

# Science (mis)information in today's society

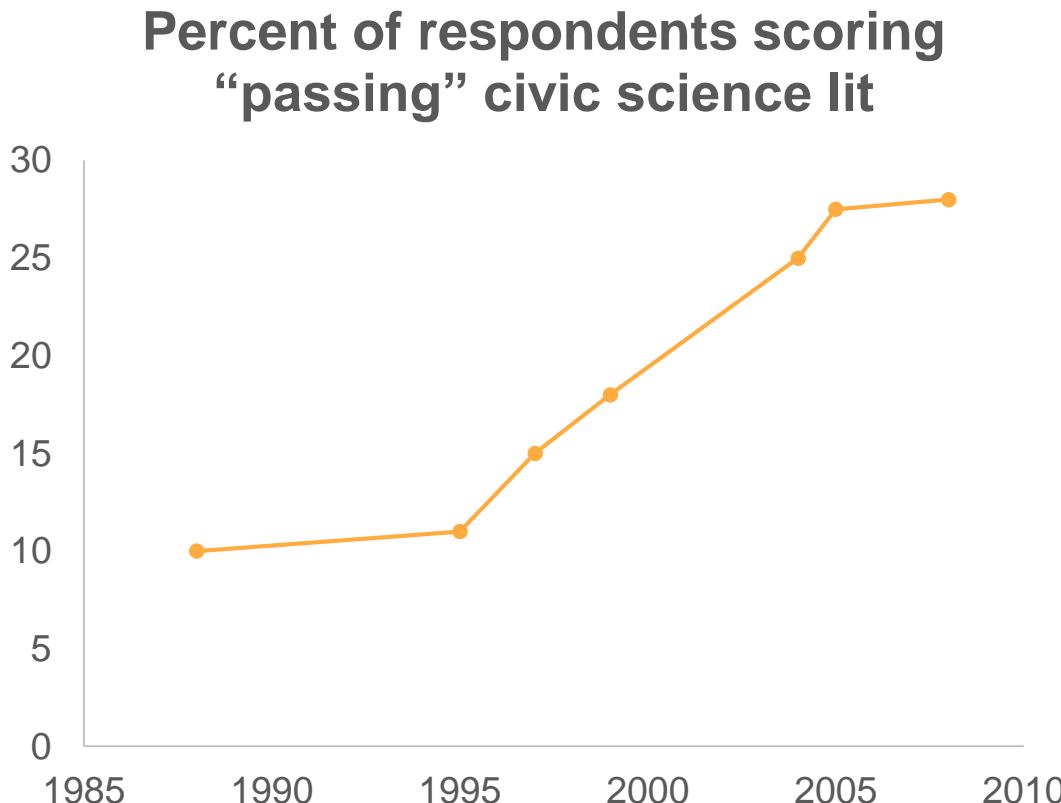
David Lazer  
*Northeastern University*



# Some background...

- What we know about what we know about science?
- How we find out about science?
- How confident are we in scientific institutions?

# Basic scientific knowledge seems to be increasing...



Source:  
(Miller, 2010)

<https://www.amacad.org/publication/science-and-educated-american-core-component-liberal-education/section/15>

