA
VISUALIZATION
Charts, Maps, and Interactive Graphics

JIM ALBERT



VISUALIZING
BASEBALL

DAVID S. SALSBURG



ERRORS,
BLUNDERS,
AND LIES
How to Tell the
Difference

ASATM
A CHAPMAN & HALL BOOK

Scientific method: Statistical errors

Overview of attention for news story in Nature



Writing about statistical issues

Statistical significance
 Data privacy
 Census 2020
 Algorithmic bias
 Reproducibility

Mentioned by

- 8** news outlets
- 37** blogs
- 9688** tweeters
- 1** peer review site
- 7** weibo users
- 204** Facebook pages
- 1** Wikipedia page
- 159** Google+ users
- 1** LinkedIn user
- 14** Redditors
- 1** research highlight platform
- 3** Q&A threads

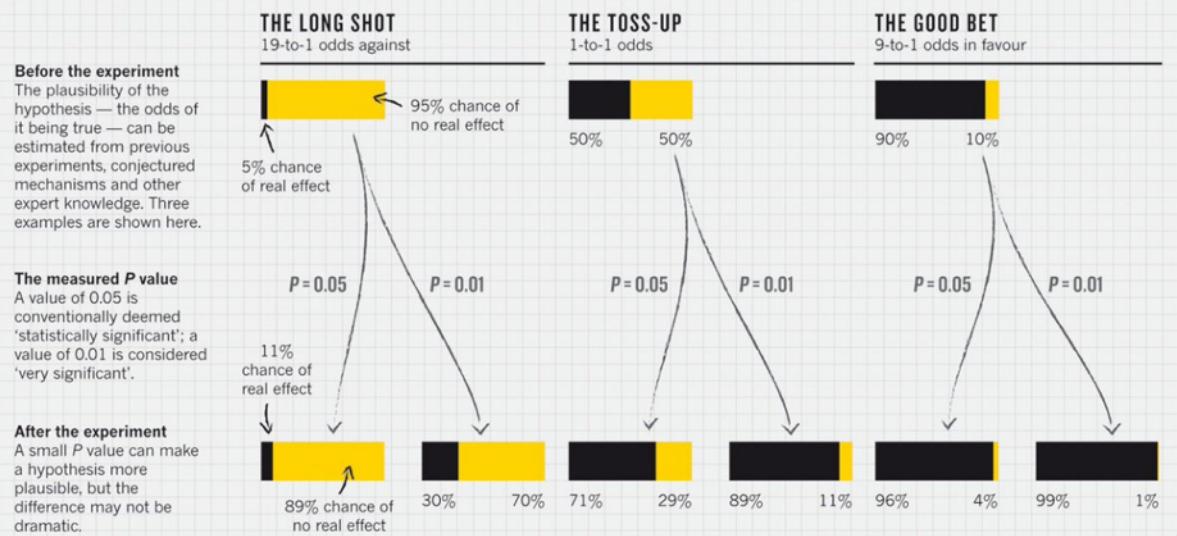


Dr. Yana Weinstein-Jones
 @doctorwhy

RT [@doctorwhy](#): I've never seen p-values represented in this way. Mind blown. [@ReginaNuzzo](#) nature.com/news/scientifi...

PROBABLE CAUSE

A P value measures whether an observed result can be attributed to chance. But it cannot answer a researcher's real question: what are the odds that a hypothesis is correct? Those odds depend on how strong the result was and, most importantly, on how plausible the hypothesis is in the first place.



'I nearly aborted my baby because of an unreliable test'

🕒 8 February 2019

Using statistics to explain the stories behind the news: “news you can use”

Cancer screening
Medication decisions
Diet
Sleep
Finance

What should I think if my NIPT says "Turner"?

Analysis by Robert Cuffe, BBC News head of statistics

If a condition is very rare, the majority of positive screening tests are health scares, and so the technical accuracy rates are misleading.

A test result can sound like a near certain diagnosis when the test says it's 95% accurate. But in many cases, it is still most likely that your child is perfectly fine.

"Ninety-five per cent accurate" means something to regulators and statisticians, but doesn't tell you the chance that your positive result will lead to a diagnosis.

It means, for example, that five out of every 100 healthy people tested will get a health scare: a false positive. But if it's a rare condition - say less than one-in-100 - then most of the positive test results will be health scares.

