

WHEN IT COMES TO EVIDENCE-BASED PRACTICE

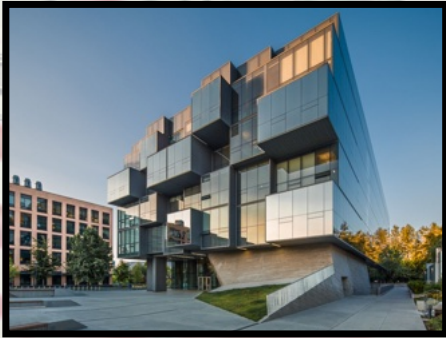
James McCormack
BSc (Pharm), PharmD
Professor
Faculty of Pharmaceutical Sciences
University of British Columbia
Vancouver, BC, Canada

TO GET A HANDOUT GO HERE
<http://therapeuticseducation.org/handouts>



peerevidence.ca
therapeuticseducation.org

Financial Conflicts of Interest



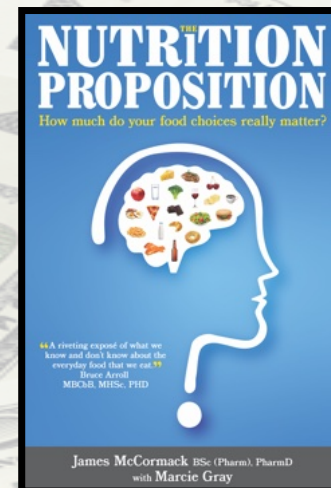
- ✓ Entire salary comes through the UBC Faculty of Pharmaceutical Sciences - also some legal/educational work

- ✓ I have received no honorarium or research money from the drug industry in the last 30 or so years



- ✓ Premium podcast subscription Best Science (BS) Medicine podcast - therapeuticseducation.org

- ✓ I have a self-published book called “The Nutrition Proposition”



My Simple Philosophy on Treatments



These sorts of terms are uniformly uninformative -
allopathic, conventional, mainstream, Western medicine,
complementary, alternative, integrative, naturopathy,
Chinese medicine, natural, homeopathy, herbal



We all treat people with “things” - oral/IV/IM/topical,
nutrition, surgery, talk, physical manipulations etc



I don't care HOW treatments work, I
care IF treatments work

The proportion of people over 65 taking prescription medications



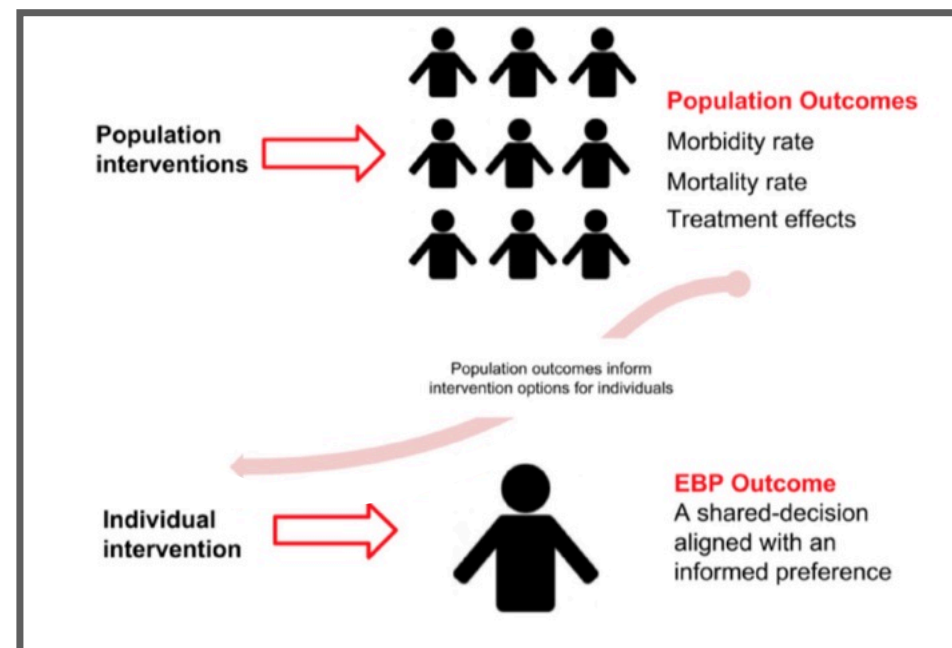


OPEN ACCESS

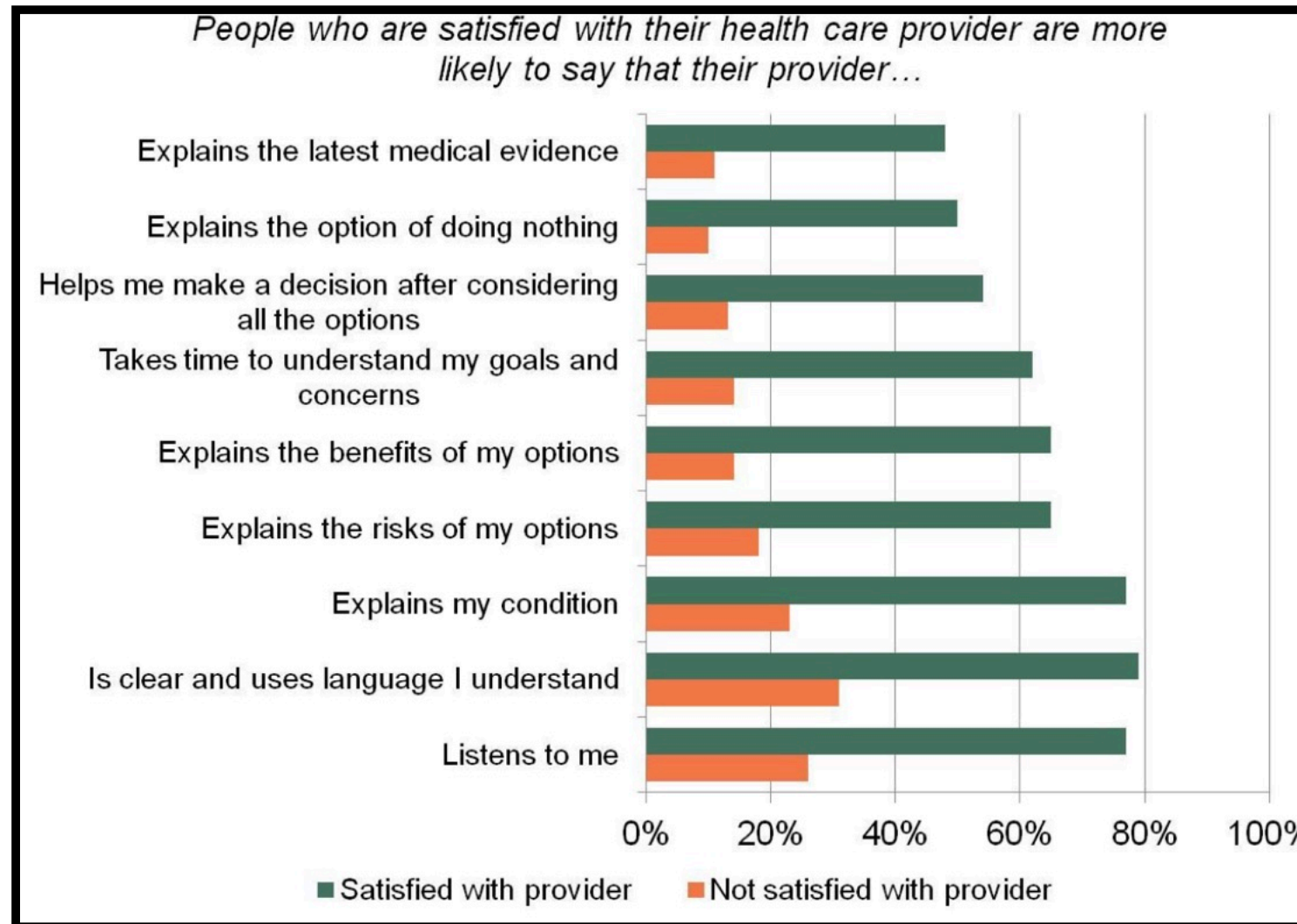
Shared decision is the only outcome that matters when it comes to evaluating evidence-based practice

James McCormack,¹ Glyn Elwyn²

“in the vast majority of circumstances, the only outcome of relevance for EBP is to measure whether a shared decision was made”

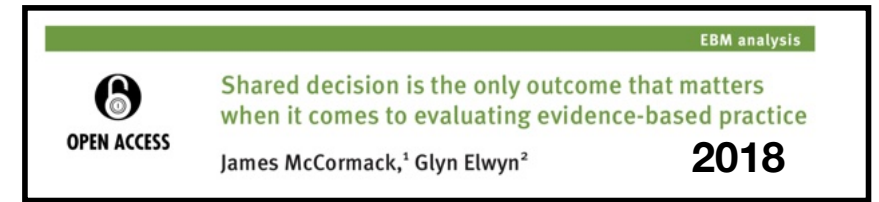


Satisfaction is linked to shared decisions



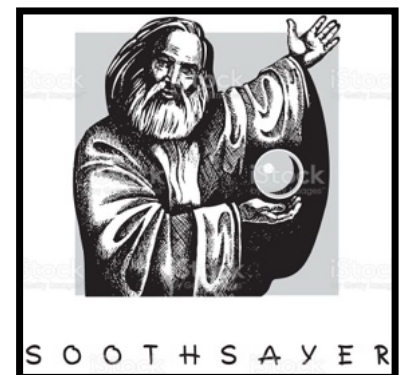
Communicating with patients on health care evidence.
Discussion Paper, Institute of Medicine, Washington, DC 2012

Where SDM may not work



In most societies there are laws that prevent certain harm from occurring, where mental incapacity or strong personal beliefs may threaten the well-being of others

1. Jehovah Witness' refusal to transfuse blood to those in dire need
2. involuntary detention for psychiatrically unstable patients who risk harming themselves or others
3. surrogates are asked to make decisions for those people truly unable to consent to treatment in immediate life-threatening situations
4. smoking bans that lead to important reductions in morbidity and mortality
5. an intriguing example that some would consider an important exception is mandatory vaccination with the potential of herd immunity. In this case, a shared-decision not to be vaccinated for a transmissible disease could lead to inherent harm of others.



Its not that difficult





My Agenda



Much of what we do, even with the best of intentions, is not that effective

Most guidelines are a BIG problem

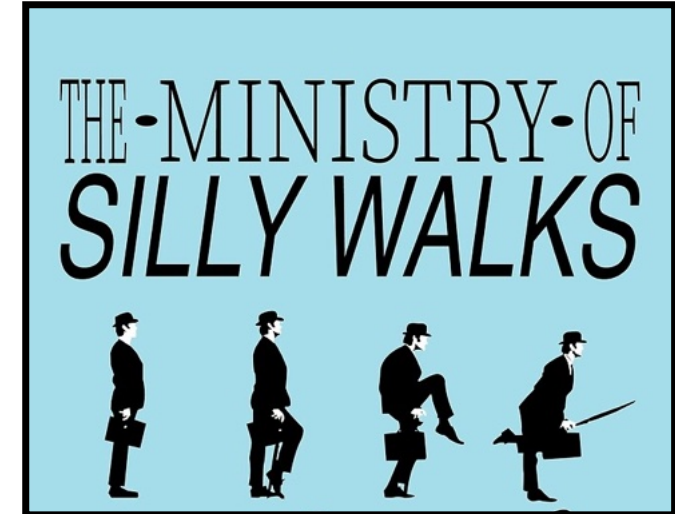
Some treatments (medications, nutrition, activity) can be effective and even life-saving BUT many aren't and they all have the potential for harm, inconvenience and cost

I believe the size of the effect for many of these treatments is much smaller than people think

Lab test variation makes many tests (especially repeat tests) of questionable use and are simply misleading

The recommended doses for most medications are too high

IT'S GOTTEN SILLY



PRE-EVERYTHING

Pre-diabetes

Pre-hypertension

Pre-osteoporosis

(osteopenia)

Pre-elderly

Pre-cancerous



Pre-menopausal

Pre-obesity

Pre-death

Post-birth

AVOID

Misleading Terminology

“Significant”

“Use with caution”

“Use with extreme caution”

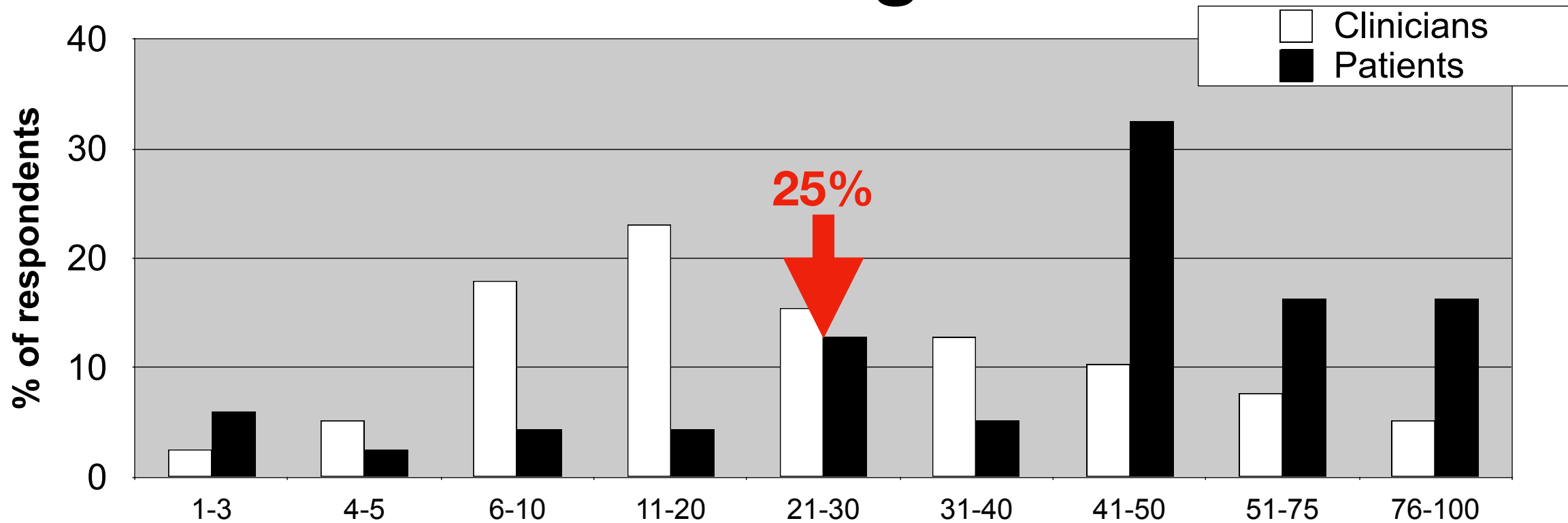
“Monitor closely”

“High risk”

“Very high risk”

“Really !@#\$\$% high risk”

What is "High Risk"



Chance of a heart attack in the next 5 years (%)

**A 60 y/o, male, smoker, diabetic,
SBP 180, total cholesterol 7.2 mmol/L**

5-year risk of heart attack PLUS stroke is at most ~ 25%

The Magnitudinous Problem

More
Increased
Reduced
Improved
Decreased
Higher
Lower
High
Low
Significant
Less
Fewer
Worsened

Better
Worse
Greater
Uncommon
Superior
Better
Worse
Lower
Important

Comparable
Different
Faster
Shorter
Longer
Shortened
Lengthened
Extreme
Unlikely
Short
Many/Most

Severe
Weak
Strong
Different
Faster
Shorter
Longer
Shortened
Lengthened
Extreme
Unlikely
Short
Many/Most

