Roundtable on measuring health promotion: Translating science into policy

Council for Responsible Nutrition
CRN-I™
INTERNATIONAL

CONTACT

CRN-I's mission is to provide science-based information to regulators, health care professionals and the media, particularly those outside the United States, supporting the safety and benefit of dietary ingredients and dietary/food supplements, and to promote sound nutrition and food safety policies well-grounded in science.

CRN-I celebrates ten years: 2009–2019

UPCOMING EVENTS:

ROUNDTABLE ON MEASURING HEALTH PROMOTION: TRANSLATING SCIENCE INTO POLICY

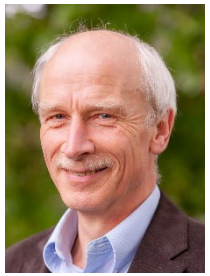
Introduction and Setting the Stage

James Griffiths, CRN-International Staff

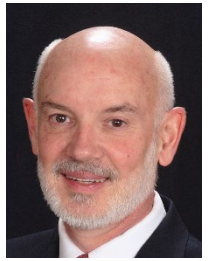
Samet Serttas, CRN-International Board

Definition of health promotion and Health Literacy: WHO perspective
Dr. Faten Ben Abdelaziz,
Coordinator, Health Promotion, Prevention of Noncommunicable Diseases,
WHO, Geneva, Switzerland

Credibility and Capability of Nutrition Sciences in the Perspective of Health Promotion
Dr. Jan DeVries,
President of the Nutrition in Transition Foundation
Member Dutch Academy of Nutrition Sciences
Gorssel, Netherlands



Defining a Healthy Gut Microbiome: Lessons Learned from Nutrtion
Dr. Michael McBurney,
Adjunct professor,
University of Guelph,
Guelph, Canada



Phenotypic Flexibility and Health Promotion
Dr. Suzan Wopereis
Senior Scientist - Systems Biology
TNO Innovation for Life
Zeist, Netherlands

NCD Interventions that are Health Promoting
Dr. Temo Waqanivalu,
Technical Officer, Health Promotion, Prevention of Noncommunicable Diseases,
WHO, Geneva, Switzerland

VIRGINIA LIFE EXPECTANCY DISPARITIES

25

The difference in life expectancy between Virginia cities Manassas Park and Galax, according to the latest County Health Rankings from the Robert Wood Johnson Foundation, one of the nation's largest public health philanthropic organizations. Residents of Manassas Park, a city of about 16,500 people outside D.C., live to 91 years old on average. But residents of Galax, a city of about 6,600 a five-hour drive away in Southwest Virginia, typically live to just 66. That wide gap in life expectancy reflects the disparities in health outcomes in Virginia, the foundation says. (AP)

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Manassas Park, VA

Galax, VA

25

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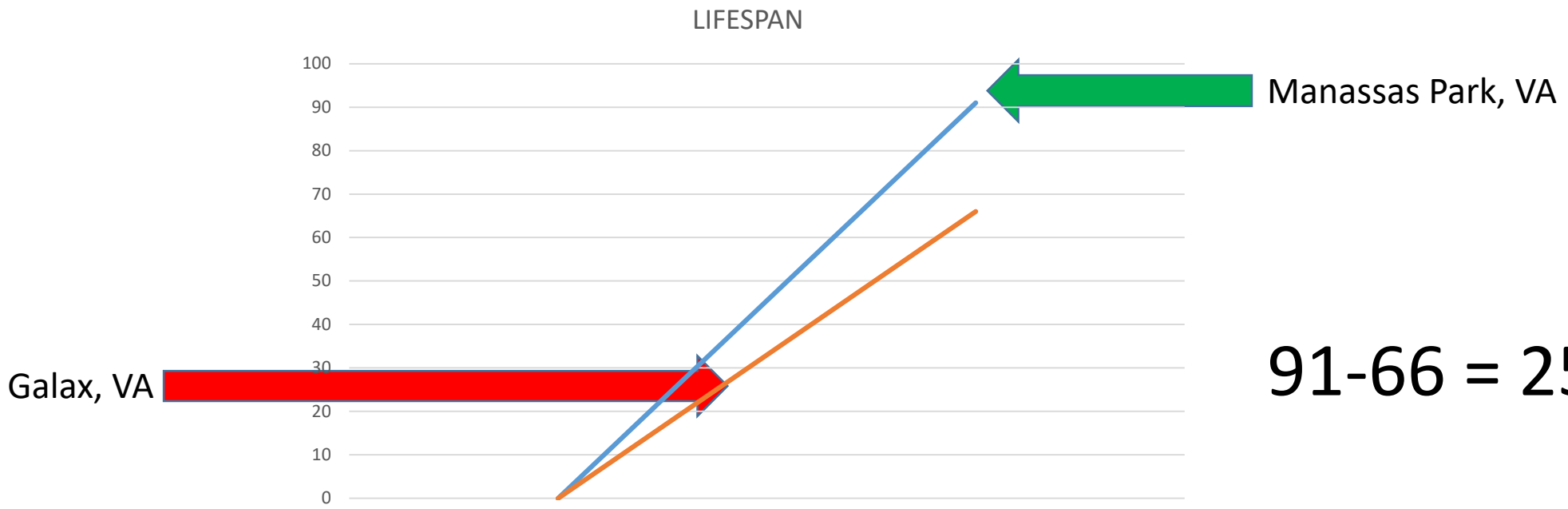
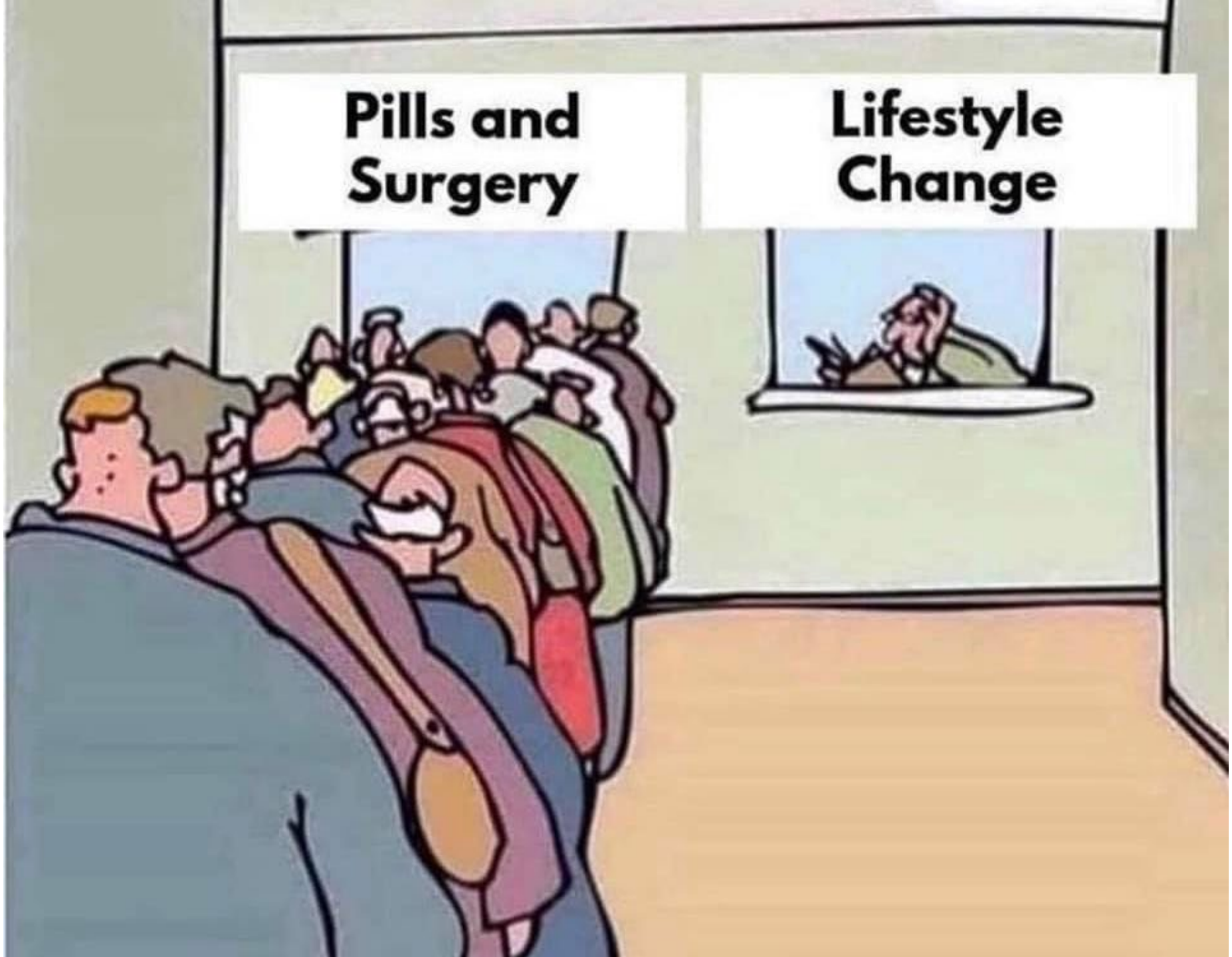


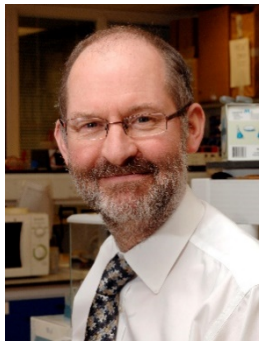
91-66 = 25 YEARS


Pills and Surgery
Lifestyle Change

FROM LIFESPAN TO HEALTHSPAN: THE ROLE OF NUTRITION IN HEALTHY AGEING

Introduction and Setting the Stage
Daniel S. Marsman, DVM, PhD
Worldwide Product Safety
Procter & Gamble Health Care
Cincinnati, Ohio, United States of America

Dietary Interventions to Promote Healthier Ageing
John Mathers, PhD
Director of the Human Nutrition Research Centre
Institute of Cellular Medicine and Newcastle University Institute for Ageing
Newcastle University
Newcastle on Tyne, United Kingdom



The Public Health Significance of Improving Healthspan (vs. Lifespan)
Kremlin Wickramasinghe, PhD
Technical Officer - Noncommunicable Diseases
WHO European Office for Prevention and
Control of Noncommunicable Diseases (NCD Office)
Moscow, Russian Federation

Impact of (Personalized) Nutrition on Healthy Ageing from the Perspective of Phenotypic Flexibility'
Suzan Wopereis, PhD
Senior Scientist - Systems Biology
TNO Innovation for Life
Zeist, Netherlands

World Health Organization

Definition of health promotion: WHO perspective on Health Literacy

Dr Faten Ben Abdelaziz, Health Promotion Department, WHO

Roundtable on measuring health promotion: Translating science into policy, Dusseldorf, Germany, 28 November 2019

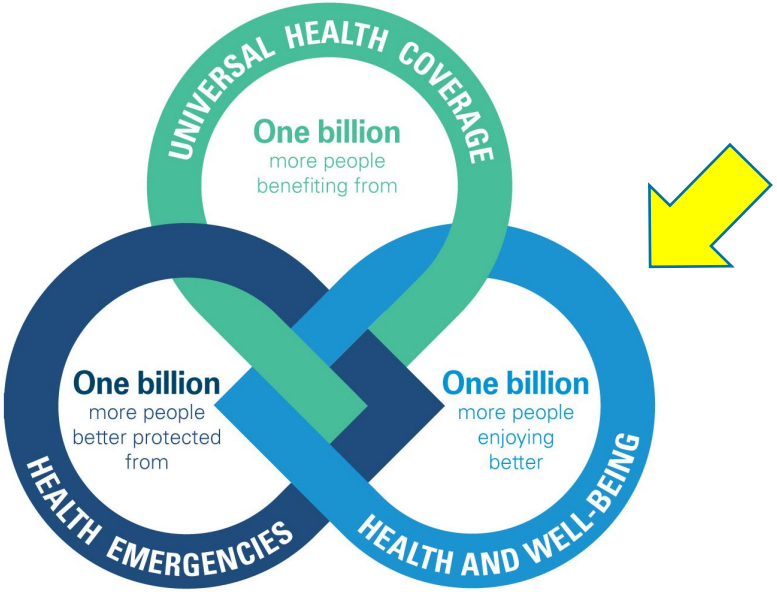
Outline

World Health Organization

- Background
- Measuring health promotion
- Defining health literacy
- Measuring health literacy
- Concluding remarks

Context: Agenda 2030

World Health Organization



The SDGs provide a unique opportunity to address health and its many determinants in an integrated and transformative way

- The GPW13 sets the strategic direction for WHO work
- Focused on country impact
- Strives for outcomes rather than output

Healthier Populations Division

World Health Organization

Ensuring one billion people are enjoying better health and well -being by 2023

Vision

A world which is free of health inequalities and preventable disease caused by risks and other determinants of health and where all people enjoy well-being through health protection and promotion, preventive actions and healthy life choices.

Mission

Contribute to people enjoying better health and wellbeing, and reduced health inequalities, through a coordinated inter-sectoral approach acting on health determinants.

Health Promotion Department

World Health Organization

Health and Wellbeing

No tobacco

Less alcohol

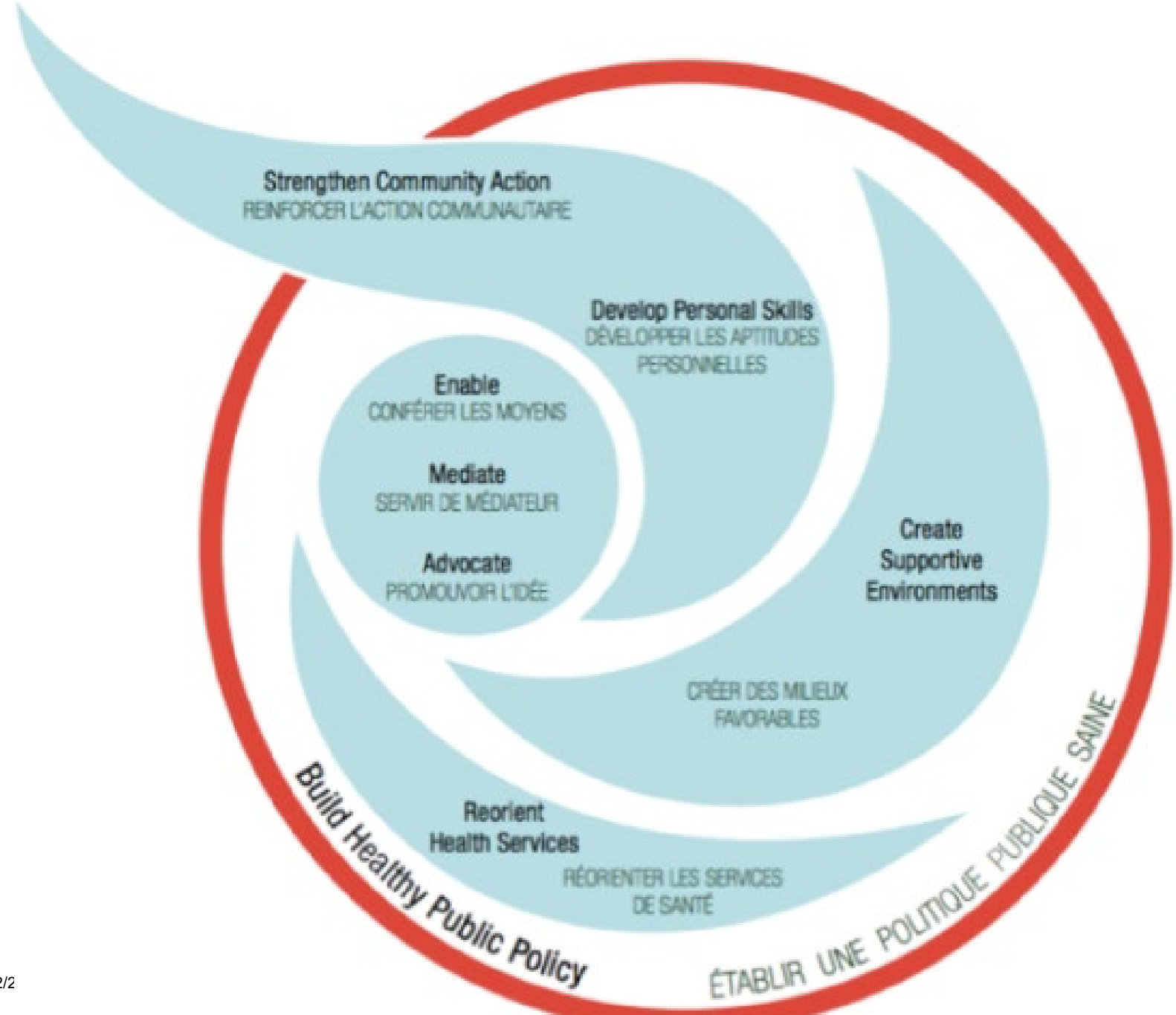
More Physical activity

Health Promotion

World Health Organization

*"health promotion is the **process** of enabling people to exert control over their health and their determinants"*

(Ottawa Charter, 1986)


Strengthen Community Action
REINFORCER L'ACTION COMMUNAUTAIRE
Develop Personal Skills
DÉVELOPPER LES APTITUDES PERSONNELLES
Enable
CONFÉRER LES MOYENS
Mediate
SERVIR DE MÉDIATEUR
Advocate
PROMOUVOIR L'IDÉE
Create Supportive Environments
CRÉER DES MILIEUX FAVORABLES
Reorient Health Services
RÉORIENTER LES SERVICES DE SANTÉ
Build Healthy Public Policy
ÉTABLIR UNE POLITIQUE PUBLIQUE SAINE

Shanghai Declaration (WHO, 2016)

World Health Organization

- Good governance for health
- Healthy cities and communities
- Health literacy
- Social mobilization

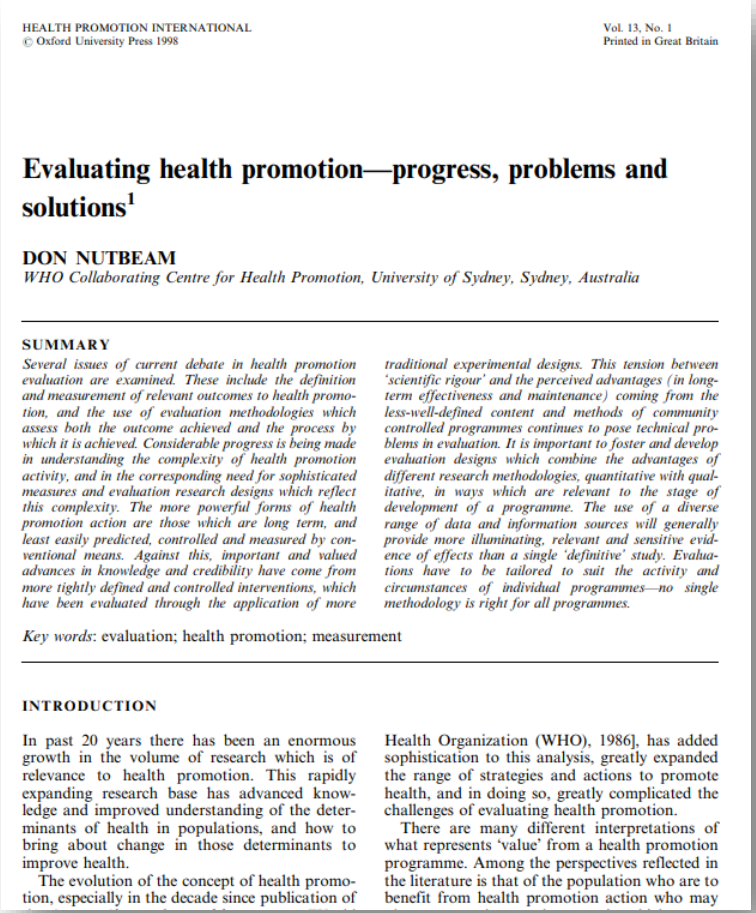
Measuring health promotion

World Health Organization

*"health outcomes which are defined mainly in terms of physical function or disease state, are not necessarily the same as the 'valued **outcomes**' from health promotion"*

(Nutbeam, 1998)

Outcomes eg:
Quality of life, Functional independence, Equity …



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Evaluating health promotion—progress, problems and solutions[1]

DON NUTBEAM
WHO Collaborating Centre for Health Promotion, University of Sydney, Sydney, Australia

SUMMARY

Several issues of current debate in health promotion evaluation are examined. These include the definition and measurement of relevant outcomes to health promotion, and the use of evaluation methodologies which assess both the outcome achieved and the process by which it is achieved. Considerable progress is being made in understanding the complexity of health promotion activity, and in the corresponding need for sophisticated measures and evaluation research designs which reflect this complexity. The more powerful forms of health promotion action are those which are long term, and least easily predicted, controlled and measured by conventional means. Against this, important and valued advances in knowledge and credibility have come from more tightly defined and controlled interventions, which have been evaluated through the application of more traditional experimental designs. This tension between 'scientific rigour' and the perceived advantages (in long-term effectiveness and maintenance) coming from the less-well-defined content and methods of community controlled programmes continues to pose technical problems in evaluation. It is important to foster and develop evaluation designs which combine the advantages of different research methodologies, quantitative with qualitative, in ways which are relevant to the stage of development of a programme. The use of a diverse range of data and information sources will generally provide more illuminating, relevant and sensitive evidence of effects than a single 'definitive' study. Evaluations have to be tailored to suit the activity and circumstances of individual programmes—no single methodology is right for all programmes.

Key words: evaluation; health promotion; measurement

INTRODUCTION

In past 20 years there has been an enormous growth in the volume of research which is of relevance to health promotion. This rapidly expanding research base has advanced knowledge and improved understanding of the determinants of health in populations, and how to bring about change in those determinants to improve health.

The evolution of the concept of health promotion, especially in the decade since publication of Health Organization (WHO), 1986], has added sophistication to this analysis, greatly expanded the range of strategies and actions to promote health, and in doing so, greatly complicated the challenges of evaluating health promotion.

There are many different interpretations of what represents 'value' from a health promotion programme. Among the perspectives reflected in the literature is that of the population who are to benefit from health promotion action who may

Measuring health promotion

World Health Organization

Figure 1 Program Management for Integrated Health Promotion Programs/Services

Program management for integrated health promotion involves managing the total set of actions, including:

1. PLANNING	1(a) Vision setting	3. EVALUATION
	1(b) Priority setting and Problem definition	
	1(c) Solution generation	3(a) PROCESS EVALUATION
	1(d) Capacity building – Support and resourcing for quality program delivery	
2. IMPLEMENTATION	Implementation of a mix of health promotion interventions and capacity building strategies to achieve the program goal and objectives	
3(b) IMPACT EVALUATION including:		
Health literacy	Social influence and action	Healthy public policy and organisational practice
Healthy lifestyles	Effective health services	Healthy environments
3(c) OUTCOME EVALUATION including:		
Quality of life, functional independence, equity, mortality, morbidity, disability		

Source: Measuring health promotion impacts: A guide to impact evaluation in integrated health promotion/ Australia, 2003

Measuring effectiveness of health promotion interventions requires:

World Health Organization

- Health and social outcomes
- Intermediate health outcomes
- Health promotion outcomes
- Health promotion actions

What is health literacy?

World Health Organization

Health literacy refers to:

"…the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health."

(Nutbeam, 1998)

What is health literacy?

World Health Organization

Critical health literacy

The most advanced cognitive and social skills which enable people to critically analyse health information from a variety of sources and use this information to exert greater control over personal health decisions and the wider influences on those decisions.

Communicative health literacy

More advanced literacy and personal skills required to access, understand and discriminate between health information from different sources, and independently apply new information to changing circumstances.

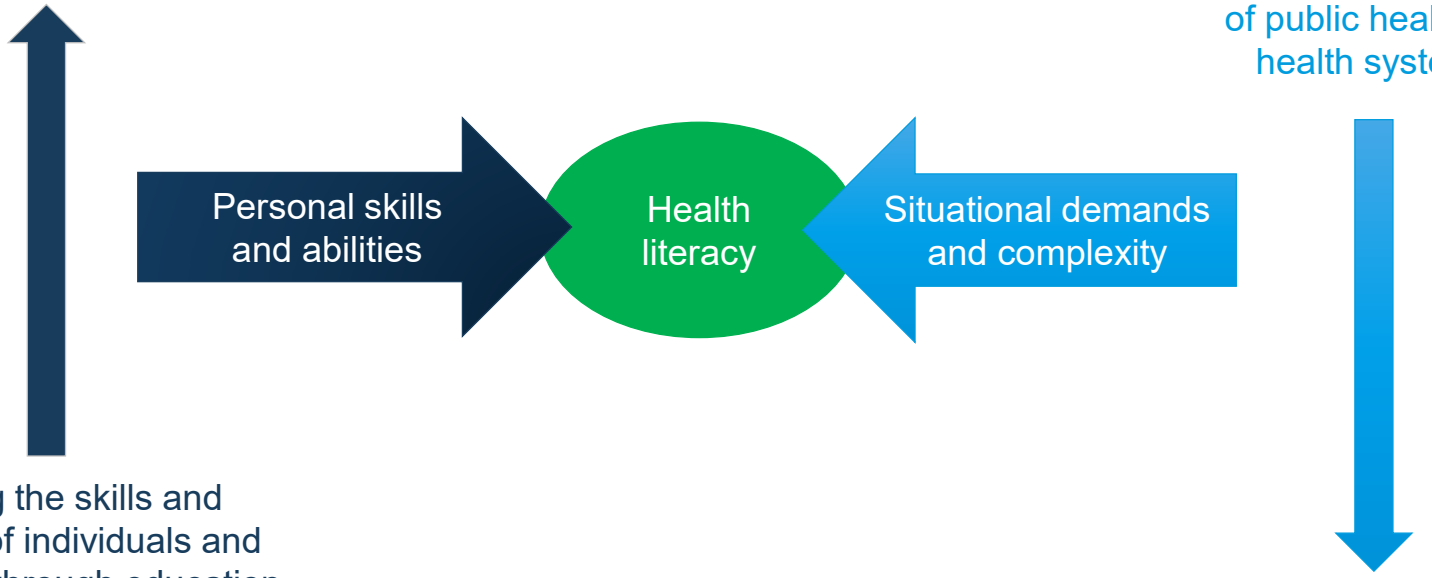
Functional health literacy

Refers to the basic skills in reading and writing as well as knowledge of health conditions and health systems needed to obtain health information, and comply with this information.

Source: Nutbeam, Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promot Int, 2000

Improving & measuring Health Literacy

World Health Organization



Reducing the complexity of public health and health systems.

Increasing the skills and confidence of individuals and communities through education and information which addresses functional, communicative and critical health literacy.

Source: Parker, R., & Ratzan, S. (2010). Health Literacy: A Second Decade of Distinction for Americans. *Journal of Health Communication*, *15* (Supp 2), 20–33.

Functional, communicative and critical health literacy

World Health Organization

Nutrition Facts

Serving Size			½ cup
Servings per container			4
Amount per serving			
Calories	250	Fat Cal	120
			%DV
Total Fat 13g			20%
Sat Fat 9g			40%
Cholesterol 28mg			12%
Sodium 55mg			2%
Total Carbohydrate 30g			12%
Dietary Fiber 2g			
Sugars 23g			
Protein 4g			8%

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

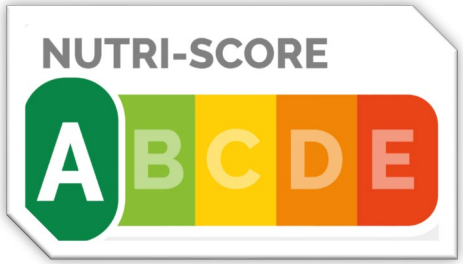
Functional:
Being able to read the label to find out how much salt the product contains.

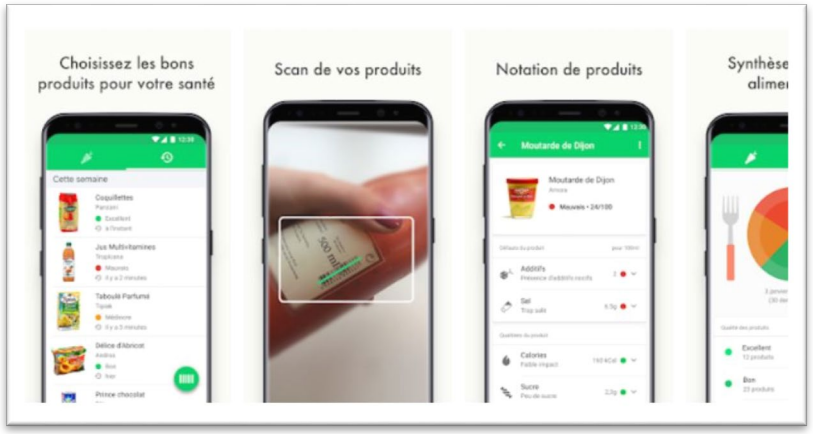
Communicative:
Being able to compare the salt content of two similar products and use this information to choose the healthier option.

Critical:
Understanding that food choices are ecologically situated and that effective regulations are not in place, and lobbying for changes in policy.