Medical professionals agree that for Down's Syndrome and some other conditions, the technical accuracy of the test is the right level to give helpful guidance. But that isn't the case for rarer conditions like Turner Syndrome.

So ask your doctor before making any big decisions and, if you are tempted to ask Dr Google, look for how common the condition is before jumping to any conclusions.

Equal pay day: What is the gender pay gap like where you are?

By Daniel Wainwright
BBC News

0 November 2017

Using statistics to explain the stories behind the news: “news you can talk about”

Polling
Political fact-checking
“What are the chances?”
Sports

Analysis by Robert Cuffe, BBC News Head of Statistics

If official figures say the gap is 9% and campaigners say it's 14%, is someone using a dodgy number?

Not necessarily. Both figures come from the [Office for National Statistics](#). They use different averages. The 9% figure uses the middle (median) number. The 14% figure uses the mean average.

The mean can be pushed up by very a small number of high values. If Bill Gates walks into your local pub, the mean wealth there will shoot up by millions, but the median won't change much.

The ONS prefer 9% for that reason but campaigners say that the average should reflect the gaps across all of society.

Whether equal pay day lands on 10 November (mean), 27 November (median) or on a different day in your area, this analysis shows that there are few places in the UK where it lands on 31 December.

The Future of Election Forecasting

Landlines are dying—and taking phone-based opinion polling with them



By Regina Nuzzo on November 1, 2014

Explaining statistics research around an application

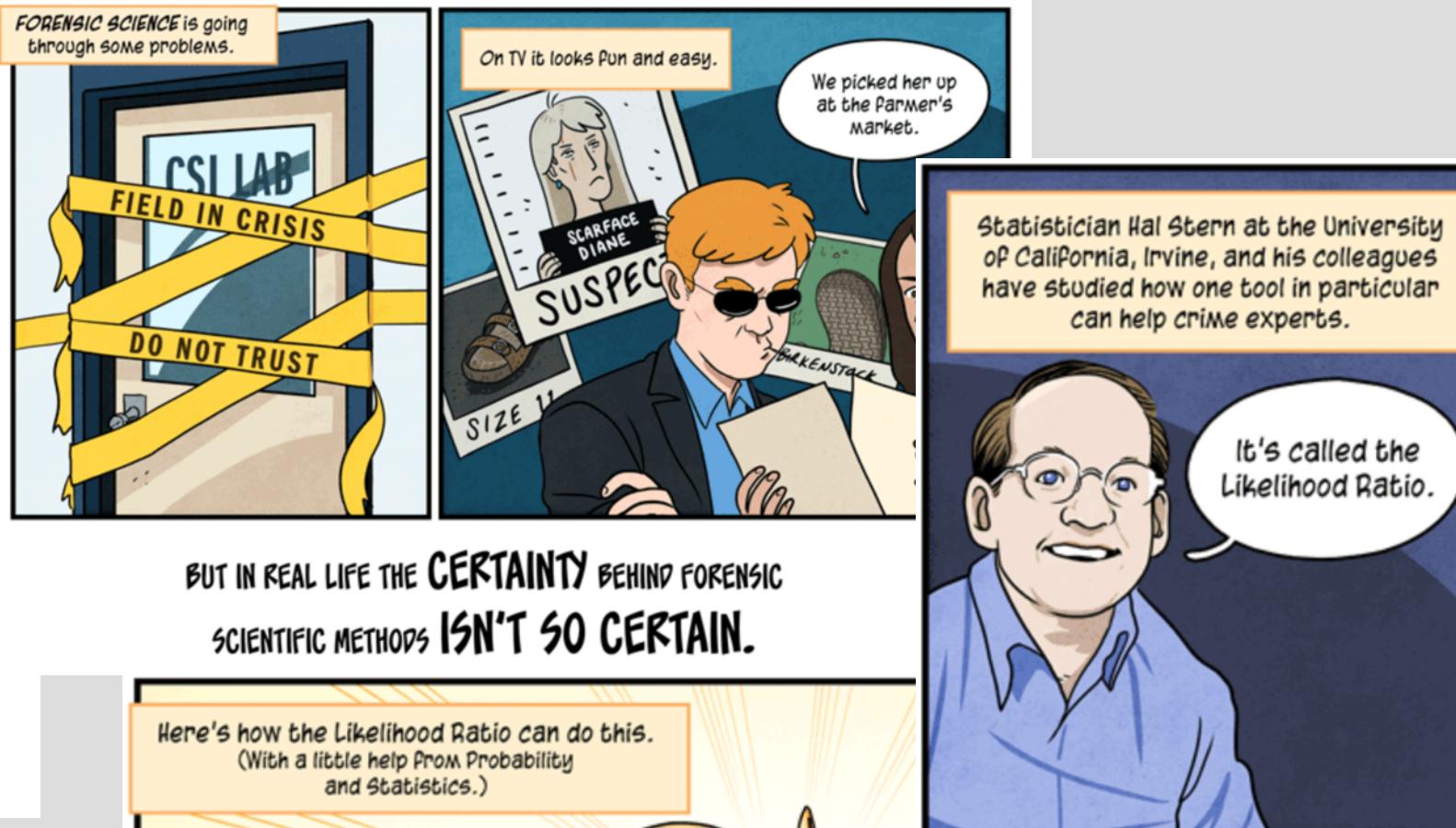
Poverty measurement
Sports
Environmental health