## U.S. 2015 PISA Results in an International Context

### Science



No change in  
average score from 2012

#### U.S. Ranking\*

**21** 2012      **18** 2015

5 that were now   
3 that were now

### Reading



No change in  
average score from 2012

#### U.S. Ranking\*

**18** 2012      **15** 2015

6 that were now   
5 that were now

### Math



Average score lower  
than in 2012

#### U.S. Ranking\*

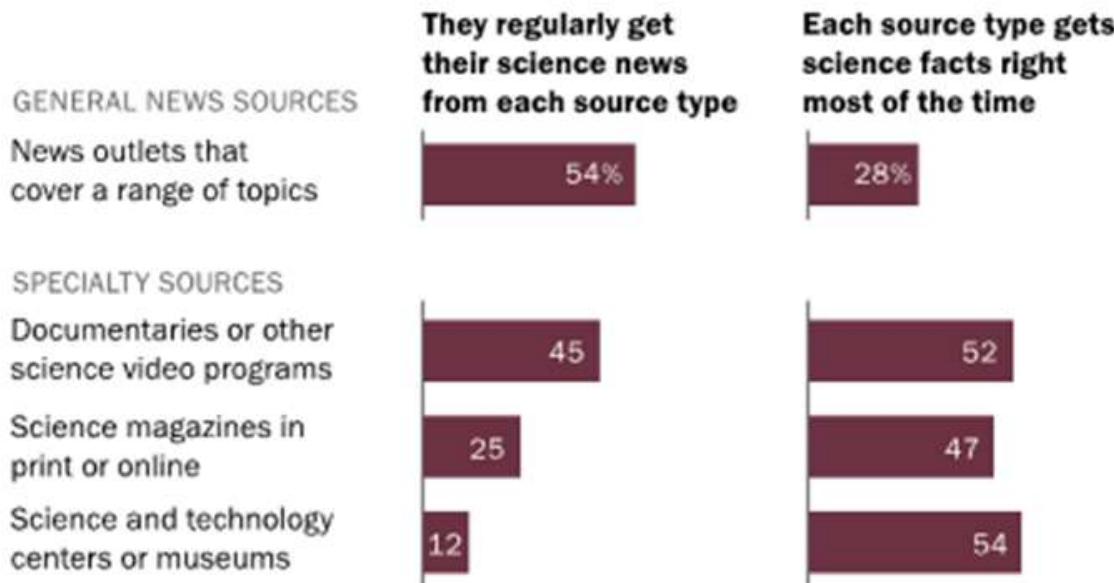
**28** 2012      **35** 2015

7 that were now   
3 that were now

Where do we get scientific knowledge?

## Most Americans get science news from general sources, but fewer see them as accurate

*% of U.S. adults who say ...*



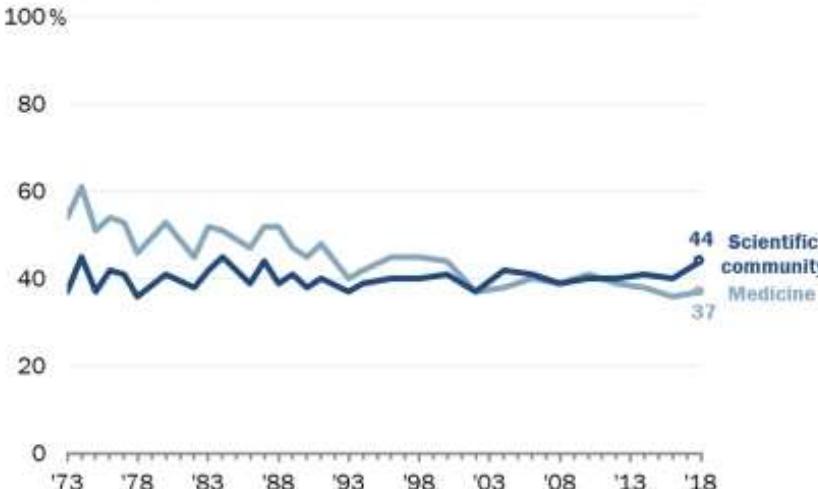
Note: "Most of the time" combines those who said "almost all" or "more than half" of the time. Respondents who gave other responses or who did not give an answer are not shown. Other source types rated are not shown.

Source: Survey conducted May 30-June 12, 2017.  
"Science News and Information Today"

# How confident are we in science?

## Confidence in the leaders of the scientific community has been stable since the 1970s

*% of U.S. adults who say they have a great deal of confidence in the people running each of these institutions*

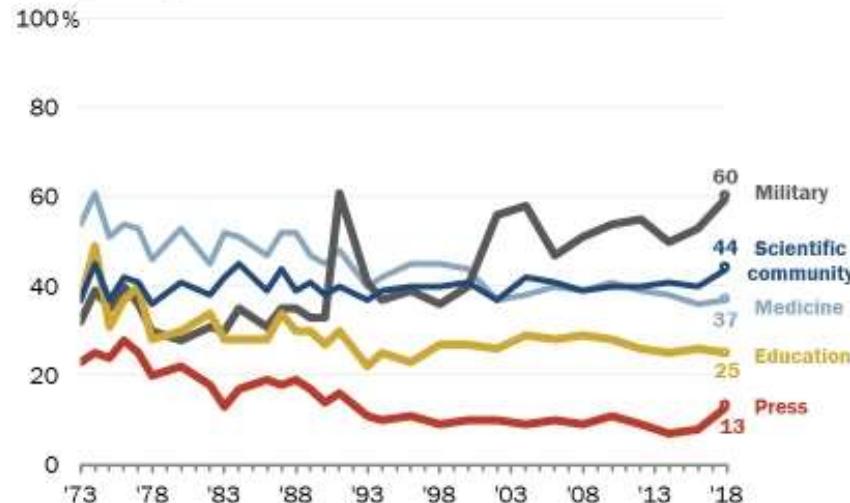


Note: Respondents who gave other responses or who did not give an answer are not shown.  
Source: General Social Surveys, NORC.