**Convey a story but not
really the evidence/
numbers**

All these words likely mean something different to everyone

Examples that probably require quantification clarification

Your salary will be **INCREASED**

Turn left after a **MODERATE** number of kilometres

You will be getting a **SHORT** jail sentence

You have an **UNLIKELY** chance of getting an STD

You have a **SIGNIFICANT** chance of a heart attack

A **SMALL** tube will be placed a **CONSIDERABLE** distance into your rectum

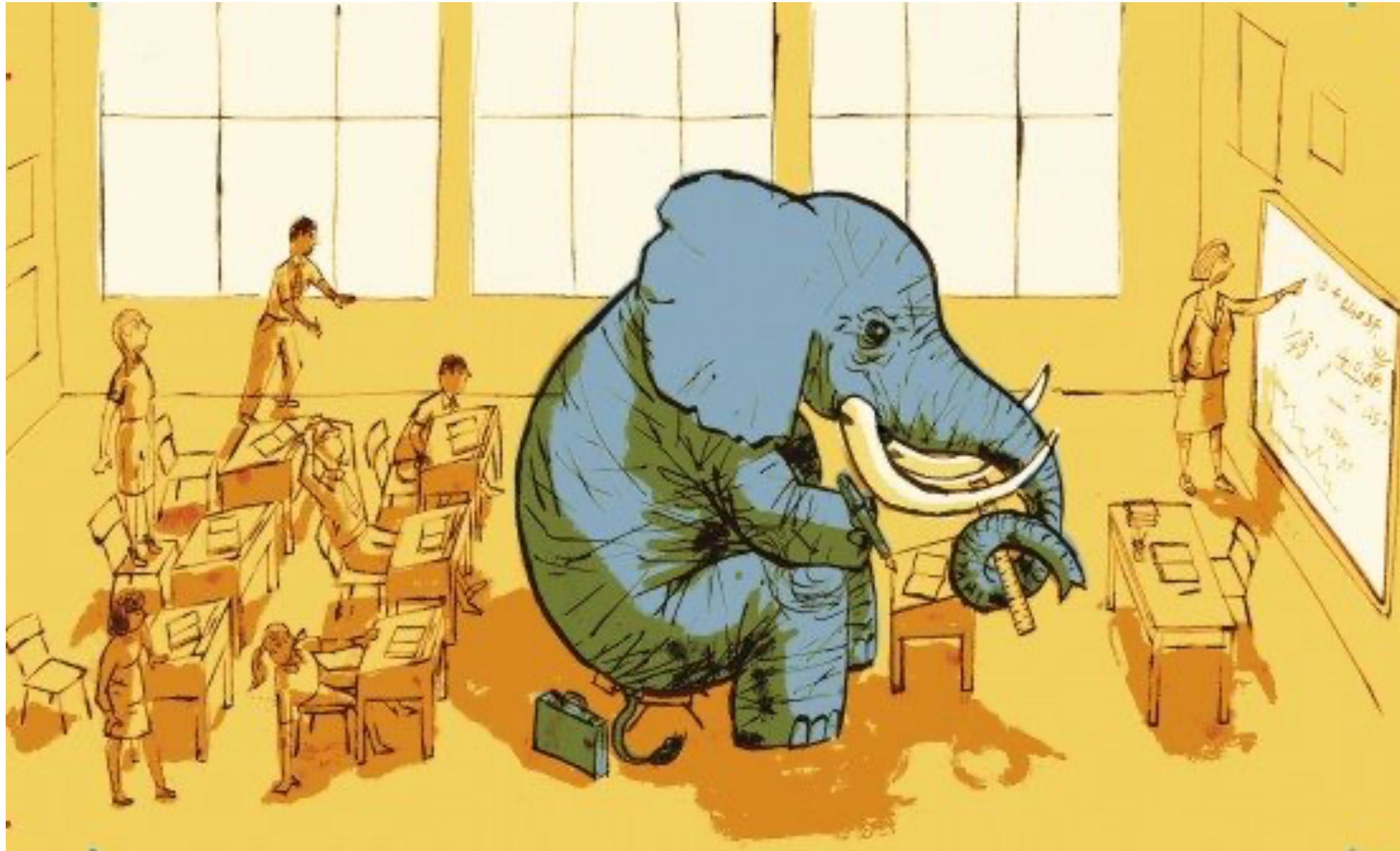
Beware of “qualitative quantification”

Qualitative descriptor	EU assigned frequency	Mean frequency estimated by participants (n=200)	
Very common	>10%	65% (24.2)	
Common	1–10%	45% (22.3)	OFF BY
Uncommon	0.1–1%	18% (13.3)	~350% to 18,000%
Rare	0.01–0.1%	8% (7.5)	
Very rare	<0.01%	4% (6.7)	

Values are mean (SD).

Lancet 2002;359:853–54

Let's first address the ELEPHANT in the room





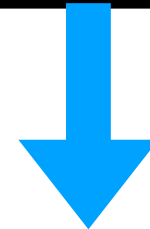
Most Docs Practice
**Defensive
Medicine**



“Standard of Care”
and follow
Clinical Practice Guidelines



Shared Decision Making
(SDM)



May or may not follow
Clinical Practice Guidelines

Medicolegal Sidebar: Clinical Practice Guidelines—Do They Reduce Professional Liability Risk?

**Joseph P. McMenamain MD, JD, Wendy Teo BA(Cantab), BM BCh (Oxon), LLM,
B. Sonny Bal MD, JD, MBA, PhD**

“Clinical practice guidelines, however, are designed to improve care, **not to define standard care**. They can also **limit physician autonomy**, impose rules that are adopted mainly to **avoid litigation risk**, and may be developed by physicians with **relevant financial conflicts**. **In our view, courts should exclude clinical practice guidelines from evidence of the standard of care or of its breach.**”

Patient preferences for shared decisions: A systematic review

Betty Chewning^{a,*}, Carma L. Bylund^b, Bupendra Shah^c, Neeraj K. Arora^d,
Jennifer A. Gueguen^e, Gregory Makoul^f

“the number of patients who prefer participation has increased over the past three decades so that **the majority of patients prefer to participate in decisions**”

**Factors involved in deciding to start preventive treatment:
qualitative study of clinicians' and lay people's attitudes**

David K Lewis, Jude Robinson, Ewan Wilkinson

BMJ 2003;327:841

“Many of the preferences expressed by the clinicians and lay people in this study are at **odds with recommendations in guidelines**”

**Differing perceptions of intervention thresholds for fracture
risk: a survey of patients and doctors** Osteoporos Int 2012;23:2135–40

77% of doctors would recommend treatment

21% of our patient cohort would consider treatment justified

RESEARCH ARTICLE

Open Access

Can shared decision-making reduce medical malpractice litigation? A systematic review

Marie-Anne Durand^{1,2*}, Benjamin Moulton^{3,4,5}, Elizabeth Cockle², Mala Mann⁶ and Glyn Elwyn^{1,7}

“There is insufficient evidence to determine whether or not shared decision-making and the use of decision support interventions can reduce medical malpractice litigation. Further investigation is required.”

Two or more reasonable treatment or screening options

Shared decision-making model

Defensive medicine model

ADVERSE OUTCOME OCCURS

Choice made does **NOT MEET** the "standard of care"

Choice made **MEETS** the "standard of care"

Choice made **MEETS** the "standard of care"

Choice made does **NOT MEET** the "standard of care"

Discussion **NOT** documented

Discussion documented in notes

Decision aid used

Discussion **NOT** documented

Discussion documented in notes

Decision aid used

Plaintiffs lawyer argues risks and benefits should have been discussed

No medico legal protection

Medium risk

Low risk

Low to medium risk

Low risk

Low risk

Low to medium risk

No medico legal protection

Reducing litigation risk

2 THINGS to DO

Shared decision-making model

1) Use a decision aid

2) Document decision



“I would rather know evidence and try to apply it to each patient, than memorize guidelines and try to apply them to all patients”

Mark McConnell

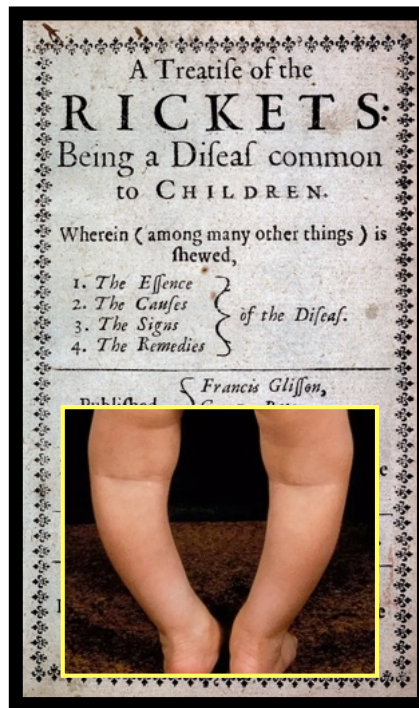
Making An Example Of Food!



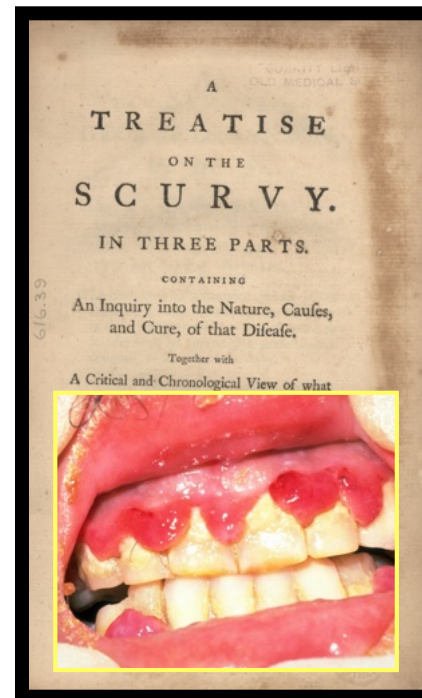
Setting the Stage

Food can absolutely can have a large effect on health

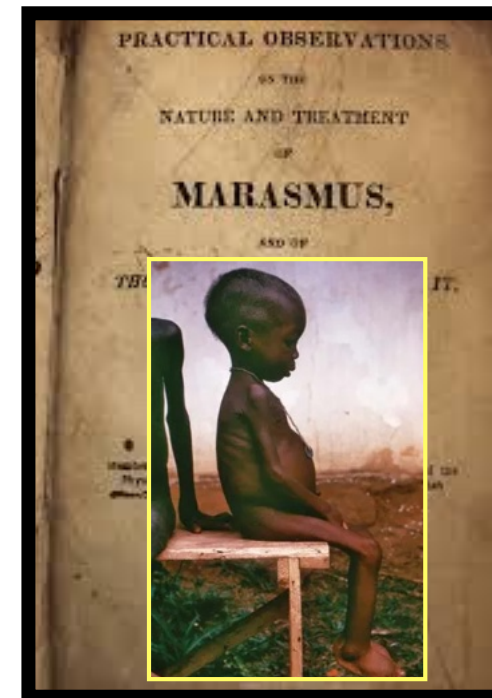
**Vitamin D
deficiency**



**Vitamin C
deficiency**



**Macronutrient
deficiency**



You really don't need RCTs or cohort studies to evaluate this



The Evidence Issues



Cohort studies and RCTs

Surrogate (blood pressure/glucose/lipids) versus clinical outcomes (heart attack/stroke/mortality)

Relative versus absolute numbers

A 50% reduction (relative) has very different implications if the baseline risk is 10/1,000 versus 10/100

“This food is healthy/unhealthy” – the size of the effect is key

Lab tests and what do they mean

Examples of BS

Food = values and preferences

9 Health Benefits of Broccoli, According to a Nutritionist

Broccoli offers disease-fighting nutrients that can decrease signs of aging, among other benefits.

By [Elyse Cole, MPH, RD](#) | Updated January 27, 2020

Broccoli has a bounty of nutrients ✓

Broccoli is high in fiber ✓

It may help prevent cancer

Broccoli offers heart protection

It's linked to brain health

Broccoli can keep bones strong

It fights inflammation

It's a natural detox

Broccoli has antioxidant protection



The article starts with

**“You KNOW that broccoli is GOOD for you”
It is a “SUPERFOOD”**

**At best
low quality
evidence and
in general
NO evidence**

10 superfoods to boost a healthy diet

April 13, 2020



HARVARD
UNIVERSITY

➔ **NOT A
SINGLE
REFERENCE** ➔



<https://www.gousto.co.uk/blog/top-10-superfoods>

In 2015 alone - 36% rise in the number of food and drink products launched globally featuring the terms “superfood”, “superfruit” or “supergrain”.

<https://www.mintel.com/press-centre/food-and-drink/super-growth-for-super-foods-new-product-development-shoots-up-202-globally-over-the-past-five-years>

It's really easy to simply state these things are **good** or **bad** for your health

Drinking 2, 4, 6 or 8 glasses of water a day

Drinking 0, 1, 2 or 3 alcoholic beverages a day

Eating 2, 3, 4, 5, 6 or 7 servings of fruits and vegetables a day

Eating 0, 1, 2 or 3 eggs a day

Adding salt to food

Restricting or increasing the amount of carbs, fat and protein

Adding sugar to 1, 2, 3, 4 or 5 cups of coffee or tea a day

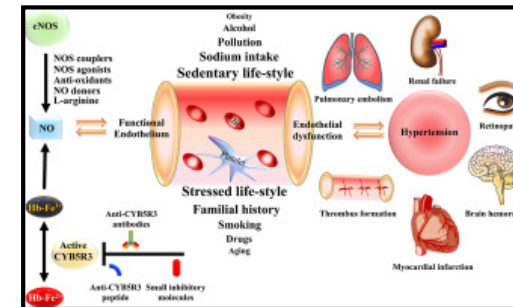
Being a meat eater, a vegetarian, or a vegan

Eating a doughnut, cheesecake, ice cream, or chocolate

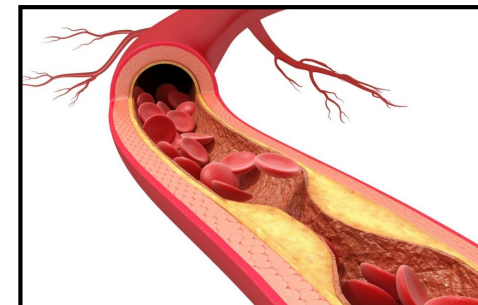
Drinking a glass of milk or a soft drink a day

Eating an apple a day

Everything is "linked"



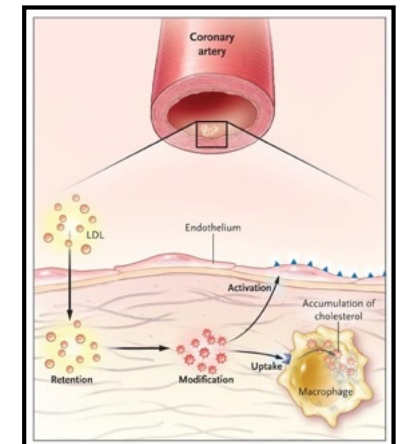
"Clogged" arteries



"Smart" words



Images with "arrows"



"Medical" References



The Bullshit Asymmetry



The amount of energy needed to refute
bullshit is an **order of magnitude**
bigger than to produce it.

Annals of Internal Medicine

IDEAS AND OPINIONS

U.S. Dietary Guidelines: An Evidence-Free Zone

2016

Steven E. Nissen, MD

*“a detailed review of the new guidelines confirms a disturbing reality: the nearly complete absence of high-quality randomized, controlled clinical trials (RCTs) studying meaningful clinical outcomes for dietary interventions. The report repeatedly makes recommendations based on observational studies and surrogate end points, failing to distinguish between recommendations based on expert consensus rather than high-quality RCTs. **Unfortunately, the current and past U.S. dietary guidelines represent a nearly evidence-free zone**”*

2015 DGAC: MEETING 7
December 15, 2014

Science Base Chapter:

*Food and Nutrient Intakes,
and Health:*

Current Status and Trends

Evidence
Committee

Subcommittee 1

health.gov

HOWEVER, THE FINAL REPORT FROM THE GUIDELINE COMMITTEE RELEASED IN JANUARY 2016 STATED "individuals should eat as little cholesterol as possible"

- Cholesterol is a source of concern for

Intakes, and Health: Current Status and Trends

SETTING THE TABLE



**The
“Studies”
“Numbers”
“Outcomes”**

Simple But Elegant

My Nutrition Proposition

1. Eating food is one of life's greatest joys
2. Excessively “worrying” about food is just wrong
3. If you wish to make nutrition decisions based on health reasons you should know the best available evidence, or lack thereof, and appreciate the context of that evidence

NO RCTs LOOKING AT
IMPORTANT CLINICAL
OUTCOMES

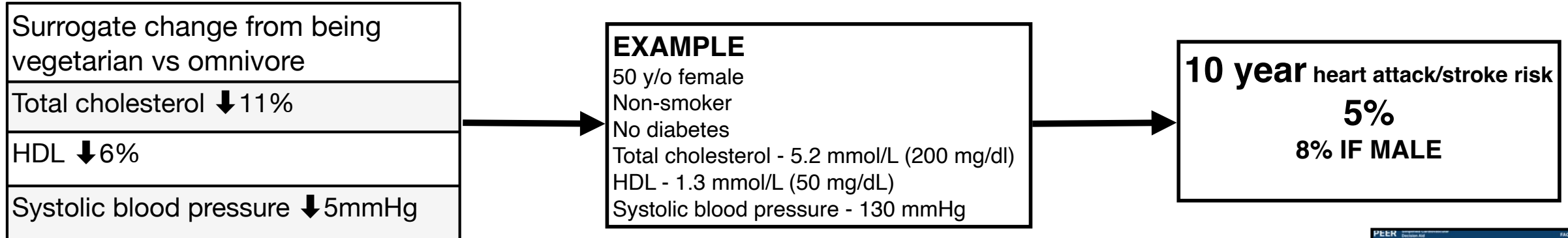
AN EXAMPLE



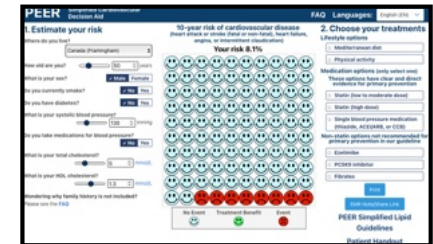
The health impact of being a vegetarian vs a carnivore

SURROGATE markers (lipids, blood pressure etc)

The impact that has on **ESTIMATED heart attack/stroke risk**



REASONABLE ESTIMATE OF THE IMPACT ON RISK
~1% absolute decrease over 10 years
~2% absolute decrease over 20 years