When courtroom science goes wrong—and how stats can fix it

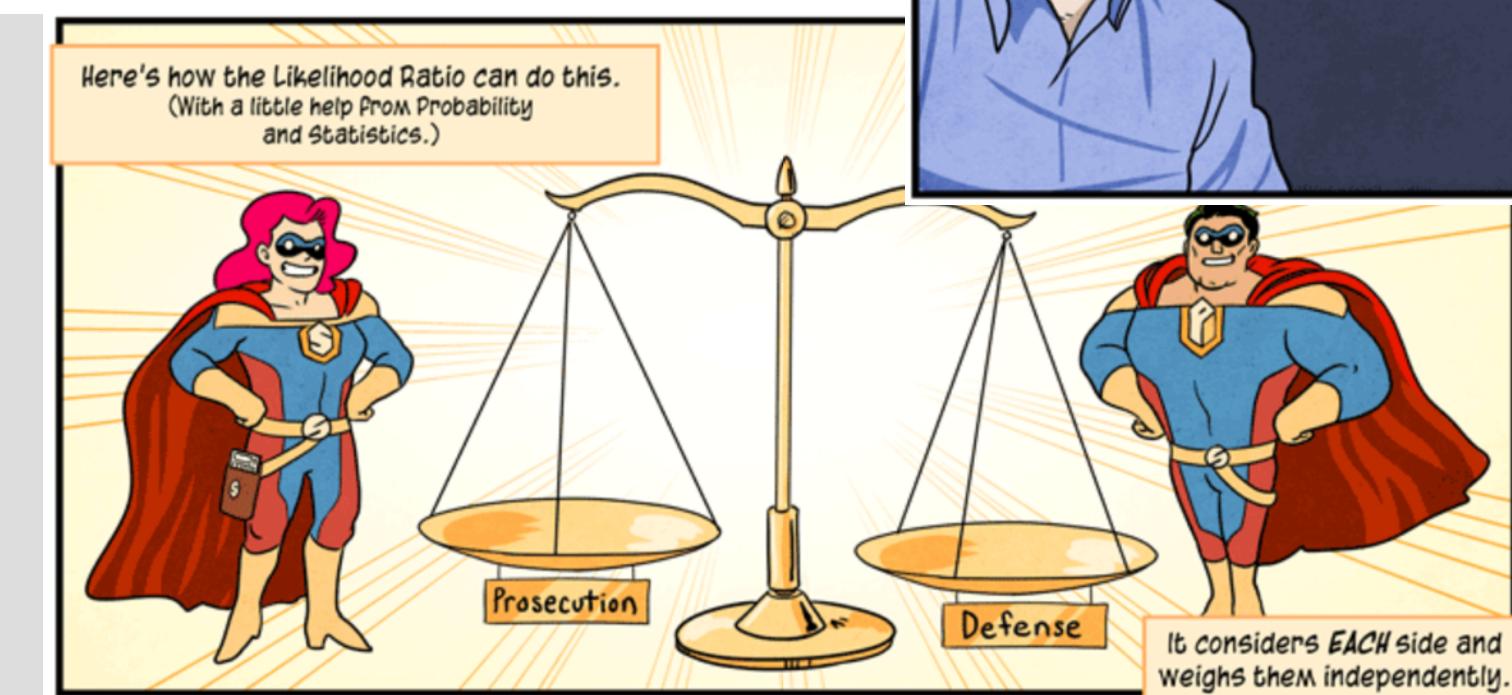
COMIC: Bite marks, shoe prints, crime-scene fibers: Matches to suspects are often far shakier than courtroom experts claim. Better statistical methods — among them, a little beast known as the “likelihood ratio” — can cut down on wrong convictions.

