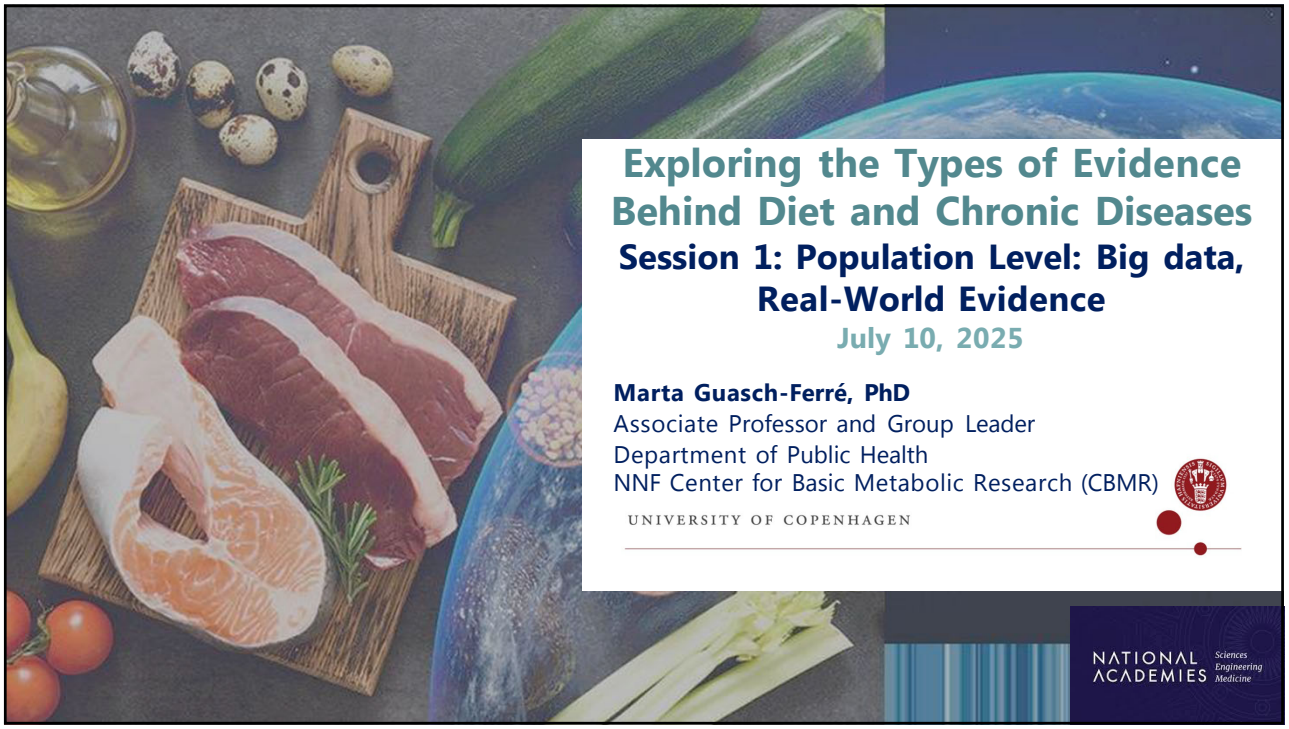

Exploring the Types of Evidence Behind Diet and Chronic Diseases

Session 1: Population Level: Big data, Real-World Evidence

July 10, 2025

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Associate Professor and Group Leader
Department of Public Health
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NATIONAL ACADEMIES Sciences Engineering Medicine

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Cardiovascular diseases can be prevented

The American Heart Association Life's Essential 8

Eat Healthy	Get Active	Manage Blood Glucose	Maintain a Healthy Weight	Control Blood Cholesterol	Manage Blood Pressure	Stop Smoking	Prioritize Healthy Sleep