# How confident are we in science?

**Confidence in leaders of the military has gone up; confidence in some other institutions is declining**

*% of U.S. adults who say they have a great deal of confidence in the people running each of these institutions*



Note: Respondents who gave other responses or who did not give an answer are not shown.  
Source: General Social Surveys, NORC.

# Why do we care?

Decisions of public consequence (e.g., climate change)

Decisions of private consequence (e.g., medical)

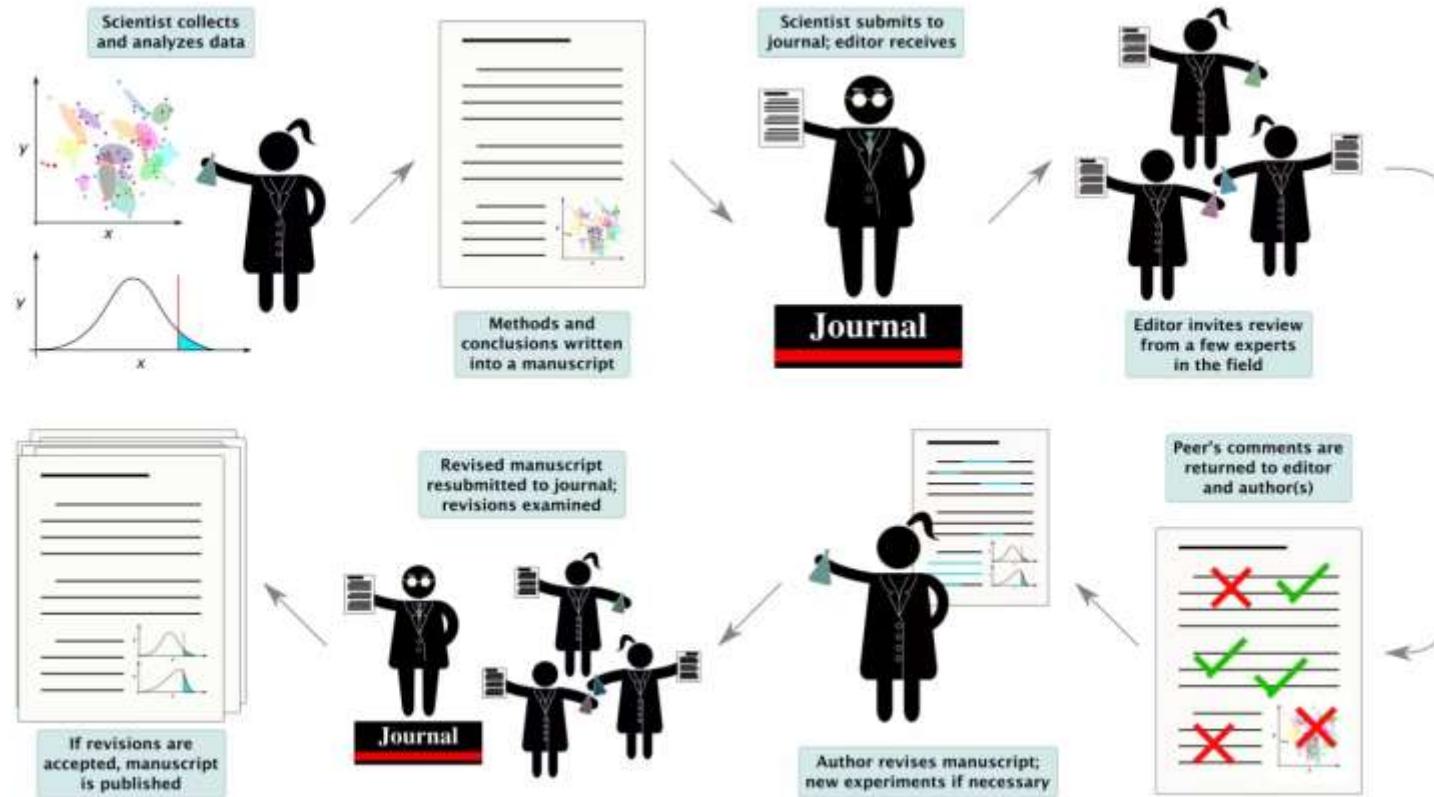


# Almost all knowledge of shared interest is mediated

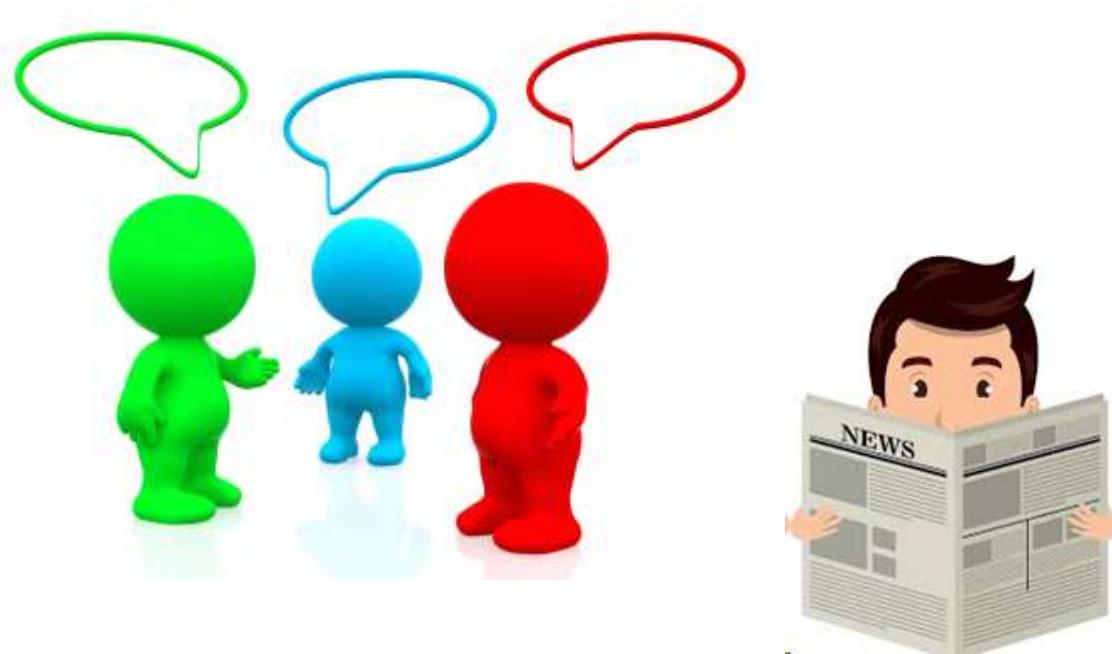
What scientific knowledge do you know from direct experience?



# Mediation process for scientists...



# Mediation process for citizens



# That mediation process varies...

The science curriculum in K12 is much more robust than health...

But many more people see doctors regularly for advice about their health than scientists regarding scientific issues of contemporary interest.

# And is consequential.

How many of you have a family member who is a doctor, and who you might call for advice?

# And is consequential.

How many of you have a family member who is a doctor, and who you might call for advice?

From Chen, Persson, Polyakova (NBER, 2019)-- **having a doctor in the family is causally associated with improved health behaviors and outcomes:**

*Eight years after the applicant's matriculation, older relatives are 3 (5) percentage points less likely to have had a heart attack (heart failure), and 27% more likely to adhere to medication that can prevent heart attacks. Among younger relatives, access to intra-family expertise also raises preventive investments: adolescents are 20 percentage points more likely to be vaccinated against HPV by the age 25. Further, children have fewer inpatient stays, suggesting general health improvements.*

# The mediation process has changed



**IFLSCIENCE!** ≡

**MORE SCIENCE**

A news article from IFLSCIENCE! titled "MORE SCIENCE". The article features a black and white photograph of a scientist in a lab coat and safety goggles looking down at a metallic, spherical object. The text below the image reads "SHARE". At the bottom of the article, there is a blue banner with the text "HEALTH AND MEDICINE". The date "28 MAR 2019" is at the bottom left, and the main headline is "This AI Algorithm Can Tell You Who Will Die Prematurely With Terrifying Accuracy".