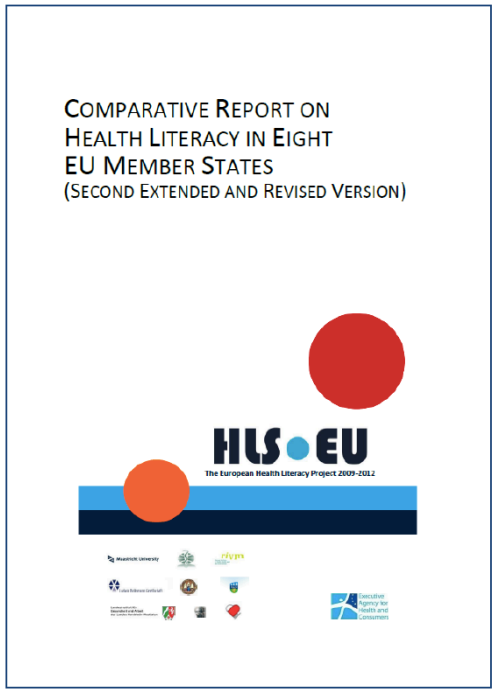
Food and drink literacy

- Nutritional information provided by some food manufacturers on pre-packaged products (depending on regulations)
- Helps consumers make informed food and drink choices
- Changing supply and demand





CASE STUDY: Measurement



HLS-EU-47

- HLS-EU survey used to measure health literacy in eight EU member states using probability samples of each 1000 EU citizens aged 15+ by personal interviews in 2011.

- Showed that:
  - Considerable proportions (1/3 to 2/3) of EU citizens have limited HL.
  - There is a social gradient of health literacy.

Source: Pelikan, J. M. (2018). From the European Health Literacy Survey (HLS-EU) to a European Action Network on the Measurement of Population and Organizational Health Literacy (M-POHL) within WHOs European Health Indicator Initiative (EHII)10th Annual Health Literacy Research Conference Bethesda, US.

Measure of adult Health literacy

World Health Organization

Health literacy (47)	Access/obtain information relevant to health (13)	Understand information relevant to health (11)	Process / appraise information relevant to health (12)	Apply / use information relevant to health (11)
Health care (16)	*1) Ability to access information on medical or clinical issues* ***(4 Questions)***	*2) Ability to understand medical information and derive meaning* ***(4 Questions)***	*3) Ability to interpret and evaluate medical information* ***(4 Questions)***	*4) Ability to make informed decisions on medical issues* ***(4 Questions)***
Disease prevention (15)	*5) Ability to access information on risk factors for health* ***(4 Questions)***	*6) Ability to understand information on risk factors and derive meaning (3 Questions)*	*7) Ability to interpret and evaluate information on risk factors for health (5 Questions)*	*8) Ability to make informed decisions on risk factors for health(3 Questions)*
Health promotion (16)	*9) Ability to update oneself on health related issues (5 Questions)*	*10) Ability to understand health related information and derive meaning (4 Questions)*	*11) Ability to interpret and evaluate information on health related issues (3 Questions)*	*12) Ability to make a informed decision on health related issues (4 Questions)*

Source: Pelikan, J. M., Röthlin, F., Ganahl, K., & Peer, S. (2014). *Measuring comprehensive health literacy in general populations – the HLS-EU instruments.* The Second International Conference of Health Literacy and Health Promotion. Oct. 6-8, 2014, Taipei / Taiwan.

Concluding remarks

World Health Organization

- Measuring HL is important especially for life style related issues
- Data on levels of HL is a marker of access to health information
- Countries should put in place regular HL surveys and address potential barriers
- Innovation and technology e.g. digital information are important tools to enhance HL of individuals on health issues.

Thank you

- For more information contact healthpromotion@who.int
- Join our webinar series at www.who.int/healthpromotion

World Health Organization

nutrition
in transition

www.nutritionintransition.nl

Nutrition Sciences Beyond Nutritionism In perspective of public health

Jan de Vries
Chair Foundation NiT
Dusseldorf, 28-11-2019

Eur J Nutr (2017) 56:2009–2012
DOI 10.1007/s00394-017-1507-y

EDITORIAL

Capable and credible? Challenging nutrition science

Bart Penders[1] · Anna Wolters[1] · Edith F. Feskens[2] · Fred Brouns[3] · Machteld Huber[4] · Els L. M. Maeckelberghe[5] · Gerjan Navis[6] · Theo Ockhuizen[7] · Jogchum Plat[3] · Jan Sikkema[8] · Marianne Stasse-Wolthuis[2] · Pieter van 't Veer[2] · Marcel Verweij[9] · Jan de Vries[10]

Received: 27 June 2017 / Accepted: 11 July 2017 / Published online: 17 July 2017
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Abstract Nutrition science has enriched our understanding of how to stay healthy by producing valuable knowledge about the interaction of nutrients, food, and the human body. Nutrition science also has raised societal awareness about the links between food consumption and well-being, and provided the basis for food regulations and dietary guidelines. Its collaborative and interdisciplinary research has accomplished much, scientifically and socially. Despite this, nutrition science appears to be in crisis and is currently confronted with a public reluctance to trust nutritional insights. Though deflating trust is a general phenomenon surrounding

In other words, nutrition science is facing limitations to its capability and credibility, impeding its societal value. We take up the challenge to halt the threatening erosion of nutrition science's capability and credibility, and explore a way forward. We analyse limitations to capability and credibility, then argue that nutrition science is caught in a vicious circle, and end by offering some suggestions to transcend the limitations and escape the current deadlock. We invite nutritional experts as well as scholars from adjacent disciplines to engage in the discussion.

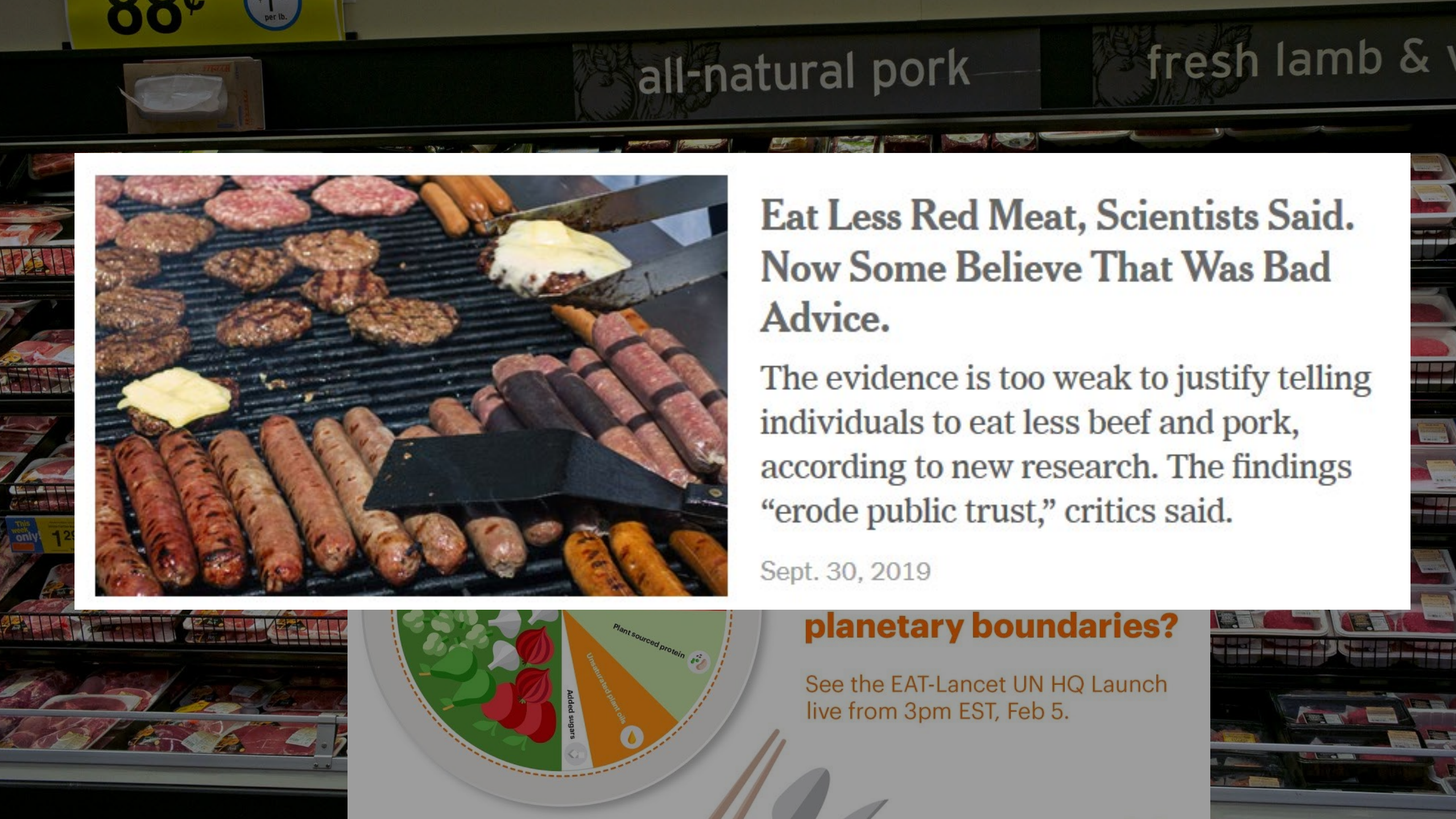
Keywords Nutrition science · Credibility · Capability ·

Capability and credibility, drawn from the pursuit of reciprocity, inclusiveness and a humble rhetoric in research practice and research translation alike will allow us to tell compelling narratives about how nutrition science helps to gain a better understanding of the interaction of dietary habits,foods, quality of life, and health.

What is Nutrition in Transition?

Why
Nutrition in Transition?

all-natural pork
fresh lamb &
Whole grains
Starchy vegetables
Dairy foods
Animal sourced protein
Plant sourced protein
Unsaturated plant oils
Added sugars
How can we feed a future population of 10 billion people a healthy diet within planetary boundaries?
See the EAT-Lancet UN HQ Launch live from 3pm EST, Feb 5.


88¢
per lb.
all-natural pork
fresh lamb &
Eat Less Red Meat, Scientists Said. Now Some Believe That Was Bad Advice.
The evidence is too weak to justify telling individuals to eat less beef and pork, according to new research. The findings "erode public trust," critics said.
Sept. 30, 2019
Plant sourced protein
Unsaturated plant oils
Added sugars
planetary boundaries?
See the EAT-Lancet UN HQ Launch live from 3pm EST, Feb 5.

Business

Research group that discounted risks of red meat has ties to program partly backed by beef industry

Sept. 30, 2019

See the EAT-Lancet UN HQ Launch live from 3pm EST, Feb 5.

Nutrition Science needs to reflect on its field

The Nutrition in Transition group

prof. em. dr. Fred Brouns, nutrition scientist, Maastricht University

prof. dr. Edith Feskens, nutrition scientist, Wageningen University

prof. dr. ir. Hinke Haisma, health geographer, Groningen University

dr. Wim Calame, biostatistician, Statistical

dr. Machteld Huber, arts, Institute for positive health

dr. Els Maeckelberghe, ethicist, Groningen University

prof. dr. Gerjan Navis, medical doctor, Groningen University

dr. Theo Ockhuizen, nutrition scientist, Nutricom Consultancy

dr. Bart Penders, sociologist of science , Maastricht University

prof. dr. Jogchum Plat, nutrition scientist, Maastricht University

dr. ir. Gerda Pot, nutrition scientist, King’s College London

dr. Jan Sikkema, nutrition scientist, Groningen University

prof. dr. ir. Pieter van ‘t Veer, nutrition scientist, Wageningen University

prof. dr. Marcel Verweij, philosofer of science, Wageningen University

prof. dr. Emely de Vet, behavorial scientist, Wageningen University

dr. Jan de Vries, nutrition scientist, NutritionSolutions

Anna Wolters, MPhil, sociologist of science , Maastricht University

The credibility and capability of nutrition science is at stake.

Challenges for nutrition sciences

Scientific challenges

- Transdisciplinary — Biomedical, cultural, environmental
- Multi-level — Personal and system level behaviour and outcomes
- Inter-generational — Sustainability, present and future generations

Societal challenges

- Multi-sectoral — In-between agricultural and health care sector
- Multi-stakeholder — Public and private problems & solutions

Food systems transition, diet transition?

Science transition!

Given the grand societal challenge of sustainable diets, should nutritional sciences:

Stick to the biomedical perspective?

Become engaged in the social dimension (behavioural & cultural)?

Become engaged in ecology and food supply?

What is the research domain of 21st century nutritional sciences?

OUR MAIN WORRIES

CONCEPTS

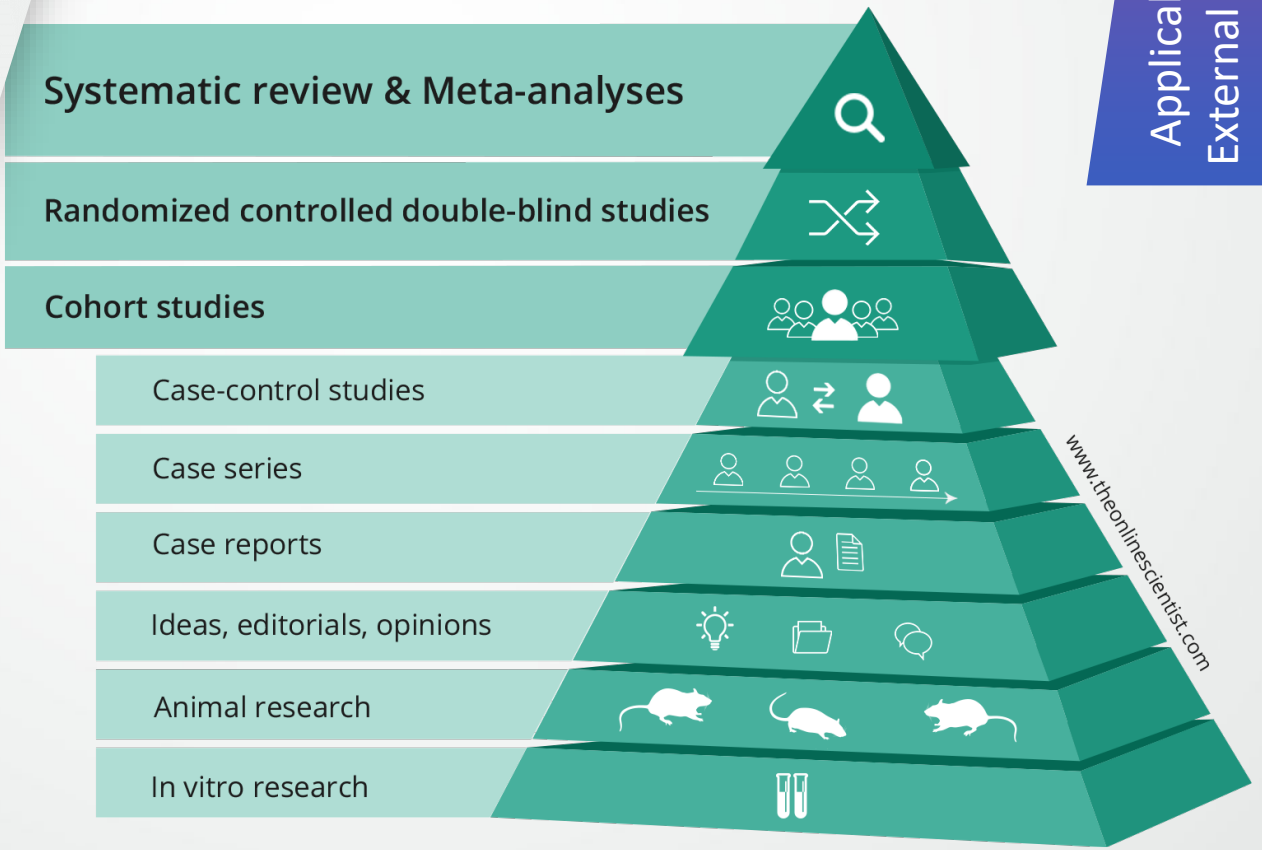
INTERACTION / COMMUNICATION

METHODS

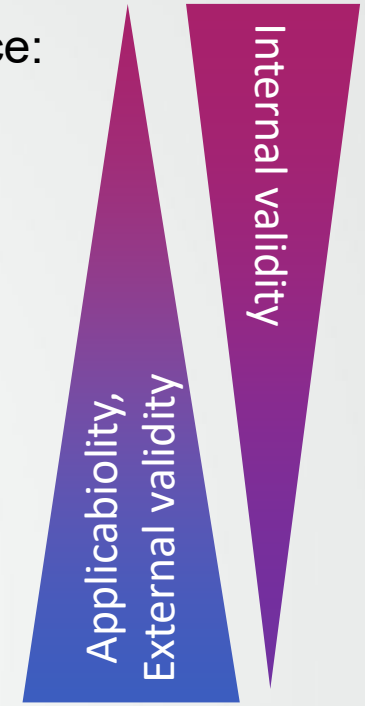
ORGANISATION

CONCEPTS

The totality of the evidence (?)



Balance:



CONCEPTS

Re-evaluate the process on evidence?

J Cllin Epidemiol 2015;68:1247-5

ELSEVIER

CrossMark

Journal of Clinical Epidemiology

Journal of Clinical Epidemiology 68 (2015) 1247–1250

EDITORIAL

Is the 'Evidence-Pyramid' now dead?

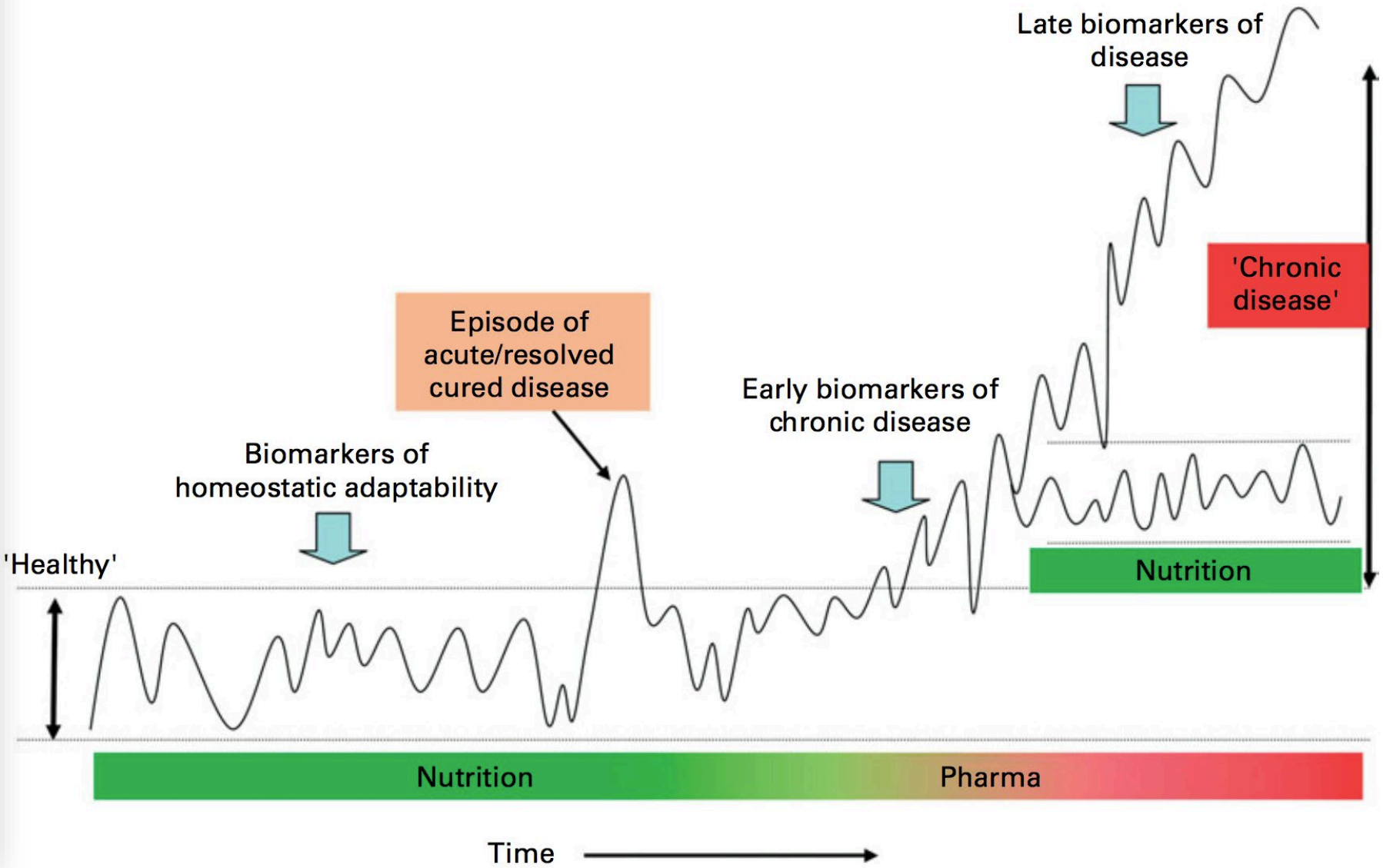
CONCEPTS

Scientific evidence

CONCEPTS

What is health?

WHO: A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.



CONCEPTS

Nutrition, foods, & diets of human

As determinants of healthy and sustainable diets

and as outcomes of food supply, food environment and food choice.

Societal & natural food environment

Particles to planetary health

Lifelong interaction biology-behaviour-society

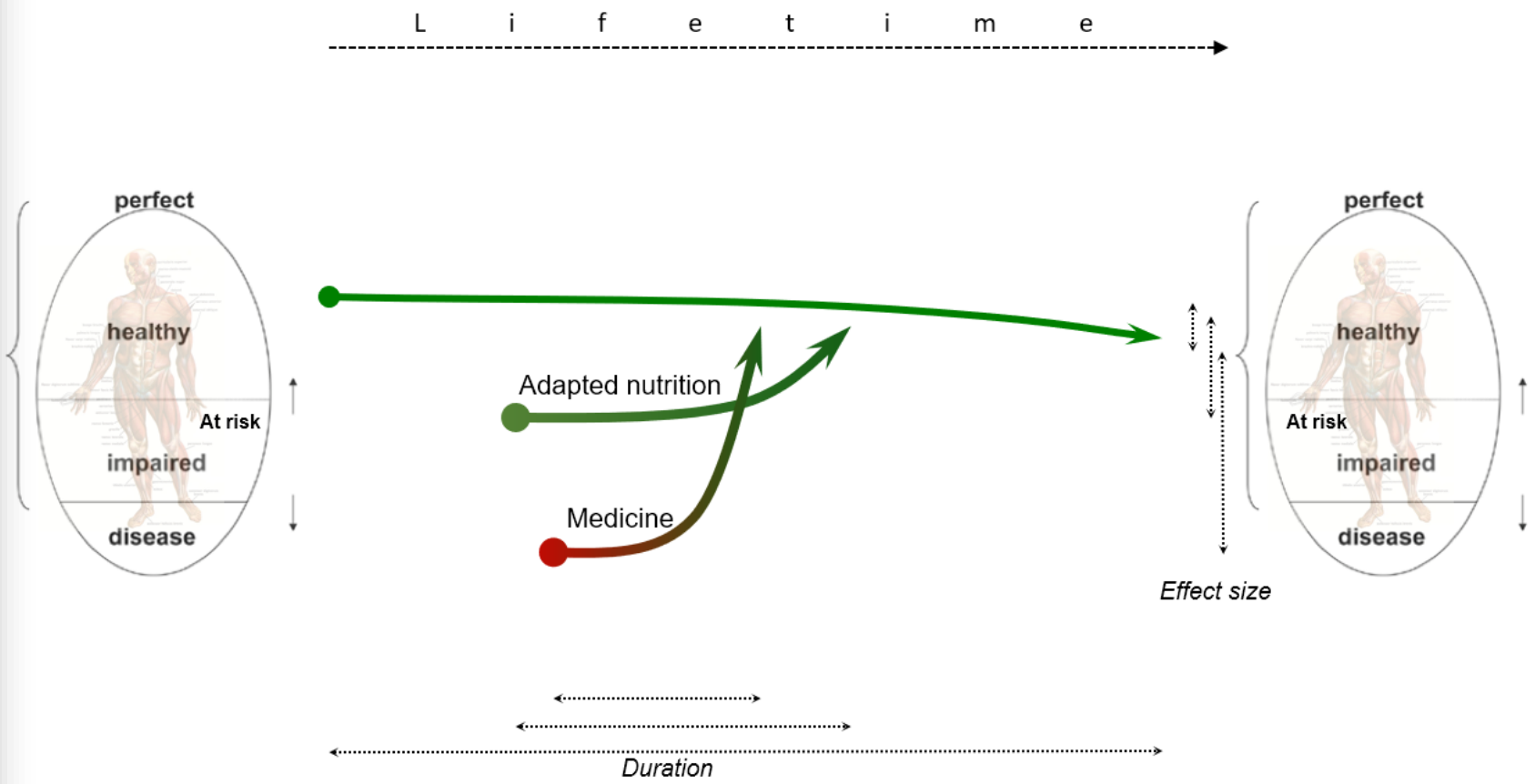
METHODS

Double-blind placebo controlled?

"Anyone for a game of Blind Man's Bluff after dinner?"

METHODS

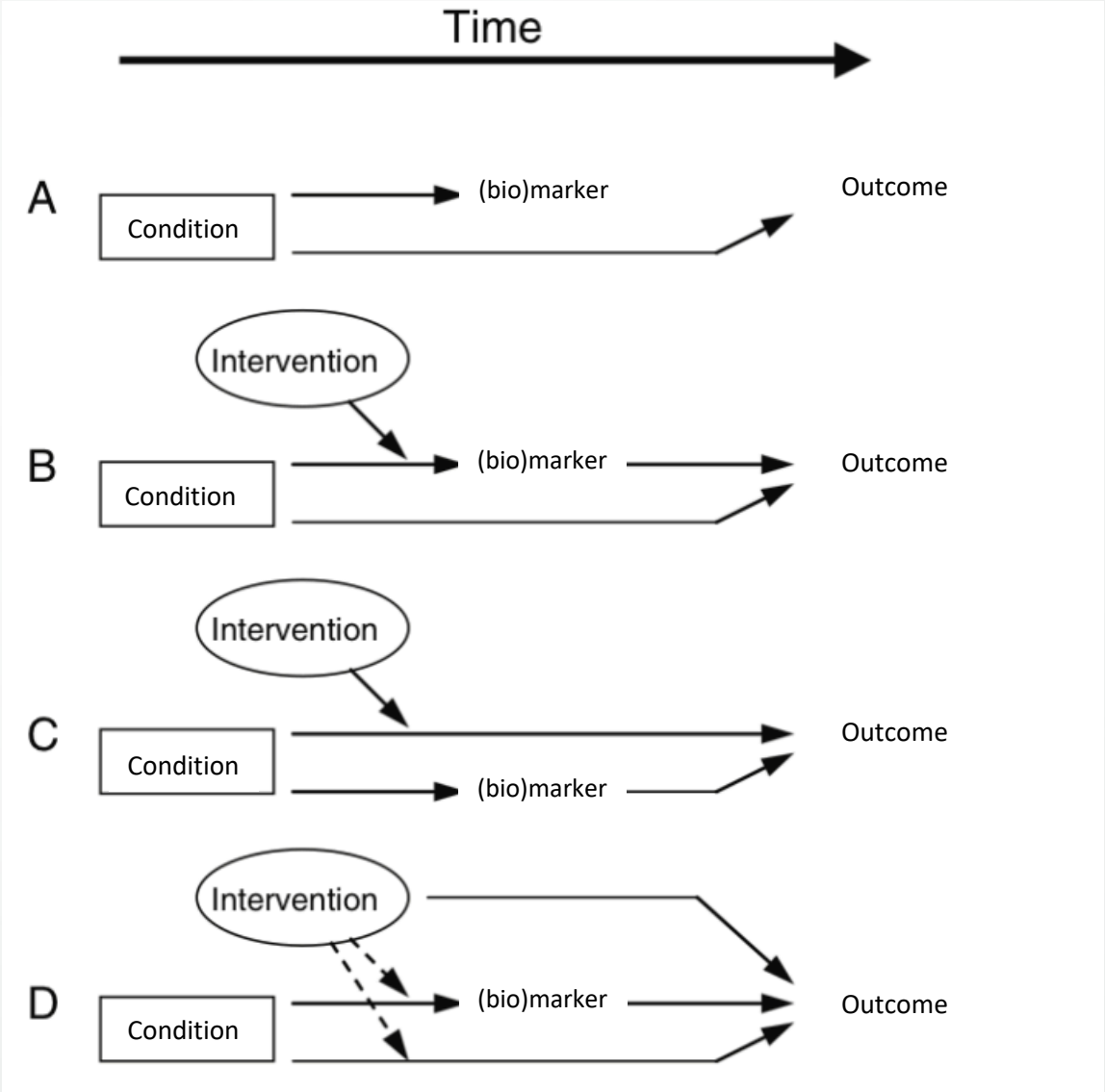
Is understanding molecular effects always possible?