****Studies of the Mediterranean diet show it produces minimal if any changes on surrogate markers****

Very important things I'm not discussing

1. Animal rights
2. Environmental issues



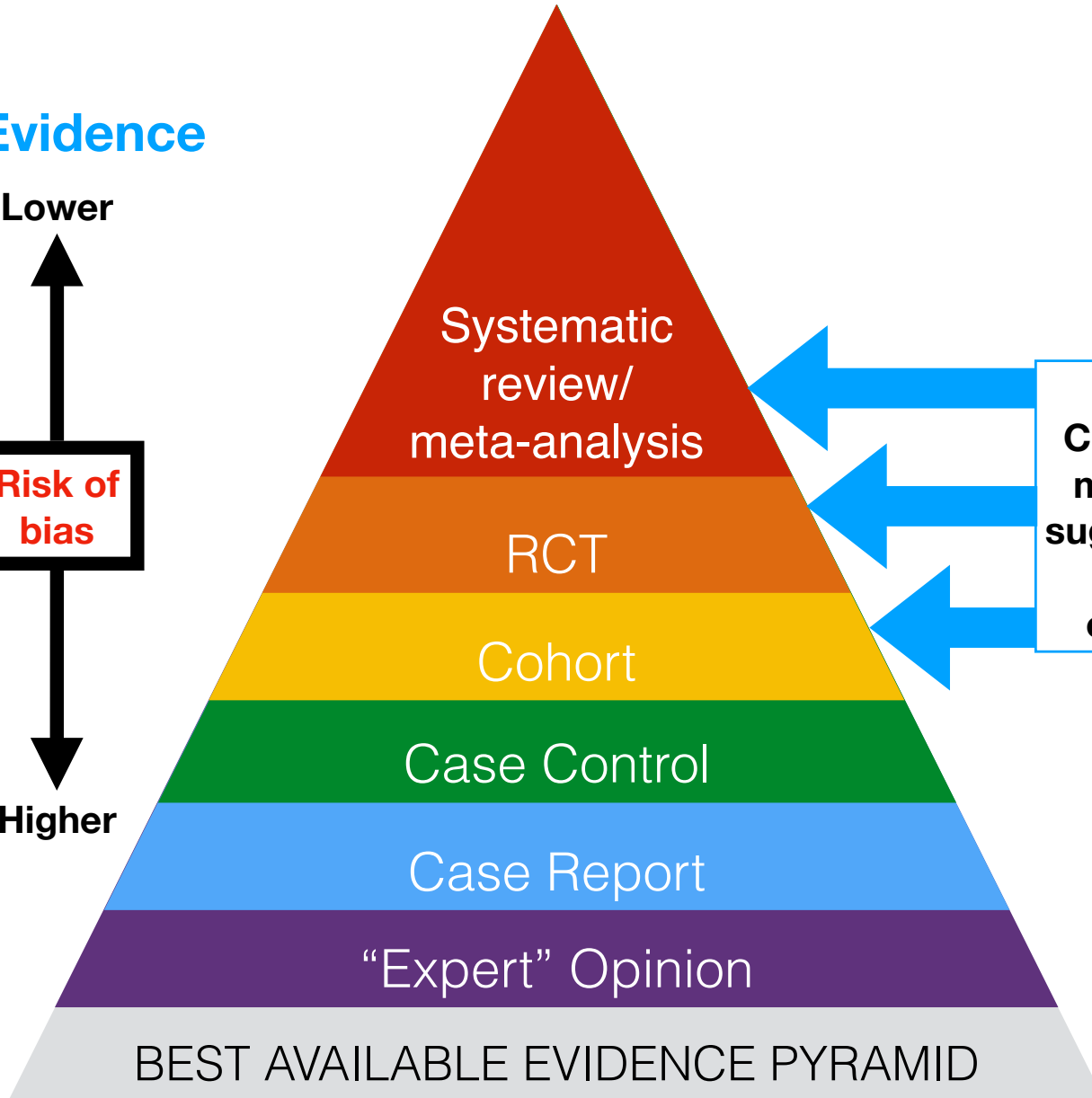
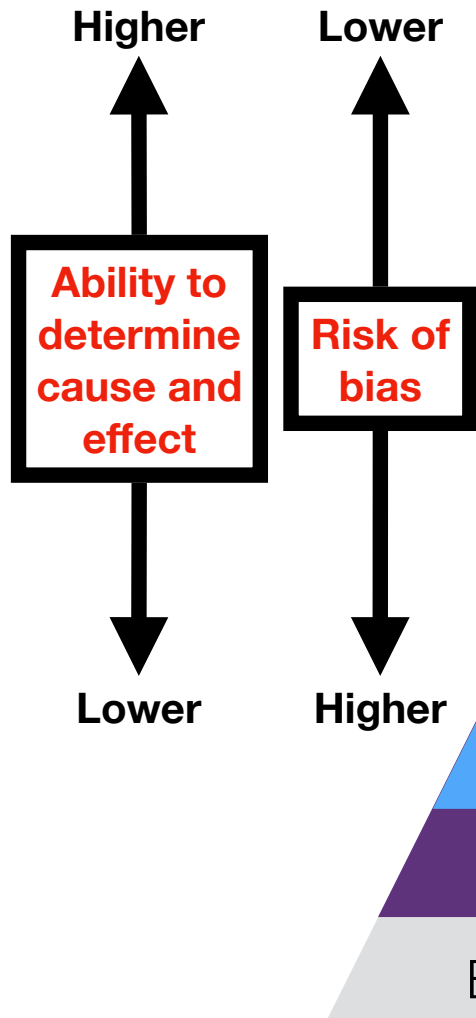
STRICTLY SHOWING HEALTH EVIDENCE

The BIG Question We Have

**What foods are
~~delicious~~ healthy?**

Hierarchy of Evidence

Quality of Evidence



Still Considered moderate/suggestive or strong evidence

Three blue arrows point from this box to the top three layers of the pyramid: Systematic review/meta-analysis, RCT, and Cohort.

Hierarchies of evidence applied to lifestyle Medicine (HEALM): introduction of a strength-of-evidence approach based on a methodological systematic review

Katz et al. BMC Medical Research Methodology (2019) 19:178 <https://doi.org/10.1186/s12874-019-0811-z>

If you have a “Mechanism of action” or Basic Science research or Animal Research Still considered insufficient or weak research

A large blue arrow points from the citation box down to this box.

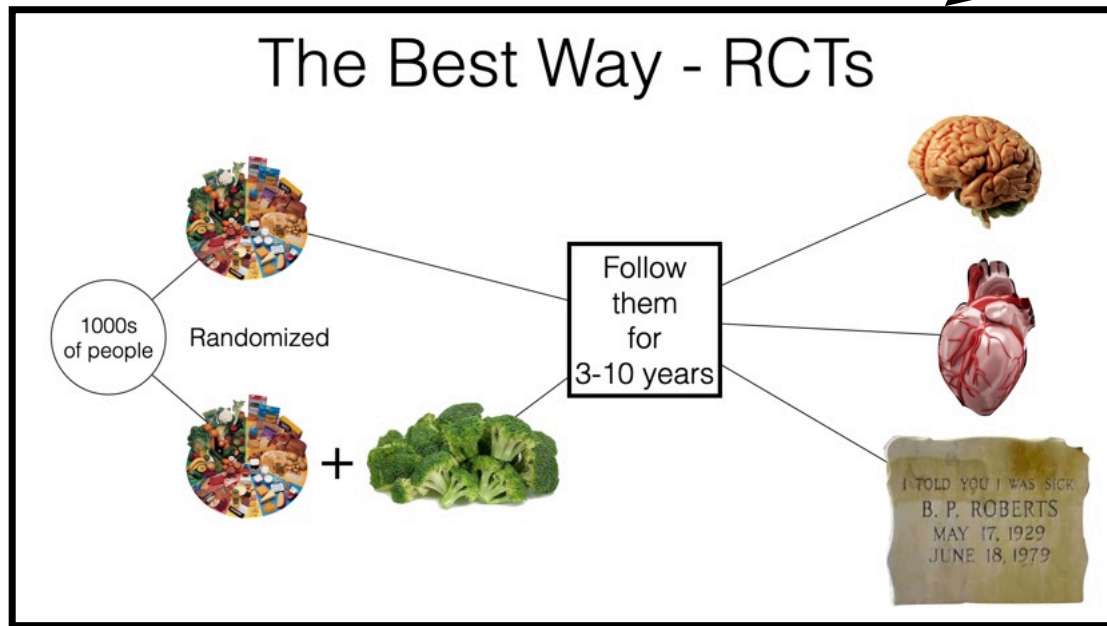
DEBATE

Should this evidence pyramid apply to nutrition?

Answering the food question

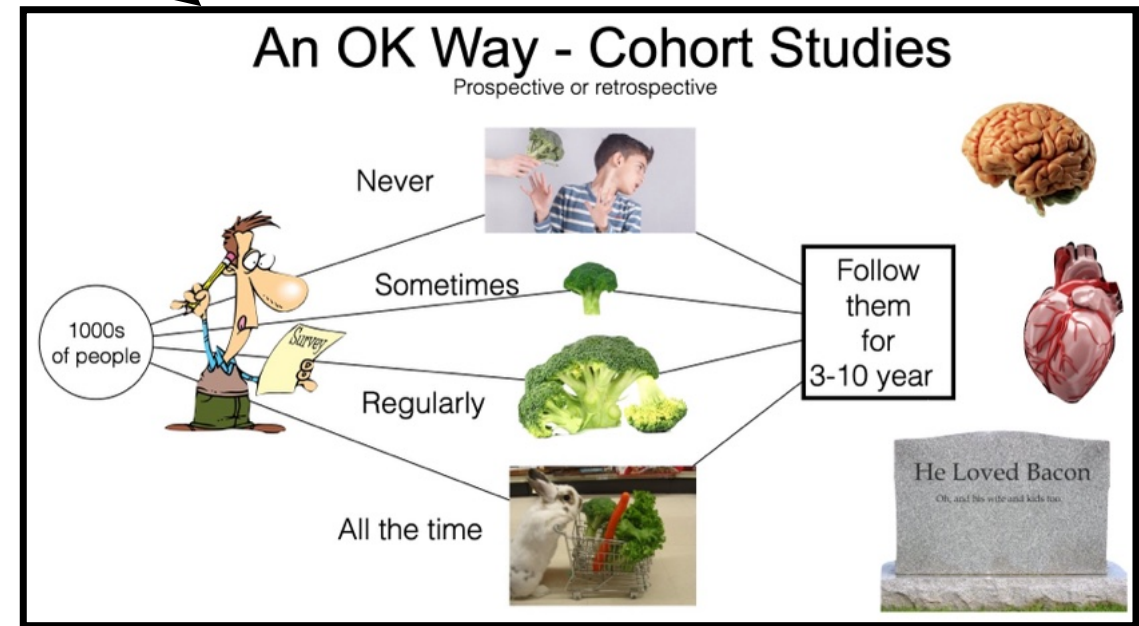
Considered moderate/suggestive or strong evidence

CLINICAL TRIALS



SHOWS CAUSE AND EFFECT

COHORT STUDIES



SHOWS ASSOCIATION

We are bombarded with health claims

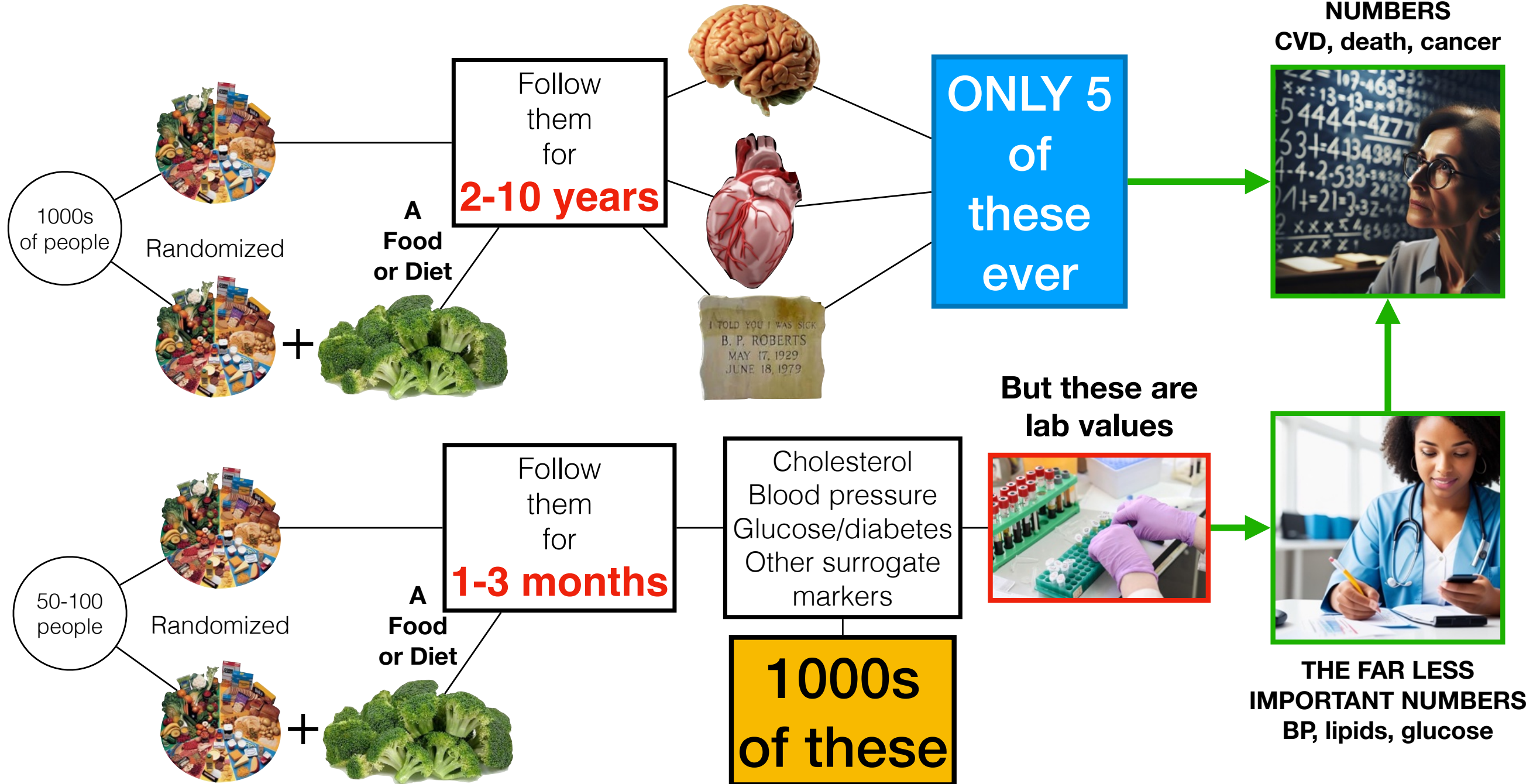


Hierarchy of WTF



Stolen from Kevin Whelan

RCTs can show cause and effect



From 2008 to 2015

20 LARGE TRIALS IN A ROW SHOWED NO BENEFIT FROM CHANGING A SURROGATE MARKER

DIABETES

ACCORD, ADVANCE, VADT
(aggressive A1c lowering)
ROADMAP (olmesartan)
ORIGIN (insulin)
SAVOR-TIMI 53 (saxagliptin)
EXAMINE (alogliptin)
ALECARDIO (aleglitazar)

GENERAL

ACTIVE (irbesartan/afib)
CRESCENDO (rimonabant)
VISTA-16 (varespladib)

5 cholesterol trials

8 diabetes/glucose trials

4 blood pressure trials

3 general risk reduction trials

LIPIDS

AIM-HIGH, HPS2-THRIVE (niacin)
ACCORD (fibrates)
dalOUTCOMES (dalcetrapib)
STABILITY (darapladib)

BLOOD PRESSURE

ALTITUDE (aliskiren)
VALISH, AASK, ACCORD
(aggressive BP lowering)

FINALLY!!!!2015

- 1) EMPA-REG OUTCOME (empagliflozin) - **1.6% ↓** over 3 years
- 2) LEADER (liraglutide) - **1.8% ↓** over 4 years
- 3) SPRINT (120mmHg vs 140mmHg) - **1.6% ↓** (CVD) over 3 years but also **1.8% ↑** (Kidney)
- 4) HOPE 3 - statins YES, BUT blood pressure no benefit
- 5) FOURIER - **1.6% ↓** over 2 years BUT \$15,000/year

BUT!!!!

- 1) ACCELERATE (evacetrapib - increased HDL (130%), reduced LDL (40%) - **no CVD benefit**



Despite all the potential evidence issues

Let's assume the evidence is "correct"

Then it's all about the numbers!!