**WIKIPEDIA**  
The Free Encyclopedia

# Scientific misinformation



# Scientific misinformation

*Definition: Information inconsistent with the scientific epistemic consensus.*



# Scientific misinformation

*Definition: Information inconsistent with the scientific epistemic consensus.*

Does not equal: uninformed or untrue.



# Processes of misinformation

# What we've got here is a failure to mediate...

Fake science + oblivious mediation

Incompetent mediation

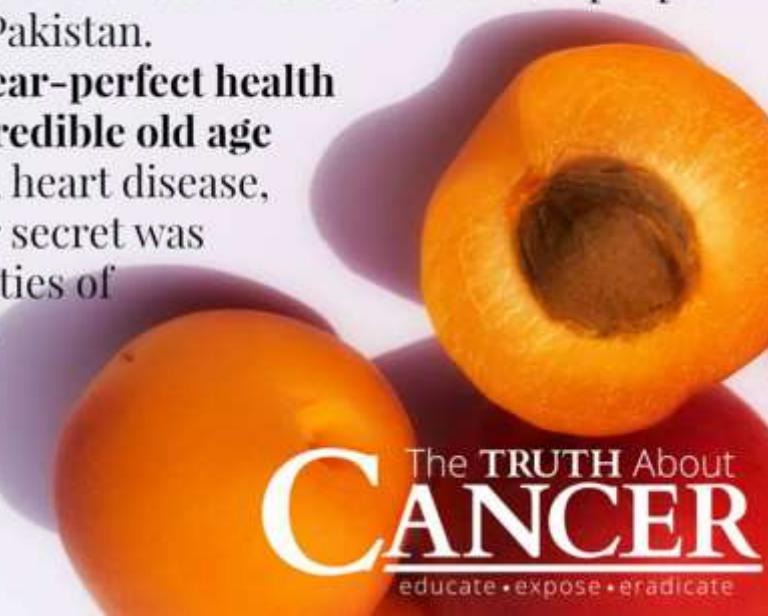
Corrupted scientific mediation

# Fake science + oblivious mediation

Dr. Ernest Krebs was a biochemist fascinated by the lifestyle habits of the ancient Hunzas, a remote people near Northern Pakistan.

They enjoyed **near-perfect health** and lived to **incredible old age** without obesity, heart disease, or cancer. Their secret was the large quantities of **apricot kernels** they consumed in their diet.

The TRUTH About  
**CANCER**  
educate • expose • eradicate



About 1,390,000 results (0.78 seconds)

**Apricot kernels** may have some health benefits, and some people have suggested that they may help fight **cancer**. Scientists have proposed that a compound called amygdalin, present in **apricot kernels**, may be a way to eradicate tumors and prevent **cancer** by stopping cells from reproducing. Jul 20, 2018



thetruthaboutcanc...

### Apricot seeds: Cancer treatment or health risk? - Medical News Today

<https://www.medicalnewstoday.com/articles/314337.php>

[About this result](#) [Feedback](#)

#### People also ask

Can apricot seeds cure cancer?



How many apricot seeds can kill you?



Why is the vitamin b17 illegal?



Can you die from eating apricot seeds?



[Feedback](#)

### Apricot Seeds and Cancer: Debunking the Myth | Dana-Farber Cancer ...

<https://blog.dana-farber.org/insight/2017/11/apricot-seeds-cancer-debunking-myth/>

Nov 24, 2017 - Apricot Seeds and Cancer: Debunking the Myth. ... Another theory holds that cancer is a result of a vitamin deficiency, and amygdalin – also known as Vitamin B17 – can restore the body to health. Yet another theory claims that in damaging cancer cells, amygdalin boosts the immune system to fight cancer.

#### See cancer apricot seeds

Sponsored



Organic Wild Apricot Kernels (Sweet) - Bulk Savings  
\$11.99  
Nuts.com



Fresh Bitter Raw Apricot Seeds | 100% Natural | 8oz Bag  
\$15.99  
Amazon.com

[More on Google](#)

## Apricot Kernels for Cancer: The Real Story - The Truth About Cancer

<https://thetruthaboutcancer.com> › Cancer Prevention

Jul 19, 2017 - Have you heard about apricot kernels and a compound known as amygdalin, laetrile, or Vitamin B17? Discover the history of this powerful ...