Story by Regina Nuzzo | Illustrated by Maki Naro | 10.12.2018

Making a creative narrative involving statistics



BUT IN REAL LIFE THE CERTAINTY BEHIND FORENSIC SCIENTIFIC METHODS ISN'T SO CERTAIN.



Stop Saying White Mortality Is Rising

It's an argument that relies on misinterpreting the data.

Debunking
or criticizing
ideas using
statistics

By JONATHAN AUERBACH and ANDREW GELMAN

MARCH 28, 2017 • 9:00 AM

"The white working class is really struggling." This statement has been assumed as a fact and used as an explanation to rationalize Donald Trump's upset election. Is it true?

One major data point feeding into the narrative of the struggle is the purported increase in mortality rates among middle-aged white people in America. As Anne Case and Angus Deaton noticed a bit over a year ago in a paper that received much well-deserved attention, other countries and U.S. nonwhites have seen large declines in death rates, something like 20 percent. That finding was certainly true—but what received far more attention was their secondary point, that American middle-aged whites were not experiencing these same declines and, in fact, faced an increasing mortality rate.

As we've explained before, this is not quite correct: What seems to be happening is that non-Hispanic white women, aged 45–54, are experiencing an increase in mortality, and everyone else seems to keep making gains.



THE CONVERSATION

June 11, 2019

Cricket's Duckworth-Lewis method: how to work out who wins when rain interrupts

Russell Gerrard, City, University of London

When bad weather hits, there's a complex formula organisers turn to to make lost game time fair.

Writing essays
about statistics
in society

- **Inform** public debate with knowledge-based journalism that is responsible, ethical and supported by evidence.
- **Unlock the knowledge** of researchers and academics to provide the public with clarity and insight into society's biggest problems.
- Create an **open site for people around the world** to share best practices and collaborate on developing smart, sustainable solutions.
- Provide a **fact-based and editorially independent forum**, free of commercial or political bias.

When both teams involved in a one day international cricket match have their full allocation of overs, the team scoring the most runs is the winner. There is, however, a regrettable tendency for the weather to intervene – especially in England, as the World Cup 2019 teams [have been finding out](#) – and to deprive one or both teams of a portion of their allotted time. The solution, as it turned out, lay in statistics.

Top contributors



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Geoff Cumming

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THE CONVERSATION

Academic rigor, journalistic flair

Arts + Culture Economy + Business Education Environment

Articles on Statistics

Displaying 1 - 20 of 158 articles



June 10, 2019

The most unpopular presidential election winner ever could win again in 2020

Liberty Vittert, Washington University in St Louis and Brendan Lind, Harvard Business School

Approval ratings are usually a good way to predict the winner of the next presidential election. But Trump's numbers fall far outside any historical trends.

Explaining statistical concepts and answering questions about statistics

What is an intuitive explanation of Bayes' Rule?

[Answer](#)[Follow · 585](#)[Request](#)[1](#)

...

63 Answers

**Michael Hochster, PhD in Statistics, Stanford**

Updated Jun 21, 2016 · Upvoted by Anupam Kundu, B.S. , M.S. Statistics, Indian Statistical Institute (2017) and Peter Flom, Independent statistical consultant for researchers in behavioral, social and medical sciences



Your roommate, who's a bit of a slacker, is trying to convince you that money can't buy happiness, citing a Harvard study showing that only 10% of happy people are rich.

After giving it some thought, it occurs to you that this statistic isn't very compelling. What you really want to know is what percent of *rich people* are *happy*. This would give a better idea of whether becoming rich might make you happy.

Bayes' Theorem tells you how to calculate this other, **reversed** statistic using two additional pieces of information:

Statistics (academic discipline)

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 Bookmark



Election StatSheet

Quantitative election forecasting and political analysis.