The Numbers - cohort studies

Almost always

Look at **10,000-100,000s** of people - looking for a **small** absolute difference
Benefits/harms always described as relative numbers - while “**correct**”, they are **misleading**

Differences seen typically **ONLY** when extremes of intake are compared

LOWEST quartile/quintile vs the **HIGHEST** quartile/quintile



COFFEE

NEJM - 229,000 men - 13 years - 1% absolute ↓

As compared with men who did not drink coffee, men who drank 6 or more cups of coffee per day had a 10% lower risk of death,

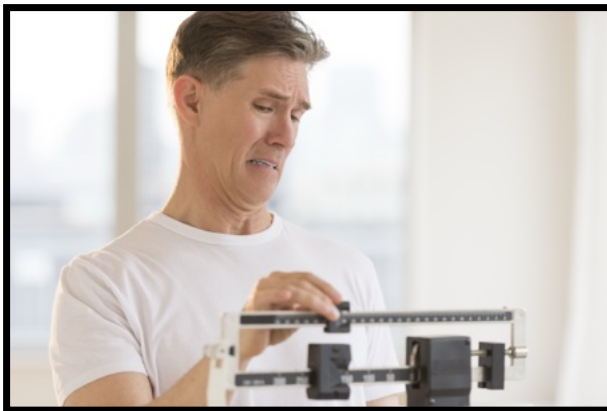


RED MEAT

BMJ - 81,000 people - 8 years - 1% absolute ↑

An increase in total red meat consumption of at least half a serving per day was associated with a 10% higher mortality risk

WEIGHT - the Battle of the Bulge



WORDS MATTER

words have
direct and
indirect impacts

on the people
who hear or
read them

WHEN IT COMES TO WEIGHT



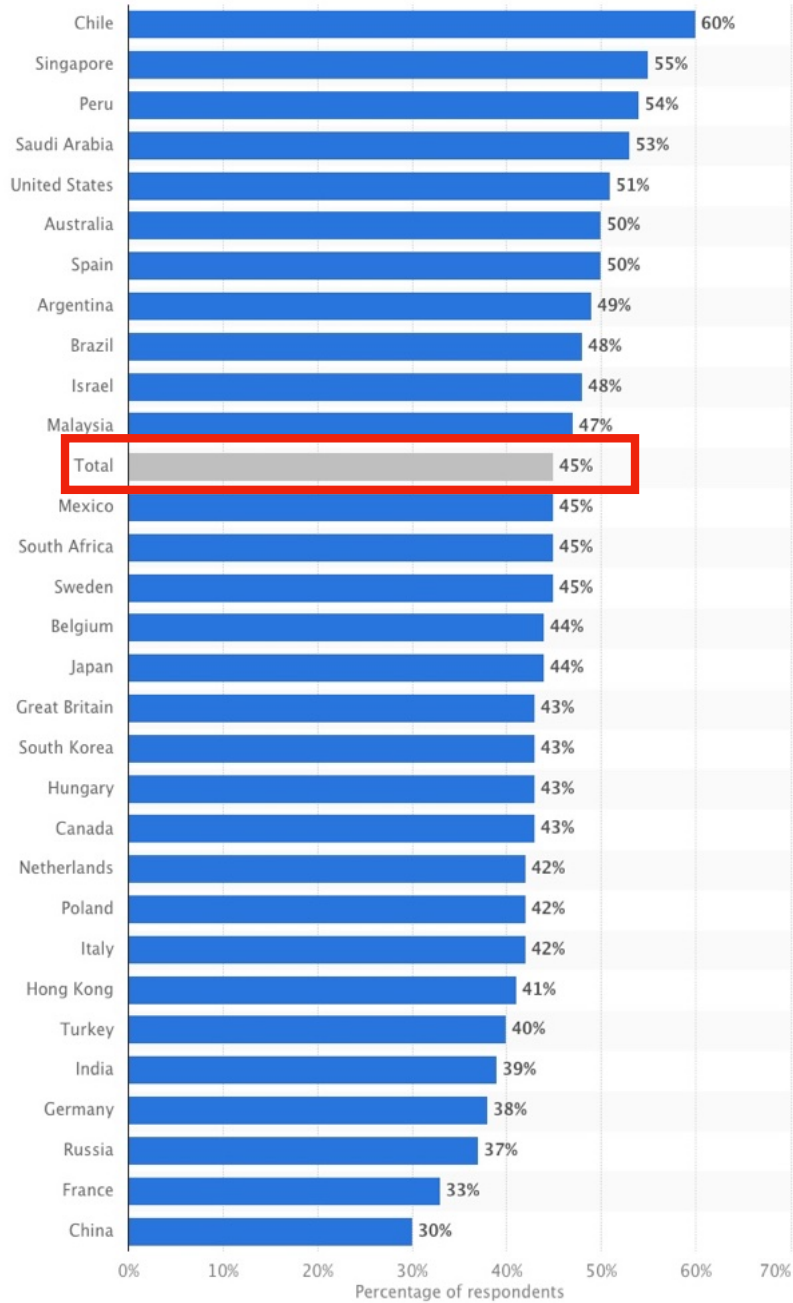
WHEN IT COMES TO WEIGHT

Focus on the **HEALTH**
aspect **NOT** the size

~~Obesity~~ ~~Fat~~ ~~Large~~ ~~Overweight~~

Percentage of the population in select countries worldwide who were trying to lose weight in 2020

45% of people globally are trying to lose weight



What is the “Best Weight”

“The ‘best weight,’ is whatever weight a person reaches when they’re living the healthiest life they can actually enjoy and they don’t have any BMI, weight or waist circumference goals.”

Yoni Freedhoff Associate Professor, Family Medicine, University of Ottawa

A Weighty Conclusion

Categorize people using BMI/unhealthy weight rather than size words

Waist and hip-waist ratio measurements and what sort of “fruit” you are doesn’t really inform much about health risks over and above BMI

The 1/3 of the population that is categorized as “overweight” really have minimal if any associations with worse health outcomes - especially if they are physically active

Alcohol ingestion can absolutely be harmful

CONTEXT
MATTERS

The psychosocial impacts of alcohol ABUSE are devastating to individuals, families and the general public - cirrhosis, violence, accidents

Drinking and driving is 1000% wrong - SELFISH!!

Binge drinking can lead to very poor judgments



**Anything more than 3 drinks a day is likely a health issue
BUT what about 1, 2, or 3**

A History Lesson

REPORT

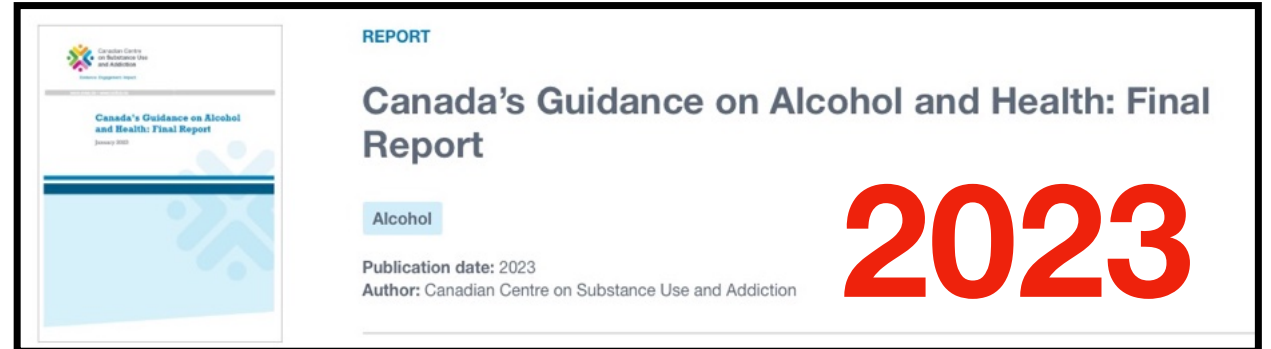
Alcohol and Health in Canada: A Summary of Evidence and Guidelines for Low-Risk Drinking

Alcohol Health Effects

2011

Publication date: 2011

Author: Canadian Centre on Substance Use and Addiction



“no more than
10 drinks a week for females
and 15 drinks for males”

Do not drink and drive
Do not drink when pregnant

“A continuum of health risk starting with
consumption as low as
3 standard drinks per week”

“We now know that even a small amount of
alcohol can be damaging to health”

“Drinking alcohol, even a small amount, is
damaging to everyone”

The Red Wine Theory

BEFORE THE 1980s ALCOHOL WAS SIMPLY CONSIDERED HARMFUL

1980s researchers found in France that despite a diet relatively high in saturated fat - lower risk of heart disease - the “French Paradox”

The theory - antioxidants - polyphenols in wine - resveratrol

SURROGATE MARKERS

2 RCT meta-analyses - **resveratrol** - **NO EFFECT** on BP/LDL/HDL/TG, but ↓ total cholesterol by **~5%**

Beer and wine - **NO EFFECT** on total cholesterol/LDL/TG/BP, but ↑ HDL by **8%**

IMPACT THESE SURROGATE MARKER CHANGES WOULD MAKE ON CVD ESTIMATES

10-year cardiovascular risk estimates go from ~5% down to 4.7%

Proposed update to Canada's alcohol guidelines suggests as few as **3 drinks per week**

By Cassandra Szklarski · The Canadian Press
Posted August 30, 2022 1:23 pm · Updated August 30, 2022 6:42 pm



Proposed alcohol guidelines recommend no more than **2 drinks per week**

A new measure of unhealthy drinking

PUBLISHED SEPTEMBER 1, 2022

If you have **three or more alcoholic drinks in a week**, you're putting your health at risk. That's according to a new report from the Canadian Centre on Substance Abuse and Addiction (CCSA). The government of Canada's current recommendations are more than a

Calgarians react to new guidelines for alcohol intake

Having **three to six drinks per week** increased the risk to moderate, while having more than six was found to contribute to increased risks of cancer, stroke, heart disease and situations of violence.

1 drink a day means higher risk of heart disease, stroke, cancer: Report

A recent report highlights the many health risks associated with consuming just one alcoholic drink a day

Michael Ranger
Sep 5, 2022 3:00 PM



Living

Are Canadians drinking too much alcohol?

By NetNewsLedger - September 7, 2022

182



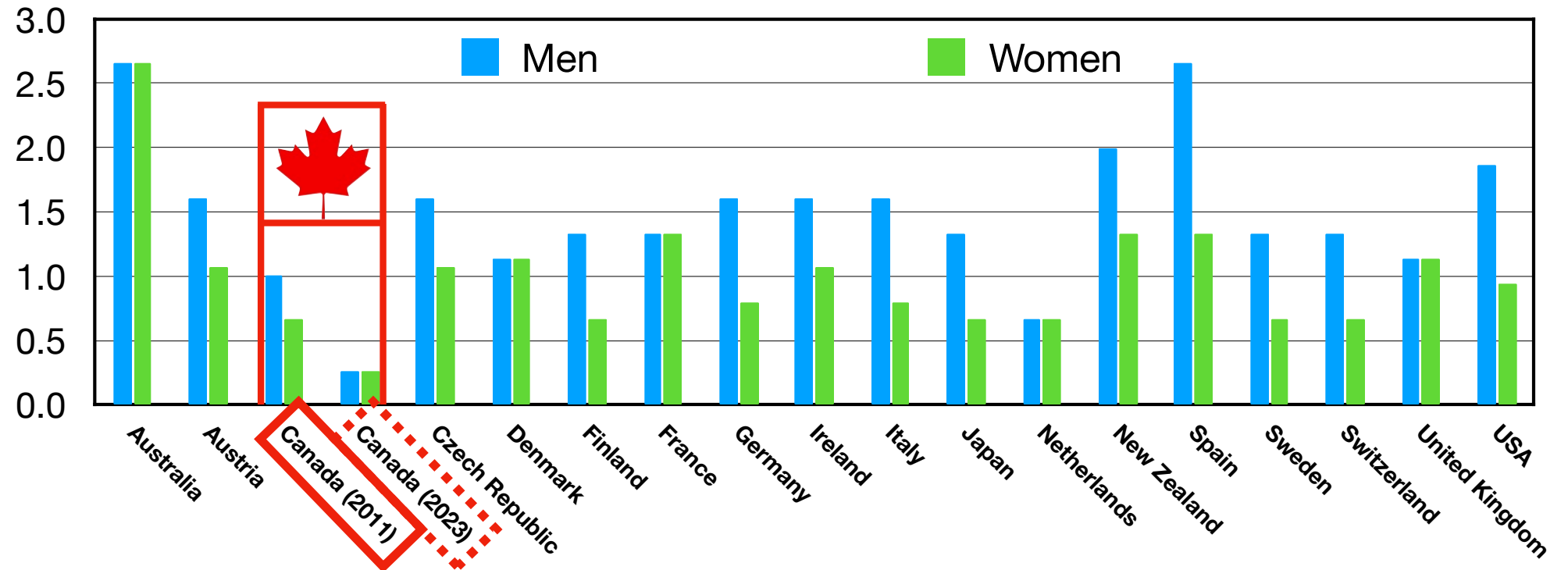
Are Canadians Drinking too much?

Across The

Recommended maximum intake of alcoholic beverages



per day



THIS IS CONSIDERED A DRINK

BEER/
CIDER/
COOLERS
341mL/12oz
5% alcohol

WINE
142mL/5oz
12% alcohol

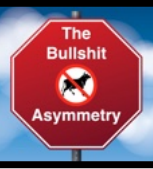
SPIRITS
43mL/1.5oz
40% alcohol

~15g of alcohol

Release dates of these recommendations are variable

How Much Do We drink?

	Zero	If you do drink - typical drinking day		
		1-2/day	3-4/day	5+ a day
Women	23%	74%	17%	9%
Men	18%	54%	23%	23%



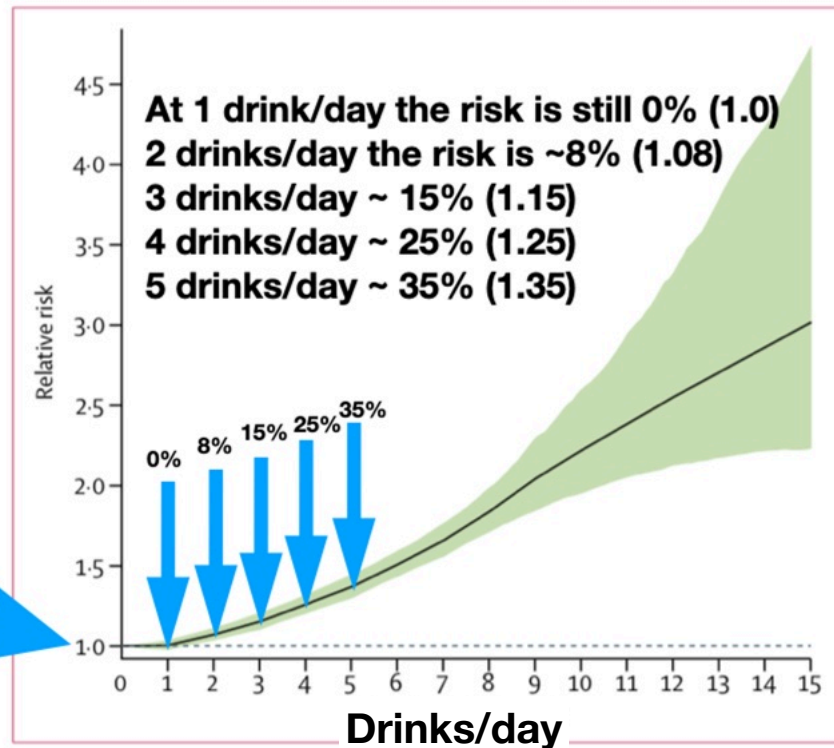
Alcohol

Lancet 2018

Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016

GBD 2016 Alcohol Collaborators*

“We found that the risk of all-cause mortality, and of cancers specifically, rises with increasing levels of consumption and the level of consumption that minimises health loss is zero”



1.0 means no increased risk of mortality attributable to alcohol

ABSOLUTE NUMBERS - the number who would experience an alcohol related problem

OVER ONE YEAR	Additional people out of 100,000	Extrapolated Increase over 30 years
1 drink a day	4	0.1% or 1/1000
2 drinks a day	63	1.5%
5 drinks a day	338	10%

TOP 3 HARMS
 tuberculosis, road injuries, self harm

Alcohol effect on different health risks - data is only for up to 3 drinks/day

RESULTS FROM THE LARGEST AND MOST COMPREHENSIVE COHORT EXAMINING THE RELATION BETWEEN ALCOHOL USE AND HEALTH RISK data taken from the relative_risks.csv database available at https://data.mendeley.com/datasets/5thy2mcwn7/1				Data from a similar analysis (Lancet 2016 - table 5) that provides the Age standardized death rate per 100,000 for each of these outcomes	Absolute change in the number of deaths/100,000 (calculated by multiplying the age standardized death rate by the relative difference found)
22 outcomes	Males	Female	If there is a HARM or BENEFIT this is the ~ size and direction of the effect Relative difference and point		
Ischemic heart disease	Benefit any amount	Benefit any amount	~15% ↓ or 0.85	142	21 ↓
Hemorrhagic stroke	Harm if >2 drinks/day	None	~25% ↑ or 1.25	52	13 ↑
Ischemic stroke	None	Benefit if 1-2 drinks/	~20% ↓ or 0.80	49	10 ↓
Lower respiratory tract infections	None	None	~0% or 1.00	42	0
Unintentional injuries	Harm any amount	Harm any amount	~15% ↑ or 1.15	27	4 ↑
Diabetes	None	Benefit	~25% ↓ or 0.75	24	6 ↓
Transport injuries	Harm any amount	Harm any amount	~20% ↑ or 1.20	20	4 ↑
Cirrhosis	Harm if >1 drink/day	Harm if >1 drink/day	~100% ↑ or 2.00	19	19 ↑
Self harm	None	None	~0% or 1.00	17	0 or 4.3 ↑
Interpersonal violence	Harm if >1 drink/day	Harm if >1 drink/day	~25% ↑ or 1.25	16	11 ↑
Tuberculosis	Harm if >1 drink/day	Harm if >1 drink/day	~70% ↑ or 1.70	15	5 ↑
Hypertensive heart disease	Harm if >1 drink/day	Harm if >1 drink/day	~30% ↑ or 1.30	13	2 ↑
Colon/rectum cancer	Harm any amount	Harm any amount	~15% ↑ or 1.15	12	0 ↑
Liver cancer	None	None	~0% or 1.00	8	2 ↑
Breast cancer	Harm any amount	Harm any amount	~25% ↑ or 1.25	7	4 ↑
Esophageal cancer	Harm if >1 drink/day	Harm if >1 drink/day	~50% ↑ or 1.50	3	<1 ↑
Atrial fibrillation/flutter	Harm any amount	Harm any amount	~10% ↑ or 1.10	2	0
Pancreatitis	None	None	~0% or 1.00	2	1 ↑
Larynx cancer	Harm if >2 drinks/day	Harm if >2 drinks/day	~40% ↑ or 1.40	2	1 ↑
Epilepsy	Harm any amount	Harm any amount	~30% ↑ or 1.30	2	1 ↑
Lip and oral cavity cancer	Harm any amount	Harm any amount	~50% ↑ or 1.50	2	1 ↑
Pharynx/nasopharynx cancer	Harm any amount	Harm any amount	~80% ↑ or 1.80	1	1 ↑

MAIN ASSOCIATIONS

Relative Numbers

DECREASE

15-25% ↓

in heart attack/strokes

INCREASE

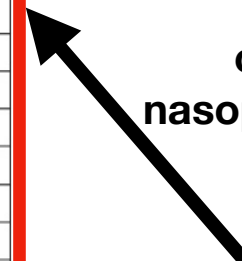
unintentional injuries 15% ↑

transport injuries 20% ↑

tuberculosis 70% ↑

atrial fibrillation 10% ↑

colon/esophageal/breast/nasopharynx/lip cancers 15-80% ↑



Absolute change in number of deaths/100,000

THIS IS THE PUBLIC SUMMARY (August 2022)

created by the Canadian Center on Substance Use and Addiction
and they **asked for public consultation**

Even in **small** quantities,
alcohol is not good for your health

Let's rethink the way we drink...