2

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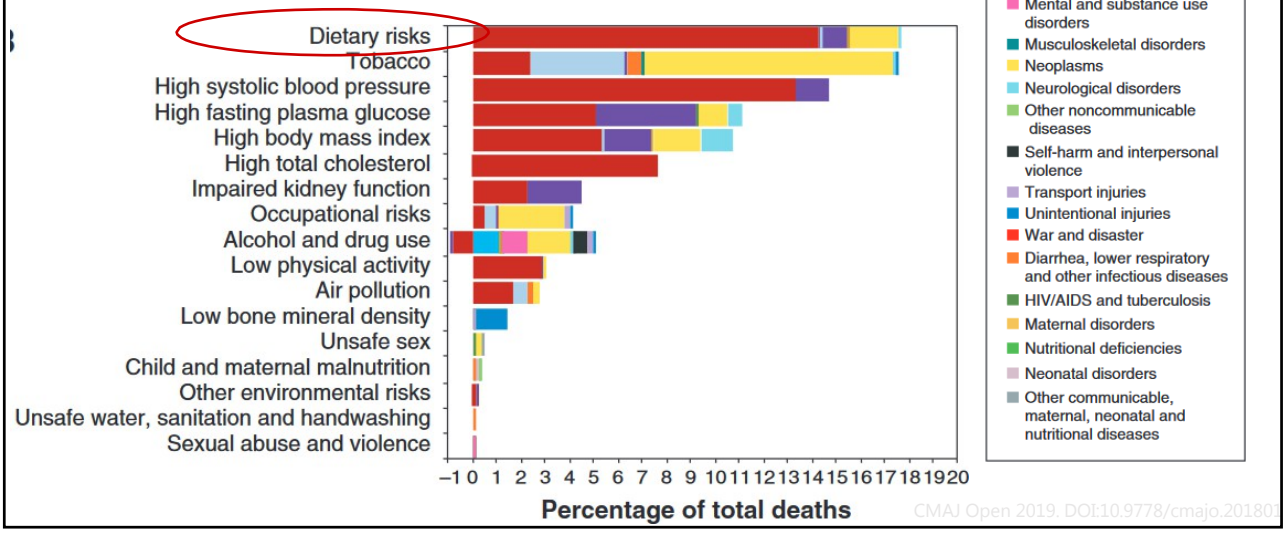
Burden of diseases and injuries attributable to risk factors : Global Burden of Disease Study



CMAJ Open 2019. DOI:10.9778/cmajo.20180

3

TIME

Coffee: Is It Bad For You?

Markham Heid @markhamh | Aug. 20, 2014 | Updated: July 19, 2016 11:35 AM ET

For years, your morning joe got a bad rap from health experts. But newer research suggests coffee may actually be good for you—if you follow the rules

"I gave up coffee" is a refrain of the health conscious. But should it be? The idea that coffee is a dangerous, addictive stimulant springs mostly from 1970s- and 1980s-era studies that tied the drink to higher rates of cancer and heart disease,

CANADA

Can drinking wine replace the gym? You wish!

By Su-Ling Goh · Global News
Posted February 4, 2015 8:03 pm · Updated February 4, 2015 9:11 pm

EATING AND HEALTH

Processed And Red Meat Could Cause Cancer? Your Questions Answered

October 26, 2015 · 5:04 PM ET
Heard on All Things Considered

U.S.News & WORLD REPORT

Study: Drinking Alcohol More Important Than Exercise to Living Past 90

Instead of an apple a day, try a glass of wine.

The Atlantic

Don't Hold the Salt: Attempts to Curb Sodium Intake Are Misguided

MICHAEL S. FENSTER | JAN 4, 2012 | HEALTH

The New York Times

The Opinion Pages | CONTRIBUTING OP-ED WRITER

Butter Is Back

Mark Bittman MARCH 25, 2014

The Guardian

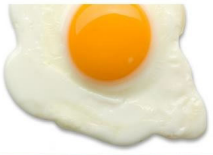
Cakes and drinks sweetener neotame can damage gut wall, scientists find

Industry's sugar substitute E961 can have 'toxic effect on health', says study finding sweetener capable of damaging intestinal bacteria

Eggs Are Back: The Earnest Simplicity of the New Nutrition Guidelines

The proposed 2015 U.S. dietary recommendations were revealed today.

JAMES HAMBLIN | FEB 19 2015, 5:14 PM ET



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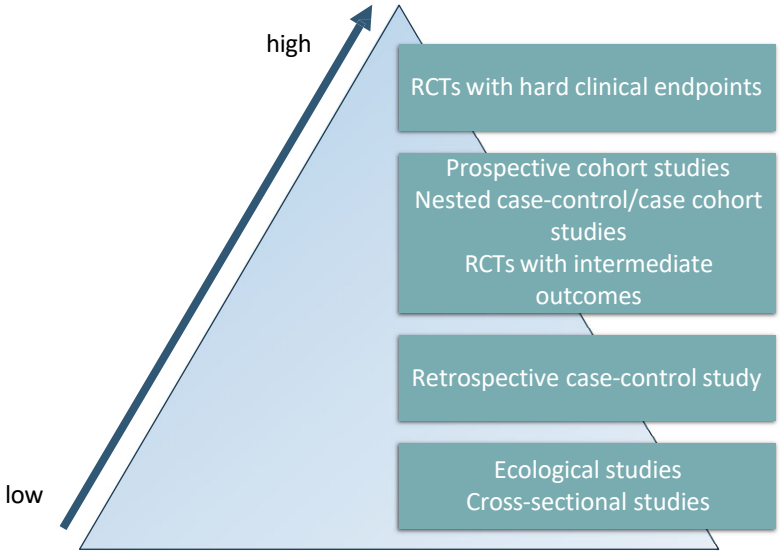
Hierarchy on study designs