 Follow 4.7k



The Art of Data Science

Data science, from practitioner perspectives

 Follow 8k



ouR Space

All about using R, its applications, and even some data science, too.

 Follow 772



Most Viewed Writers in Statistics

The 10 writers with the most answer views in the last 30 days.

108,870

Views



Valdis Klētnieks, former Computer System Senior Engineer (1989-2018)

[View 13 Answers](#)

108,712

Views



Aaron Brown, MBA Finance & Statistics, The University of Chicago Booth School of Business (1982)

[View 1,482 Answers](#)

87,388

Views



Peter Flom, Independent statistical consultant for researchers in behavioral, social and medical sciences

[View 2,398 Answers](#)

68,475

Views



Steve Baker, Blogger at LetsRunWithIt.com (2013-present)

[View 15 Answers](#)

61,933

Views



Colleen Farrelly, Data Scientist/Poet/Social Scientist/Topologist (2009-present)

[View 556 Answers](#)

RECAP OF STATISTICAL WRITING TYPES

1. Writing about statistical issues
2. Using stats to explain the news
3. Explaining stats research
4. Creative narratives around stats work
5. Debunking ideas using statistics
6. Opinion piece
7. Explaining stats concepts

CLASSROOM IDEAS

PRACTICE: TAKE A TECHNICAL SUMMARY AND WRITE A LAY SUMMARY (PREFERABLY SOMEONE ELSE'S WORK AT FIRST)

Original: “Here we leverage the wide usage of smartphones with built-in accelerometry to measure physical activity at the global scale. We study a dataset consisting of 68 million days of physical activity for 717,527 people, giving us a window into activity in 111 countries across the globe. We find inequality in how activity is distributed within countries and that this inequality is a better predictor of obesity prevalence in the population than average activity volume.”
(excerpted from: *Nature* 547, 336–339, 2017.)

Lay summary: Researchers used data from smartphones to look at the walking habits of 717,527 people from 111 countries. Countries with the widest gaps between the most active and least active people also had the highest obesity rates. Surprisingly, this “activity inequality” was a stronger predictor of obesity than the total amount of activity.

WRITING STRATEGIES TO PRACTICE

- Get over self-consciousness
- Get rid of jargon
- Get rid of details
- Avoid the curse of knowledge
- Give context – what is the problem?
- Why should I care?
 - Why is the question important – whom does it affect, or why is it interesting?
 - Why don't we have the answer already – why is the question hard?
- What are the solutions?

DRILL: WRITE WITH ONE-BEAT WORDS

When you write with one-beat words you must slow down. You must find short words that say what you mean, words that are plain and not full of pomp.

It is hard to write of stats with one-beat words. You will fail. That is fine. The point of this drill is to yank your mind out of its groove.

“...short words are best. Plain they may be, but that is their strength. They are clear, sharp and to the point. You can get your tongue round them. You can spell them. Eye, brain and mouth work as one to greet them as friends, not foes.”

DRILL: WRITE WITH THE THING EXPLAINER



SIMPLE WRITER

WRITE LIKE UP GOER FIVE AND THING EXPLAINER

(EXPLAINED USING ONLY THE TEN HUNDRED WORDS PEOPLE USE THE MOST OFTEN)

PUT WORDS HERE

Cells consist of cytoplasm enclosed within a membrane, which contains many biomolecules such as proteins and nucleic acids.

YOU USED SOME LESS SIMPLE WORDS

Cells consist cytoplasm enclosed membrane contains biomolecules proteins nucleic acids

TINY BAGS OF WATER YOU'RE MADE OF

Everything that's alive is made of tiny bags of water. Some living things are made of just one bag of water. Those things are usually too small to see. Other things are made of a group of bags stuck together. Your body is a group of lots and lots of these bags that are working together to read this page.

These bags are full of smaller bags. Life uses lots of bags. All life is made from different kinds of water, and a bag keeps the stuff inside it from touching the stuff on the outside. By using bags, living things can keep different kinds of water in one place without it all coming together.

Some of the little bags you see here were once living things on their own. Long ago, some little green bags learned to get power from the Sun. Then they got stuck inside other bags; and those became flowers and trees. The green color of leaves comes from the children of those little green bags.

LITTLE ANIMALS

These are living things (not really "animals") that got stuck in our bags of water a long time ago, like the green things in tree leaves. Now we can't live without each other. They get food and air from our bodies and turn them into power for our bags.