## Laetrile Amygdalin - Cancer Research UK

<https://www.cancerresearchuk.org/about-cancer/cancer-in-general/.../laetrile>

Oct 17, 2018 - Laetrile is promoted as an alternative cancer treatment. ... substance found in raw nuts, bitter almonds, as well as apricot and cherry seeds.

## Amygdalin from Apricot Kernels Induces Apoptosis and Causes Cell ...



<https://www.ncbi.nlm.nih.gov/pubmed/29308747>

by M Saleem - 2018 - Cited by 2 - Related articles

Amygdalin from Apricot Kernels Induces Apoptosis and Causes Cell Cycle Arrest in Cancer Cells: An Updated Review. Saleem M(1), Asif J(2), Asif M(2), Saleem ...

## Apricot Seeds Cancer at Amazon® | Amazon Official Site

Ad [www.amazon.com/](http://www.amazon.com/)

★★★★★ Rating for [amazon.com](http://amazon.com): 4.7 - Call wait time: About 1 minute

Buy Apricot Seeds Cancer at Amazon. Free Shipping on Qualified Orders. Explore Amazon Devices.

Save with Our Low Prices. Fast Shipping. Read Ratings & Reviews. Shop Our Huge Selection. Shop Best Sellers & Deals. Try Prime for Free.

[Amazon Home & Kitchen](#) · [Shop Echo & Alexa Devices](#) · [Explore Amazon Smart Home](#)

## Searches related to cancer apricot seeds

[apricot seeds cancer testimonials](#)

[apricot seeds cancer success rate](#)

[how to eat apricot seeds](#)

[apricot kernels dosage](#)

[has anyone died from eating apricot seeds](#)

[apricot seeds cyanide](#)

[apricot kernels uk](#)

[apricot seeds health benefits and side effects](#)

About 105,000 results (0.47 seconds)

## Videos



[Apricot Kernels Kill Cancer Cells](#)

iHealthTube.com  
YouTube · Oct 24, 2013



[Seeds Cured His Cancer](#)

Allegheny Health Network  
YouTube · Apr 20, 2012



[Jason Vale cured his cancer with Apricot Kernels](#)

Sal DiBella  
YouTube · Jun 14, 2018



## APRICOT KERNEL: User ratings for effectiveness, side effects, safety ...

[https://www.webmd.com/.../ingredientreview-1190-APRICOT-KERNEL.aspx?...APRI... ▾](https://www.webmd.com/.../ingredientreview-1190-APRICOT-KERNEL.aspx?...APRI...)

Read user ratings and reviews for APRICOT KERNEL on WebMD including side effects and ... I have just been taking Apricot Kernels for about 1 1/2 weeks now, and I am ... I am cancer free and will take apricot pits for the rest of my life.

## Apricot Kernels for Cancer: The Real Story - The Truth About Cancer

[https://thetruthaboutcancer.com/.../Cancer-Prevention ▾](https://thetruthaboutcancer.com/.../Cancer-Prevention)

Jul 19, 2017 - Have you heard about apricot kernels and a compound known as amygdalin, laetrile, ... Discover the history of this powerful anti-cancer agent.

★★★★★ **Natural cancer fighters**

November 18, 2018

**Verified Purchase**

For years this has been deemed cancer fighter mostly in Mexico. I was diagnosed with stage 4 cancer and gave been fighting it for almost 2 years. It has remained dormant however I started taking this and with other items I have found at last on Amazon, on my last MRI and Dr. appointment my tumors are finally shrinking!!!!

11 people found this helpful

Helpful

Comment | Report abuse

## Recommended



10

Watch This Before You See  
The Final Game Of Thrones...

Looper

1.4M views • 2 weeks ago



LATE  
SHOW  
stephen  
colbert

THE CLOSER



28:53



12:33



5:09

What Happens If Trump  
Closes The Mexican Border?

The Late Show with Stephen C...  
808K views • 11 hours ago

Emirates Boeing 777 new  
First Class Dubai to Brussel...

the Luxury Travel Expert  
2M views • 3 months ago

Tesla Model 3 Review: The  
TRUTH After 26,000 Miles

Andy Slye  
349K views • 1 week ago

The Tragic Story Of The Girl  
Who Plays Kate On This Is Us

Nicki Swift  
1.1M views • 11 months ago

vaccines

vaccinated vs unvaccinated

vaccine injury

vaccination

vaccination for children

vaccines for babies

vaccine documentary youtube

vaccines calling the shots

vaccine man

vaccines penn and teller

Report search predictions



## Vaccines gave my son autism

VAXXED TV • 8.3K views • Streamed 1 year ago

13:33



## Vaccines Destroy Children: Is Your Child Next?

LarryCook333 • 27K views • 2 years ago

What would happen if parents \*believed\* that vaccination will maim or kill their child? Vaccines are destroying our children ...