METHODS

Validity of biomakers

On Biomarkers and Mechanistic reasoning



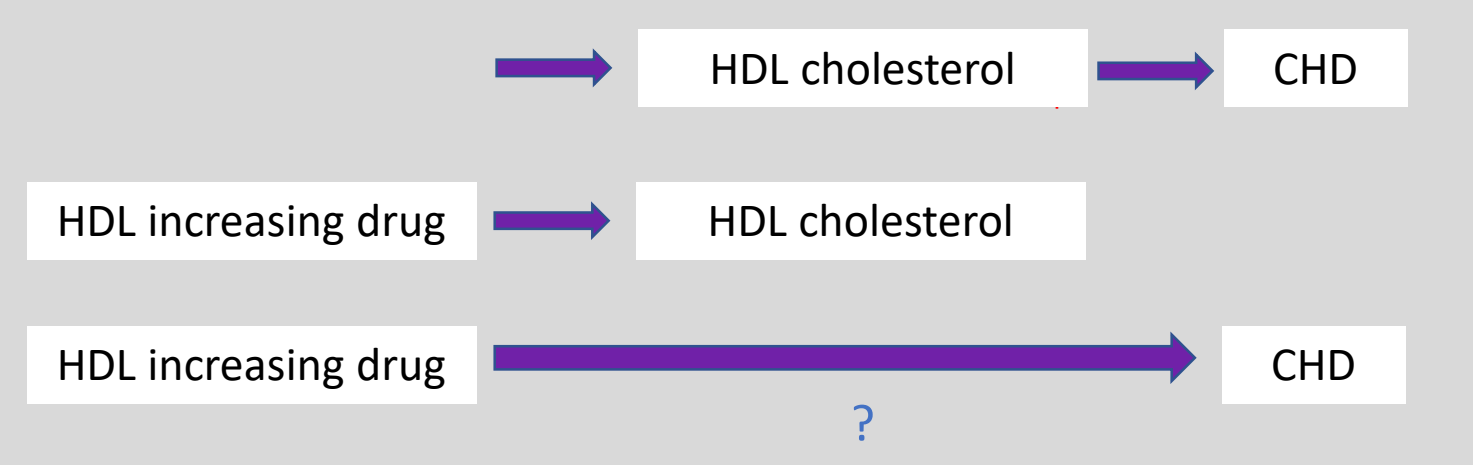
Fleming, DeMets. Annals of Internal Medicine 1996;125:605-613

METHODS

On Biomarkers and Mechanistic reasoning

- When the true endpoint of a claimed benefit cannot be measured directly, studies should use markers.
- Markers should be:
  - biologically valid in that they have a known relationship to the final outcome and their variability within the target population is known;
  - methodologically valid with respect to their analytical characteristics.

EXAMPLE:
HDL cholesterol and CHD



METHODS

On Biomarkers and Mechanistic reasoning

When the true endpoint of a claimed benefit can-
not be measured directly studies should use

NEJM Journal Watch

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SUMMARY AND COMMENT | CARDIOLOGY

INFORMING PRACTICE

August 28, 2017

Why Have CETP Inhibitors Failed in Clinical Trials?

Karol E. Watson, MD, PhD, FACC

Associate Editor

NEJM JOURNAL WATCH CARDIOLOGY

Biography | Disclosures | Summaries

EXAMPLE:

HDL cholesterol and CHD

→ HDL cholesterol → CHD

HDL increasing drug → HDL cholesterol

HDL increasing drug → CHD

?

METHODS

Strong statistical disciplines

data science, ML, AI

Post-omics & real life behaviour

big data > integration

Data quality first

definitions, vocabulary, ontology, protocols

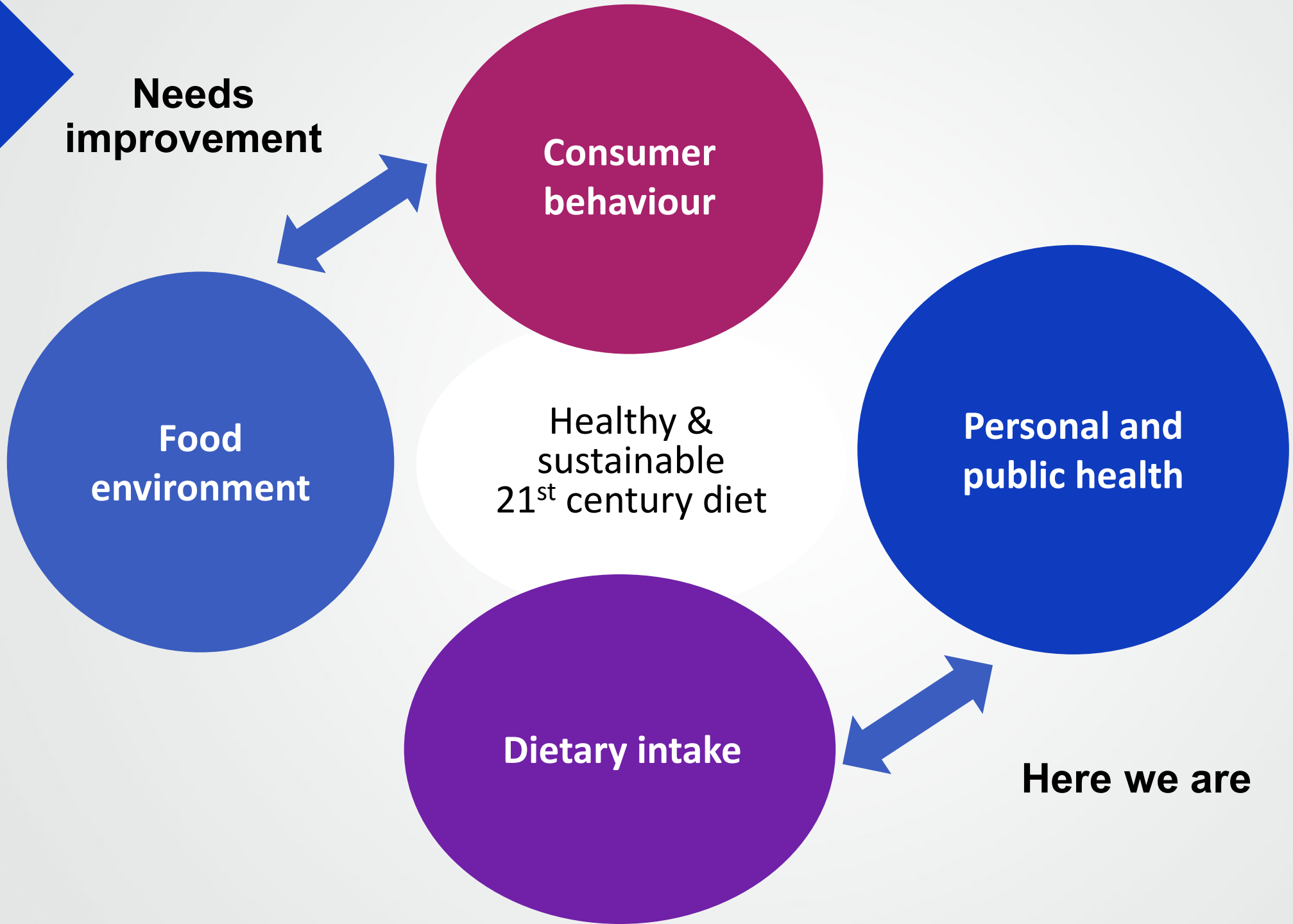
Social science + life science

Qualitative + quantitative + mixed methods

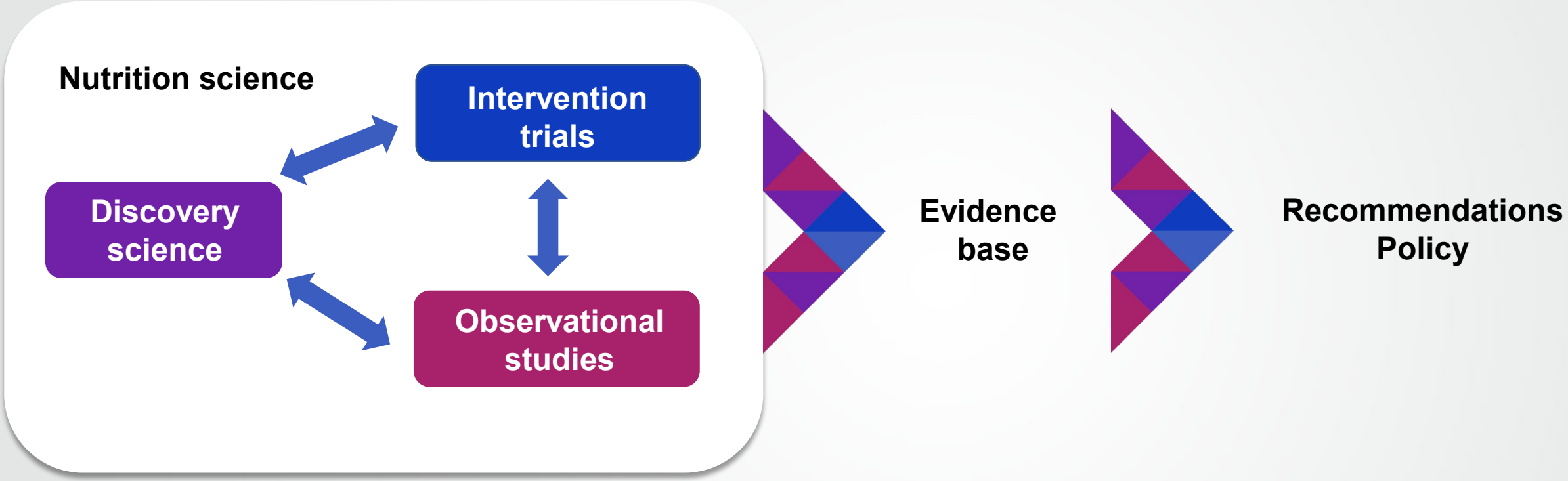
Transdisciplinary & open science

any relevant discipline + FAIR data disciplines

METHODS


Needs improvement
Consumer behaviour
Food environment
Healthy & sustainable 21st century diet
Personal and public health
Dietary intake
Here we are

INTERACTION



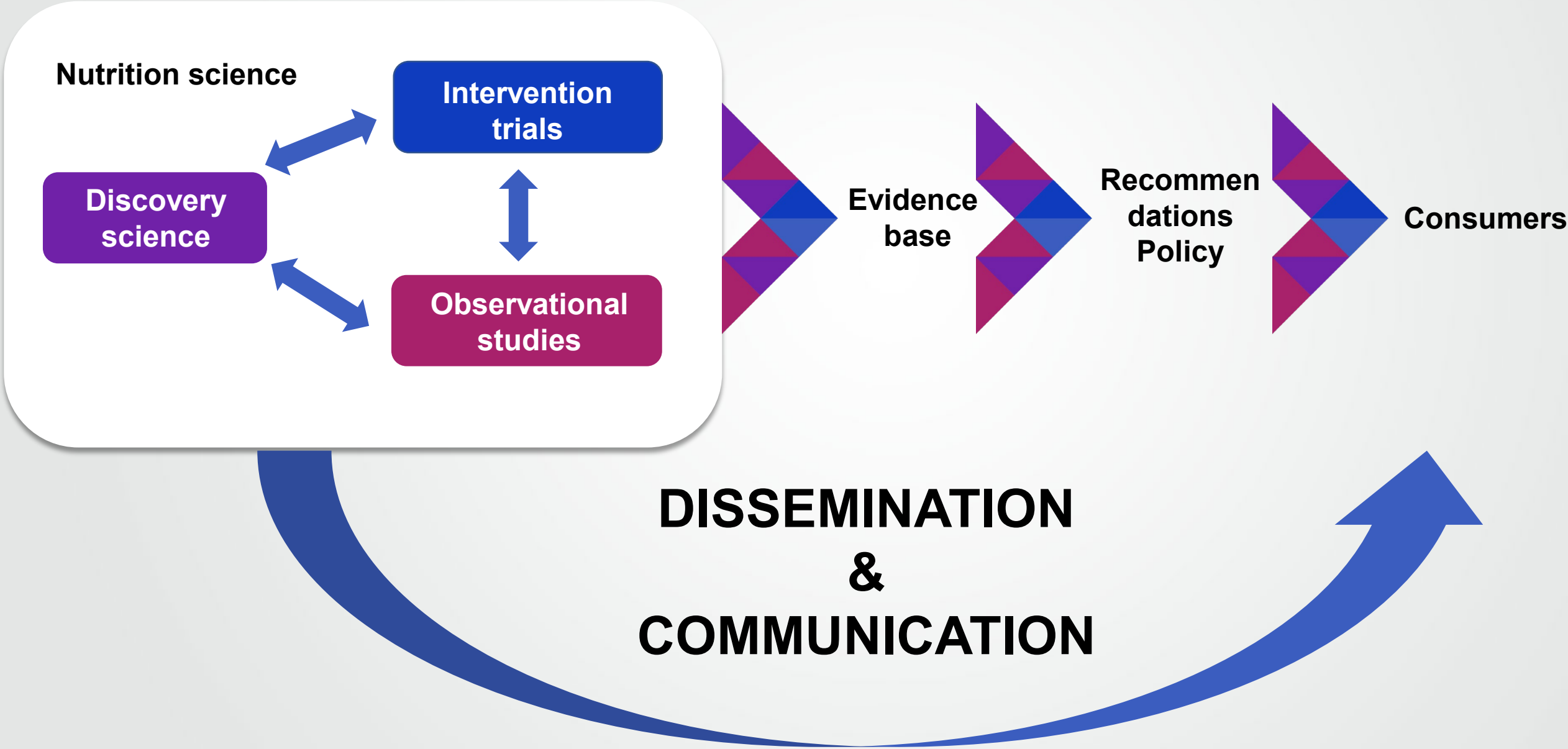
Robust recommendations demand a <u>credible</u> evidence base which requires:

A <u>standardised</u> approach to the science

Recognition of the <u>totality of the evidence</u>

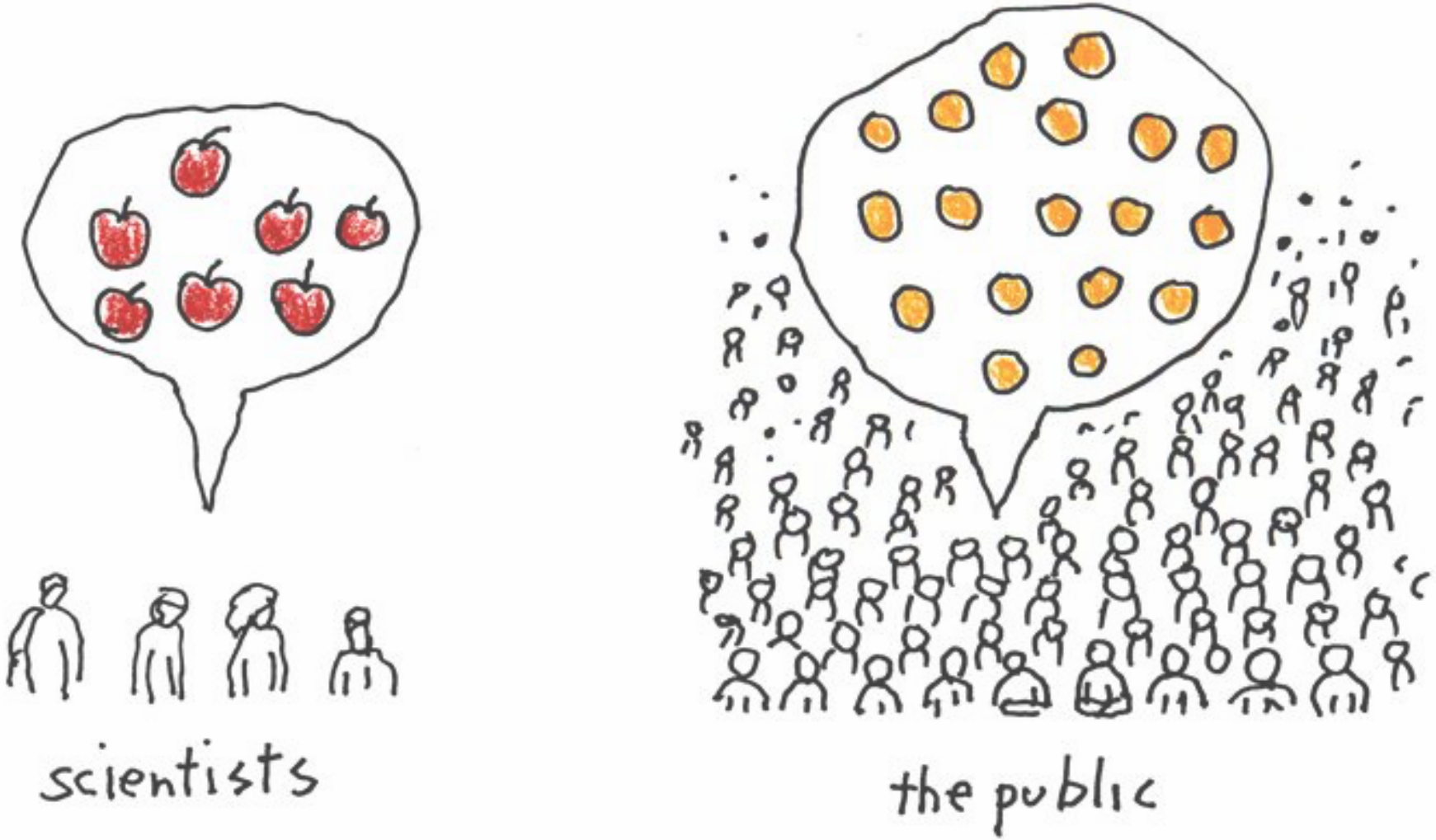
*Academics biggest **<u>conflict of interest</u>** is what an **<u>academic believes</u>** of the science he conducts.*
That is a much bigger conflict than the funds that are given by industry.

INTERACTION



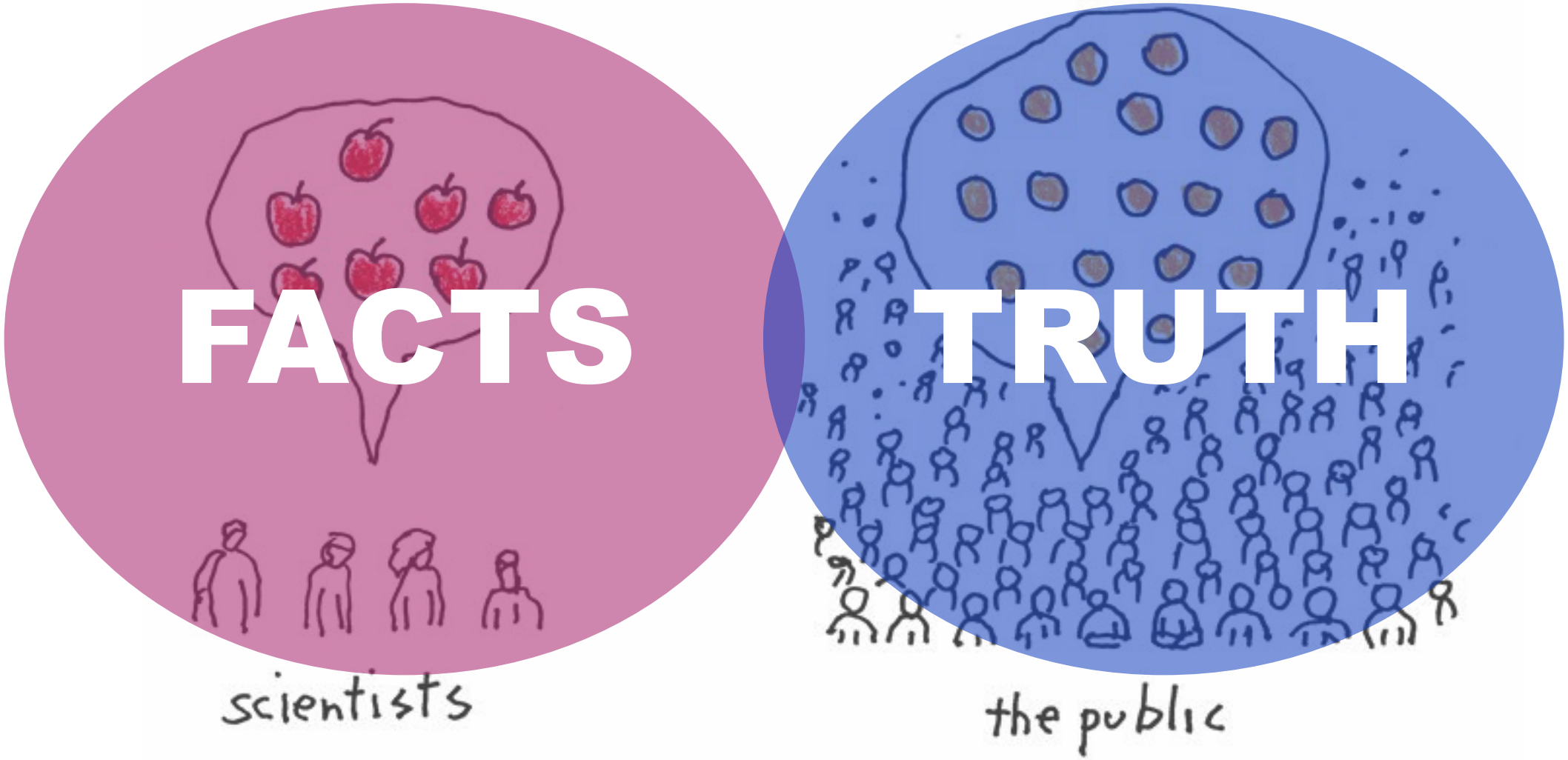
INTERACTION

science communication

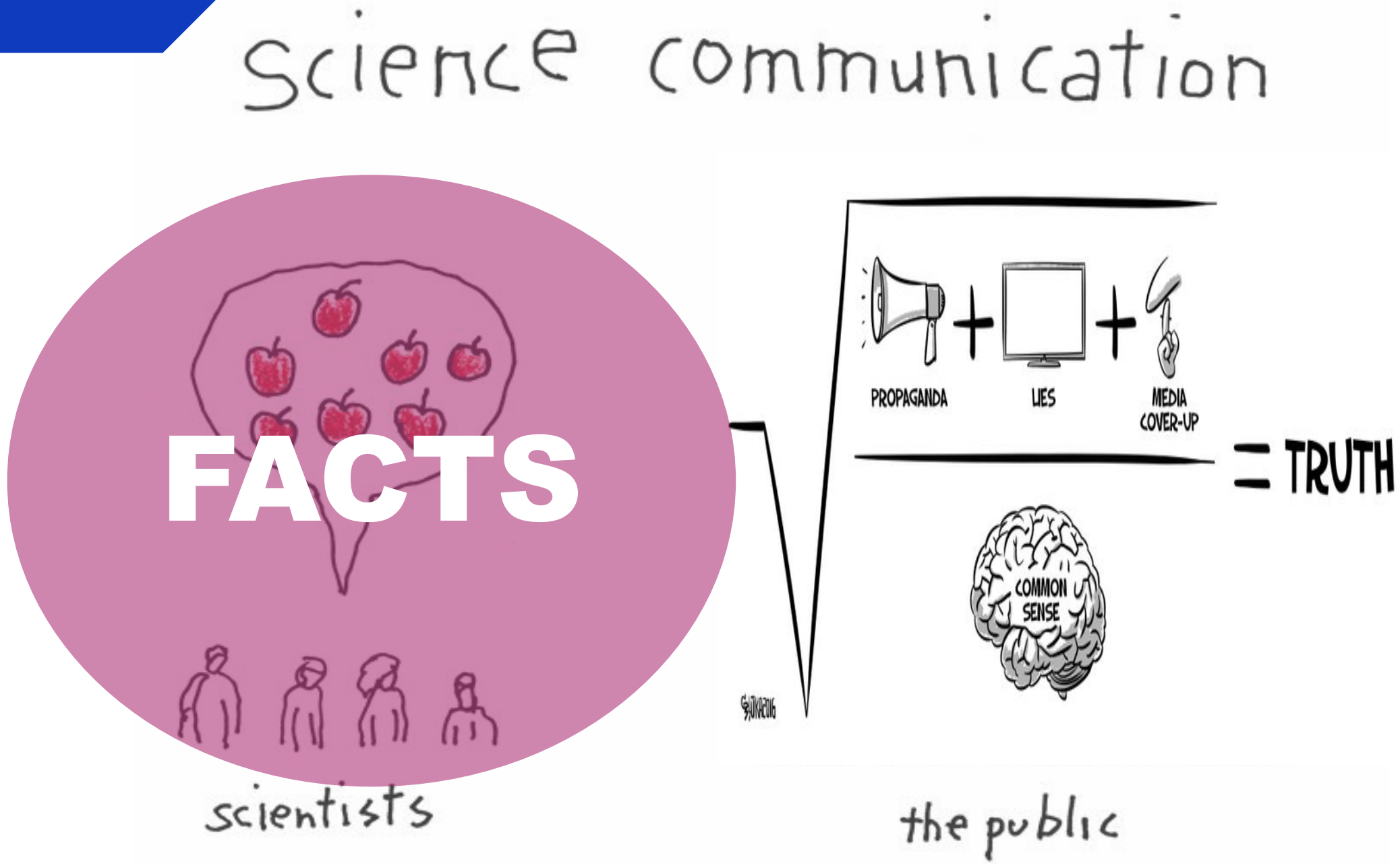


INTERACTION

science communication



INTERACTION



ACTIONS

Nutrition in Transition activities

ACTIONS

nutrition in transition

Steering group
(myself + Chairs of working groups)

Concepts

Methods

Organisation, interaction & communication

From globally organised structured DISCUSSION

To globally organised structured ACTION

FNH-RI

nutrition in transition

www.nutritionintransition.nl

fens
Federation of European Nutrition Societies

Defining a Healthy Gut Microbiome

Michael I McBurney, PhD

Adjunct Professor, University of Guelph and Tufts University

Nov 28, 2019

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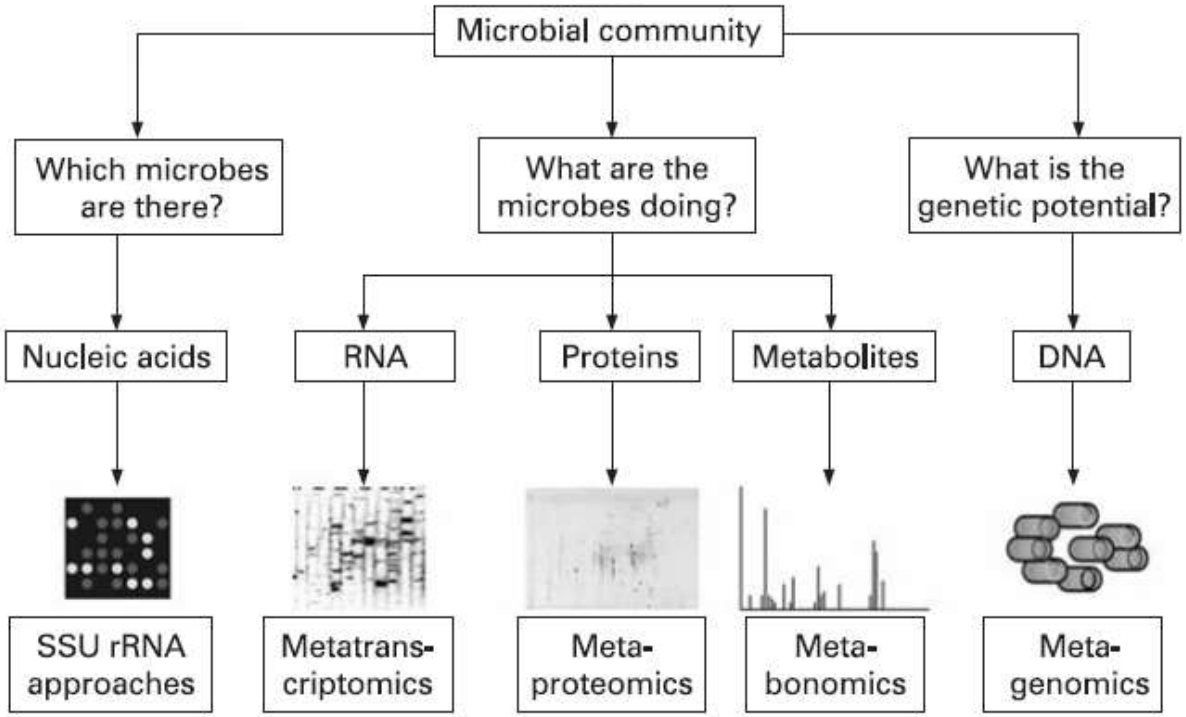
@MIMcBurney

Disclosures for:
Michael I McBurney, PhD

AFFILIATIONS	University of Guelph, Adjunct Professor & Associated Graduate Faculty Tufts University, Adjunct Professor
Grants/Research Support:	N/A
Scientific Advisory Board/Consultant:	VitaScan Scientific Advisory Board Church & Dwight Nutrition & Health Advisory Council VIVA Nutrition Scientific Advisory Board OmegaQuant Scientific Advisory Board
Stock Shareholder:	DSM

Characterizing the Gut Microbial Community

Who is there and what are they doing?