SIZE

These bags are almost always too small to see. In fact, they're almost as small as the waves of light we see with:

BLUE ~~~~~
GREEN ~~~~~
RED ~~~~~

OUTSIDE WALL

The water bags that make up animals have soft walls. The bags in trees and flowers, which don't need to move around as much as us, have a less-soft outside layer.

GETTING IN AND OUT

Some things can go through the bag's wall on their own. Other things can only go through if the bag helps them, either by letting them through an opening, or by making part of the wall into a new bag to hold them.



THINGS THAT MAKE YOU SICK

These tiny things can get into your bags and take control of them. When they do that, they use the bag to build more of them.

When the kind shown here gets into you, your body gets hot, your legs

PUT WORDS HERE

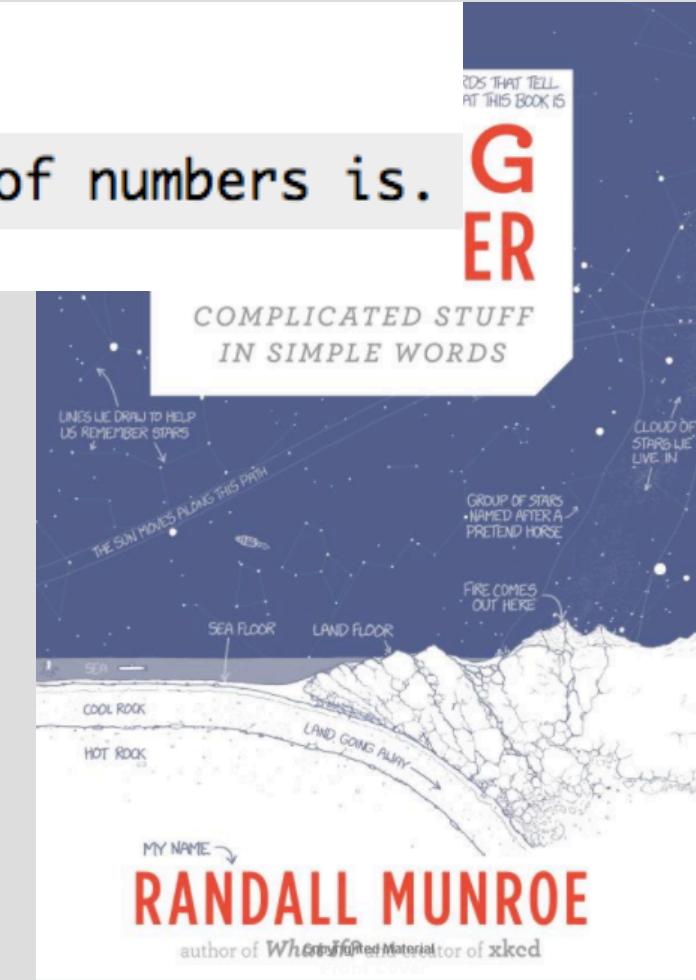
Everything that's alive is made of tiny bags of water. Some living things are made of just one bag of water. Those things are usually too small to see.

PUT WORDS HERE

The **probability** for a given **statistical model** that, when the **null hypothesis** is true, the **statistical summary** (such as the **sample mean difference** between two **compared groups**) would be the same as or of greater **magnitude** than the **actual observed results**.

PUT WORDS HERE

A number that tells us how surprising another group of numbers is.



DRILL: TIME TRAVELER EXPLAINER

Time Traveler

Your mission:
Explain
logistic
regression to
your hosts.

19th-century Vermont family

You are:

- Husband and wife farmers
- Five kids, including two who died in early childhood
- Quakers
- Involved in abolitionist movement (though not the women's suffrage movement)

"YOU DO NOT REALLY UNDERSTAND SOMETHING UNLESS YOU CAN EXPLAIN IT TO YOUR GRANDMOTHER."

EXPLAIN THE INTERNET TO A 19TH CENTURY BRITISH STREET URCHIN

> YOUR TIME MACHINE LANDS IN 1835 without anyone noticing your arrival. You have a passenger with you, but you warn them to stay near the machine to avoid

You try to explain the Internet using a:

TALKING
TEDDY
RUXPIN
DOLL

You pull the stuffed bear out and slip an audio tape into his back. His piercing orange eyes open with an audible click. "Hi!" the bear says, its mouth opening and closing in a chewing motion, "I'm Teddy Ruxpin!" The waif screams in terror and runs away.