Science is evolving. So, we need to tell you something different than we have in the past. Recommendations regarding the quantities of alcohol need to change.

We now know **that even small quantities of any alcohol** can be harmful to your health. It doesn't matter whether it's red wine, white wine, beer or spirits. Your tolerance to alcohol doesn't make a difference, either.

Even in small quantities, drinking alcohol has consequences for everyone, whether you are male or female, younger or older. In fact, it's biological, it's physical.

That's why drinking less is better!



Even in small quantities, drinking alcohol has consequences for everyone, whether you are male, female, younger or older. In fact, it's biological, it's physical.

That's why drinking less is better!

The terms small, low, moderate, increasingly high risk are too subjective and in no way inform people as to the actual size of the risks

Not sure the weekly amount is all that useful - likely better to think about drinks per day given that when people "drink", they drink "daily"

Not sure of the point of having a weekly target of drinks - kind of sounds like a challenge to achieve either high or low

There are no numbers here and it implies each category has only the risks listed - there is no mention of liver cirrhosis which may numerically be the largest risk

The consequences of drinking

Having 2 drinks or fewer per week should allow you to avoid negative alcohol consequences.

If you have 3 to 6 drinks per week, you are increasing your risk of developing certain cancers, including breast and colon cancer.

If you have 7 drinks or more per week, you are actually increasing your risk of developing a heart disease or having a stroke.

And with each additional drink, your risk of having these health problems, and many other diseases and injuries, exponentially increases.

Alcohol has another consequence

All of these health problems, diseases and injuries can also shorten your life.

DRAFT



Our organization, the Canadian Centre on Substance Use and Addiction, was commissioned by Health Canada to update the low-risk drinking guidelines. This document summarizes the main changes. For more information, visit our website at www.ccsa.ca.

Let's rethink the way we drink

Keep track of how many drinks you have per week



It's never too late to revisit our habits!
We are aiming to drink less.
How about you?

What is your weekly drinking target?



Tips to reduce your drinking

- Stick to the limits you've set for yourself.
- Choose drinks with a lower percentage of alcohol.
- Drink slowly in small sips.
- Always have a pitcher of water on hand.
- For every drink of alcohol, have one non-alcoholic drink.
- Try some alcohol-free cocktail recipes.

Public Consultation: Summary of Key Actions Taken

The responses received from the open consultation were analyzed and categorized. The table below presents the main categories of comments as well as the actions taken by the LRDG-Scientific Expert Panel (LRDG-SEP) to address comments which fell within the scope of this project’s mandate.

There were several suggestions made for knowledge mobilization activities, including knowledge synthesis, dissemination, transfer and exchange. These suggestions have been recorded but are not listed here as they could not be considered for action (i.e., could not lead to edits and revisions of the final report).

Consultation comment or suggestion	Action taken
Public Summary	
Provide more information about specific cancers.	There are already many consequences of different types presented in the public summary, the suggested consequences were not added. However, the public summary was edited to link the average amount of weekly
In gene	<div style="border: 2px solid red; padding: 10px;"> <p>The objective of the document is to communicate information without statistics that would need contextual information and more explanations to be easily understood. No statistics were added.</p> </div>

The Top 5 Harms

CONTEXT
MATTERS

4 were the same for men and women

intentional injuries
unintentional injuries

**DON'T
DRINK IF
YOU DO
STUPID
THINGS**

liver cirrhosis
colorectal cancer

**DON'T
DRINK
AND
DRIVE**

and then breast cancer (women) and road injuries (men)

Lifetime cancer risk

Breast cancer

lifetime risk of dying would increase from 3% to roughly 3.5%

Colorectal cancer

lifetime risk of dying would increase from 3.0% to roughly 3.3%

Cirrhosis

CCSA reports that 1-2 drinks a day ↑ the risk of liver cirrhosis in both men and women

But the single paper they use to support these claims states quite clearly that, “although consumption of 1–2 drinks was associated with a substantially elevated risk for liver cirrhosis in women, **this was not the case in men**”

based on the CCSA numbers

Drinking less is better

We now know that even a small amount of alcohol can be damaging to health.

Science is evolving, and the recommendations about alcohol use need to change. Research shows that no amount or kind of alcohol is good for your health. It doesn't matter what kind of alcohol it is—wine, beer, cider or spirits.

Drinking alcohol, even a small amount, is damaging to everyone, regardless of age, sex, gender, ethnicity, tolerance for alcohol or lifestyle.

That's why if you drink, it's better to drink less.

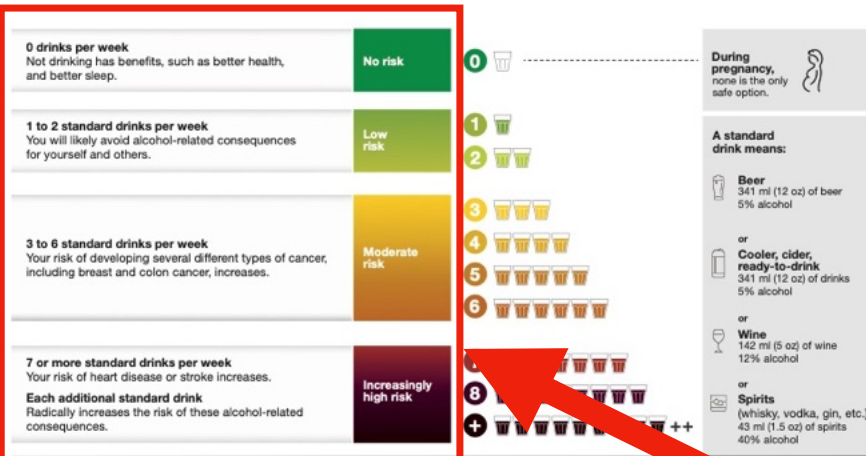
“Drinking alcohol, even a small amount, is damaging to everyone”

FINAL

Public Summary

Alcohol consumption per week

Drinking alcohol has negative consequences. The more alcohol you drink per week, the more the consequences add up.



Aim to drink less

Drinking less benefits you and others. It reduces your risk of injury and violence, and many health problems that can shorten life.

Here is a good way to do it

Count how many drinks you have in a week.



Set a weekly drinking target. If you're going to drink, **make sure you don't exceed 2 drinks on any day.**

Good to know

You can reduce your drinking in steps! Every drink counts: any reduction in alcohol use has benefits.

It's time to pick a new target

What will your weekly drinking target be?



Tips to help you stay on target

- Stick to the limits you've set for yourself.
- Drink slowly.
- Drink lots of water.
- For every drink of alcohol, have one non-alcoholic drink.
- Choose alcohol-free or low-alcohol beverages.
- Eat before and while you're drinking.
- Have alcohol-free weeks or do alcohol-free activities.

My Opinion

The 2023 CCSA Alcohol Guidelines:

1. Are misleading
2. Don't provide appropriate "context"
3. Create unnecessary fear and confusion
4. In no way inform the public as to the absolute risks/benefits
5. Very likely have nothing to do with your values and preferences
6. Ignore the research (although it's not great) around the functional social benefits - they state it was "out of the scope for this summary" yet their research question clearly states "What are the risks and **benefits** (physical and mental health, and social impact)"

A number of their harm comments are not supported by their own data. Their data show a CVD benefit at 1 drink a day that is greater than the cancer risks and this is not mentioned

Alcohol Risk Visualizer

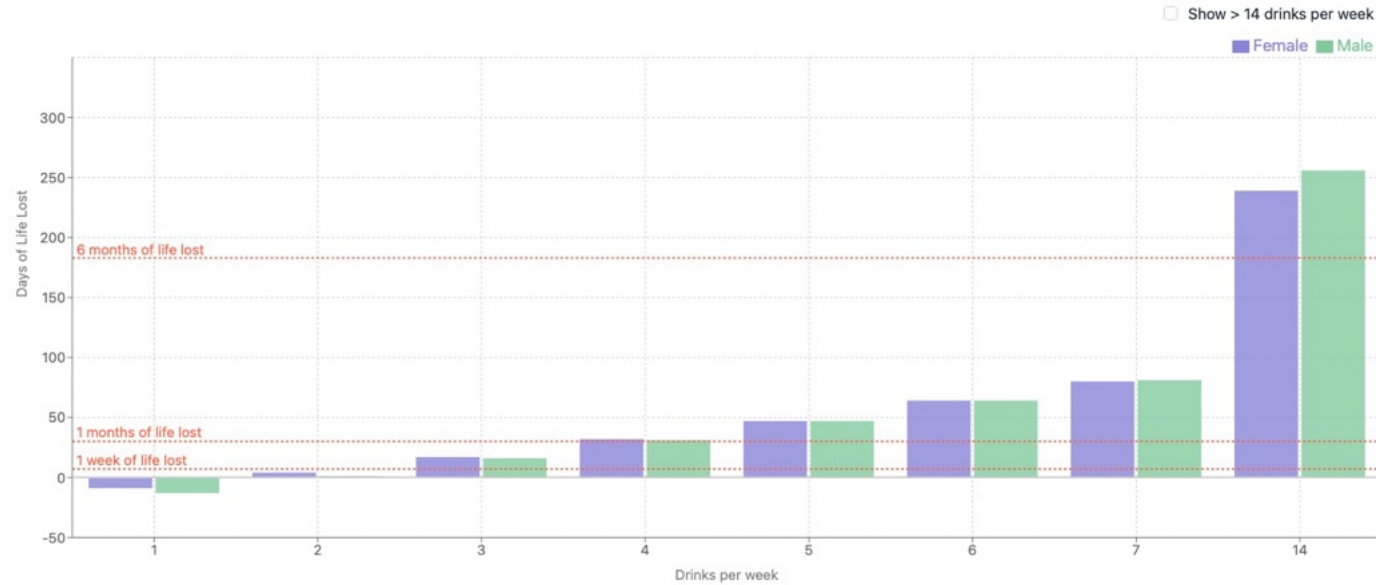
Based on the [latest CCSA report](#) on the lifetime risk of alcohol-attributable death and disability.

This chart shows how many days of life, on average, an individual could lose based on the amount of drinks they have per week.

The CCSA considers one drink as:

- 341 ml (12 oz) of beer 5% alcohol or cooler 🍺
- 142 ml (5 oz) of wine 12% alcohol 🍷
- 43 ml (1.5 oz) of spirits (whiskey, vodka, gin, etc) 40% alcohol 🍸

Days of Life Lost by Drinks Per Week



Combined Risk from 21 Different Health Outcomes

Disease selectors allow you to select the diseases you're interested in. For example, consider removing physical injuries if you don't drink and drive and you are not reckless when you drink.

- | | | | | |
|--|---|---|--|--|
| <input checked="" type="checkbox"/> Cancer | <input checked="" type="checkbox"/> Cardiovascular Diseases | <input checked="" type="checkbox"/> Liver Damage | <input checked="" type="checkbox"/> Physical Injuries | <input checked="" type="checkbox"/> Other |
| <input checked="" type="checkbox"/> Oral cavity and pharynx cancer | <input checked="" type="checkbox"/> Diabetes | <input checked="" type="checkbox"/> Liver cirrhosis | <input checked="" type="checkbox"/> Road injuries | <input checked="" type="checkbox"/> Tuberculosis |
| <input checked="" type="checkbox"/> Oesophagus cancer | <input checked="" type="checkbox"/> Atrial fibrillation and flutter | | <input checked="" type="checkbox"/> Other unintentional injuries | <input checked="" type="checkbox"/> Lower respiratory infections |
| <input checked="" type="checkbox"/> Colorectal cancer | <input checked="" type="checkbox"/> Hypertension | | <input checked="" type="checkbox"/> Intentional injuries | <input checked="" type="checkbox"/> Pancreatitis |
| <input checked="" type="checkbox"/> Liver Cancer | <input checked="" type="checkbox"/> Ischemic heart disease | | | <input checked="" type="checkbox"/> Epilepsy |
| <input checked="" type="checkbox"/> Breast cancer | <input checked="" type="checkbox"/> Ischemic stroke | | | |
| <input checked="" type="checkbox"/> Larynx Cancer | <input checked="" type="checkbox"/> Intracerebral hemorrhage | | | |
| | <input checked="" type="checkbox"/> Subarachnoid haemorrhage | | | |

**ASSUMING THEIR NUMBERS ARE CORRECT
WHICH IS A BIG ASSUMPTION**

Remove injuries/cirrhosis/tuberculosis

1 drink a day for life = just over 2 week of life lost

2 drinks a day for life = just over 3 months of life lost

The Bottom Line

If you have a history of an alcohol problem or are pregnant - DON'T DRINK

If you drink and drive, become aggressive when you drink, or have a history of doing stupid things when you drink - DON'T DRINK TO EXCESS

3-5 drinks/day

Very likely a health issue

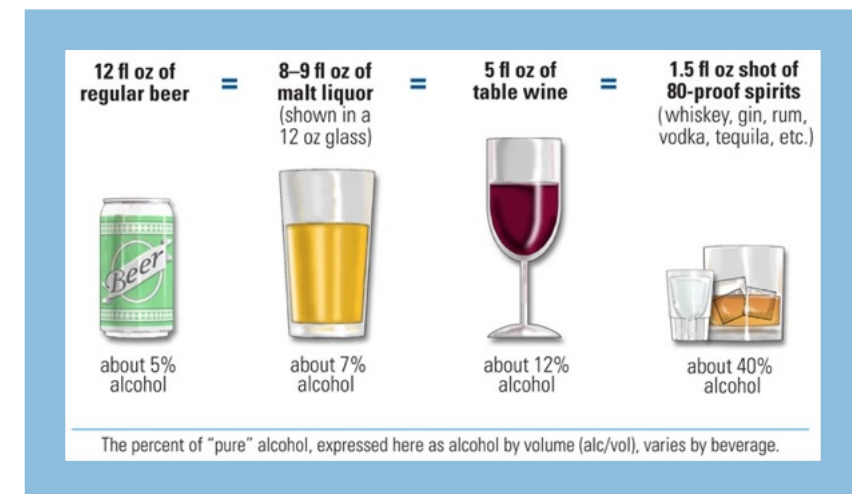
2 drinks/day

at most a ~1% increase in mortality over a lifetime

1 drink/day

doesn't seem to produce an **INDIVIDUAL** health risk OR benefit

BUT THE EVIDENCE IS TRICKY AT BEST



Coffee and mortality/heart attack/stroke/cancer associations

CLINICAL OUTCOMES	RESULTS Risk ratio (confidence intervals)	
	High versus low intake	For each extra cup
All cause mortality	10% ↓	4% ↓
Heart attack mortality	No change	Not reported
Heart attack/stroke mortality	No change	No change
Stroke mortality	No change	Not reported
After a heart attack mortality	45% ↓	Not reported
Cancer mortality	No change	No change
COHORT STUDIES	Meta-analysis - 2017 Poole	

Tea and mortality associations

CLINICAL OUTCOMES	RESULTS Risk ratio (confidence intervals)		
	Highest versus lowest and also per 1 cup/day 3-28 years		Per 1 cup/day 3-28 years
	Green tea	Black tea	Tea
All cause mortality (highest vs lowest)	20% ↓	10% ↓	Not reported
All cause mortality (1 cup/day)	4% ↓	3% ↓	2% ↓
Heart attack/stroke mortality (highest)	33% ↓	No change	Not reported
Heart attack/stroke mortality (1 cup/	5% ↓	8% ↓	4% ↓
Cancer mortality	No change	21% ↓	Not reported
Heart attack/stroke events	Not reported	Not reported	No change
COHORT STUDIES	Meta-analysis - 18 studies 2015 Tang		Meta-analysis - 39 studies 2020 Chung

Coffee consumption and health: umbrella review of meta-analyses of multiple health outcomes

9 outcomes

Intakes of three to four cups a day versus none

for all cause mortality 17% ↓, cardiovascular mortality 19% ↓, and cardiovascular disease 15% ↓

High versus low consumption - incident cancer 18% ↓

Consumption was also associated with a **lower risk** of several specific cancers and neurological, metabolic, and liver conditions

In pregnancy - high versus low/no consumption

low birth weight 31% ↑, preterm birth in the first 22% ↑ and second 12% ↑ trimester, and pregnancy loss 46% ↑

Effect of coffee on surrogate markers

SURROGATE OUTCOMES	RESULTS Change in surrogate marker				
	45 days (2.4-8 cups) for lipids, 62 days (2- ≥5 cups) for blood pressure				
	Overall	Filtered	Unfiltered	Caffeinated	Decaffeinated
Total cholesterol	↑4%	↑2%	↑6%	↑5%	No effect
LDL cholesterol	↑4%	No effect	↑9%	↑4%	No effect
HDL cholesterol	No effect	Not reported	Not reported	Not reported	Not reported
Triglycerides	↑8%	No effect	↑13%	↑9%	No effect
Blood pressure	No effect	Not reported	Not reported	Not reported	Not reported
CLINICAL TRIALS	Meta-analysis - 2017 Poole				

TheUpshot
THE NEW HEALTH CARE

Meat's Bad for You! No, It's Not! How Experts See Different Things in the Data

As the latest controversy over new research illustrates, nutrition science can be open to interpretation.