'gold standard' but not always feasible (i.e. for some diseases such as CVD long follow-up needed)

More time consuming, expensive
Prospective associations

Quick, easy to perform
Can't establish causality, more prone to bias (ie. selection bias)

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Advantages and limitations of study designs

	Description	Advantages	Disadvantages
Ecological studies	Observational study in a group (i.e. country)	Quick Inexpensive	Selection bias Shows correlation but no causation
Cross-sectional studies	Survey in a population at a single time point	Quick Inexpensive	Difficult to know if exposure preceded outcome No follow-up More prone to bias (selection bias, reverse causation)
Case-control studies	Two groups of people selected: one with disease one without	Quick and inexpensive Can study rare outcomes	Selection bias Can study only one disease at a time Recall bias
Cohort studies	Participants classified according to a particularly exposure that are followed up prospectively to see who develops the disease	Risk is easily calculated Large populations Prospective (longitudinal) design Many disease outcomes	Time consuming because of follow-up Can be expensive Risk of subjects lost of follow-up
Randomized controlled trials	Comparison of a group receiving an intervention with a control group	Randomization reduces confounding Considered the 'gold standard' Control of interventions	Time consuming Expensive Sufficient recruitment can be difficult Risk of non-compliance

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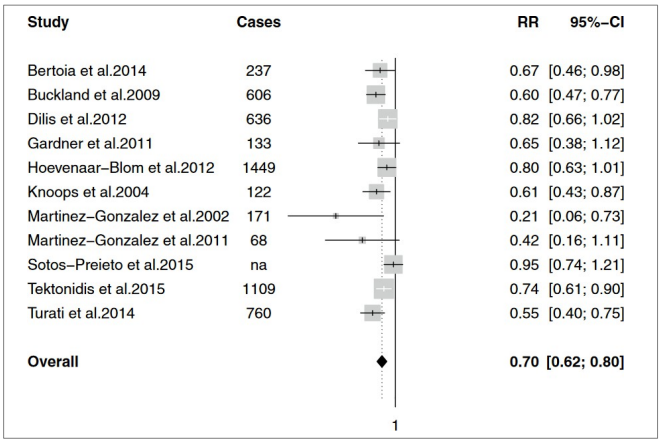
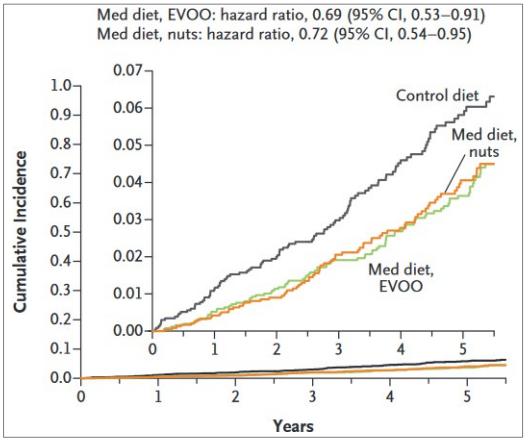
Mediterranean diet and primary prevention of CVD



Prospective cohort studies: ~30 lower risk of CVD



RCT ~30 lower risk of CVD

European Journal of Nutrition (2019) 58:173–191

N Engl J Med 2018;378:e34.

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Bradford-Hill criteria for inferring causality from cohort

A checklist of several key conditions for establishing causality:

- Strength of the association
- Consistency of the association
- Specificity
- Temporality
- Biological gradient (dose-response)
- Biological plausibility
- Biological Coherence
- Experimental evidence
- Analogy