Terms Commonly Used:

- Species richness – number of species
- Diversity indices - consider species richness (#) and species evenness (relative abundance distributions)

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From: Dr JW Lampe, ILSI NA Gut Microbiome presentation, July 23, 2018

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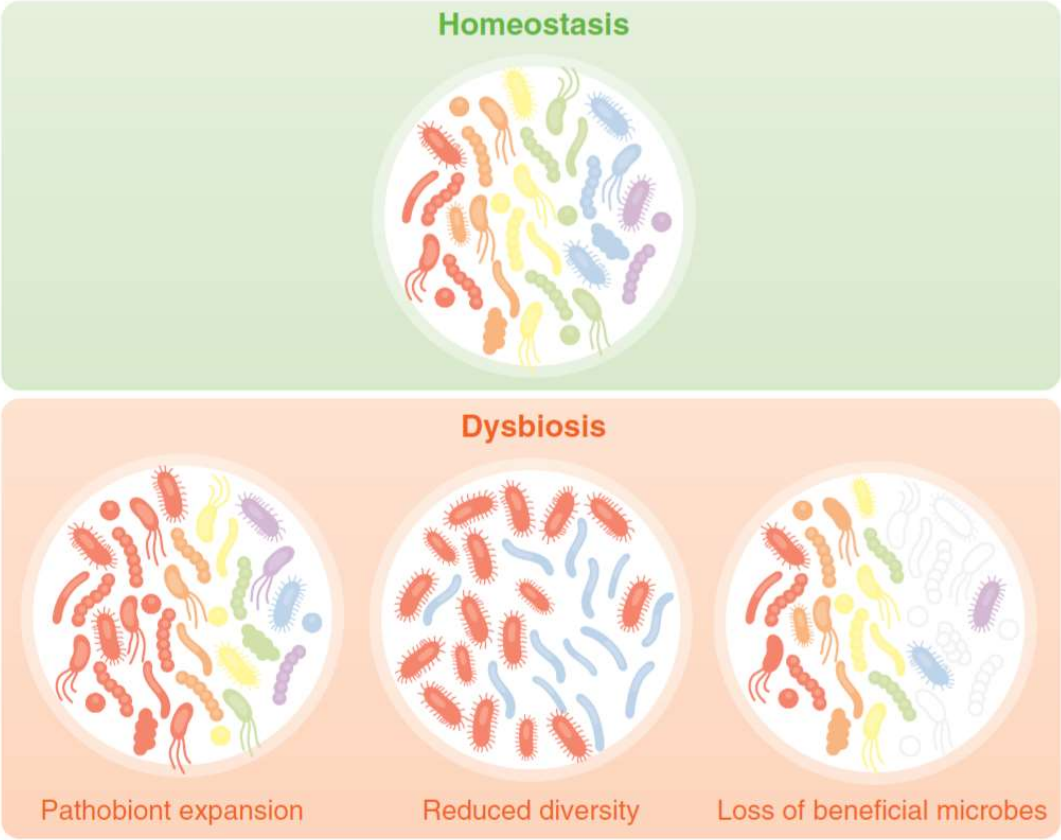
Trying to Define a Healthy Human Gut Microbiome



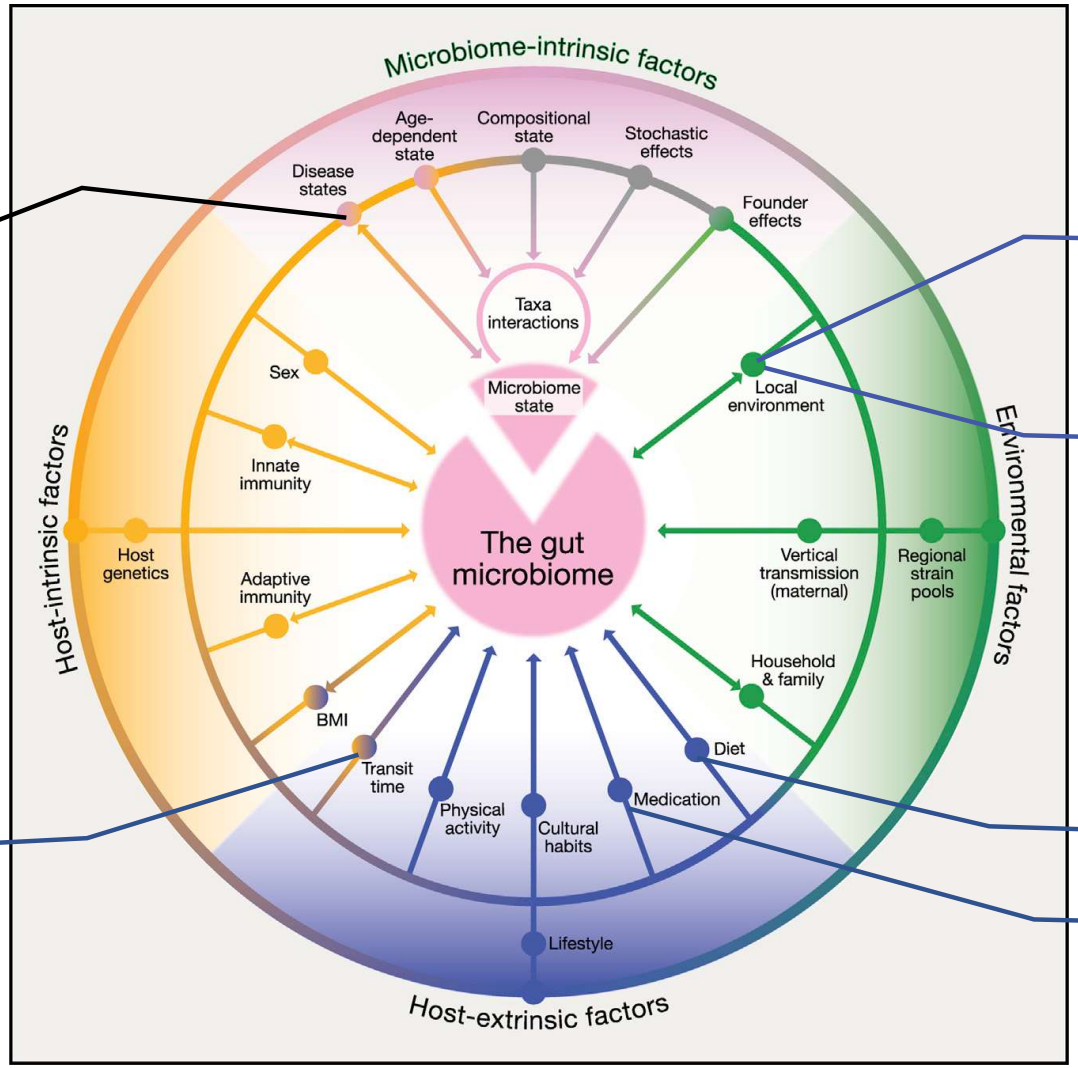
Stable equilibrium with a diversity of organisms interacting synergistically with the host to help maintain host health

Disruptions to the structure and function of the microbial community

- Proceed (cause) disease?
- Consequence of disease?
- Both occurrences are possible?

From: Petersen C and Round JL. 2014 Cell Microbiol 16:1024-1033

Lactose intolerance
Irritable bowel disease
Diabetes



Vaginal or C-section birth

Sanitation

Retention Time

Quantity of non-digestible carbohydrate
Composition & fermentability

Antibiotics

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From: Schmidt TSB et al. 2018 Cell 172:1198-1215

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From Birth, We Look and Are Different

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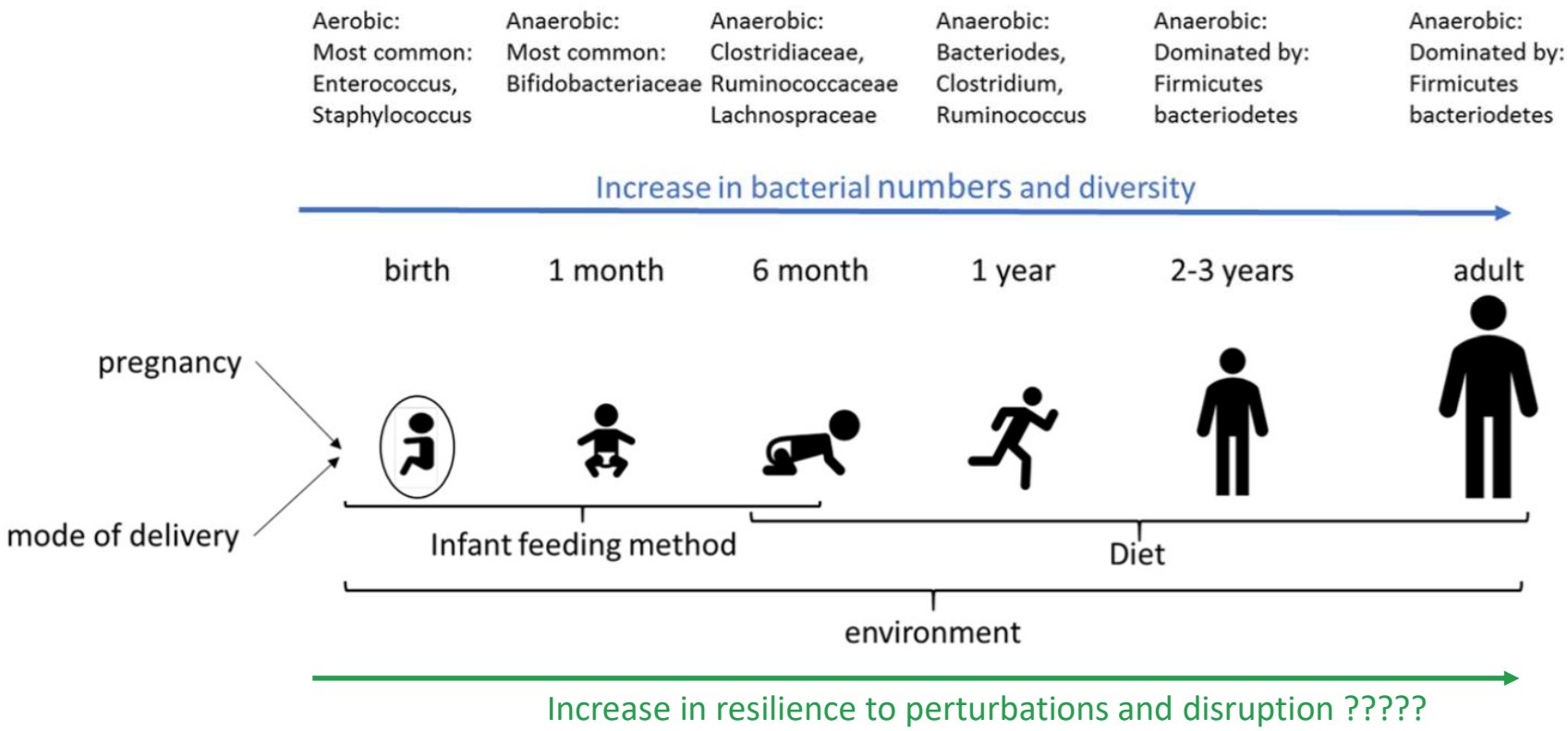
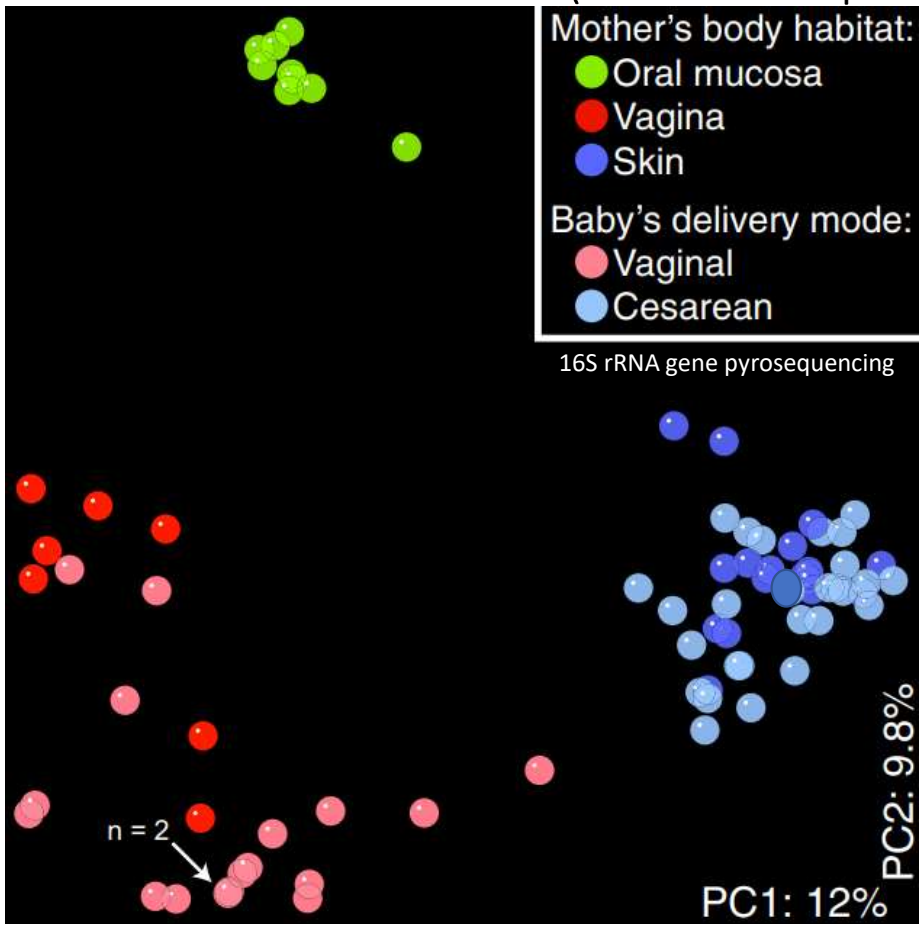
Development of the Gut Microbiome



From: Mohajeri MH et al. 2018. EJCN 10.1007/s00394-018-1703-4

Delivery Mode Affects the Infant Microbiome

(each circle is a person)



Skin, oral mucosa & vaginal swabs 1h before delivery

Skin & oral mucosa swabs seconds after birth
Rectal swab after passing meconium & within 24h of birth

Across all body habitats (skin, mouth, gut)

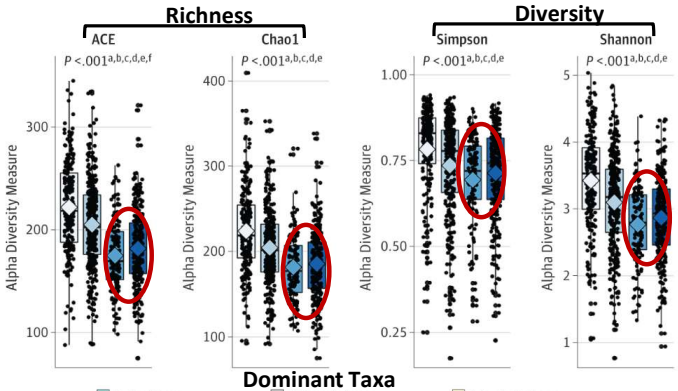
- C-section infants harbored bacterial communities most similar to maternal skin composition
- Vaginally-delivered infants harbored bacterial communities most similar to maternal vaginal composition

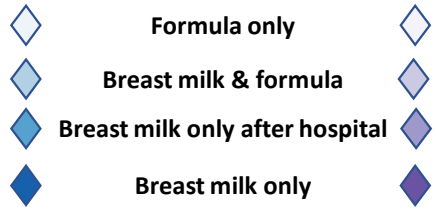
From: Dominguez-Bello MG et al. 2010 PNAS https://doi.org/10.1073/pnas.1002601107

Infant Feeding Practices, Gut Microbiota & Risk of Overweight

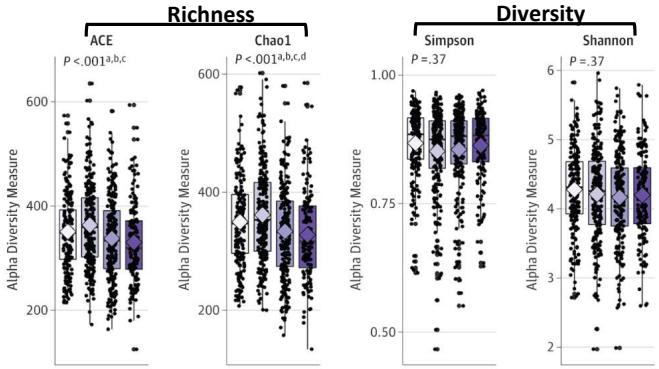
(n=1,087 infants Canadian Healthy Infant Longitudinal Development cohort)

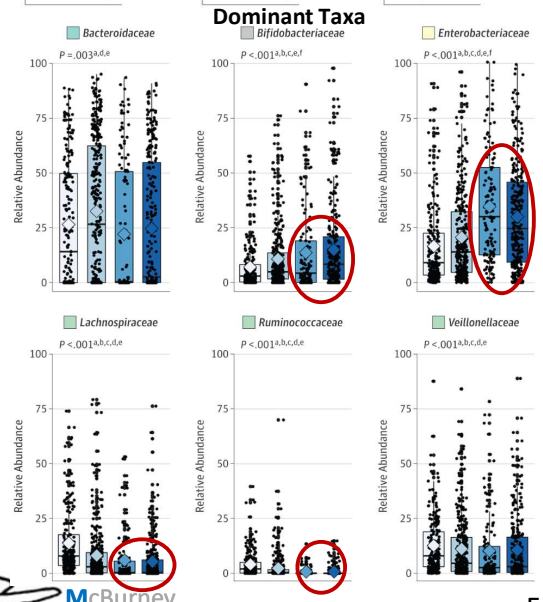
3-4 months



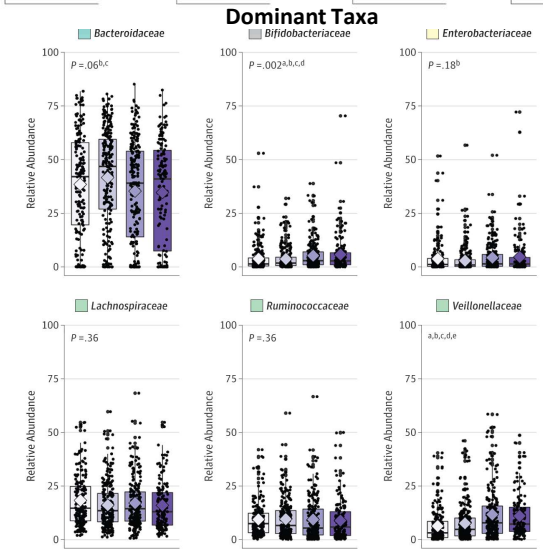


12 months





- Community structure differs between infants receiving breastmilk or formula
- With introduction of complementary food, microbiota profiles become more homogeneous
- Overweight or at risk of overweight infants at 12mo had higher microbiota richness at 3mo



From: Forbes et al. 2018. JAMA Pediatr 10.1001/jamapediatrics.2018.1161

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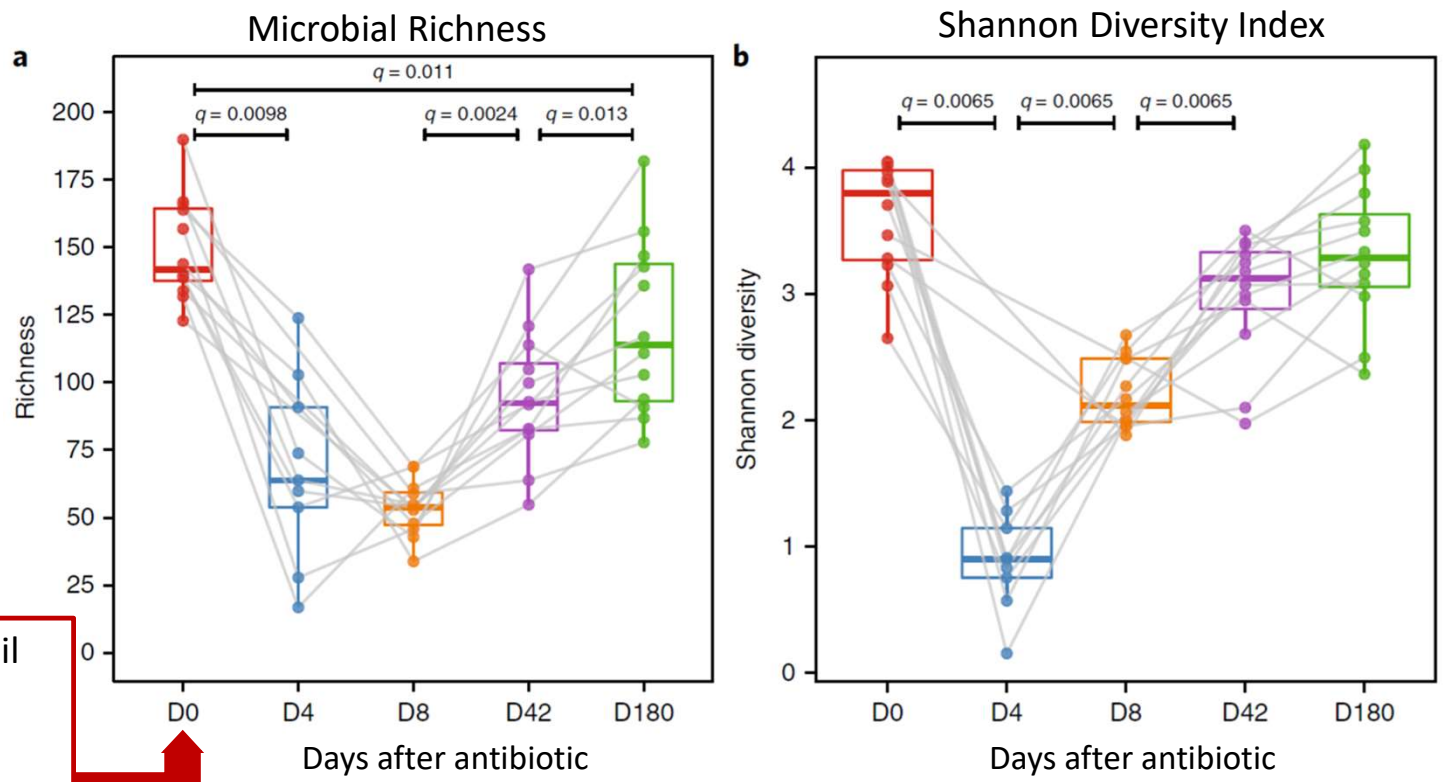
Antibiotics Reduce Gut Microbiota Richness and Diversity

(n=12 healthy males)



4d antibiotic cocktail
- Meropenem
- Gentamicin
- Vancomycin

From: Palleja A et al. 2018 Nature Microbiol 3:1255-1265

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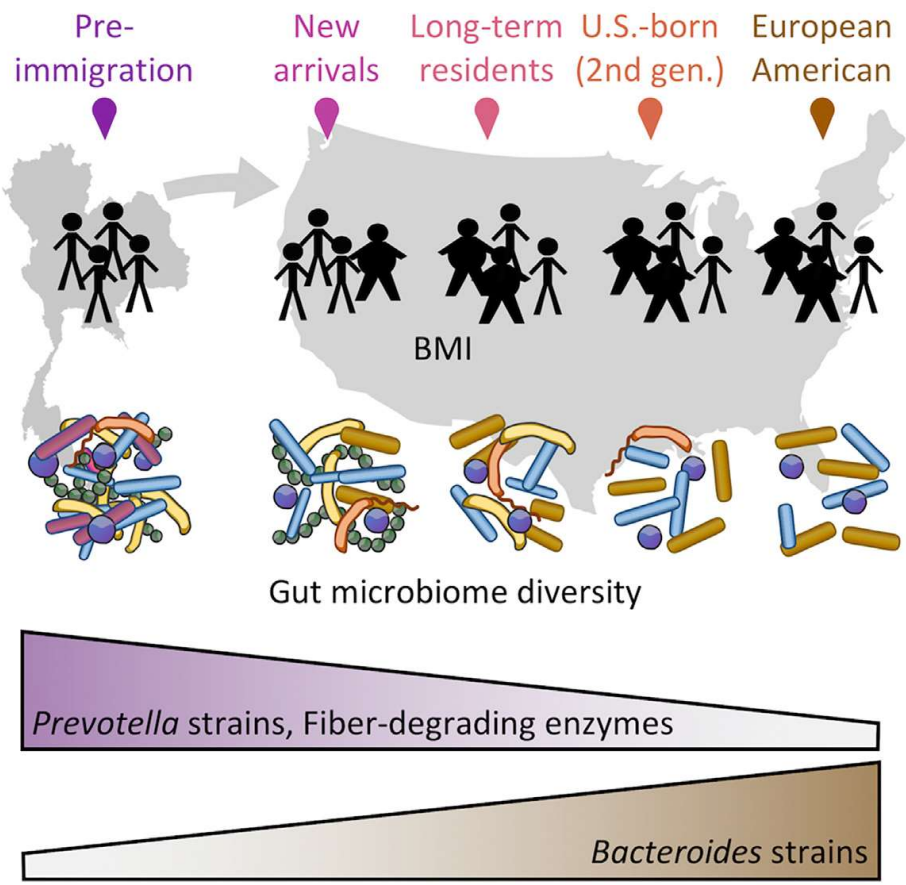
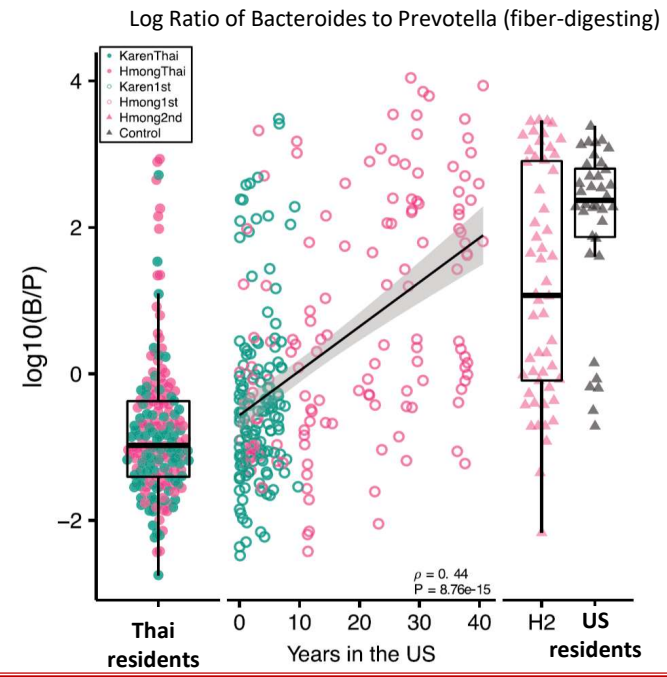
Migration Changes the Gut Microbiome

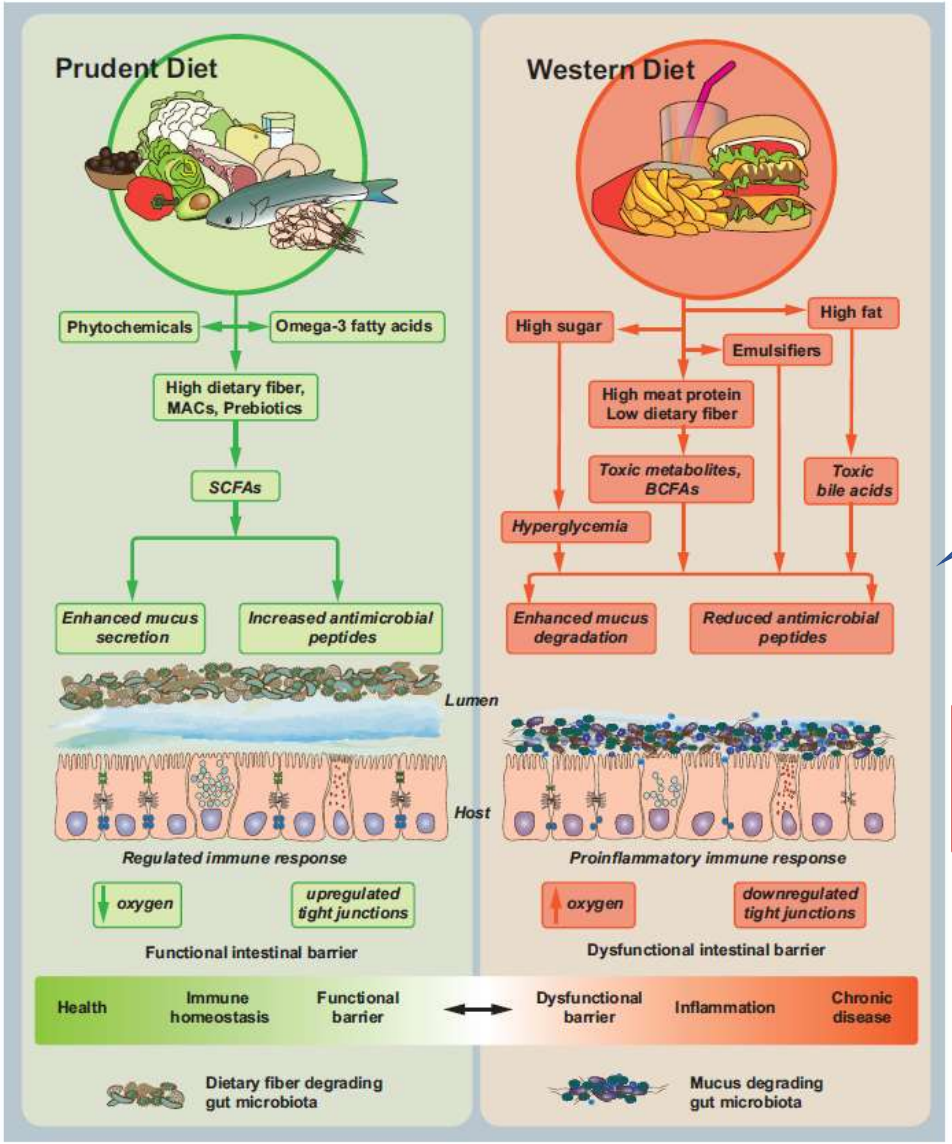




Migration from Thailand to USA is associated with

- Loss of gut microbiome diversity
- Loss of bacterial enzymes for fiber digestion
- Displacement of *Prevotella* strains by *Bacteroides* strains with time
- Increased prevalence of obesity

From: Vangay P et al. 2018 Cell 175:962-972



The primary issue seems to stem from a lack of plant-based cell wall components, i.e. dietary fiber, to support a healthy gut microbiome

From: Makki K et al. 2018
Cell Host & Microbe 23:705-715

Strategies to maintain a healthy microbiome:
1. Rebalance with beneficial probiotics
2. Selectively feed beneficial microbiota