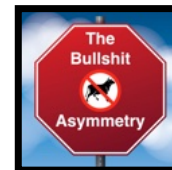
By Aaron E. Carroll

Oct 2019

Oct. 1, 2019



Meat



NutriRECS
Nutritional Recommendations and accessible Evidence summaries
Composed of Systematic reviews

THI
True Health Initiative
A global coalition of world-renowned experts, fighting fake facts and combating false doubts to create a world free of preventable diseases

Somewhere between zero and three servings per week is a good recommendation

Oct 2019

Annals of Internal Medicine®

REVIEWS | 1 OCTOBER 2019
Red and Processed Meat Consumption and Risk for All-Cause Mortality and Cardiometabolic Outcomes: A Systematic Review and Meta-analysis of Cohort Studies

REVIEWS | 1 OCTOBER 2019
Reduction of Red and Processed Meat Intake and Cancer Mortality and Incidence: A Systematic Review and Meta-analysis of Cohort Studies

REVIEWS | 1 OCTOBER 2019
Health-Related Values and Preferences Regarding Meat Consumption: A Mixed-Methods Systematic Review

NutriRECS
"THI response was completely predictable and hysterical"

Norrina Allen
stated the NutriRECS study contradicted previous research and also their new findings were "comparable with those reported in the literature" and then **referenced**

A riddle, wrapped in a mystery, inside an enigma

Adults can continue eating the same amount of red meat — whether unprocessed or processed — as is being done in typical omnivore diets

THI
"NutriRECS articles are information terrorism"
Called for Annals to retract publication

Feb 2020

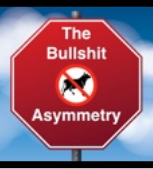
JAMA Internal Medicine | Original Investigation
Associations of Processed Meat, Unprocessed Red Meat, Poultry, or Fish Intake With Incident Cardiovascular Disease and All-Cause Mortality
Victor W. Zhong, PhD; Linda Van Horn, PhD; Philip Greenland, MD; Mercedes R. Combarros, PhD; Hongyan Ning, MD, MS; John T. Wilkins, MD, MS; Donald M. Lloyd-Jones, MD, ScD; **Norrina S. Allen, PhD**

"Small increased risk of heart disease and mortality"

THI
Praised the results and said findings were "consistent with virtually all prior research on the topic"



Meat - it's about your "values"



So Why the Different Response?

NutriRECS

Focused exclusively on health outcomes associated with meat and did not consider animal welfare and environmental issues.
Also felt a 1% risk in 11 years was small

THI

Appear to think of this as more of a public health issue and that 1% risk means millions (1% of 300 million) could be affected and also considered the environmental perspective

Message	The two different meta-analyses of cohort studies	# of cohorts	What was examined	Time	Mortality		Overall cardiovascular	
					Unprocessed meat	Processed meat	Unprocessed meat	Processed meat
Continue to eat meat group	Zeraatkar October 2019	55	A 3 serving/week REDUCTION*	11yr	↑8%* Absolute ↑~1%	↑9%* Absolute ↑~1%	↑5%* Absolute ↑<0.5%	↑3%* Absolute ↑<0.5%
Eat less meat group supported	Zhong February 2020	6	Each additional 2 serving/week INCREASE	19 yr	↑3% Absolute ↑~1%	↑3% Absolute ↑~1%	↑3% Absolute ↑~0.5%	↑7%** Absolute ↑~2%

*Because the Zeraatkar meta-analysis examined a REDUCTION in meat intake and the Zhong meta-analysis examined an INCREASE in meat intake numbers the Zeraatkar numbers have been inverted so they can be directly compared to the Zhong numbers
** for this number 2 versus zero servings a week, not 2 servings/week increase

nature
medicine

ARTICLES

<https://doi.org/10.1038/s41591-022-01968-z>

OPEN **Systematic review and meta-analysis** 

Health effects associated with consumption of unprocessed red meat: a Burden of Proof study

Oct 2022

Table 2 | Strength of the evidence for the relationship between unprocessed red meat consumption and the six health outcomes analyzed

Health outcome	ROS	Average BPRF	Star rating	RR at 50 g d ⁻¹ (conservative 95% UI)	RR at 100 g d ⁻¹ (conservative 95% UI)
Colorectal cancer	0.06	1.06	2 stars	1.3 (1.01, 1.64)	1.37 (1.01, 1.78)
Breast cancer	0.03	1.03	2 stars	1.26 (0.98, 1.56)	1.26 (0.98, 1.56)
IHD	0.01	1.01	2 stars	1.09 (0.99, 1.18)	1.12 (0.99, 1.25)
Type 2 diabetes	0.01	1.01	2 stars	1.14 (0.97, 1.32)	1.23 (0.96, 1.52)
Ischemic stroke	-0.02	0.98	1 star	1.05 (0.97, 1.12)	1.15 (0.93, 1.4)
Hemorrhagic stroke	-0.13	1.14	1 star	0.9 (0.64, 1.26)	0.87 (0.56, 1.35)

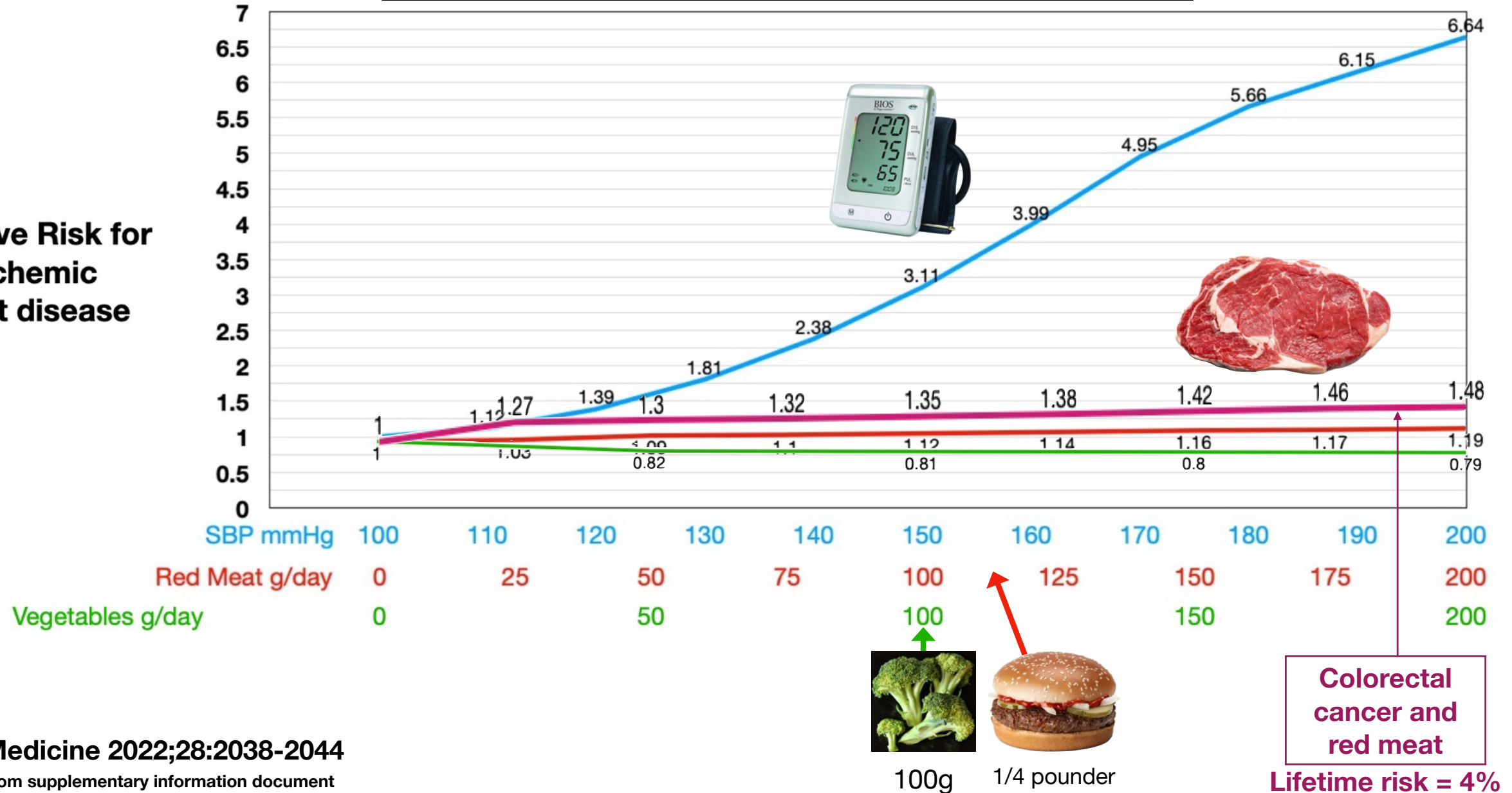
The ROS represents the signed value of the log BPRF averaged across the 15th to 85th percentiles of exposure: the lower (if harmful) or higher (if protective) uncertainty interval—inclusive of between-study heterogeneity—for the RR curve for each risk–outcome pair. ROSs are directly comparable across outcomes and each risk–outcome pair receives an ROS based on the final formulation of the risk curve. For hemorrhagic stroke, the ROS reflects a protective effect of red meat consumption, whereas for the other outcomes it reflects a harmful effect. Negative ROSs indicate that a conservative interpretation of the available evidence suggests there may be no association between risk and outcome. For ease of interpretation, we have transformed the ROS and BPRF into a star rating (1–5), with a higher rating representing a larger effect and stronger evidence.

“In other words, given all the data available on red meat intake and risk of a subsequent outcome, we estimate that consuming unprocessed red meat across an average range of exposure levels increases the risk of subsequent colorectal cancer, breast cancer, IHD and type 2 diabetes at least slightly compared to eating no red meat (by at least 6%, 3%, 1% and 1%, respectively).”

CONTEXT IS ALWAYS IMPORTANT

OPEN
The Burden of Proof studies: assessing the evidence of risk

Relative Risk for Ischemic heart disease



Colorectal cancer and red meat
 Lifetime risk = 4%

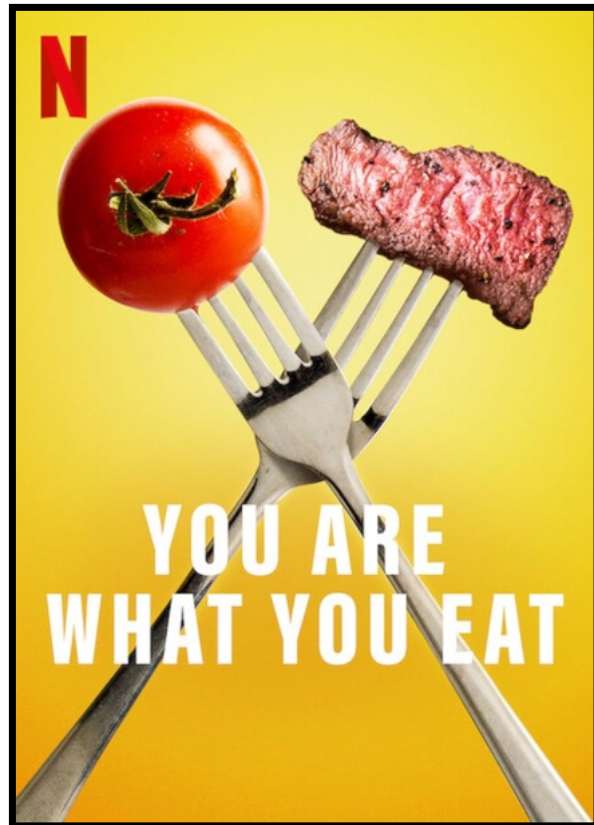
A recent example of Nutrition Evidence Propaganda





The Stanford Twin Study

It is a **VERY** well done trial **BUT...**



Food documentary
“You Are What You Eat:
A Twin Experiment.”
4-part series chronicles
the study from start to
finish



Original Investigation | Nutrition, Obesity, and Exercise

Cardiometabolic Effects of Omnivorous vs Vegan Diets in Identical Twins

A Randomized Clinical Trial

Nov 2023

8 week trial

22 pairs of twins - pretty much removes genetic issues

~40 y/o, 75% female

randomized the twins - healthy vegan or healthy omnivorous diet - delivered meals/self-provided

Baseline kcal/day started at ~1,950 kcal - then Vegan ~1650 kcal and Omnivore ~1850 kcal

Baseline cholesterol started at ~250mg/day - then Vegan ~0mg/day and Omnivore ~ 325-500mg/day

8-week results for vegan versus omnivore

Vegan - LDL ↓ 14mg/dL ~12% - statistically different

Vegan - HDL ↓ 4mg/dL ~ 7% - not statistically different

Vegan - Weight ↓ 2 kg - statistically different

Vegan - fasting insulin ↓ ~17% - statistically different

Triglycerides, vitamin B12, glucose, and TMAO- no difference

Diet satisfaction (5 point scale - higher better)

Vegan 3.5 (baseline) ↓ to 3.0 (8 weeks)

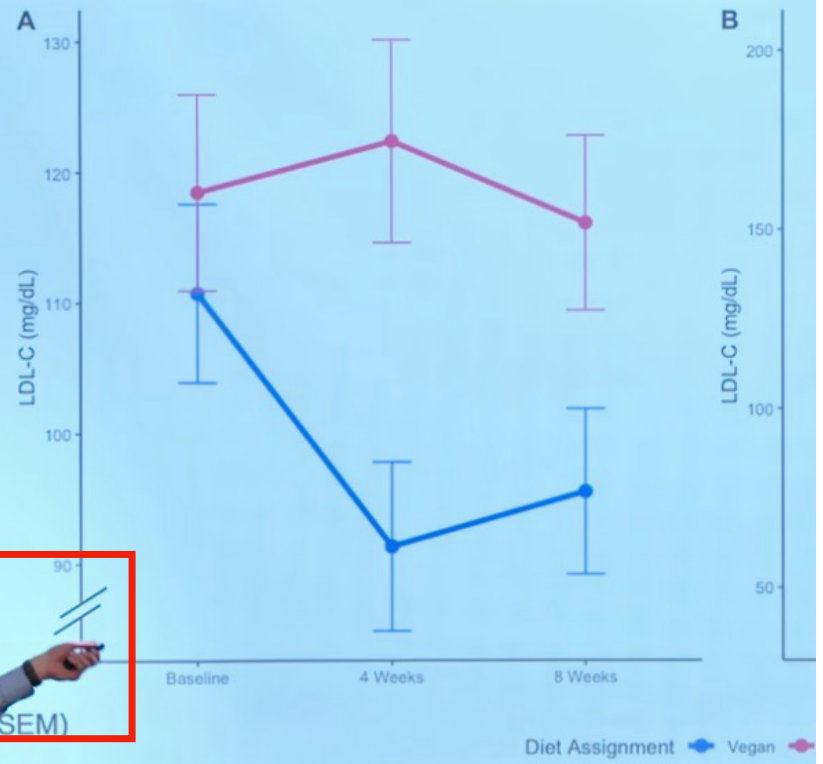
Carnivore 3.5 ↑ to 3.6

From Netflix - no change in cognitive scores, telomere lengthening?