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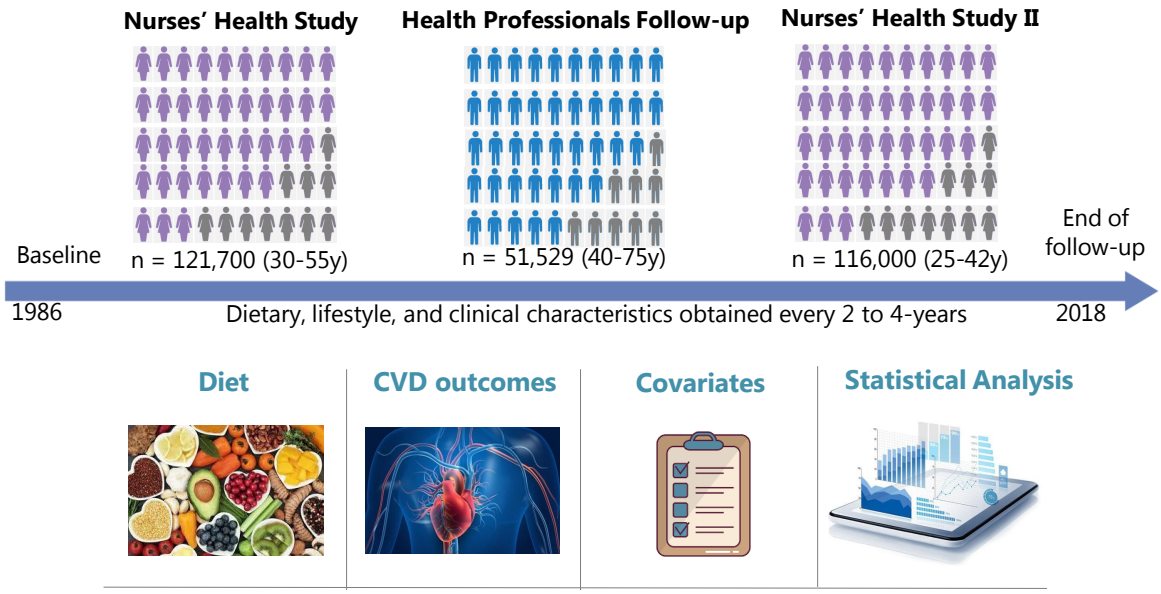
Prospective cohort studies: example of design



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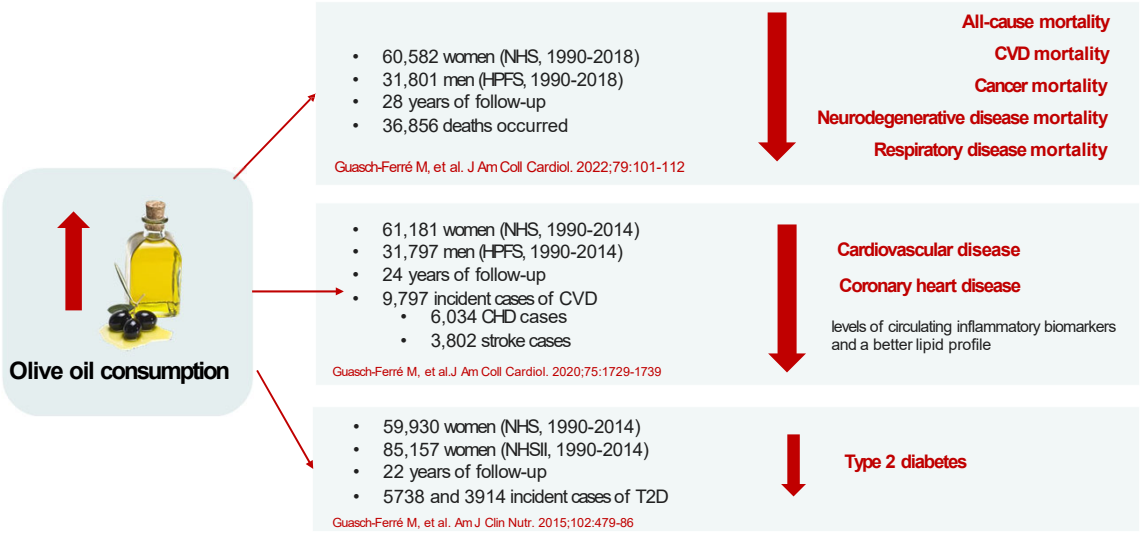
Olive oil associated with lower risk of diseases



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Optimal dietary patterns for healthy aging

nature medicine

Article

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Optimal dietary patterns for healthy aging

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Anne-Julie Tessier[1,2,3,4], Fenglei Wang[1], Andres Ardisson Korat[5,6], A. Heather Eliassen[1,7,8], Jorge Chavarro[1,7,8], Francine Grodstein[9], Jun Li[1,10], Liming Liang[7,11], Walter C. Willett[1,7,8], Qi Sun[1,7,8], Meir J. Stampfer[1,7,8], Frank B. Hu[1,7,8] & Marta Guasch-Ferré[1,12,13]