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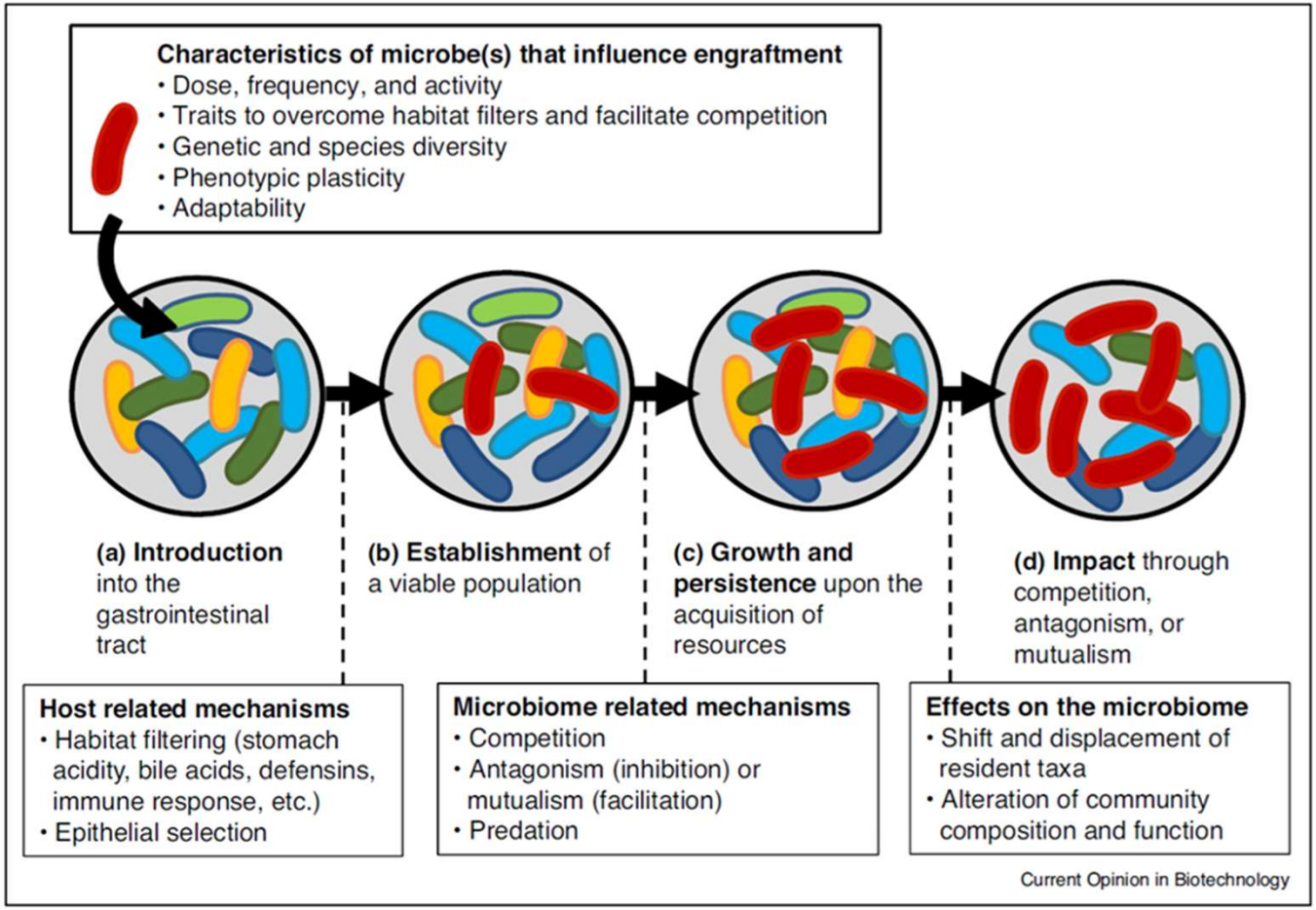
Requirements for Successful Invasion with a Probiotic



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From: Walter J et al. 2018 Curr Opin Biotechnol 49:129

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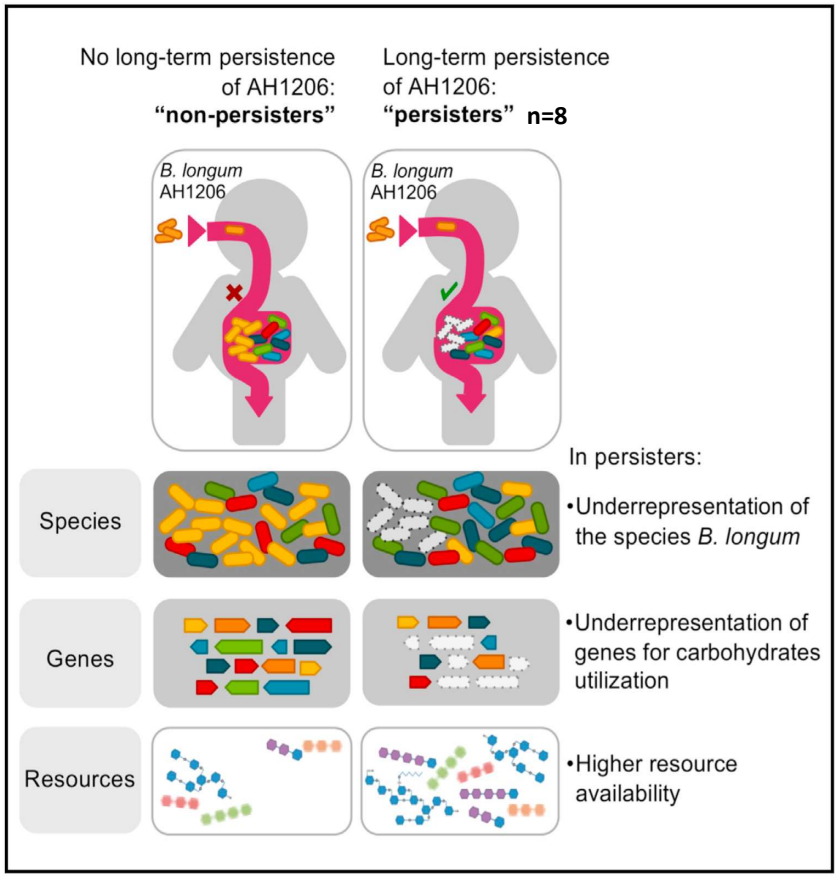
Probiotics can Modulate the Gut Microbiome

(n=23, cross-over trial, 10^{10} CFU/d or placebo [maltodextrin] for 14d followed by 38 or 46d washout)



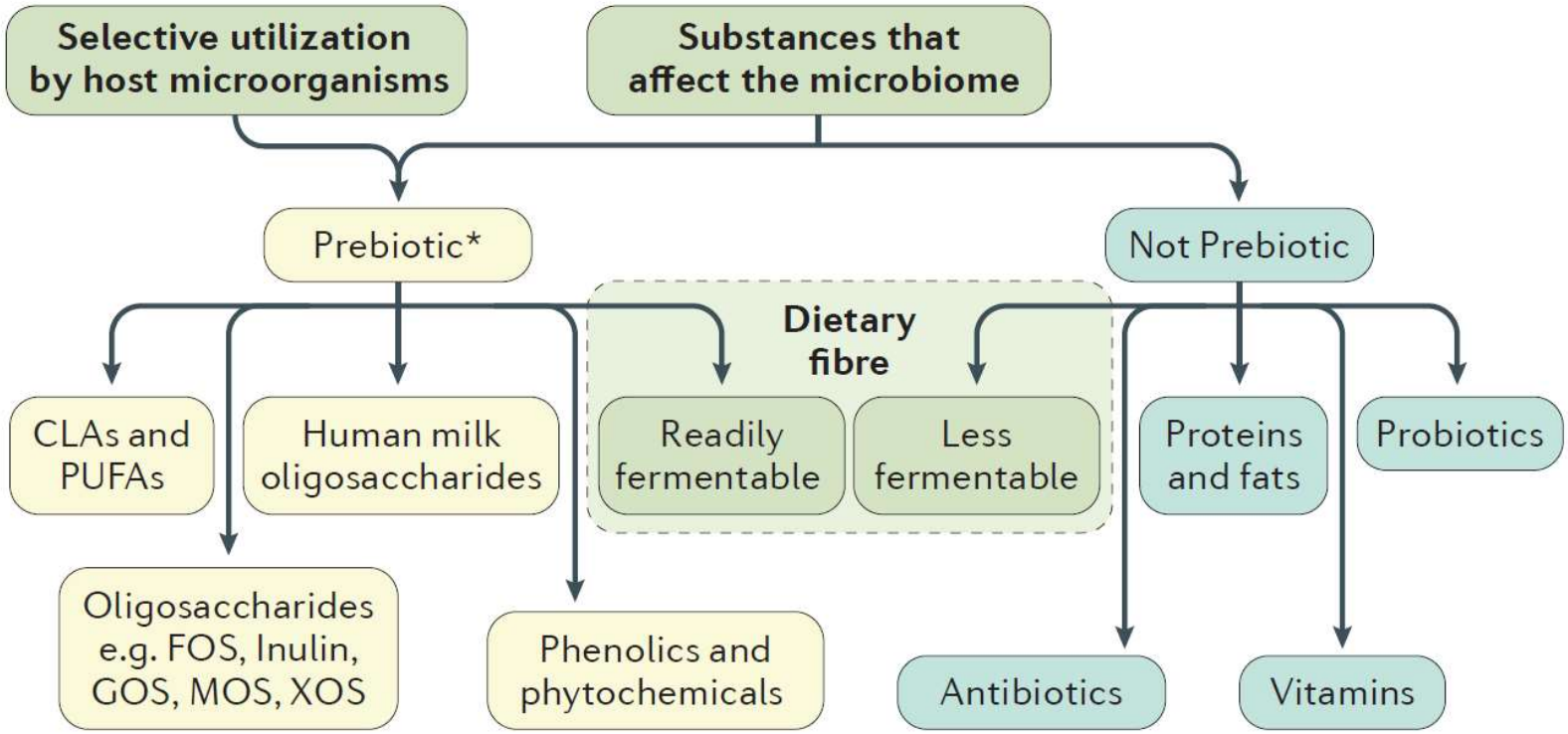
Orally administered AH1206 probiotic:

- Persist in the gut of 30% of humans for 6 mo
- Engraftment did not alter resident microbiota composition
- Lower baseline levels of B longum predicted persistence
- Under representation of carbohydrate-utilization genes is linked to persistence

From: Maldonado-Gomez et al. 2016. Cell Host Microbe 20:515-526

Using Diet to Modulate the Gut Microbiome

(The International Scientific Association for Probiotics and Prebiotics (ISAPP) Consensus Statement on the Definition and Scope of Prebiotics)



From: Gibson GR et al. 2017 Nature Rev Gastroenterol Hepatol 10.1038/nrgastro.2017.75

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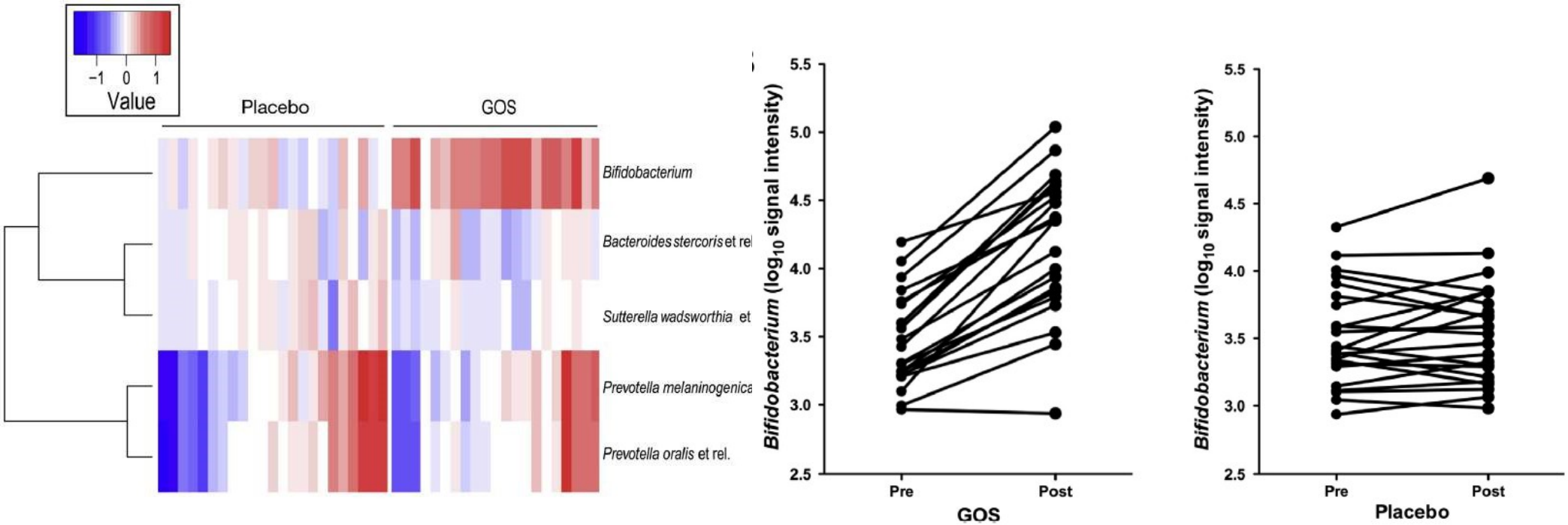
Galactooligosaride (GOS) Supplementation Changes the Gut Microbiome

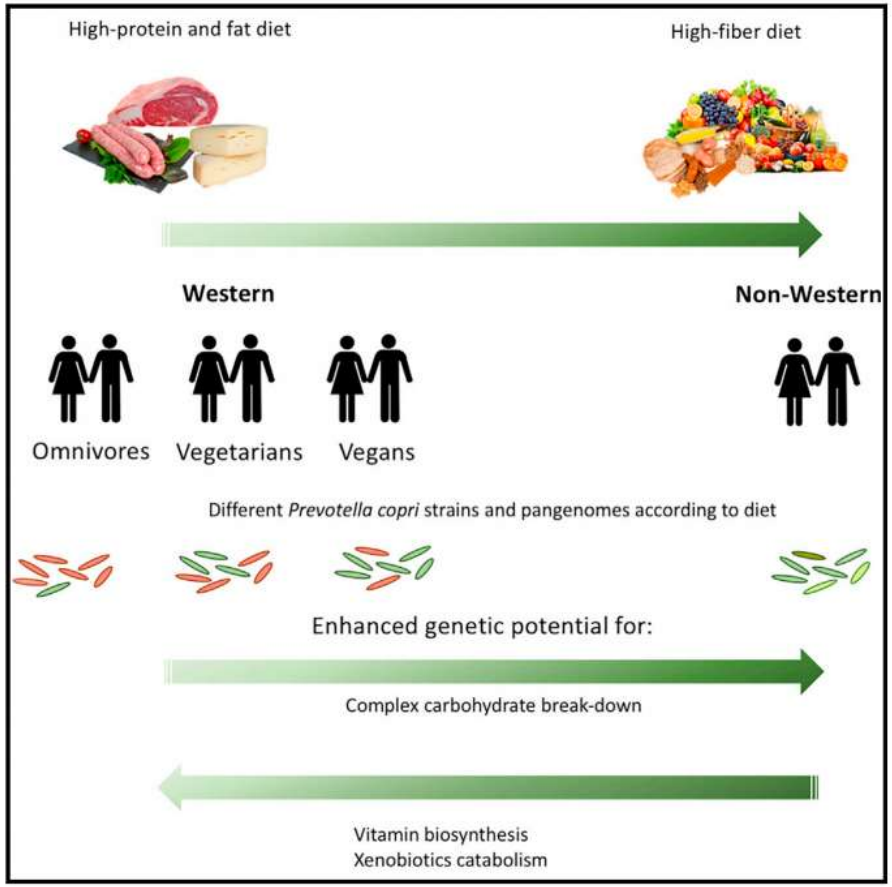
(n=46 obese prediabetic adults, 12wk intervention)



From: Canfora EE et al. 2017 Gastroenterol 1533:87-97

Diet Affects Strain-Level Differences in *P copri* Diversity

(n= 9 omnivores, 22 vegetarians, and 16 vegans)

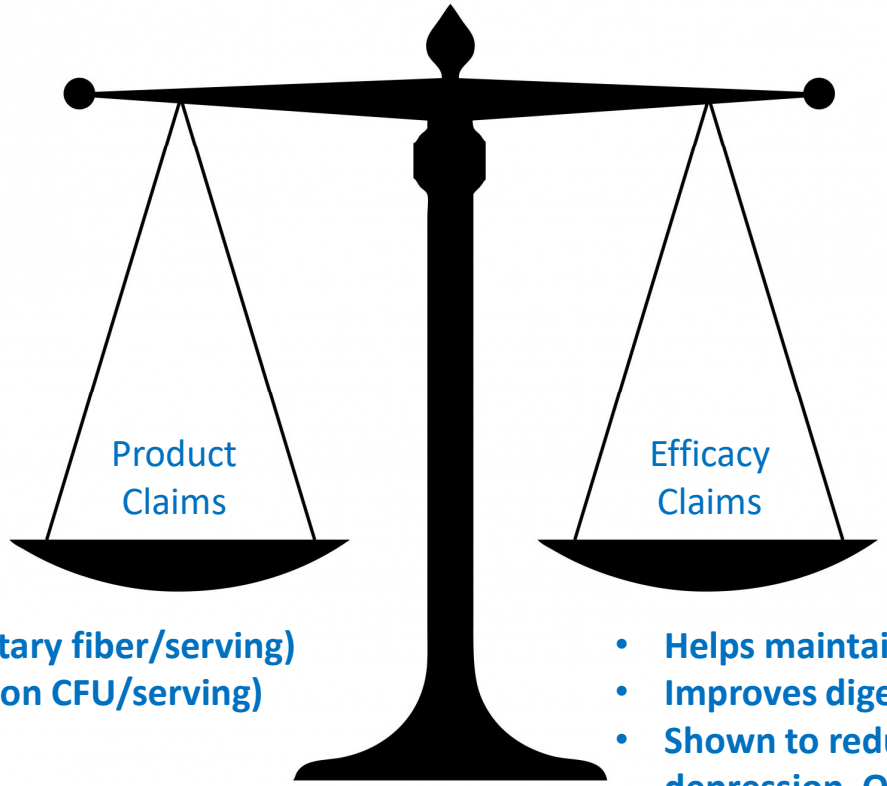


- Among the Bacteroidetes, *Bacteroides* and *Prevotella* are prevalent genera
- *Prevotella,* a fiber-degrader, is associated with diets rich in fruit and vegetables (fiber)

Fiber-rich diets are linked with *P copri* types with enhanced potential for carbohydrate catabolism

From: De Felippis F et al. 2019 Cell Host & Microbe 25:444-453

Elucidating Gut Microbiome-Human Health Relationships

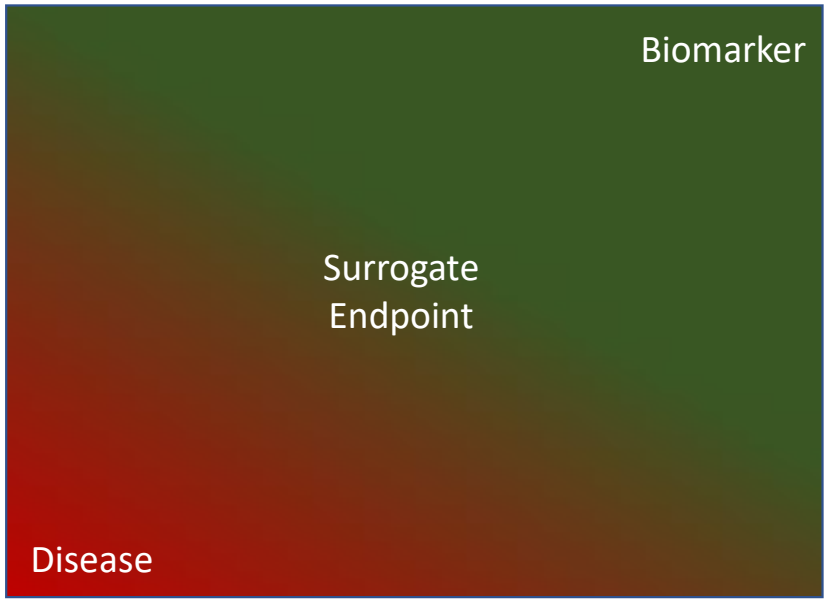


- **Prebiotic (3 g dietary fiber/serving)**
- **Probiotic (30 billion CFU/serving)**

- **Helps maintain a healthy digestive system**
- **Improves digestion and nutrient absorption**
- **Shown to reduce symptoms of anxiety, clinical depression, OCD and stress**

Efficacy Claims Require Effective Biomarkers

A characteristic that is measured objectively and evaluated as an indicator of normal biological processes, pathogenic processes, or pharmacologic responses to an intervention



Surrogate endpoints measure metabolic or other processes that are **predictive of disease risk**

- LDL-cholesterol for cardiovascular disease
- Blood pressure for hypertension
- Hemoglobin A1c for diabetes

Have an Important Regulatory role

- Used to define disease, select therapies, choose drug dosage and establish prognosis
- Applied to clinical trials to demonstrate efficacy of treatments

Adapted from: Institute of Medicine, Evaluation of Biomarkers and Surrogate Endpoints in Chronic Disease, Institute of Medicine, 2010 and Robb et al. 2016 JAMA 315:1107

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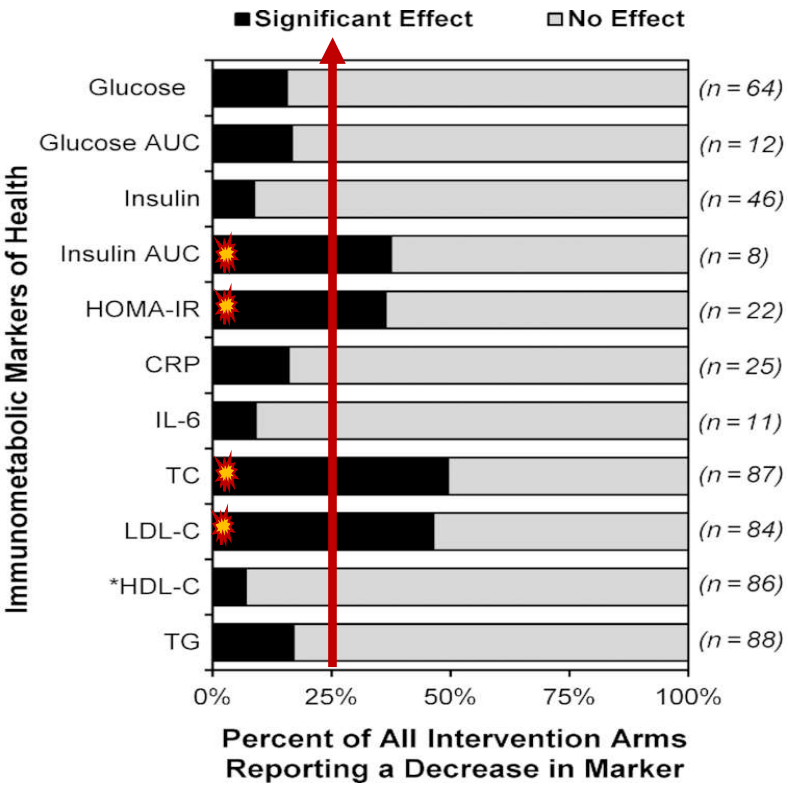
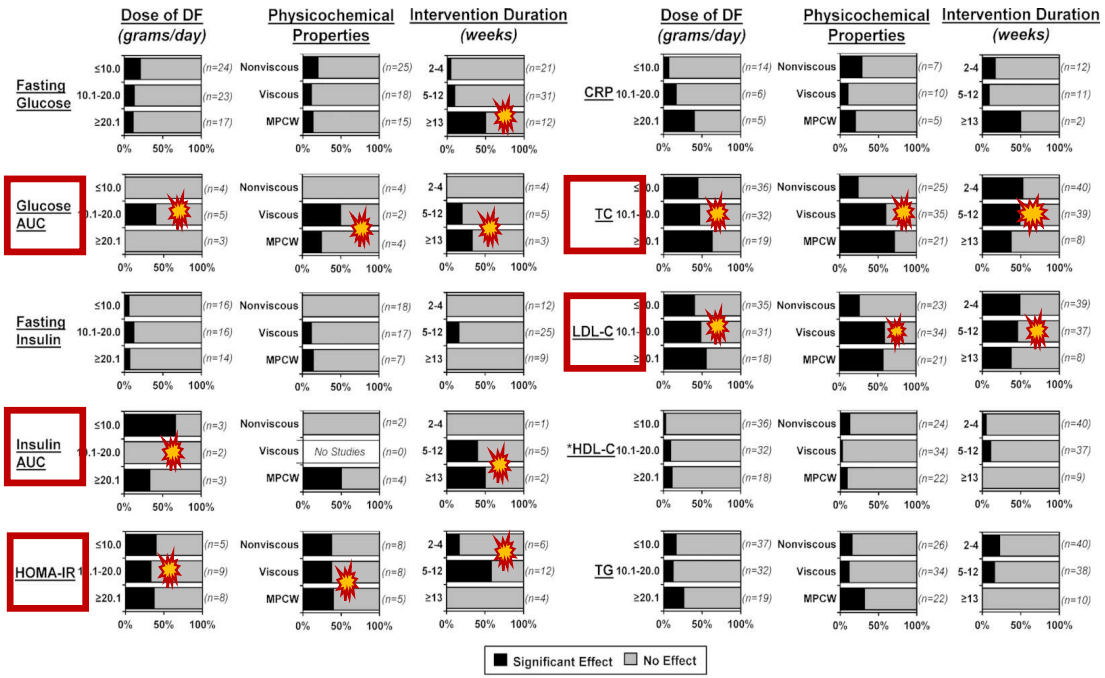
Meta-analysis of Clinical Studies comparing Isolated & Synthetic Dietary Fibers vs Placebo



Stratified Comparisons in Healthy Adults



Source: Armet AM et al. 2019 Adv Nutr nmz074

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Human Health Benefits of Nondigestible Carbohydrates

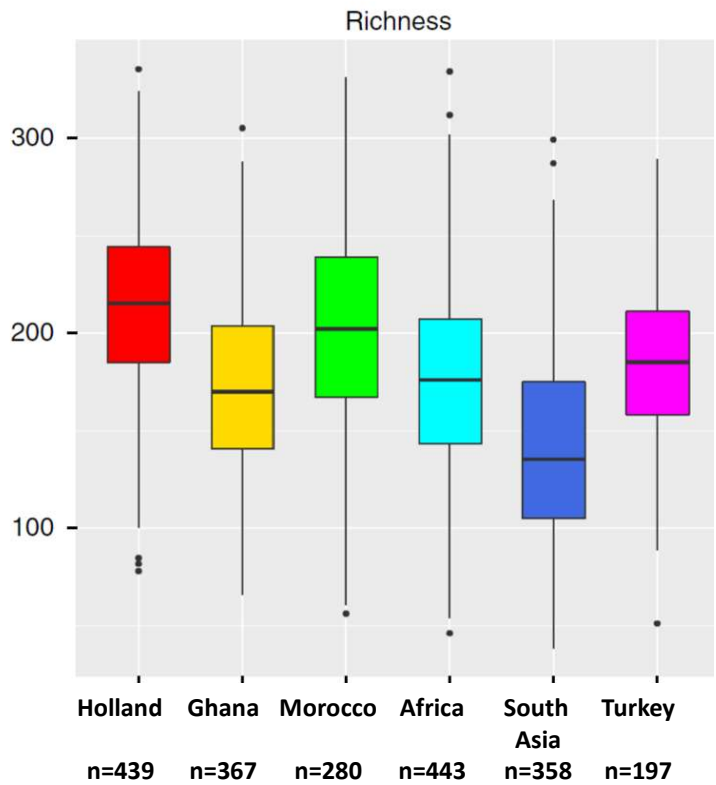
(Efficacy Claims)

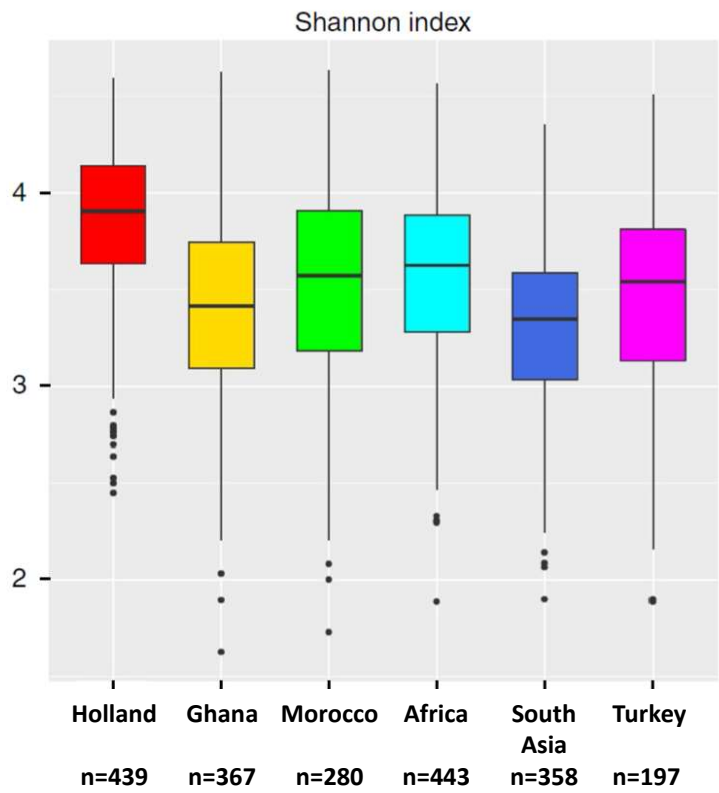
United States	Canada
• Lowering blood glucose and cholesterol	• Reduces blood total or LDL cholesterol levels
• Lowering blood pressure	• Reduces postprandial blood glucose and/or insulin levels or increases sensitivity to insulin
• Increase in frequency of bowel movements (improved laxation)	• Improves laxation or regularity by increasing stool bulk
• Reduced energy intake (e.g., due to the fiber promoting a feeling of fullness)	• Provides energy-yielding metabolites through colonic fermentation
• Increased mineral absorption in the intestinal tract	

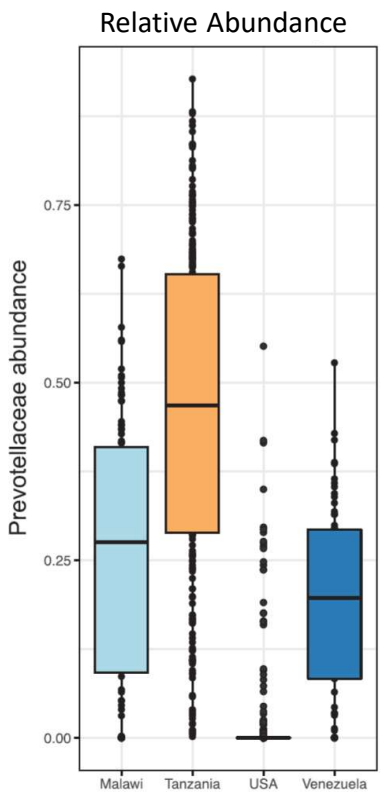
Claims require a minimum amount of an ingredient (fiber) per serving

From: McBurney MI et al. 2019 J Nutr https://doi.org/10.1093/jn/nxz154

What is a Healthy Gut Microbiome? Where will it be Found?