SIMILE

IPAD

You pull out your ipad and try to hop on the Internet, but for some reason, you can't pick up a wifi signal. "Is there a coffee shop nearby?" you ask the waif.

"You see, the Internet is like a:"

ENDLESS
LIBRARY

The urchin says, "I was inside a library once, before my

"IT'S IN THE AIR.
THE BOOKS ARE
INVISIBLE."

OLIVER
THE INTERN

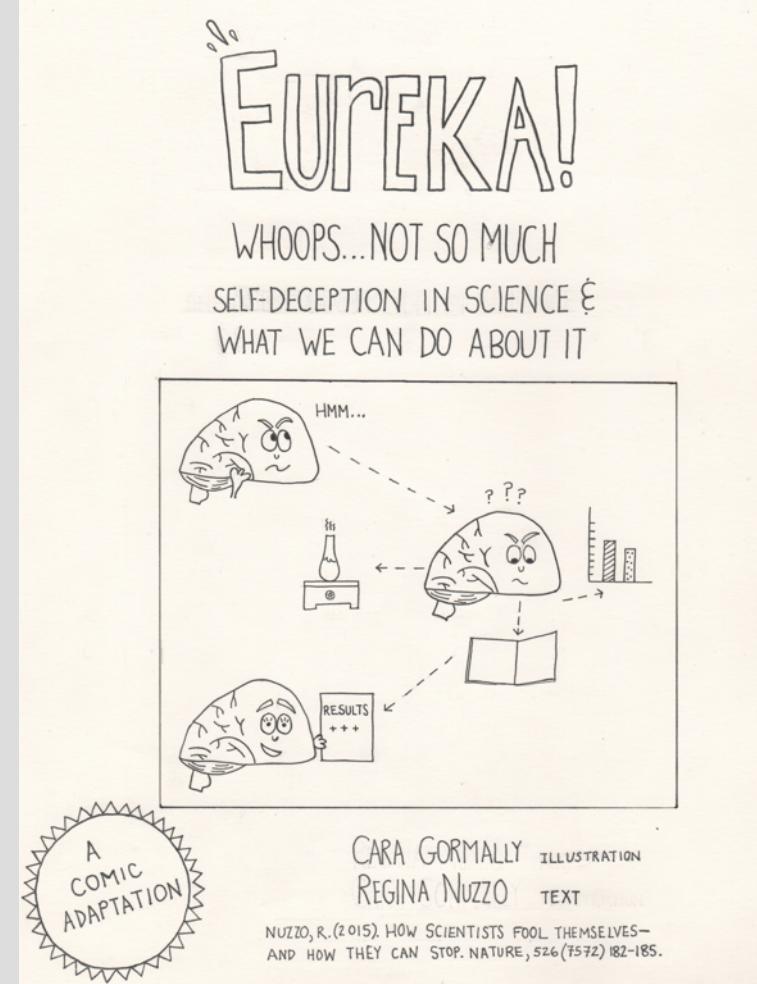
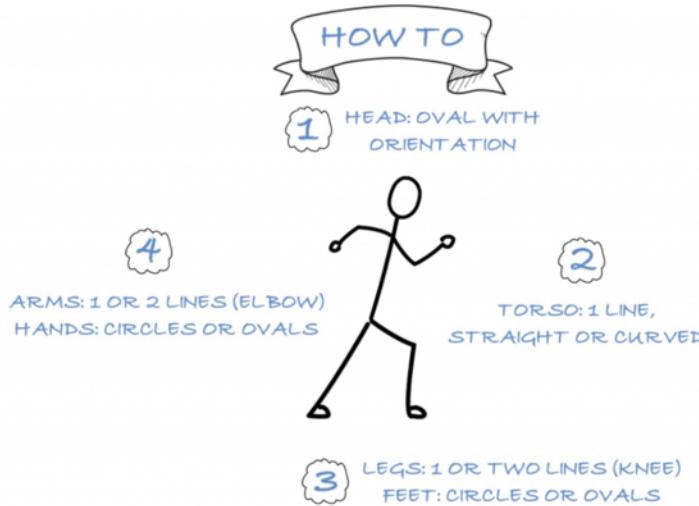
Moments later you are stabbed from behind, and your posession is snatched from your hands by a gang of dancing chimney sweeps. (2)

You're dead.