CC

[www.youtube.com/watch?v=r56quakj0fF](http://www.youtube.com/watch?v=r56quakj0fF)

4:42



## Truth! Vaccines DO Cause Autism!!

VAXXED TV • 23K views • 9 months ago

Get Peeps TV on Roku and follow Peeps TV on Periscope, Facebook and Instagram for more truth from the people.

2:26



## Madison: Before & After Vaccine Induced Autism

madinmikala • 1.4M views • 10 years ago

Our Journey of Autism through our daughter's eyes! I will always welcome others whom have witnessed the same experience with ...

# New York county takes 'extremely unusual' step to ban unvaccinated minors from public places amid measles outbreak

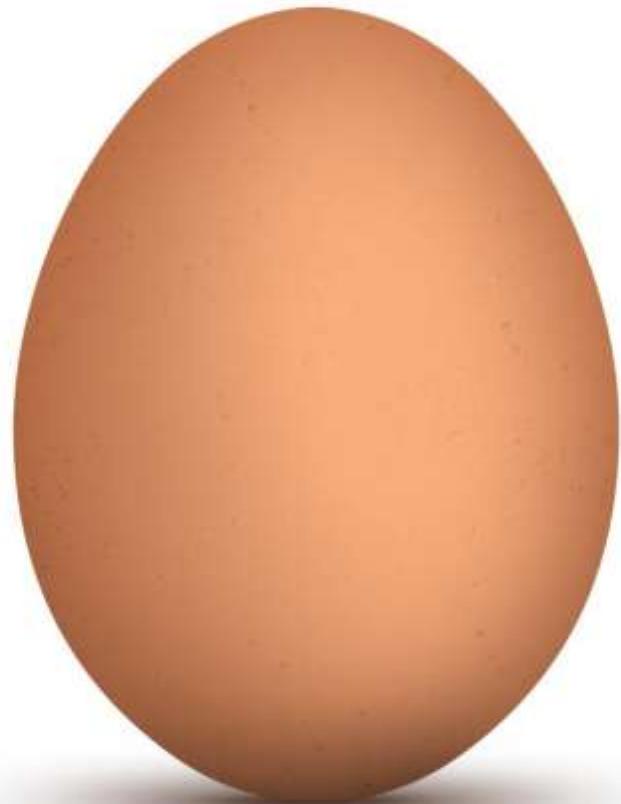
By Debra Goldschmidt, CNN

① Updated 9:57 AM ET, Wed March 27, 2019

# Inept mediation

“Honest” but failed effort to communicate science

Many examples in media, esp nutrition



# Eating three or more eggs a week increases risk of heart disease and early death, study says

POSTED 7:01 PM, MARCH 17, 2019, BY [CNNWIRE](#)

 FACEBOOK 4K+

 TWITTER

 PINTEREST

 LINKEDIN

 EMAIL

CHICAGO — It's been debated for years: Are eggs good or bad for you? People who eat an added three or four eggs a week or 300 milligrams of dietary cholesterol per day, have a higher risk of both heart disease and early death compared with those who eat fewer eggs, new research finds.



\*\*This image is for use with this specific article only\*\*



disease epidemiology. Sixth, the study findings are observational and cannot establish causality.

---

## Conclusions

Among US adults, higher consumption of dietary cholesterol or eggs was significantly associated with higher risk of incident CVD and all-cause mortality in a dose-response manner.

These results should be considered in the development of dietary guidelines and updates.

# Corrupted mediation

Purposive effort to disseminate misinformation

# Corrupted mediation: Example of opioid crisis



ACTIVATE CHANGE

Make a gift that spurs reform.  
Support ProPublica today.