Total n=2,084 stool samples characterized by *Prevotella* and *Bacteroides* Operational Taxonomic Units (OTUs)

From: Deschasaux M et al. 2018 Natures Med 24:1526-1533

From: Fragiadakis GK et al. 2019 Gut Microbes 10:216-227

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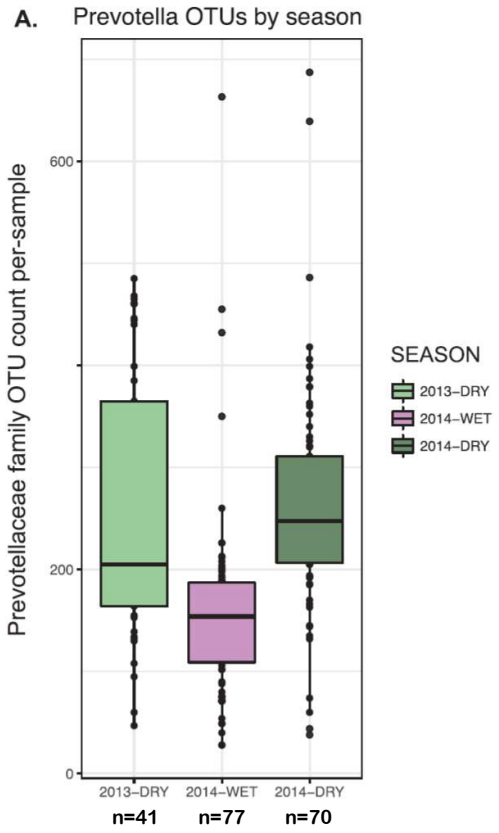
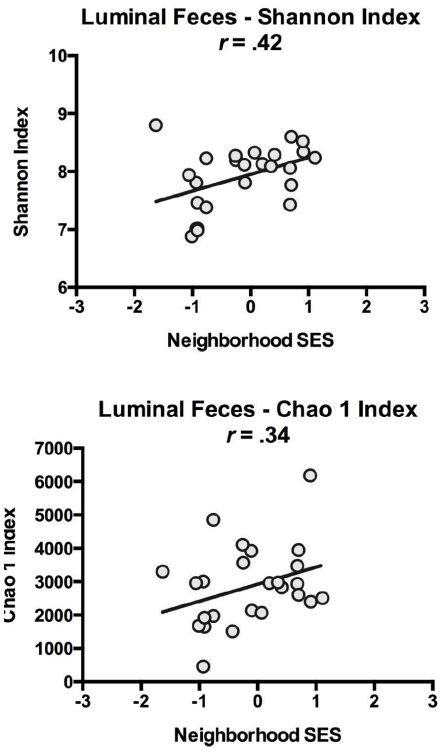
When & Where will a Healthy Gut Microbiome be Found?

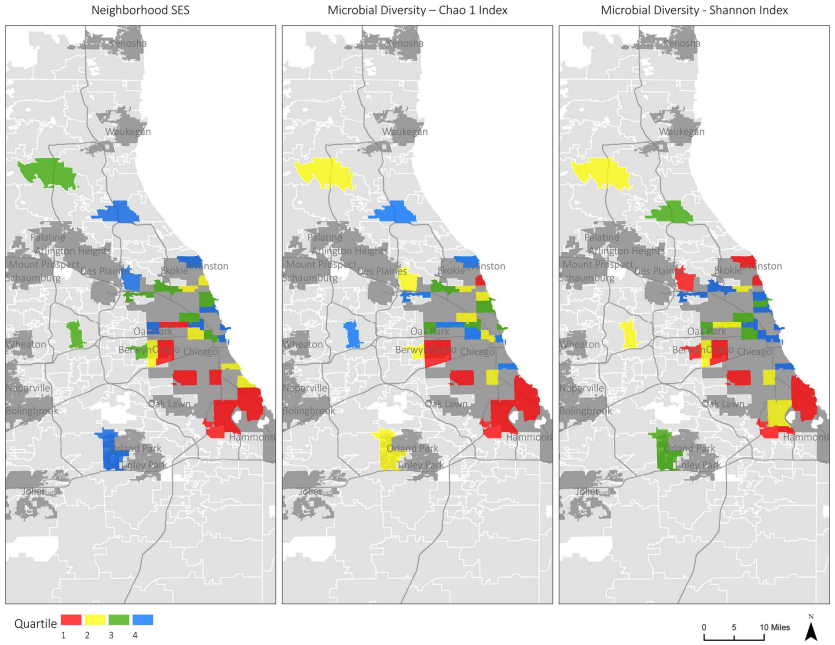
188 fecal samples from Tanzanian Hadza Hunter-gatherers



From: Fragiadakis GK et al. 2019 Gut Microbes 10:216-227

26 fecal samples from 44 healthy Chicago adults, 20-72y with household incomes of $20K-130K/y)





From: Miller GE et al. 2016 PLOS ONE 10.1371/journal.pone.0148952

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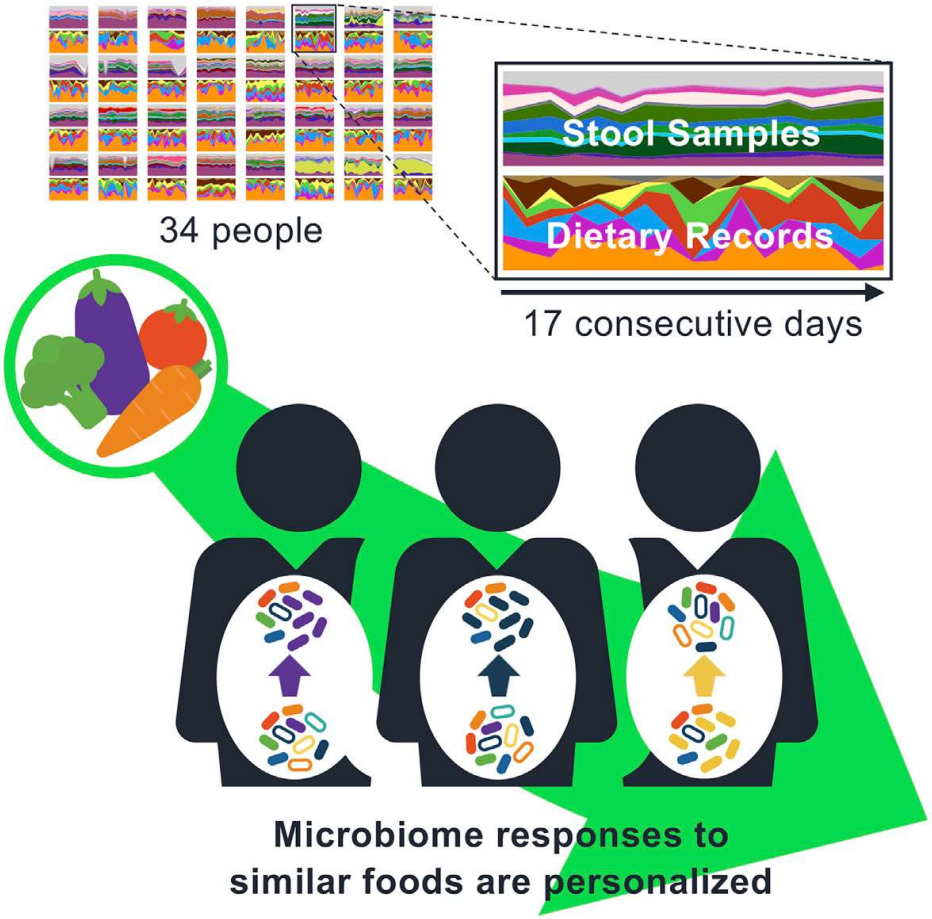
How Often Is Sampling Needed to Determine our Microbiome?



- Daily stool microbiome variation is related to food choices
- Daily microbiome variation depends upon ≥2d of diet history
- Similar foods have different effects on different people's microbiome

From: Johnson AJ et al. 2019 Cell Host Microbe 25:789-802

Questions Needing Answers to Define a Healthy Microbiome

1. What is the human health outcome of interest?
   - Is there consensus on endpoint surrogate?
   - Is the mechanism of action understood? (X affects Y)

2. Defining a 'healthy' microbiome ?
   - Microbiota composition (richness)
   - Diversity (balance)
   - Stability or resilience to perturbation
   - Microbial function (metabolism, endproducts, etc)

3. Understanding Microbiome-Host health relationships
   - Dysbiosis causes disease
   - Dysbiosis is a consequence of disease
   - Both occurrences are possible

A single tree species needn't be present for a forest to be ‘healthy’.

The presence of every tree species isn’t a requirement for a forest to be ‘healthy’.

Not every ‘healthy’ forest occurs in a typical forest environment.

Curtis Huttenhower

ILSI NA Workshop “Can We Begin to Define a Healthy Gut Microbiome Through Quantifiable Characteristics?”, Washington, DC, Dec 17, 2018

PHENOTYPIC FLEXIBILITY AND HEALTH PROMOTION

Dr. Suzan Wopereis

TNO innovation for life

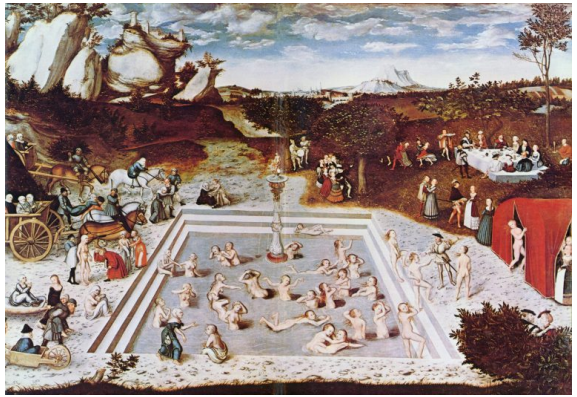
My definition of health promotion…

Promotion of substantiated healthy foods for general population

Health claims

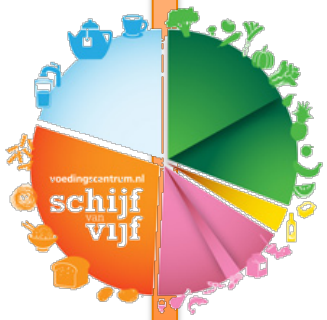
Dietary guidelines

Evidence based!



Phenotypic flexibility toolbox

Increased adherence of substantiated healthy foods



Health claims

Personalized nutrition

Why is it so difficult to quantify health effects from food/nutrition?

Free living subjects, compliance

Target population is healthy

Interaction between nutrients

Subtle and long term effects

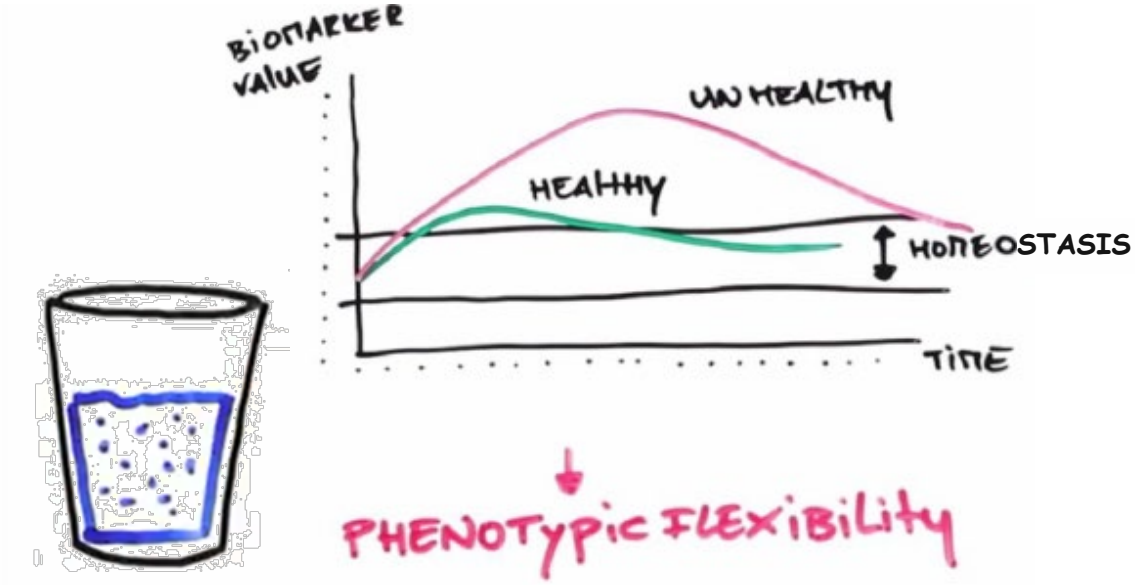
Multiple mechanisms

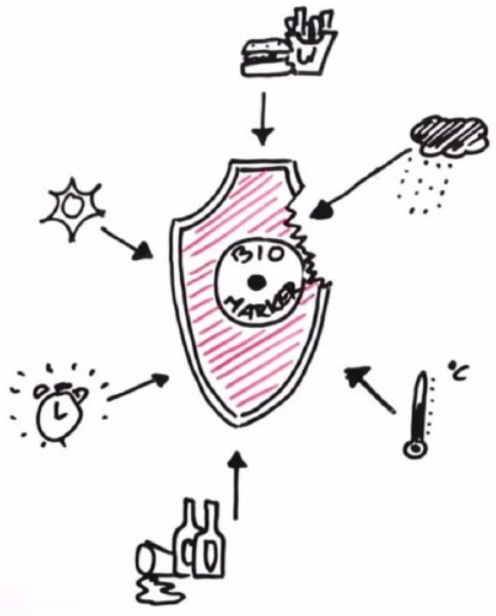
Multiple target tissues

Choice of reference

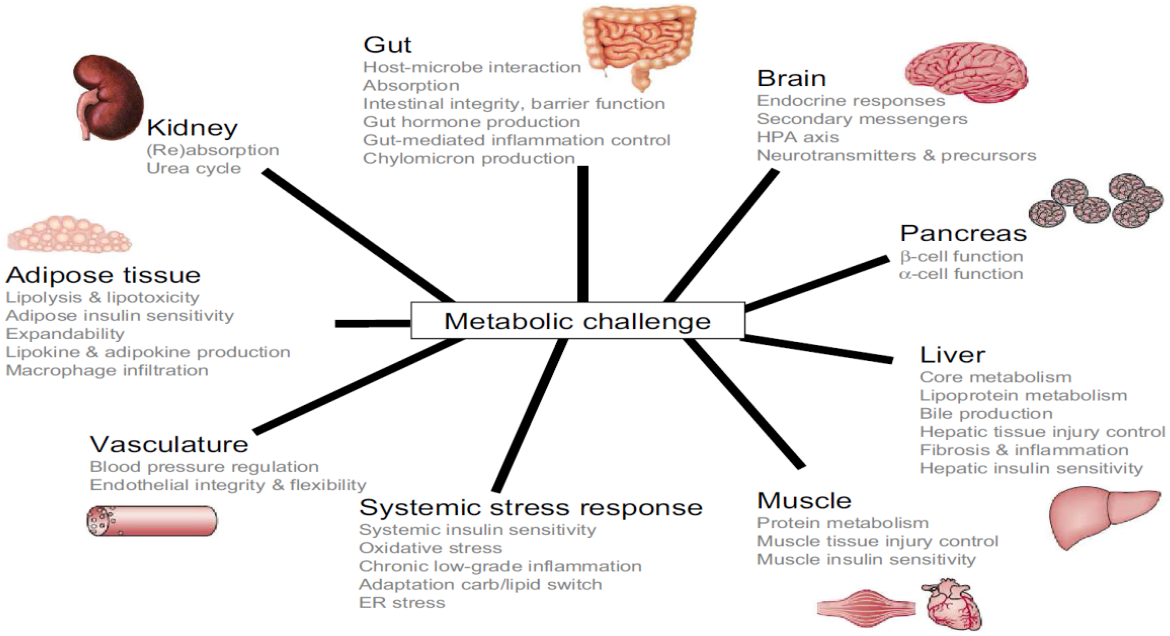
Inter individual variation

Phenotypic flexibility: next generation biomarker for health quantification!





PhenFlex challenge test:



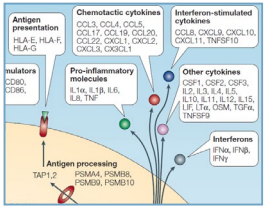
- 320 ml tapwater
- 60 grams palm olein
- 75 grams of glucose
- 20 grams of Protifar
- 0,5 gram / 20 droplets of artificial aroma

Genes Nutr (2015), 10:13

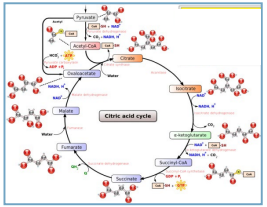
Time course studies to monitor phenotypic flexibility

Blood sampling at multiple time points after challenge, up to 10 hours

clinical chemistry



proteome

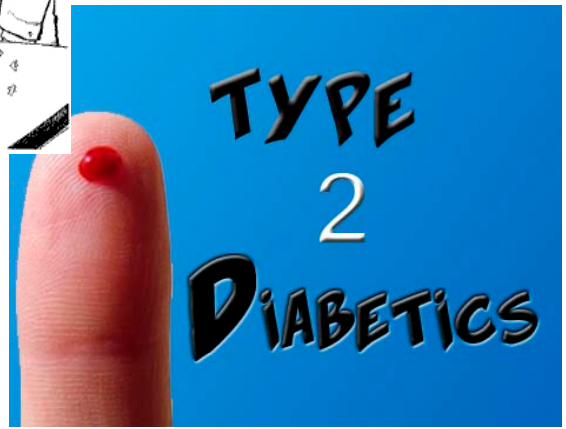


metabolome

transcriptome

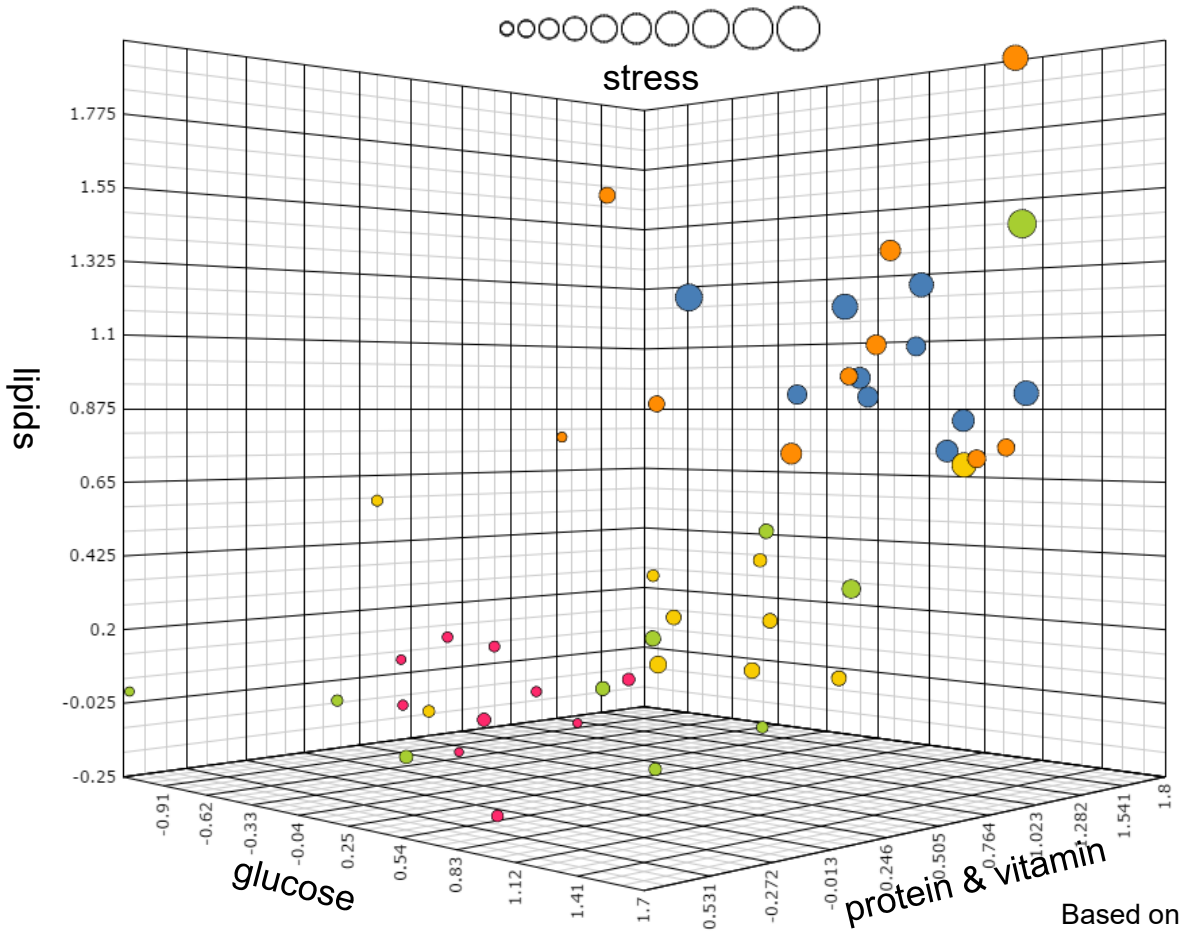
Aim: to monitor response of multiple biological processes

- GLUCOSE
- FAT
- PROTEIN



Genes Nutr. 2017;12:21
Genes Nutr. 2017;12:32

Variation in phenotypic flexibility in healthy subjects

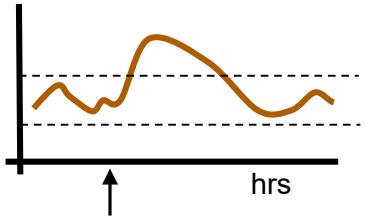


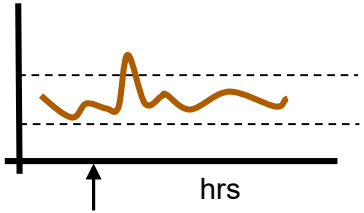
Age 20-29, L-N
Age 60-69, N-H

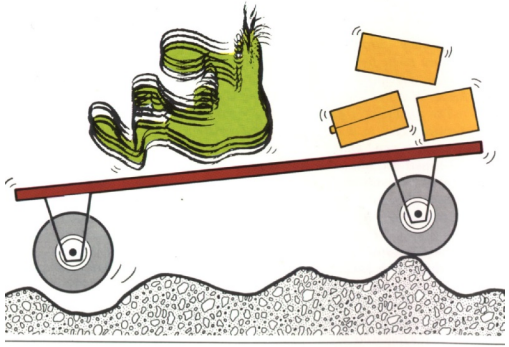
Age 30-59
LOW FAT%
NORMAL FAT%
HIGH FAT%

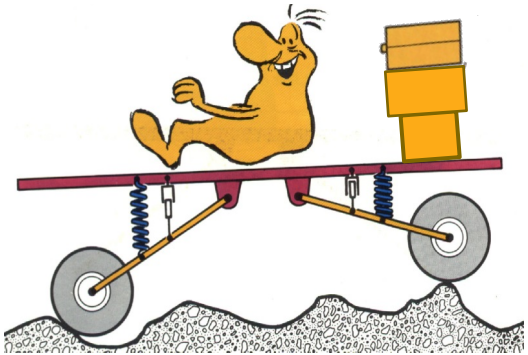
Based on ~160 markers

QUANTIFICATION OF RESILIENCE









Can a challenge test quantify health benefits from nutrition?

TNO innovation for life

- 36 overweight healthy male with elevated CRP
  5 weeks supplement mix
  cross-over design placebo vs intervention

Bakker et al. Am J Clin Nutr. 2010; 91:1044-59.
Pellis et al. Metabolomics. 2012; 8(2):347-359.
Bouwman et al. BMC Med Gen. 2012; 6;5:1.

- 10 healthy young male
  before and after 4 weeks overfeeding
  (1300 kcal/day extra)

Kardinaal et al. FASEB J. 2015;29(11):4600-13.

- 18 Metabolic Syndrome (male & female)
  12 weeks High MUFA diet before and after

Cruz-Teno et al. Mol. Nutr. Food Res. 2012;56:854–865

- 29 healthy overweight middle-aged men
  double-blind crossover study
  effects of 4 wk high flavonol chocolate (HFC)
  vs normal dark chocolate (NFC)

Esser et al. FASEB J. 2014;28(3):1464-73

- 72 healthy overweight male and female
  parallel study control vs intervention
  effects of 12 wk energy restriction

Fiomoncini J et al. FASEB J. 2018,32(10):5447-5458

HEALTH PROMOTION THROUGH HEALTH CLAIMS

The Journal of Nutrition
Nutrient Physiology, Metabolism, and Nutrient-Nutrient Interactions

TNO innovation for life

JoN, 2019. doi 10.1093

Whole Grain Wheat Consumption Affects Postprandial Inflammatory Response in a Randomized Controlled Trial in Overweight and Obese Adults with Mild Hypercholesterolemia in the Graandioos Study

Femke PM Hoevenaars,[1] Diederik Esser,[2] Sophie Schutte,[2] Marion G Priebe,[3] Roel J Vonk,[3] Willem J van den Brink,[1] Jan-Willem van der Kamp,[1] Johanna HM Stroeve,[1] Lydia A Afman,[2] and Suzan Wopereis[1]

[1]TNO, Netherlands Organization for Applied Scientific Research, Zeist, Netherlands; [2]Wageningen University, Division of Human Nutrition, Wageningen, Netherlands; and [3]University Medical Center Groningen, University of Groningen, Center for Medical Biomics, Groningen, Netherlands

ABSTRACT

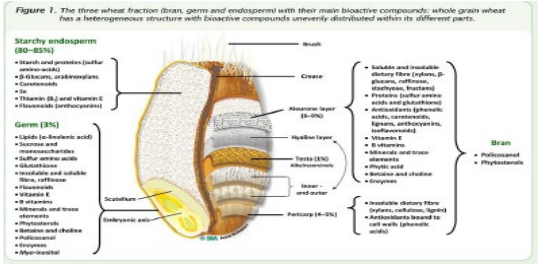
Background: Whole grain wheat (WGW) consumption is associated with health benefits in observational studies. However, WGW randomized controlled trial (RCT) studies show mixed effects.

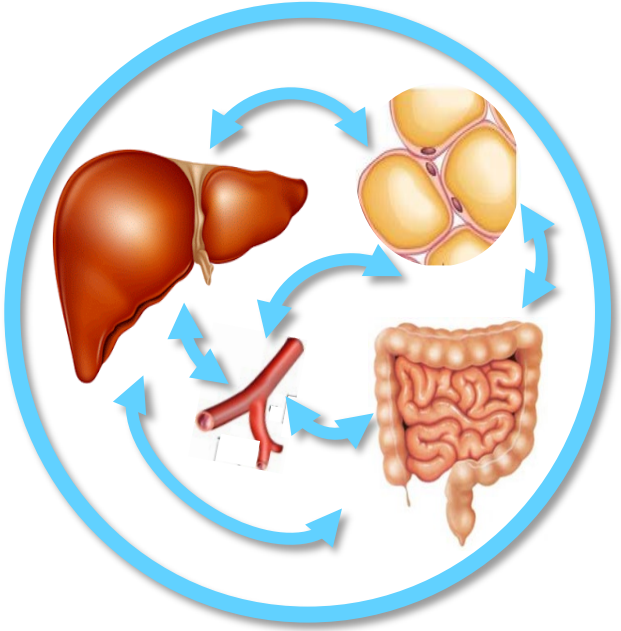
Objectives: The health impact of WGW consumption was investigated by quantification of the body's resilience, which was defined as the "ability to adapt to a standardized challenge."

Methods: A double-blind RCT was performed with overweight and obese (BMI: 25–35 kg/m^2) men (n = 19) and postmenopausal women (n = 31) aged 45–70 y, with mildly elevated plasma total cholesterol (>5 mmol/L), who were randomly assigned to either 12-wk WGW (98 g/d) or refined wheat (RW). Before and after the intervention a standardized mixed-meal challenge was performed. Plasma samples were taken after overnight fasting and postprandially (30, 60, 120, and 240 min). Thirty-one biomarkers were quantified focusing on metabolism, liver, cardiovascular health, and inflammation. Linear mixed-models evaluated fasting compared with postprandial intervention effects. Health space models were used to evaluate intervention effects as composite markers representing resilience of inflammation, liver, and metabolism.