Mistaken for an escaped lunatic

DRILL: "SKETCHNOTING" WITH STICK FIGURES

How To Draw Stick Figures, Step By Step



DRILL: STATS ON A “POSTCARD”

Dear Coach Plocki,

I'm attending #jsm2019 in Denver, CO. A few days ago, I gave a brief presentation that I thought you might be interested in. You know I'm a big University of Michigan gymnastics fan, and when the start value of the Yurchenko full was lowered between the 2015 and 2016 seasons, I wondered what that would mean for scoring. Turns out that overall, the average total score across all teams continued to rise. However, when I broke it down by event, there was a noticeable drop in the vault scores. Prior to the change, they were similar to floor scores, but afterwards, they were lower and increased more slowly. That's not all, though. In the teams that qualified for regionals, there was a more drastic drop compared to the other events, yet in D2/D3 teams, the vault scores actually increased between 2015 and 2016. Looking forward to next season already and hoping Natalie will score another 10 with her Yurchenko 1.5!

Go Blue!
@ncaagymstats

P.S. I used videos of Emma's vaults as an example of a Yurchenko full and a Yurchenko 1.5. I hope that's okay—they were a wonderful illustration for those who aren't familiar with gymnastics!



There once was a prof named De Veaux
Gave a talk that was really “no-go”
His slides were unreadable
His sentences unhearable
And his tiny p-values oh-so-macho

[JSM Presentation Skills Workshop](#)

[Devaluing the Yurchenko Full: The Effect of NCAA Women’s Gymnastics Code Modifications on Event and Total Scores: Elizabeth Jewell* \(University of Michigan\)](#)

DRILL: FREEWRITING

Freewriting



“The consequence [of writing] is that you must *start by writing the wrong meanings in the wrong words*; but keep writing until you get to the right meanings in the right words. Only in the end will you know what you are saying.” —Peter Elbow

“Don’t think; just write!” —Ray Bradbury

What do I know about election polling? Well, I’m guessing that the whole cell phone thing must be hurting the polling industry. Need to look into that one. Why did I even decide to write about this? No idea. But I do remember being interested in how people can use Twitter to try to divine answers about polling behavior, which I’m skeptical of. And there’s a difference between probability sampling and non-probability sampling, which is fascinating ...

RECAP: CLASSROOM IDEAS

1. Rewrite technical summary into lay summary
2. Write with one-beat words
3. Write with xkcd's Thing Explainer
4. Time traveler conversations
5. Stick figure cartoons
6. Freewriting

The Future of Election Forecasting

SCIENTIFIC
AMERICAN®

Landlines are dying—and taking phone-based opinion polling with them

No one answers the phone anymore. Back in the Clinton days, pollsters could collect voter opinions from about one in three calls. Today it is fewer than one in 11. Blame disappearing landlines — only 60 percent of U.S. households had one in 2013 — as well as cell-phone caller ID. Yet even as response rates plummet and costs of chasing mobile users soar, most data-driven election predictions still rely on phone-poll results. Even Nate Silver’s Five Thirty Eight models, which perfectly predicted 2012 presidential race outcomes in all 50 states and the District of Columbia, hinge largely on phone surveys. So researchers are now hunting for alternative sources of voter data — and finding them in unlikely places.



conference

October 3-5, 2019 | Bellevue, WA

Communicating Quantitative Information Is Hard! Strategies for Success

Instructor: Regina Nuzzo, Gallaudet University

You're an expert in your field. You're passionate about the subject. So then why does it sometimes feel like such a struggle to help others really understand important concepts and results in your work? It's not just you. Experts are now realizing that communicating statistics and data science information is surprisingly hard—harder than most other fields, actually, and definitely not something for which most of us have received any training. Luckily, there are a few relatively straightforward strategies that can go a long way in making things easier. This course will be a fun and interactive look at those strategies, with opportunities to practice new skills in a safe and supportive environment. Non-native English language users and/or those who have traumatic memories of high-school English class are especially welcome.

YOUR IDEAS ARE WELCOMED!

**PLUG: SPECIAL INTEREST GROUP
ON STATISTICS COMMUNICATION**

REGINA@AMSTAT.ORG