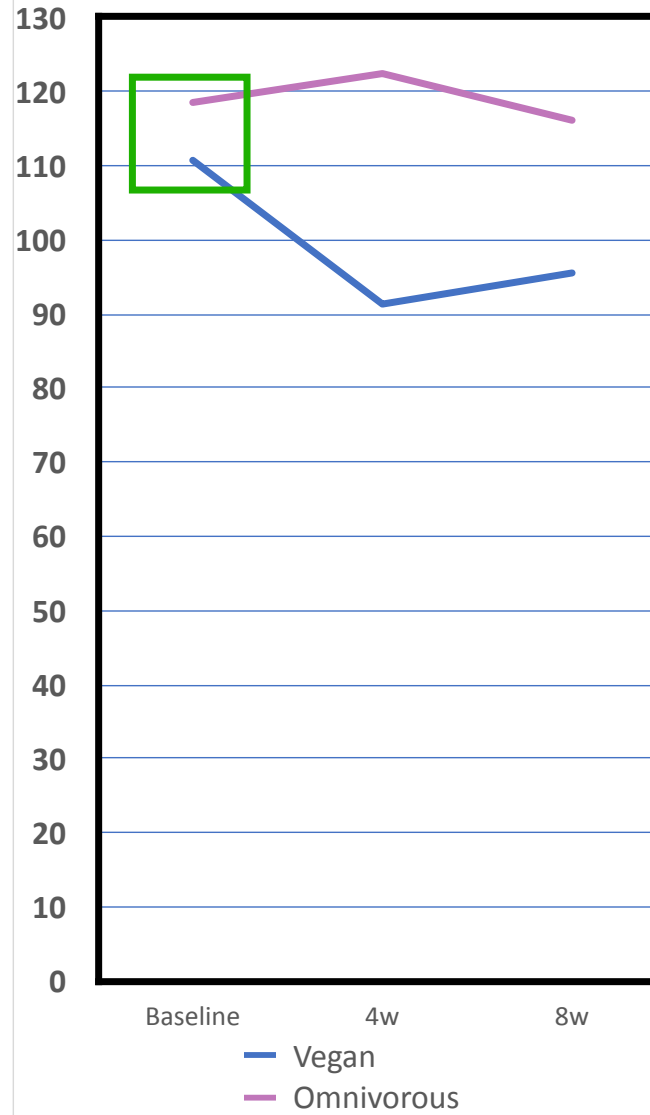
Screenshot from Netflix



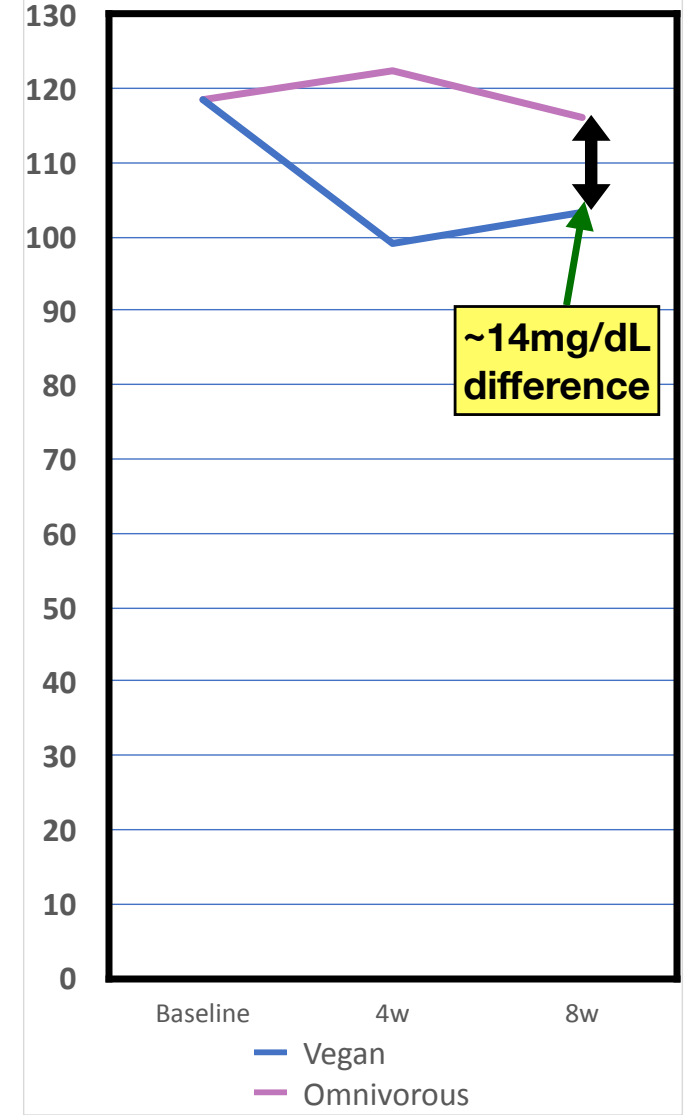
Primary Outcome: LDL-C



LDL-C properly shown



LDL-C properly adjusted



Impact of the risk marker changes on CVD risk

LDL ↓ 14mg/dL ~12% and HDL ↓ 4mg/dL ~ 7%

BASELINE NUMBERS

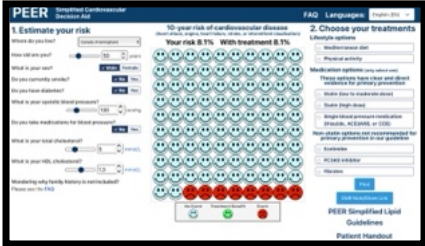
Total cholesterol ~200 mg/dL, LDL ~120, HDL ~60, SBP 120?

Impact of vegan diet on surrogate markers

Total cholesterol ~182 mg/dL, LDL ~106, HDL~56, SBP 120?

Best estimate of what these surrogate marker changes would do to 10-year risk for developing CVD

	Baseline	Change in risk factors = Vegan
40 y/o female	2.1%	2.0%
40 y/o male	3.1%	3.1%
60 y/o male	10.3%	10.4%



Meta-analyses

Health outcomes associated with vegetarian diets: An umbrella review of systematic reviews and meta-analyses

Clin Nutr 2020;11:3283-3307

Effect of vegetarians vs omnivores on surrogate markers

SURROGATE OUTCOMES	RESULTS
	Change in surrogate marker
	Vegetarians vs Omnivores 8 weeks
Total cholesterol	↓ 11%
LDL cholesterol	↓ 14%
HDL cholesterol	↓ 6% decrease
Triglycerides	No effect
Systolic blood pressure	↓ 4.8mmHg
Diastolic blood pressure	↓ 2.2mmHg
SYSTEMATIC REVIEWS	2020 Oussalah

We already knew the answer about surrogate markers and vegetarian/vegan

****Studies of the Mediterranean diet show it produces minimal if any changes on surrogate markers****

Vegetarian or vegan diets and blood lipids: a meta-analysis of randomized trials

30 trials - quantified the effect of vegetarian or vegan diets vs. an omnivorous diet on lipids

Plant-based diets

↓ total cholesterol by 0.34 mmol/L (7% from baseline) - 95% CI (5% to 9%)

↓ LDL by 0.30 mmol/L (10%)

↓ apolipoprotein B levels by 12.9 mg/dL (14%)

no effect seen with triglycerides

“this study did not investigate the effect of plant-based diets on HDL-C since we focused on established atherogenic lipids and lipoproteins”

Ultra-processed food

Common examples are carbonated soft drinks, fatty or salty snacks, candies, pastries, cakes and cake mixes, margarine, sweetened cereals, fruit yogurt, pasta, pizza, poultry or fish nuggets, sausages, burgers, hot dogs, powdered or instant soup, noodles, and desserts.

% of energy intake

US/UK ~50 to 60% from UPF

“eat the least” quintile still average 20-30%

Canada and Brazil ~50%





Spain and Portugal ~20%

Italy ~10%

A simple way to figure out if a product is ultra-processed is to see if its list of ingredients contains words such as: hydrolysed proteins, soya protein isolate, gluten, casein, whey protein, mechanically separated meat, fructose, high-fructose corn syrup, fruit juice concentrate, invert sugar, maltodextrin, dextrose, lactose, soluble or insoluble fibre, hydrogenated or interesterified oil

Ultra-processed food

NOVA Food classification

Unprocessed or minimally processed foods	Processed culinary ingredients	Processed foods	Ultra-processed foods
<p data-bbox="333 570 747 753">Foods which did not undergo processing or underwent minimal processing techniques, such as fractionating, grinding, pasteurization and others.</p> 	<p data-bbox="862 602 1284 721">These are obtained from minimally processed foods and used to season, cook and create culinary dishes.</p> 	<p data-bbox="1408 591 1849 802">These are unprocessed or minimally processed foods or culinary dishes which have been added processed culinary ingredients. They are necessarily industrialized.</p> 	<p data-bbox="1956 602 2386 753">These are food products derived from foods or parts of foods, being added cosmetic food additives not used in culinary.</p> 
<p data-bbox="290 1328 795 1419">Legumes, vegetables, fruits, starchy roots and tubers, grains, nuts, beef, eggs, chicken, milk</p>	<p data-bbox="827 1354 1338 1419">Salt, sugar, vegetable oils, butter and other fats.</p>	<p data-bbox="1373 1328 1876 1451">Bottled vegetables or meat in salt solution, fruits in syrup or candied, bread, cheeses, purees or pastes.</p>	<p data-bbox="1938 1312 2403 1451">Breast milk substitutes, infant formulas, cookies, ice cream, shakes, ready-to-eat meals, soft drinks and other sugary drinks, hamburgers, nuggets.</p>

Ultra-processed food

The NOVA classification outlines 4 food categories

1. Unprocessed and minimally processed food
2. Processed culinary ingredients
3. Processed food
4. Ultra-processed food (UPF)

% of energy intake

US/UK ~50 to 60% from UPF

“eat the least” quintile still average 20-30%

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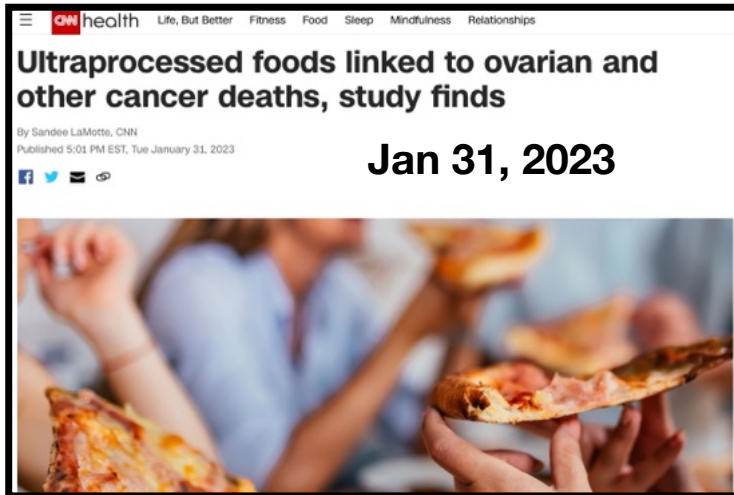
Ultra-processed food and bad outcomes

% of energy intake

US/UK ~50 to 60% from UPF
 Canada and Brazil ~50%
 Spain and Portugal ~20%
 Italy ~10%

			QUANTILE				
			1 (reference)	2	3	4	5
	Years	Outcome	~<25%* total daily energy, or ~<2 servings/day	~25-30% ~2-3.5	~30-40% ~3.5-4.5	~40-45% ~>4.5	~>45%
Zhong 2021	13.5	CVD Mortality	1	No change	No change	No change	~20% ↑
Blanco-Rojo 2019	7.7	Mortality	1	No change	No change	~45% ↑	
Schnabel 2019	7.1	Mortality	1	No change	No change	No change	
Srouf 2019	5.2	CVD	1	No change	No change	~25% ↑	
Kim 2019	19	Mortality	1	No change	No change	~30% ↑	
		CVD mortality	1	No change	No change	No change	
Rico-Campa 2019	200,432 persons years	Mortality	1	No change	No change	~45% ↑	
		CVD mortality	1	No change	No change	No change	

* numbers rounded



Ultra-processed food consumption, cancer risk and cancer mortality: a large-scale prospective analysis within the UK Biobank

Quartiles of % UPF in diet = 9%/17%/24%/41%

Looked at **209** comparisons for **25** different cancers

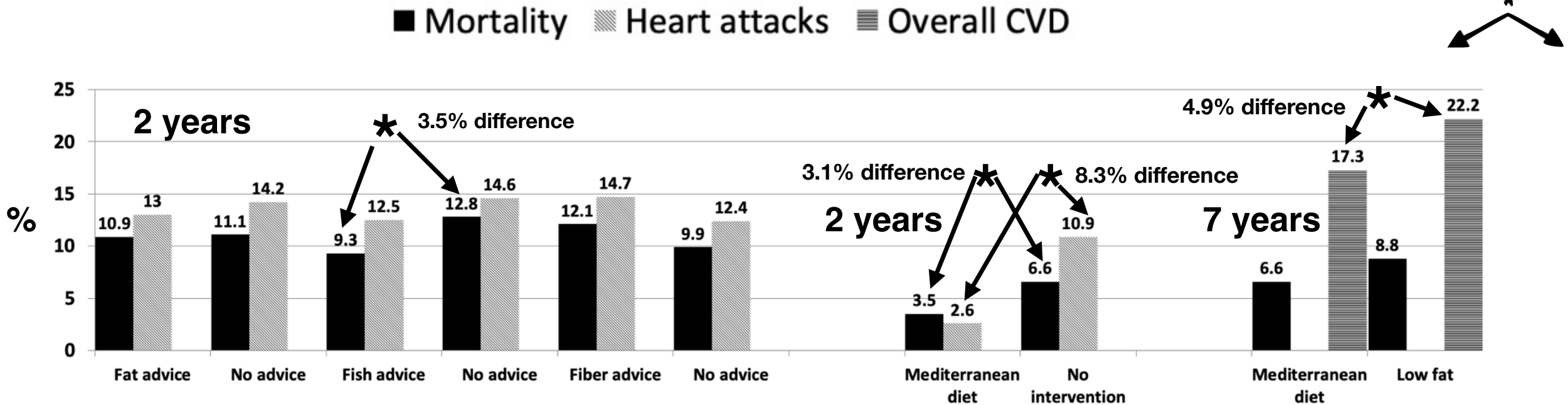
9 were statistically increased - all but **1** were in the **highest** quartile

In the highest quartile - **All cancers** 1.07 (1.02-1.14) = **7% relative increase**

The 5 large RCTs of nutrition intervention

People with previous history of heart attacks/strokes

these numbers were reported as statistically different, everything else was not statistically different



1989 - DART - Wales
2033 subjects, 100% male, 56 y/o, 62% smokers

ACTUAL NUTRITIONAL CHANGES MADE

- ↑ fibre intake from ~10g/day to ~20g/day
- ↑ polyunsaturated/saturated fat ratio from ~0.4 to ~0.8
- fish intake - ↑ EPA from ~0.7g/week to ~2.4g/week
- ↓ % fat energy from ~35 % to ~32%

1994 - Lyon - France
605 subjects, 90% male, 53 y/o, ~15-20% smokers

ACTUAL NUTRITIONAL CHANGES MADE

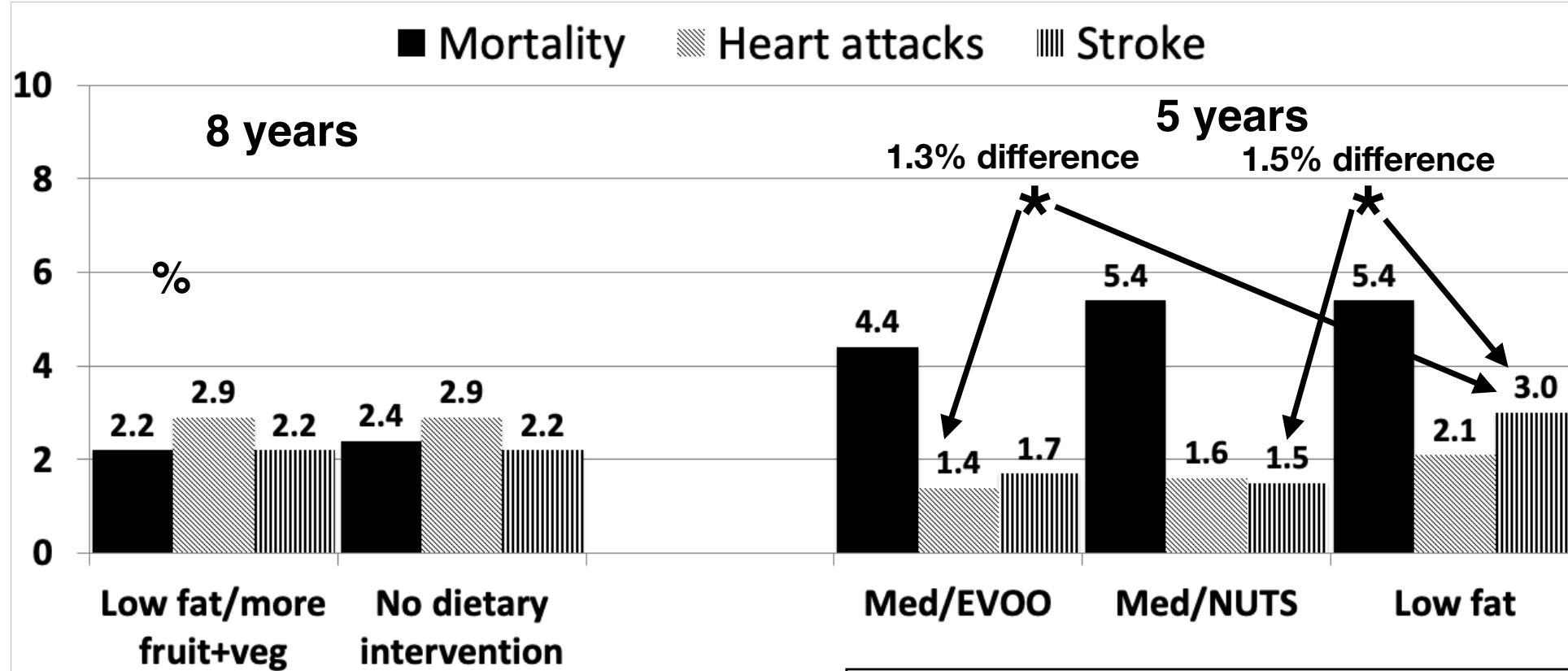
- ↔ polyunsaturated/saturated fat ratio
- ↓ cholesterol 318 mg/day vs 217 mg/day
- ↓ calories ~2100 vs ~1900
- ↓ saturated fat ~12% of total calories vs ~8%
- significantly ↑ intake of bread, fruit, and margarine; and a
- ↓ intake of butter, cream, meat, ham, sausage, and offal