Results: Postprandial biomarker changes related to liver showed decreased alanine aminotransferase by WGW (P = 0.03) and increased β-hydroxybutyrate (P = 0.001) response in RW. Postprandial changes related to inflammation showed increased C-reactive protein (P = 0.001), IL-6 (P = 0.02), IL-8 (P = 0.007), and decreased IL-1B (P = 0.0002) in

Towards health claim substantiation for whole grain wheat products





umcg

CPWSA Cereal Partners Worldwide Nestlé & General Mills

NBC Kennis- en adviescentrum voor de bakkerij

WAGENINGEN UNIVERSITY & RESEARCH

GoodMills Innovation

Study design

12 week intervention
Whole grain wheat [WGW]
Refined wheat [RW]

Run in period
[4 weeks]

Intervention period
[12 weeks]

98 g WGW per day

Uncoloured RW
***n*=50**

WGW
***n*=25**

Coloured RW
***n*=25**

45-70 years
overweight and obese
mildly elevated total cholesterol

Challenge test

MRI/MRS

Challenge test

MRI/MRS

WAGENINGEN
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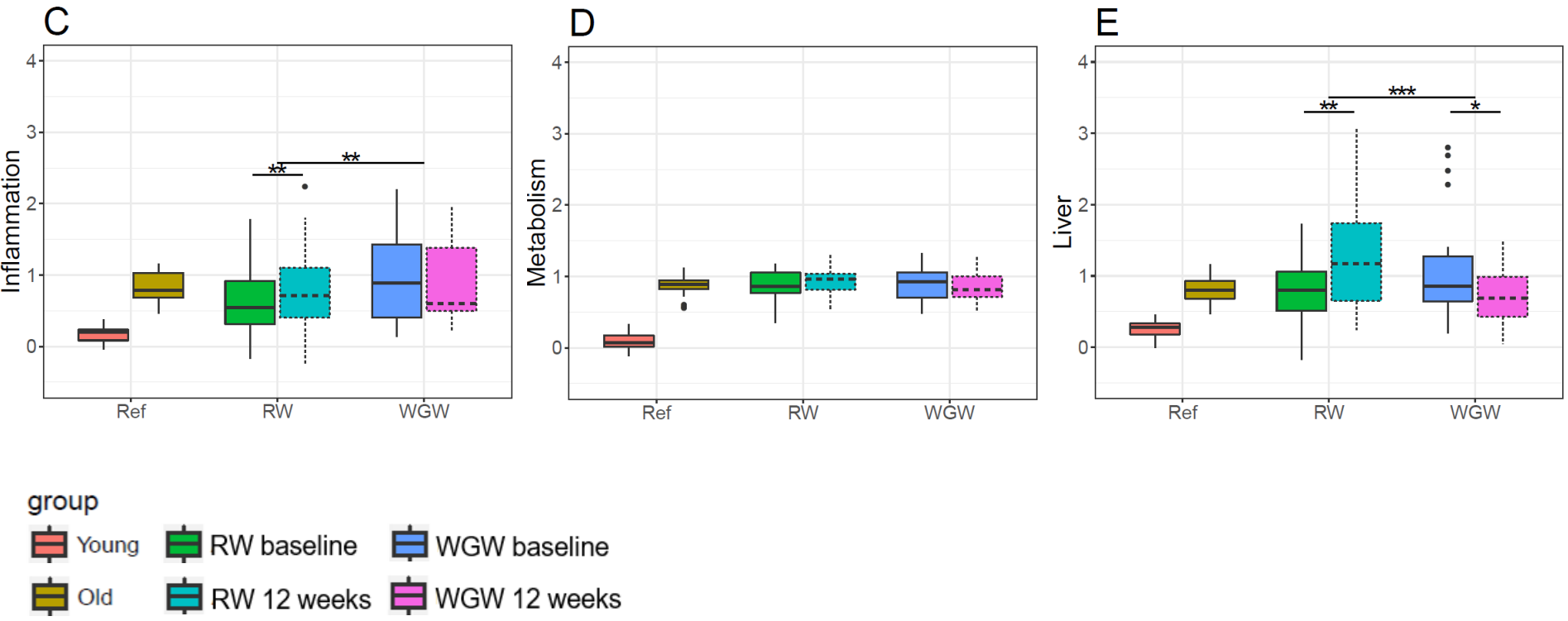
Preventive effects of WGW on liver resilience and inflammation!



Results on cardio-metabolic health by ‘classic’ evaluation

V unction

-
- A

Biomarke ular health

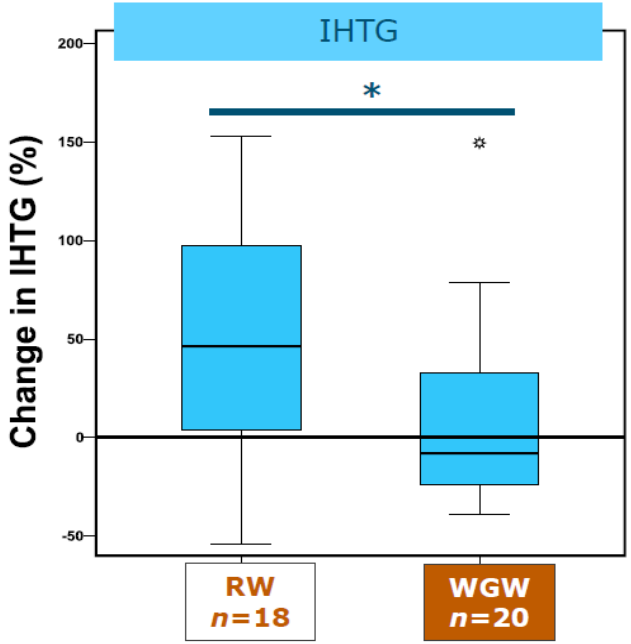
- vascu es (fasting)
- homocy
- Magnesiu

Metabolic paramet

- total, HDL, LDL rol (fasting)
- TG (fasting)
- glucose, insulin (fas
- HbA1c

NOT CHANGED

Proton Magnetic Resonance Spectroscopy (^{1}H-MRS)



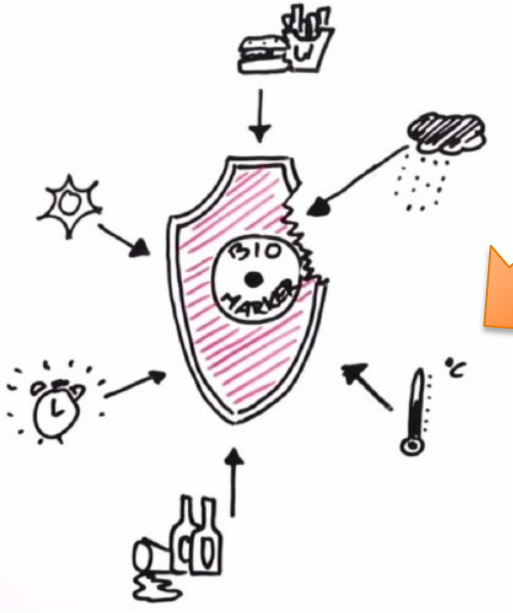
‘resilience composites’ evaluated by EFSA experts

TNO innovation for life

- **A scientific rationale has to be provided that defines resilience as a specific body function, and why improvement of resilience should be considered a beneficial physiological effect.**
  - Why ‘metabolism’ and their response to a dietary challenge, is a specific body function that may be improved, e.g. variability with age, health status.

- **Provide an explanation why the combined biomarker concept is an appropriate measure of resilience.**
  - It must be capable of being assessed in vivo in humans by generally accepted methods (EFSA 2016)
  - The proposed method of measurement of resilience (e.g. differential responses to a standardized OPGLTT as measured by the extent of disruption and rate of response of selected blood markers) should be provided, including a scientific rationale for why it is appropriate.
  - why the body function is best described by a number of outcome variables which are interrelated (e.g. different markers), and which in combination could provide information about the function
  - how changes in serum/plasma levels of these markers, individually and collectively, reflect changes in ‘metabolism’
  - At least shown in additional 2 independent studies

Next steps…



NBC
Kennis- en adviescentrum voor de bakkerij

Health Claim

efsa
European Food Safety Authority

EFSA acceptance of resilience

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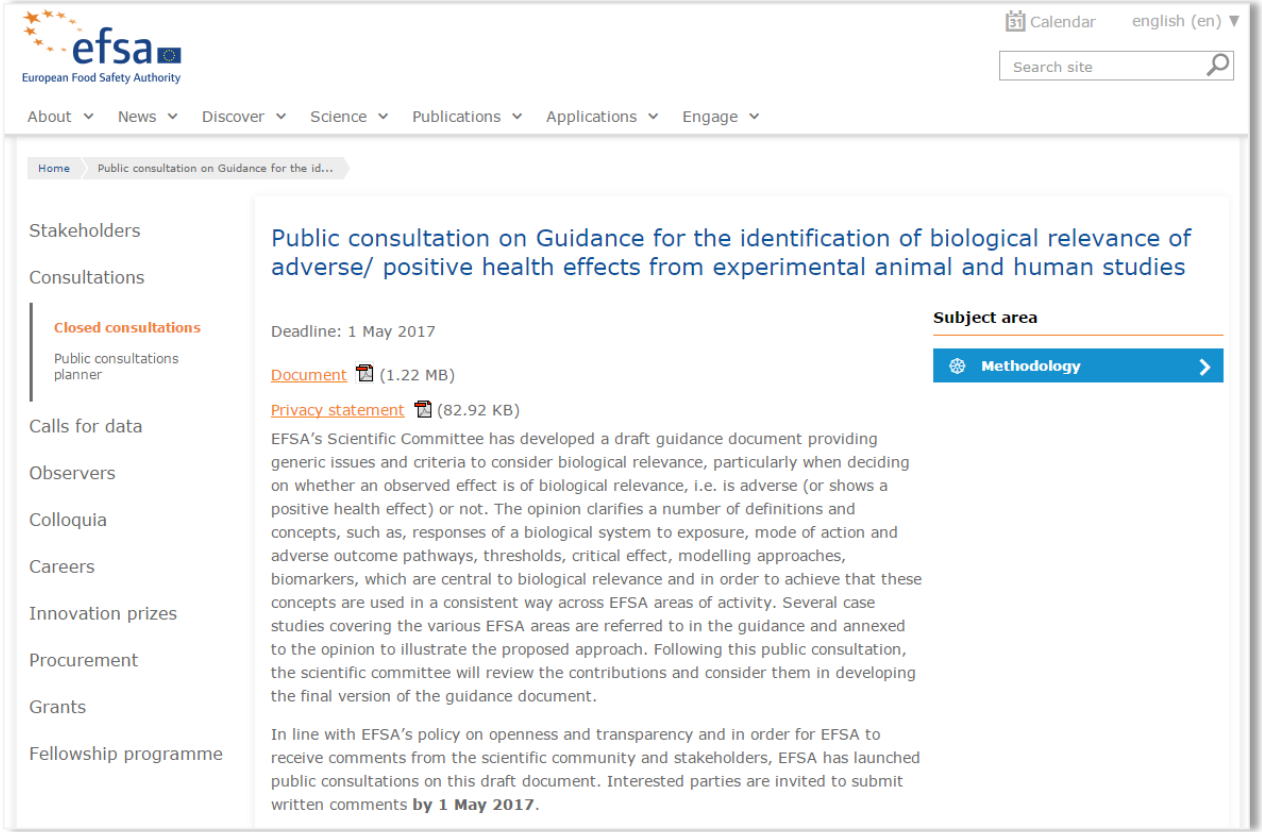

efsa European Food Safety Authority

Calendar english (en)

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Grants

Fellowship programme

Public consultation on Guidance for the identification of biological relevance of adverse/ positive health effects from experimental animal and human studies

Deadline: 1 May 2017

Document (1.22 MB)

Privacy statement (82.92 KB)

EFSA's Scientific Committee has developed a draft guidance document providing generic issues and criteria to consider biological relevance, particularly when deciding on whether an observed effect is of biological relevance, i.e. is adverse (or shows a positive health effect) or not. The opinion clarifies a number of definitions and concepts, such as, responses of a biological system to exposure, mode of action and adverse outcome pathways, thresholds, critical effect, modelling approaches, biomarkers, which are central to biological relevance and in order to achieve that these concepts are used in a consistent way across EFSA areas of activity. Several case studies covering the various EFSA areas are referred to in the guidance and annexed to the opinion to illustrate the proposed approach. Following this public consultation, the scientific committee will review the contributions and consider them in developing the final version of the guidance document.

In line with EFSA's policy on openness and transparency and in order for EFSA to receive comments from the scientific community and stakeholders, EFSA has launched public consultations on this draft document. Interested parties are invited to submit written comments **by 1 May 2017**.

Subject area

Methodology

Resilience since 2005

- >20 scientific publications on the concept
- 7 scientific publications focusing on PhenFlex test
- 7 (ongoing) clinical studies with PhenFlex test

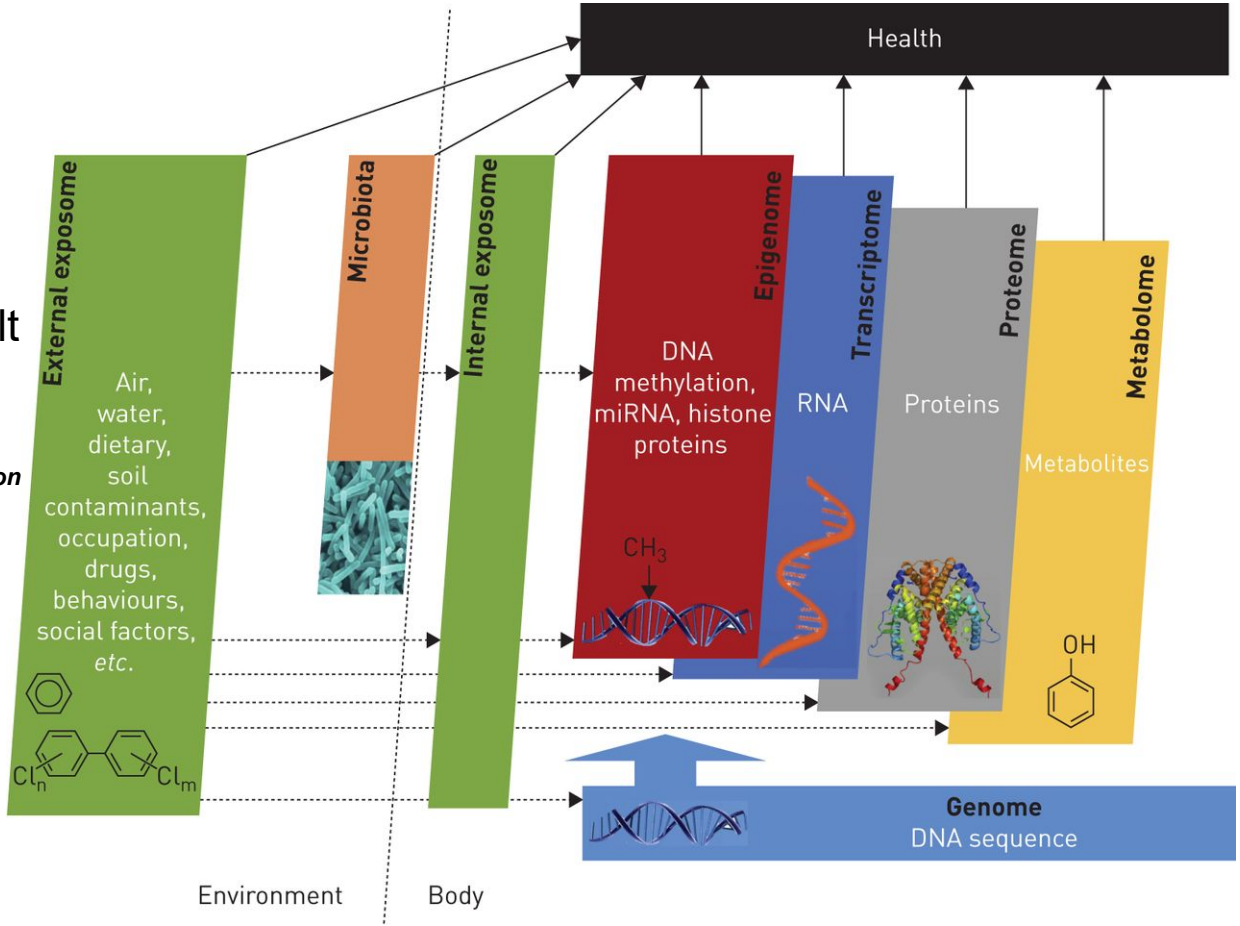
HEALTH PROMOTION THROUGH PERSONALISATION

Personalized nutrition (1)

Personalized nutrition uses individual-specific information, founded in evidence-based science, to promote dietary behavior change that may result in measurable health benefits.

Perspective: Guiding Principles for the Implementation of Personalized Nutrition Approaches That Benefit Health and Function

Adams et al. Advances of Nutrition (2019), doi 10.1093



Personalized nutrition (2)

TNO innovation for life

1 2

Personalized nutrition uses individual-specific information, founded in evidence-based science,
3 to promote dietary behavior change that may result in measurable health benefits.

1 *Individual-specific information:* This includes any information that is more specific than population level, such as behaviors, diet history, socioenvironmental factors, phenotype, and genetic and other forms of individualized testing (e.g., blood biomarkers).

2 *Founded in evidence-based science:* Supporting scientific evidence is considered adequate for the specified tool if the data, and methods of its collection and analysis, are generally accepted by experts and adhere to well-established principles of scientific substantiation, including rigor and reproducibility. Specifics of the evidence required may vary depending upon the potential benefits and risks of the tools in question.

3 *To promote behavior change:* An essential step in PN is that the information provided promotes a change in individual dietary behaviors that may result in health or function improvement [see, e.g., Ory et al. (10) and Wood and Neal (11)]. An important element to consider in behavior change is the sustainability, or longer-term adherence to diet and lifestyle patterns [see, e.g., Foreyt and Goodrick (12)], and the resulting health effects.

Adams et al. Advances of Nutrition (2019), doi 10.1093

Physiology & Behavior 210 (2019) 112642

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TNO innovation for life

P&B, 2019. 210; 112642

Beneficial effect of personalized lifestyle advice compared to generic advice on wellbeing among Dutch seniors – An explorative study

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[a] Wageningen University & Research, Wageningen Food & Biobased Research, Wageningen, the Netherlands
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ARTICLE INFO

Keywords:
Personalized nutrition
Older adults
Web-based feedback
Lifestyle behavior
Muscle health
Wellbeing

ABSTRACT

The aim of this explorative study is to evaluate whether personalized compared to generic lifestyle advice improves wellbeing in a senior population. We conducted a nine-week single-blind randomized controlled trial including 59 participants (age 67.7 ± 4.8 years) from Wageningen and its surrounding areas in the Netherlands. Three times during the intervention period, participants received either personalized advice (PA), or generic advice (GA) to improve lifestyle behavior. Personalization was based on metabolic health measures and dietary intake resulting in an advice that highlighted food groups and physical activity types for which behavior change was most urgent. Before and after the intervention period self-perceived health was evaluated as parameter of wellbeing using a self-perceived health score (single-item) and two questionnaires (Vita-16 and Short Form-12). Additionally, anthropometry and physical functioning (short physical performance battery, SPPB) were assessed.

Overall scores for self-perceived health did not change over time in any group. Resilience and motivation (Vita-16) slightly improved only in the PA group, whilst mental health (SF-12) and energy (Vita-16) showed slight improvement only in the GA group. SPPB scores improved over time in both the PA and GA group. PA participants also showed a reduction in body fat percentage and hip circumference, whereas these parameters increased in the GA group Our findings suggest that although no clear effects on wellbeing were found, still, at least on the short term, personalized advice may evoke health benefits in a population of seniors as compared to generic advice.

Personalised advice for healthy muscles

SenTo
N=800

N=59 (63% female)
Age 60 – 79y
Sedentary behaviour ≥ 10h/day
BMI 20-30
Good general health

Personalised advice:
7 x nutrition, 2 x exercise
Personalisation based on:
- Content: Muscle health, wellbeing, lifestyle
- Form: freedom of choice

Generic advice:
Leaflet Dutch food based dietary guidelines (Voedingscentrum)

Study design: measurements, feedback & advice

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9 week intervention period DiY@home

Baseline assessment @location	Generic advices	End assessment @location
	Personalised advices	

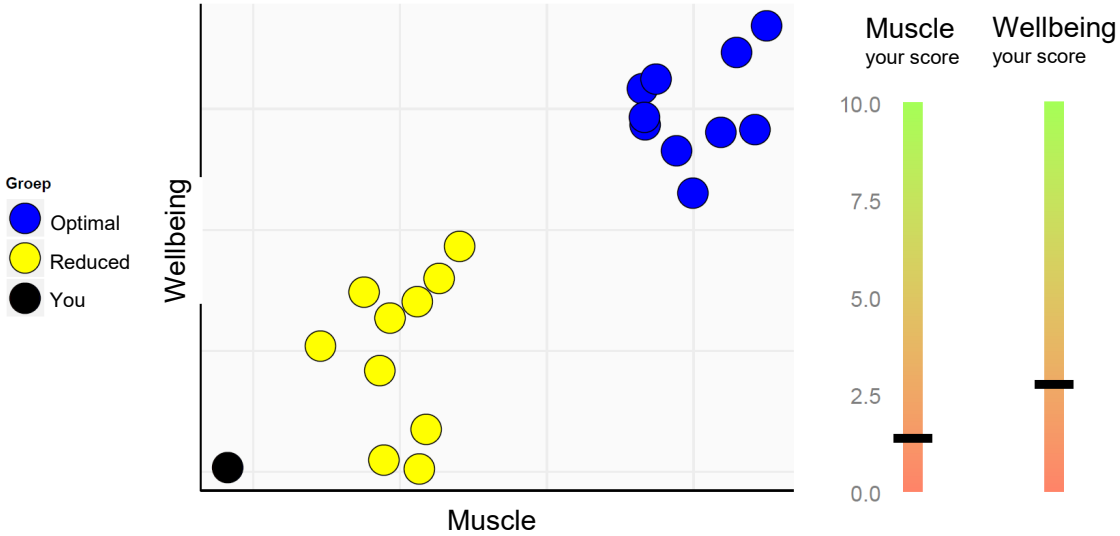
Measurements:
Muscle health
Wellbeing
Socio-psychology

Monitoring:
Weekly: physical activity
Every 3 weeks: Food intake
Every 3 weeks: Compliance & self-efficacy

Measurements:
Muscle health
Wellbeing
Socio-psychology

Feedback & Advice
Baseline & end: Feedback on health
Every 3 weeks: Feedback & advice on lifestyle behaviour

Individual feedback on health



Do it yourself (DIY) tools: muscle health & wellbeing

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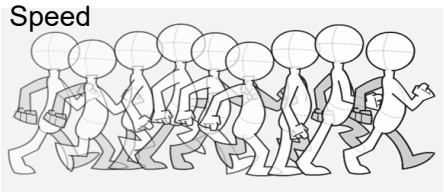
Measures included in muscle score:

Lean mass

Arm & thigh circumference

Short Physical Performance Battery



Measures included in wellbeing score:

BMI, Body Fat

Instruments

Total cholesterol
HDL & LDL
Ratio tot Chol/HDL
Triglycerides
Glucose

Waist, length

SBP
DBP

Questionnaires

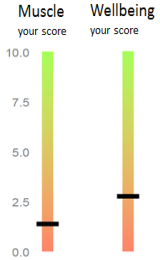
Motivation
Energy
Resilience

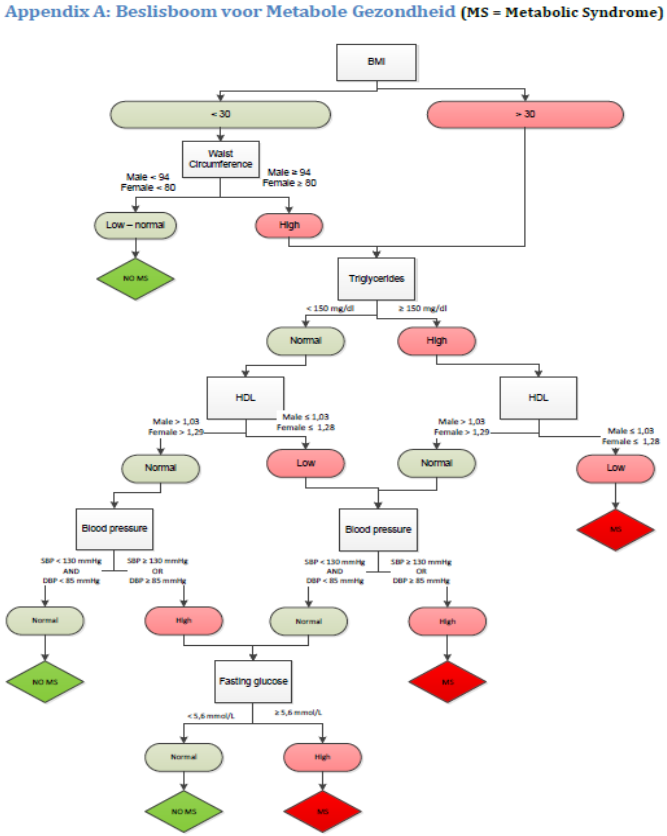
Personalized advice on phenotype, genotype and intake

Food diary

Genetic variation

ACE, TCF7L2, FTO, FADS1, GDF5, VDR





Advies

Wij raden U aan om voor minimaal 2 rode of oranje aspecten een doelstelling te formuleren.
Bij voorkeur 1 op voeding (dit is één van de bovenste 7 aspecten) en 1 op bewegen (dit is één van de onderste 2 aspecten, Kracht of Beweging). Voor groene aspecten hoeft u geen doelstelling te formuleren.
Klik op een aspect om een doelstelling te formuleren.

Een voorbeeld van een doelstelling is:
Als ik 's ochtends ontbijt, dan vervang ik een boterham met hagelslag door een gekookt ei
Als ik 's avonds eet, eet ik meer vis.
Als ik naar mijn werk ga, dan ga ik op de fiets.

- Vitamine D inname
- Verzadigd vet inname
- Calorie inname
- Zout inname
- Water inname
- Eiwit Inname
- Omega-3 inname
- Kracht
- Beweging

Vitamine D inname

U krijgt niet voldoende vitamine D binnen. Vitamine D is belangrijk in het vergroten van uw spieren en zorgt ervoor dat u zich energiek voelt. U heeft een genetische variatie waardoor het voor u extra belangrijk is om te zorgen dat u voldoende vitamine D binnen krijgt. Dit kunt u op de volgende manieren doen: • Eet meer voeding met veel vitamine D, zoals vette vis. Vitamine D wordt ook toegevoegd aan halvarine, margarine en bak- en braadproducten (geldt niet voor olie). • Slik elke dag een vitamine D supplement. Let bij het kopen van supplementen goed op de hoeveelheid vitamine D per tablet, zodat u niet te veel binnenkrijgt; de maximale hoeveelheid is 100 microgram per dag. Laat u zo nodig adviseren.

Als ik lunch, dan neem ik meer Gekookt ei

Verzadigd vet inname

Calorie inname

Zout inname

Water inname

Eiwit Inname

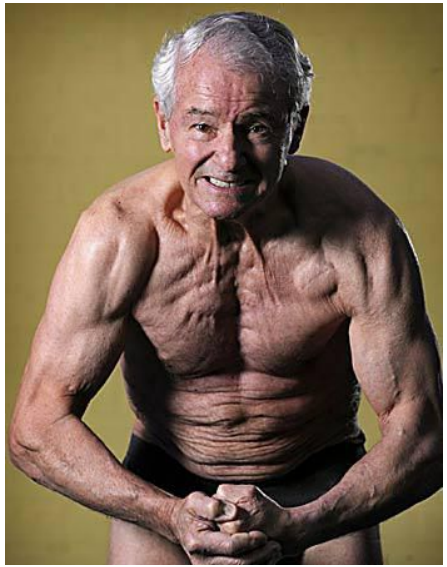
Omega-3 inname

Kracht

Beweging

Summary of health results

- Both groups showed an improved muscle health and wellbeing after 9 weeks of being provided with lifestyle advice
- Personalisation is beneficial especial for subjects with a low self-efficacy
- Only the personalised advice group showed reduced weight, fat % and waist circumference and improved vitamin D & n-3 levels
- The personalised advice group showed more improved resilience!



Take home message

- For diagnosis of health effects of nutrition we need resilience markers of health rather than biomarkers of disease
- The PhenFlex challenge discriminates between different states of health and is superior to measurements in fasted state to quantify health effects of nutrition
- The PhenFlex challenge may deliver next generation biomarkers for health that may be useful for health claim substantiation
- Personalised lifestyle advices may empower elderly to change lifestyle behaviour with measurable (short-term) health benefits
- In this way we can substantiate subtle personal health effects of nutrition. This leads to products and services that promote public health!