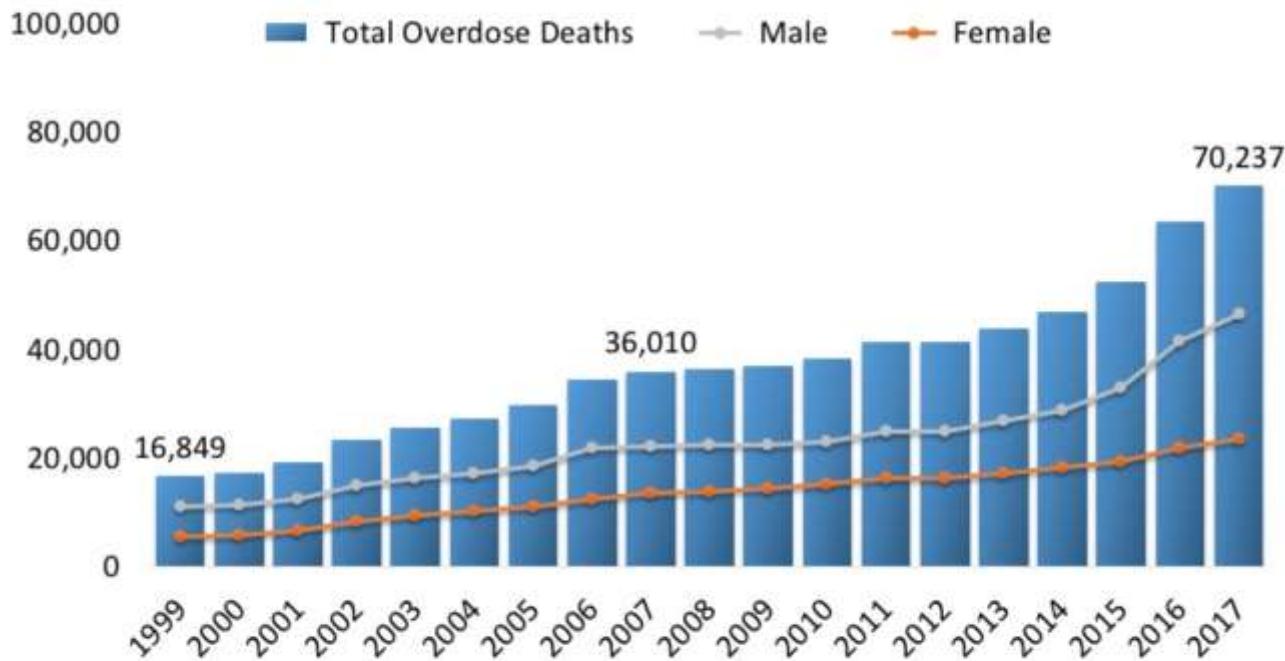
Donate

 **Sackler Embraced Plan to Conceal  
OxyContin's Strength From  
Doctors, Sealed Testimony Shows**

“It would be extremely dangerous at this early stage in the life of the product,” Friedman wrote to Sackler, “to make physicians think the drug is stronger or equal to morphine....We are well aware of the view held by many physicians that oxycodone [the active ingredient in OxyContin] is weaker than morphine. I do not plan to do anything about that.”

“I agree with you,” Sackler responded. “Is there a general agreement, or are there some holdouts?”

Figure 1. National Drug Overdose Deaths  
Number Among All Ages, by Gender, 1999-2017



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Multiple Cause of Death 1999-2017 on CDC WONDER Online Database, released December, 2018

# Interventions

Good news: people can be influenced by corrections and accurate information  
(e.g., see *work by Bode & collaborators*)

Most important: improve the mediation processes within the scientific-industrial complex.\*

Make people more discriminating consumers of information (?)

Improve media reporting on science\*

Change emphasis of Internet platforms, to *quality of information*\*

# Example:

Use of 10,000 or so contractors, who assess *relevance* and *authoritative* of search results

*But:* what is the weight between those two criteria?

And can these 10,000 individuals assess how authoritative a search is?

→ perhaps have those from within scientific community assess authoritativeness?

# Interventions

Good news: people can be influenced by corrections and accurate information  
(e.g., see *work by Bode & collaborators*)

Most important: improve the mediation processes within the scientific-industrial complex.\*

Make people more discriminating consumers of information (?)

Improve media reporting on science\* (?)

Change emphasis of Internet platforms, to *quality of information*\* (?)

# Interventions

Good news: people can be influenced by corrections and accurate information (e.g., see *work by Bode & collaborators*)

Most important: improve the mediation processes within the scientific-industrial complex.\*

Make people more discriminating consumers of information (?)

Improve media reporting on science\* (?)

Change emphasis of Internet platforms, to *quality of information*\* (?)

*\*May not be in economic interest...*