2022 - CORDIOPREV - Spain
1002 subjects, 83% male, 60 y/o, ~10% smokers

ACTUAL NUTRITIONAL CHANGES MADE

- Med diet**
 - ↑ total fat from 37% to 41%
 - ↑ amount of extra virgin olive oil/nuts/oily fish
 - ↓ carbs from 41% to 37%
- Low fat diet**
 - ↓ total fat from 37% to 32%
 - ↑ carbs from 42% to 46%

People with NO previous history of heart attacks/strokes



these numbers were reported as statistical different, everything else was not statistically different

*

2006 - WHI - USA
 48,835 subjects, 100% female,
 62 y/o, 7% smokers

ACTUAL NUTRITIONAL CHANGES MADE

~10% ↓ in energy from fat
 ↑ one more serving a day of vegetables/fruit
 ~1.4 ↓ in servings a week of meat

2018 - PREDIMED - Spain
 7447 subjects, 57% female,
 62 y/o, 14% smokers

ACTUAL NUTRITIONAL CHANGES MADE

↑ weekly servings of fish (by 0.3 servings) and legumes (by 0.4 servings)
 used 1 litre/week of extra virgin olive oil
 or took 30 gm of mixed nuts/day

Absolute differences based on 2 different baseline risk estimates - per 1000 over 5 years

Intermediate risk 5-10% 5 year CVD risk

Dietary programme v minimal intervention	All cause mortality	Cardiovascular mortality	Stroke	Non-fatal myocardial infarction	Unplanned cardiovascular intervention
Mediterranean	-17 (-26 to -5)	-13 (-17 to -6)	-7 (-11 to -1)	-17 (-21 to -11)	-1 (-12 to 16)
Low fat	-9 (-15 to -3)	-6 (-11 to 1)	0 (-5 to 6)	-7 (-13 to -1)	-13 (-20 to -2)
Very low fat	-3 (-14 to 10)	0 (-10 to 14)	-1 (-7 to 9)	6 (-4 to 20)	-2 (-14 to 19)
Modified fat	3 (-12 to 22)	3 (-7 to 17)	13 (-9 to 74)	-4 (-13 to 11)	NA
Combined low fat-low sodium	1 (-11 to 15)	2 (-12 to 25)	-8 (-14 to 5)	21 (-2 to 59)	10 (-12 to 59)
Ornish	76 (-46 to 553)	13 (-22 to 179)	NA	NA	-2 (-22 to 60)
Pritikin	-48 (-61 to 207)	NA	30 (-19 to 561)	NA	NA

High risk 20-30% 5 year CVD risk

Dietary programme v minimal intervention	All cause mortality	Cardiovascular mortality	Stroke	Non-fatal myocardial infarction	Unplanned cardiovascular intervention
Mediterranean	-36 (-58 to -10)	-39 (-54 to -19)	-16 (-25 to -3)	-42 (-53 to -28)	-4 (-51 to 62)
Low fat	-20 (-33 to -6)	-17 (-34 to 4)	0 (-12 to 13)	-18 (-31 to -3)	-57 (-89 to -9)
Very low fat	-6 (-29 to 22)	-1 (-30 to 40)	-1 (-16 to 20)	15 (-11 to 48)	-6 (-61 to 74)
Modified fat	6 (-25 to 44)	8 (-21 to 49)	29 (-21 to 151)	-9 (-32 to 26)	NA
Combined low fat-low sodium	2 (-23 to 32)	5 (-36 to 70)	-17 (-32 to 11)	42 (-7 to 116)	41 (-54 to 199)
Ornish	145 (-104 to 659)	38 (-67 to 380)	NA	NA	-10 (-101 to 202)
Pritikin	-109 (-141 to 338)	NA	63 (-43 to 718)	NA	NA

Superior to minimal intervention with moderate to high certainty

Little or no benefit relative to minimal intervention with moderate to high certainty

Might be superior to minimal intervention with very low to low certainty

Might have little or no benefit relative to minimal intervention with very low to low certainty

Superior to minimal intervention with moderate to high certainty

Little or no benefit relative to minimal intervention with moderate to high certainty

Might be superior to minimal intervention with very low to low certainty

Might have little or no benefit relative to minimal intervention with very low to low certainty

Absolute differences - over 5 years

Dietary programme v minimal intervention (usual or no/minimal advice)	All cause mortality		Cardiovascular mortality		Stroke		Non-fatal myocardial infarction		Unplanned cardiovascular intervention	
	INTER-MEDIATE	HIGH	INTER-MEDIATE	HIGH	INTER-MEDIATE	HIGH	INTER-MEDIATE	HIGH	INTER-MEDIATE	HIGH
Mediterranean	2% ↓	4% ↓	1% ↓	4% ↓	1% ↓	2% ↓	2% ↓	4% ↓	No difference	
Low fat (20-30%)	1% ↓	2% ↓	No difference		No difference		1% ↓	2% ↓	No difference	
Very low fat (10-20%)	No difference									
Modified fat (↑ in PUFA/SF)	No difference									
Combined low fat-low sodium	No difference									
Ornish (<10% fat)	No difference									
Pritikin (<10% fat)	No difference									
Low carb	NO TRIALS									

Intermediate risk 5-10% 5 year CVD risk

High risk 20-30% 5 year CVD risk

What is the answer?

Teasing out the benefits and harms of things we eat is **EXTREMELY** complicated

SINGLE NUTRIENTS

Not enough robust data to ascribe causality

Some interesting associations - eggs, salt, coffee, alcohol

MULTIPLE NUTRIENTS AND BEHAVIOURS

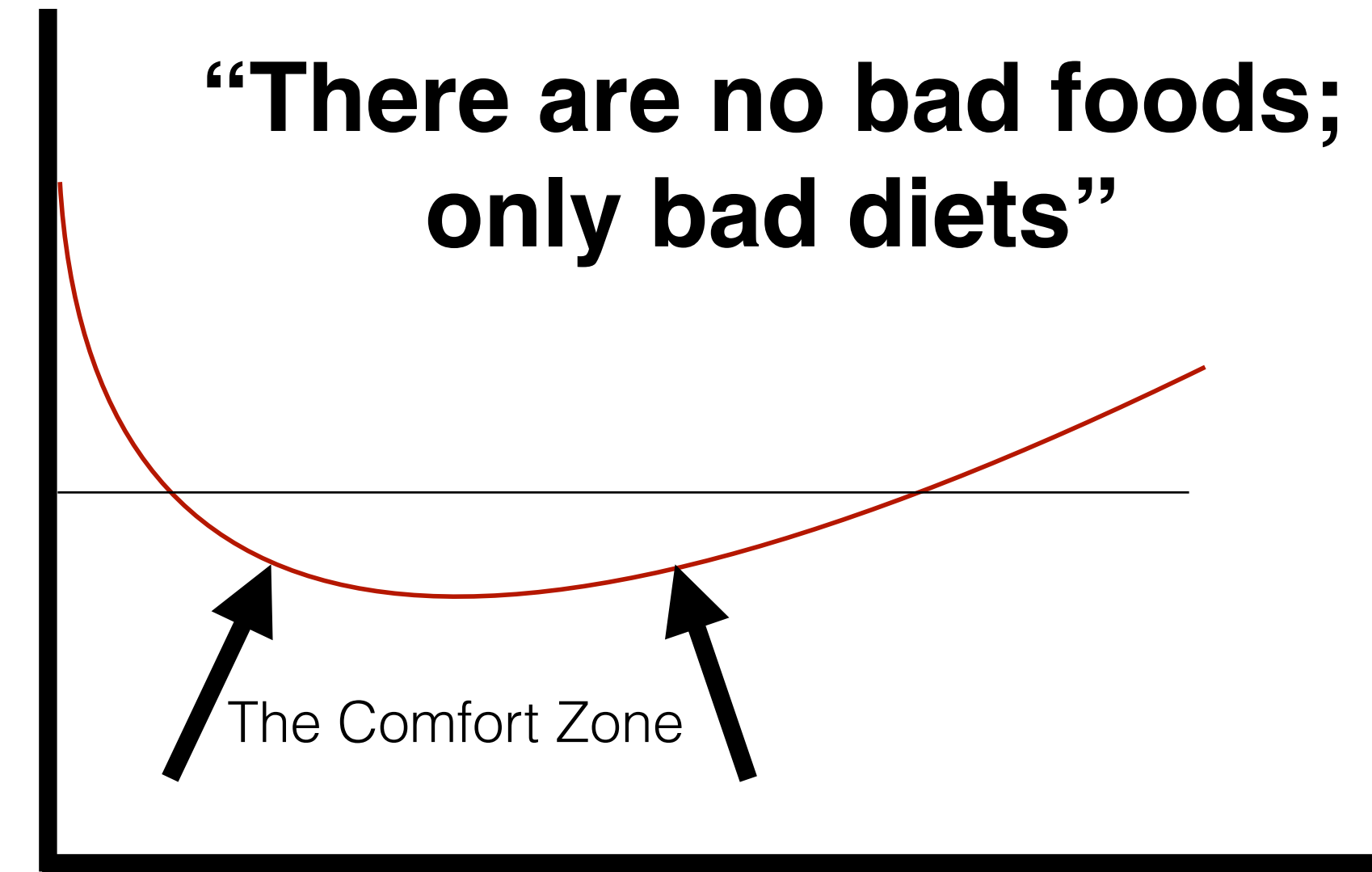
Issues of RCTs and Cohorts - bias and confounding - answer may be unknowable

How to best lose weight is very individual - low carb/higher fat/protein maybe somewhat better? - is the difference important?

Overall nutrition is hugely personal and emotional

**“There are no bad foods;
only bad diets”**

Bad Outcomes



Nothing

Moderation

Way to !@#\$\$% much

Food Ingestion

Nutrition advice to which pretty much everyone agrees

But the magnitude of the effect is “smaller than you may think”

based on the Best Available Evidence

1. Eat a greater percentage of whole foods (food that has not been overly processed or refined as little as possible)
2. Eat more vegetables
3. Eat less added sugar
4. Eat more whole grains
- 5. Eat in a style that fits your food preferences, tolerances, and lifestyle**
- 6. Eat in a style you can sustain**
- 7. When it comes to weight, how much you eat is really the KEY issue**
8. The “best” weight is the weight you are when living the healthiest life you can enjoy
9. Avoid any food that has, for you, been properly shown to cause unacceptable intolerances

BUT THERE ARE BIG CAVEATS

Almost all the nutrition “benefits and harms” evidence comes from cohort studies

real possibility of important publication bias because 100s to 1000s of researchers are looking at 100s of different databases

many potential confounders - let alone data collection issues

many associations seen in cohort studies are quite small (<10% relative) and only seen when you compare “lots quantiles” to “not much at all quantiles”

in general - single cohorts - unless that is all you have - should not be used as solid evidence

Much of nutrition research is on surrogate markers (blood pressure, lipids, glucose)

the changes seen **IF** they translated into effects on clinical outcomes would only amount to a 1% (at most 2%) absolute change in CVD risk over 10 years

in general - single RCTs of surrogates - should not be considered high quality evidence

There are only 5 large RCTs (2+years) that have looked at important clinical outcomes

the “best evidence” is for the “Mediterranean Diet” and even that only showed a 1-2% absolute ↓ in stroke over 5 years - but a bigger decrease (↓3-8%) if secondary prevention

THESE ARE ACTUALLY PRETTY REASONABLE CONSIDERING THE EVIDENCE

Canada's food guide

Eat well. Live well.

Eat a variety of healthy foods each day

Have plenty of vegetables and fruits

Eat protein foods

Make water your drink of choice

Choose whole grain foods

Discover your food guide at Canada.ca/FoodGuide

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Health Canada Santé Canada

Canada

CANADA

Fruits

Grains

Vegetables

Protein

Dairy

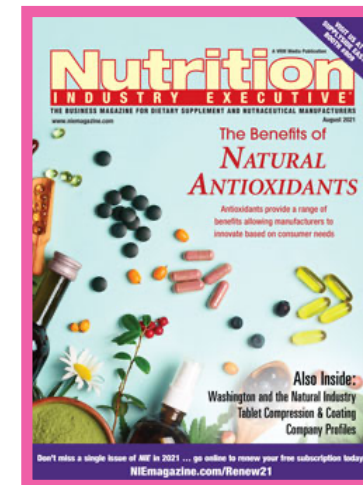
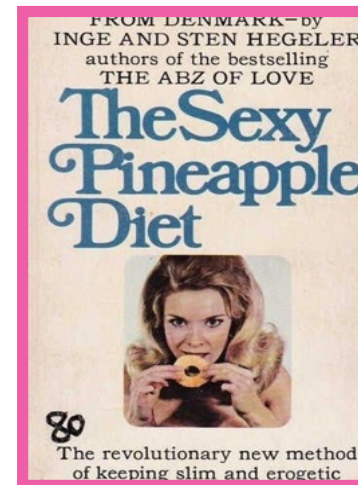
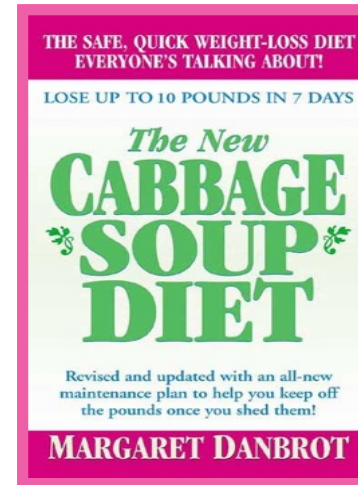
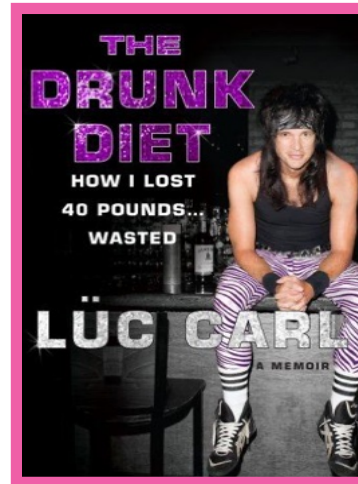
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Anything else is likely

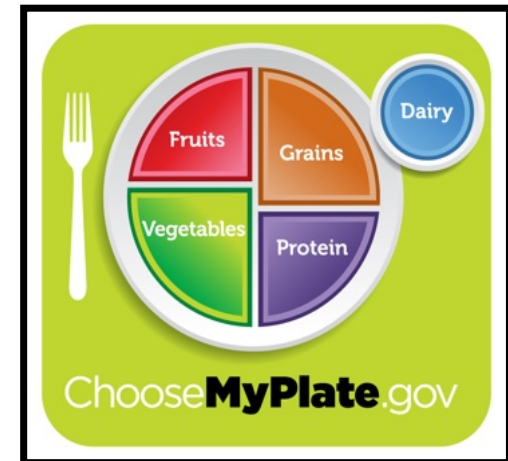
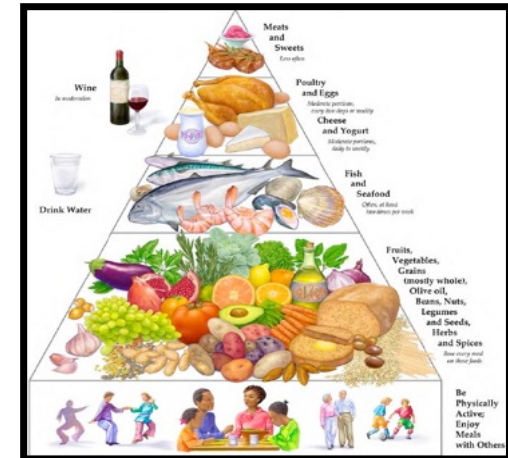


assuming you wish your eating to be informed by the best available evidence



1. ENJOY EATING

- 2. Differences in outcomes are typically found from “**extremes**” and are “**small**”
- 3. The **Mediterranean diet** (whatever it is) seems reasonable - also CFG/USDA/DASH
- 4. Eat in **moderation/moderation/moderation**
- 5. Avoid eating “lots” of **ultra processed food**
- 6. You can easily justify some red meat, butter etc
- 7. Eggs, coffee, salt, and alcohol in moderation seem fine
- 8. **Saturated fats - OK** - trans-fat?
- 9. **Added sugars (beverages mainly) at the high end** seem to increase risk of obesity
- 10. It is **VERY unlikely** a single “nutrient” would have an important effect
- 11. Animal rights/environmental issues are a whole other topic





YOUR

TABLE

IS READY

IF THERE IS CAUSATION, WHAT DO ALL THESE NUMBERS MEAN

BALLPARK

2 drinks a day ~15% relative increase for oral/GI/breast cancers

“Three slices of bacon” a day ~15% relative increase for oral/GI cancers

Lifetime risks of cancers, for the two foods associated with an increased risk of cancer

ORAL/GI CANCERS

Male/Female - 6% BASELINE RISK

~15% relative increase = ~1% absolute increase over a lifetime

BREAST

Female - 13% BASELINE RISK

~15% relative increase = ~2% absolute increase over a lifetime