Healthy aging:
- Survived to 70 years
- Free of 11 chronic diseases
- Intact mental health
- Intact cognitive health
- Intact physical function


Anne-Julie Tessier


Marta Guasch-Ferré

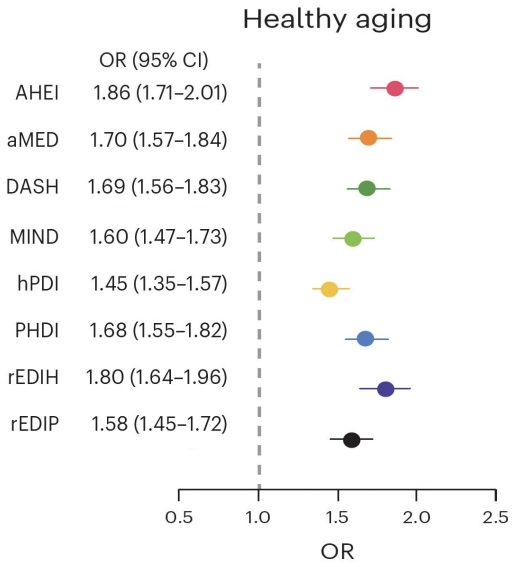

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Illustration by S.H. Nielsen

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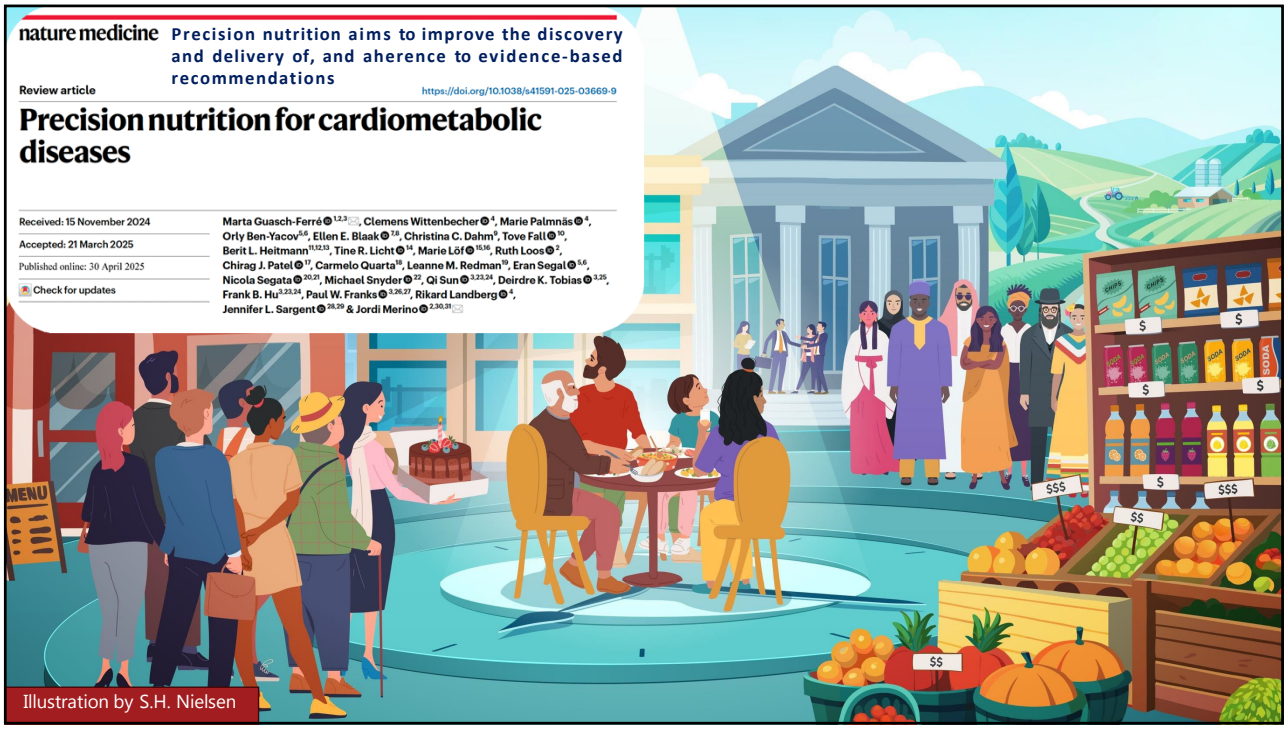
nature medicine
Precision nutrition aims to improve the discovery and delivery of, and aherence to evidence-based recommendations
Review article
https://doi.org/10.1038/s41591-025-03669-9
Precision nutrition for cardiometabolic diseases
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