THANK YOU FOR YOUR ATTENTION

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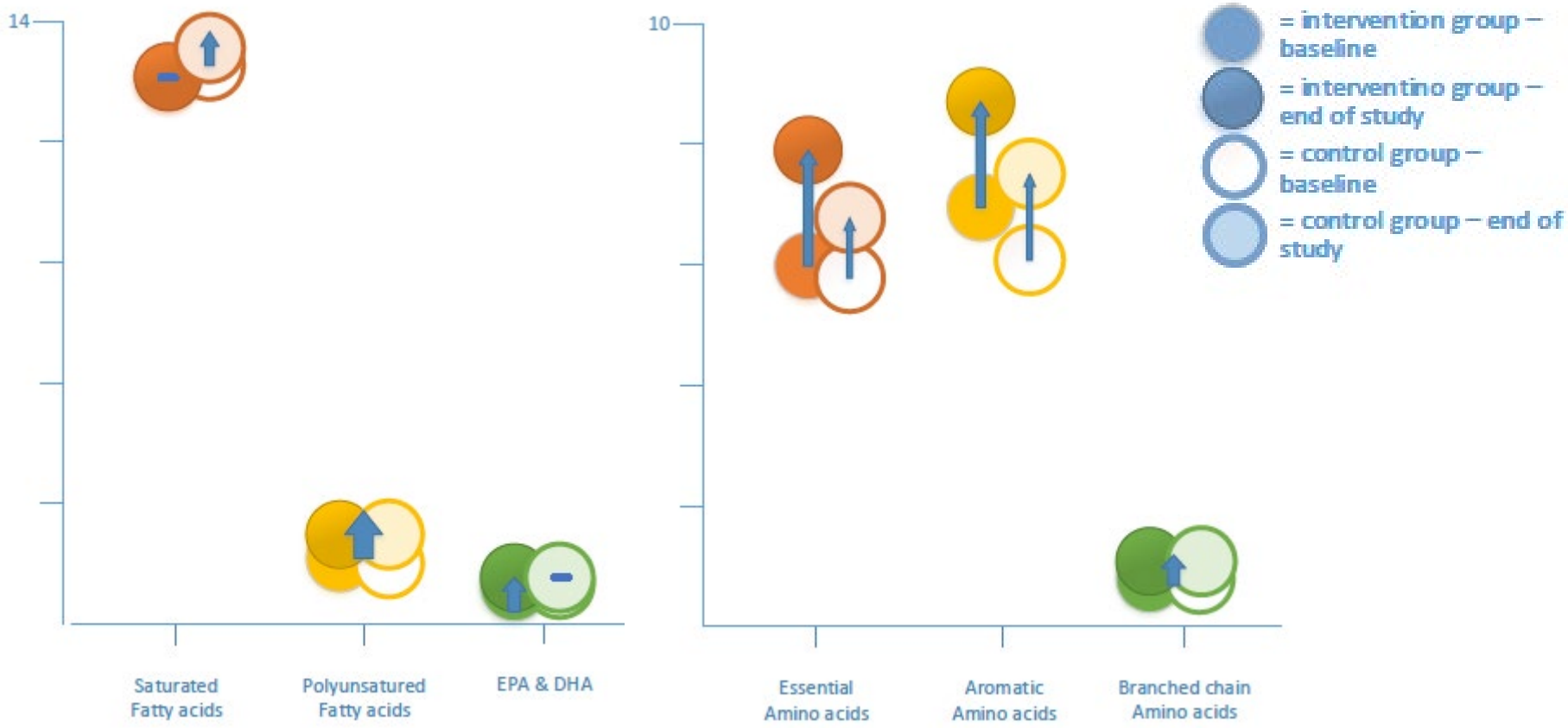
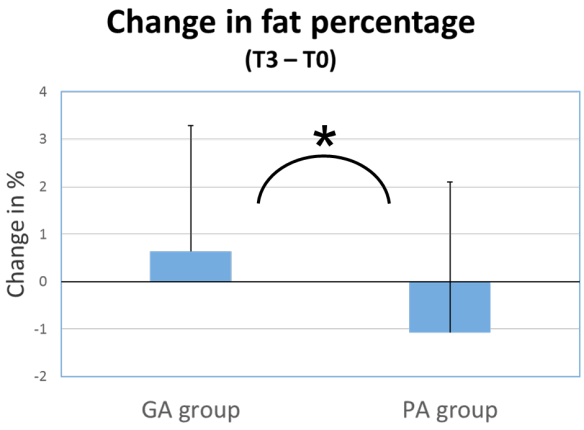
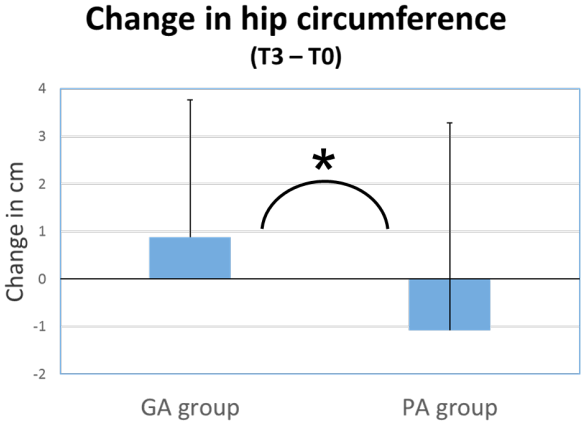
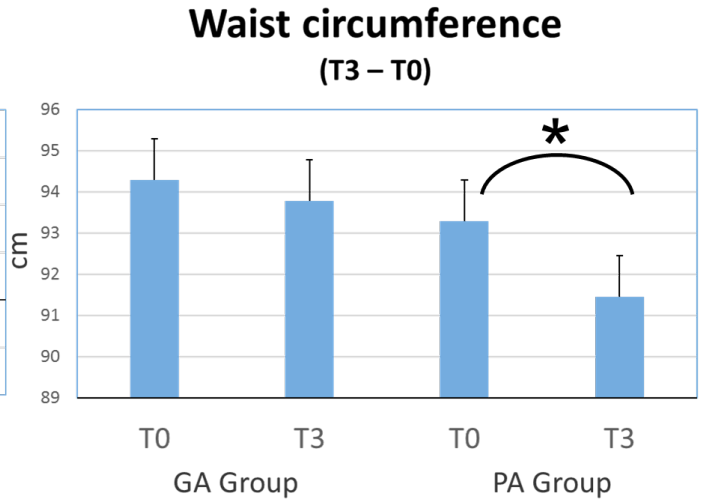
Results indicative of differences between intervention groups (I)



Results indicative of differences between intervention groups (II)







World Health Organization

28 November 2019 | CRN-I Symposium

Roundtable on measuring health promotion:

Translating science into policy

NCD Interventions that are Health Promoting

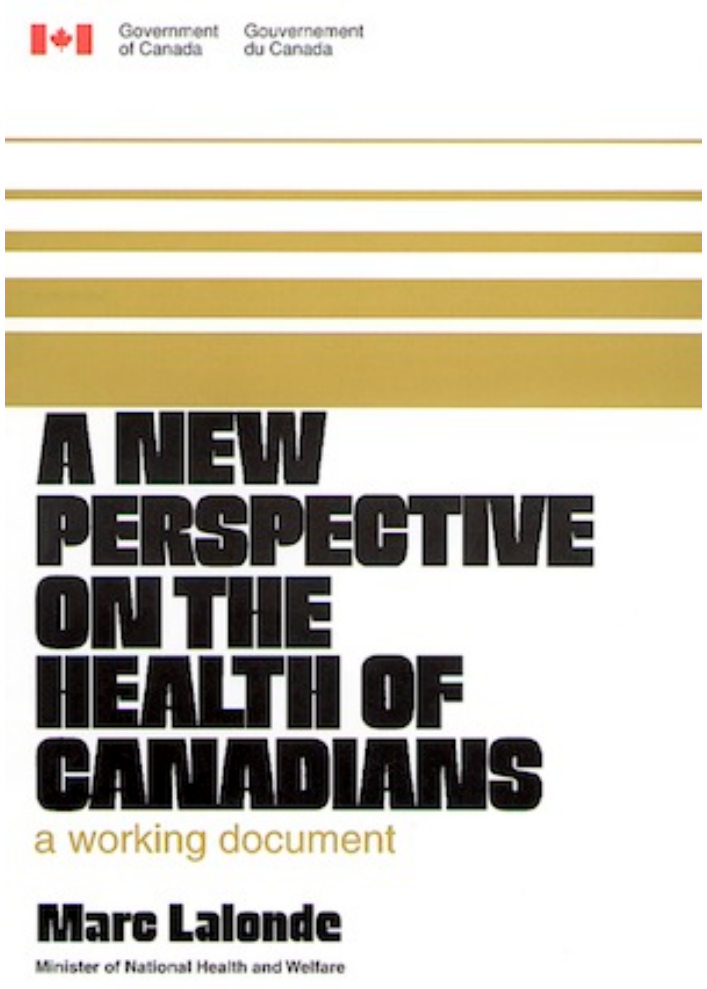
Dr. Temo Waqanivalu

WHO | NCD Integrated Services

Introduction

- Health Promotion
- Noncommunicable Disease Catastrophe
- Interventions that are Health Promoting
- Going Forward

The Lalonde Report 1974



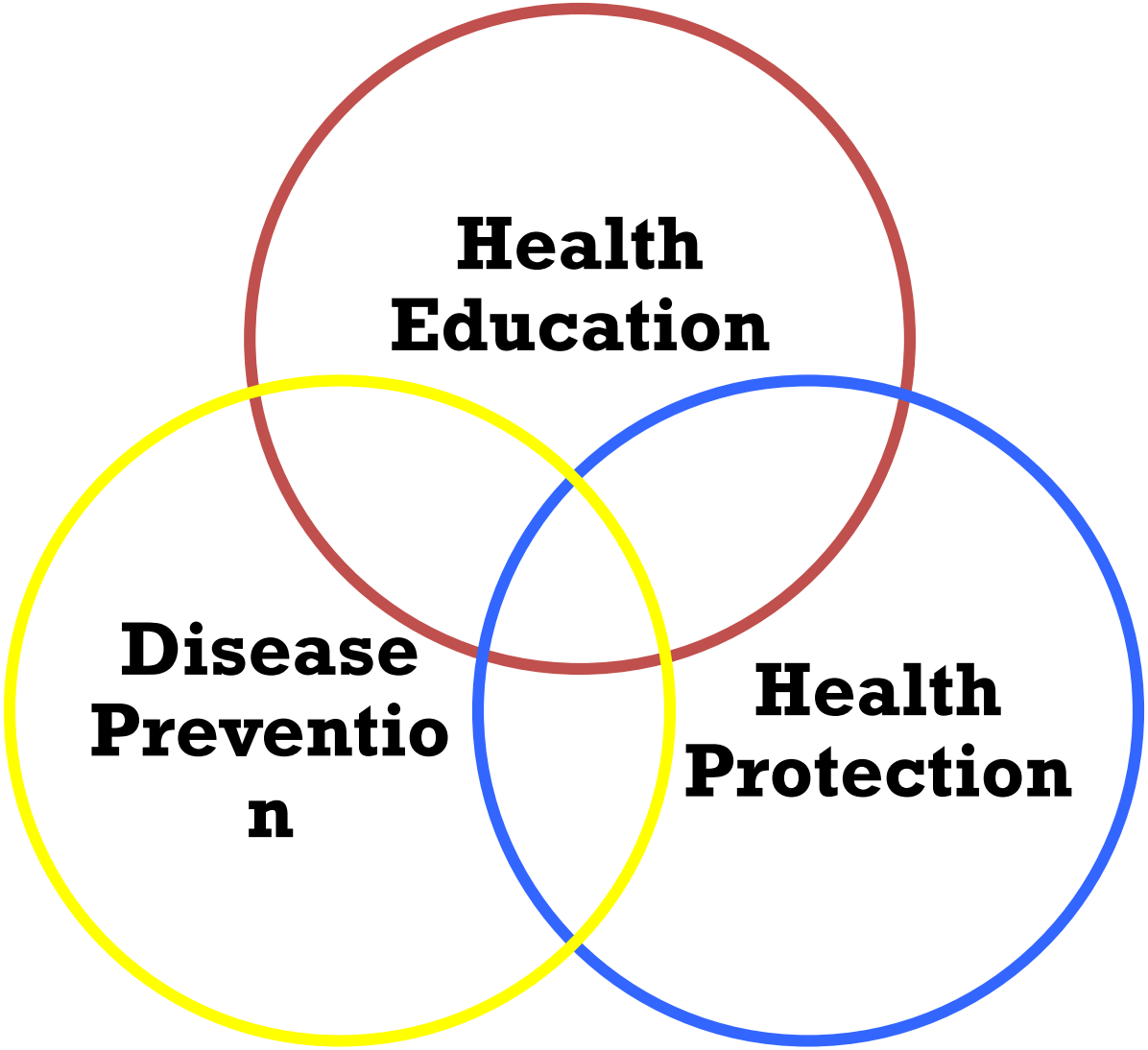
- Presents convincing statistics that despite 7.1% of GNP spent on health, Canadians health not improving.
- Shows over 70% of deaths from heart disease, cancer, drug and alcohol addiction, STDs and respiratory disease associated with smoking and pollution, and injuries from road accidents.
- Asserts that these premature illness and deaths the result of lifestyle factors.
- Argues for a new perspective - a "health promotion strategy"
- Begins the modern era of Health Promotion.

Health Promotion

The process of enabling people to increase control over their health and its determinants, and thereby improve their health.

WHO

A Model of Health Promotion



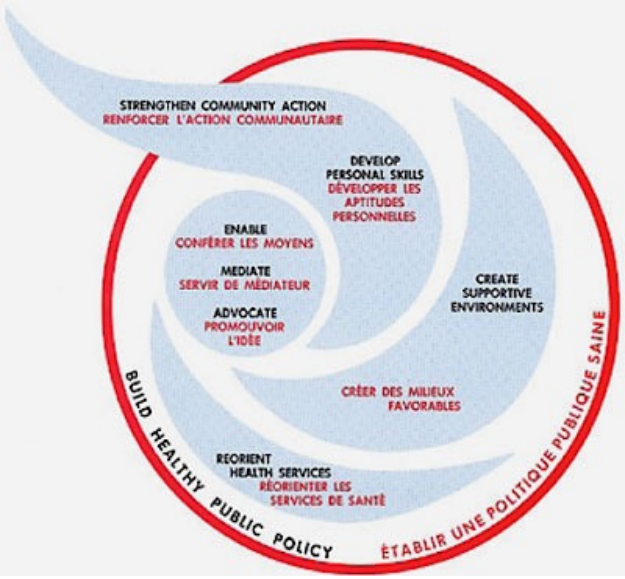
Health promotion is a highly fashionable term which has acquired so many meanings as to become meaningless…

Tannahill 1985

Health Promotion Action Means…

Enable, Mediate and Advocate to:

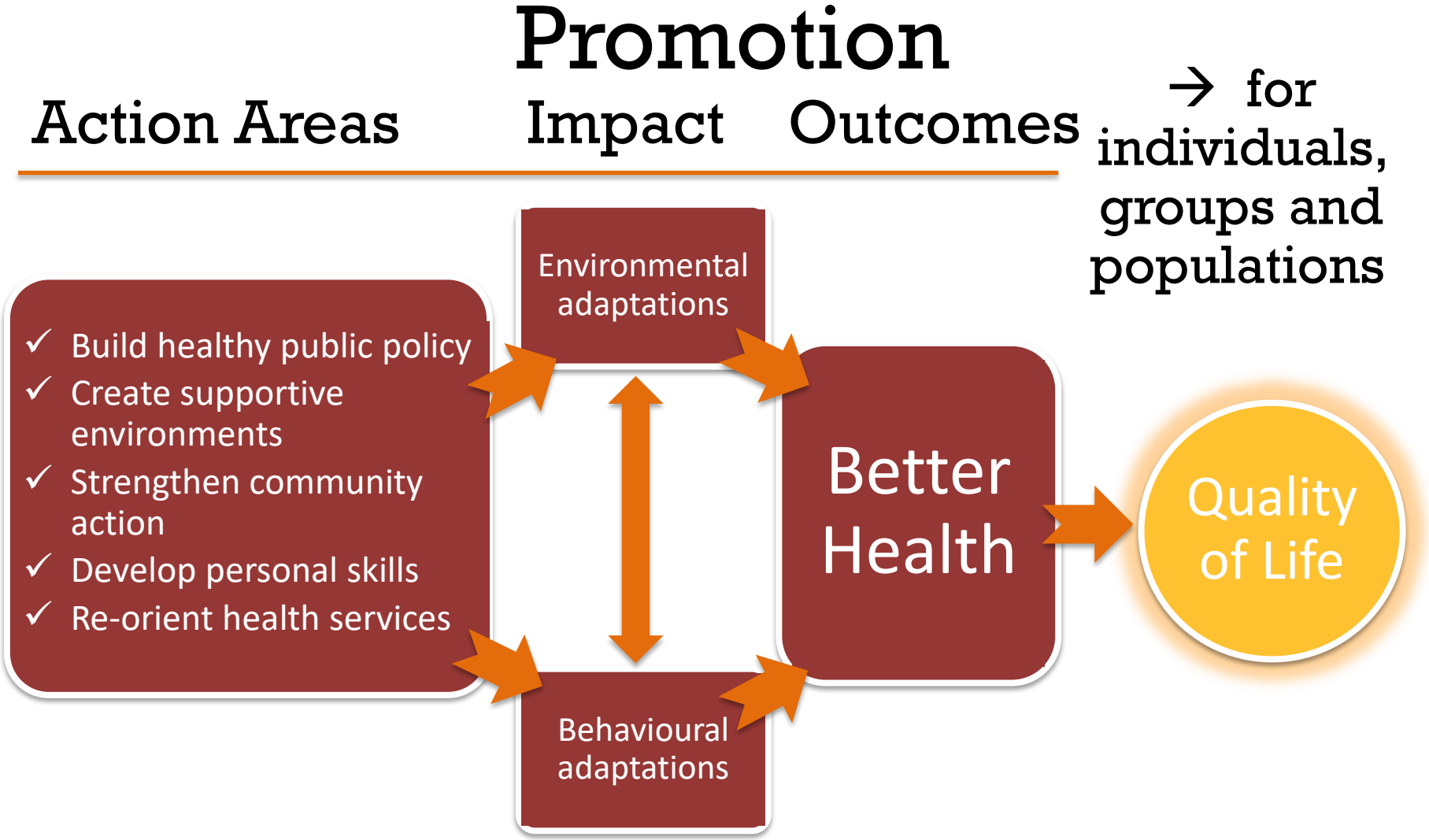
1. **Build healthy public policy**
2. **Create supportive environme**
3. **Strengthen community action**
4. **Develop personal skills**
5. **Reorient health services**



Health is a resource for everyday life, not the objective of living.

Health promotion goes beyond healthy lifestyles to **well-**

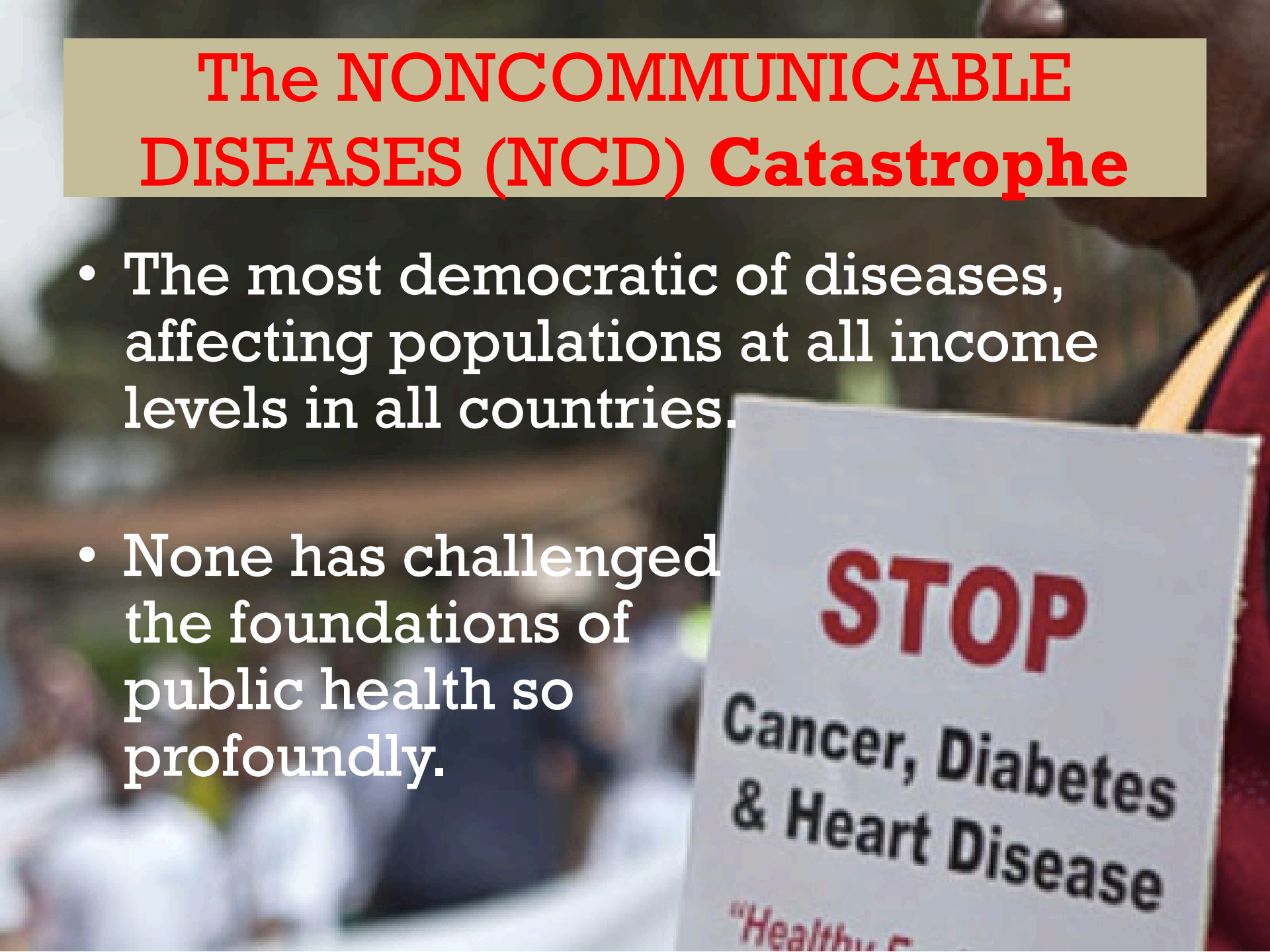
Framework for Health Promotion



The NONCOMMUNICABLE DISEASES (NCD) **Catastrophe**

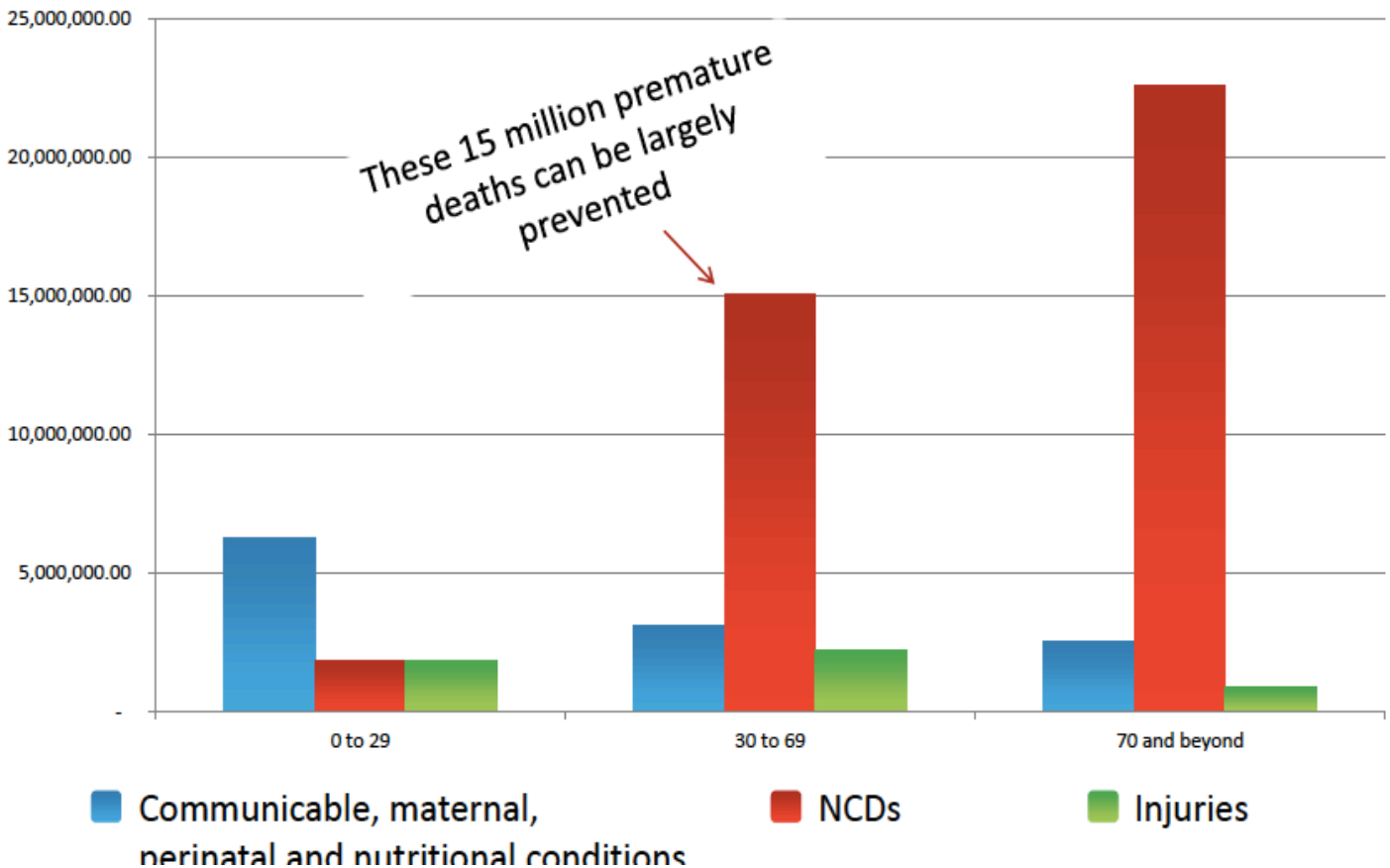
- The most democratic of diseases, affecting populations at all income levels in all countries.

- None has challenged the foundations of public health so profoundly.

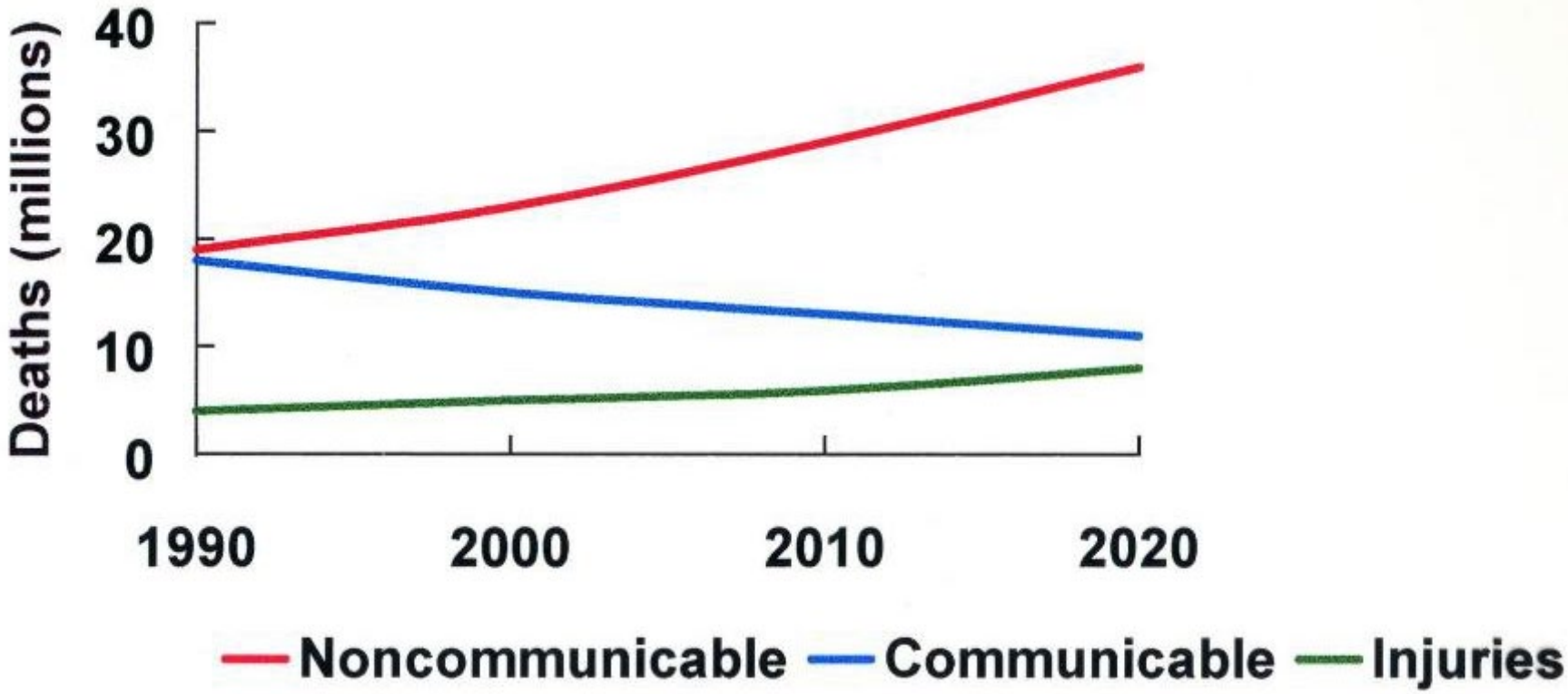


NCDs cause 71% of all deaths

15 million die each year from NCDs (ages 30-70)



Projected trends in death by broad cause Group, developing regions



Childhood Obesity

- An increasing problem with some coexistence of micronutrient def.
- Globally 5% 2000, 6% 2010 & 6.3% in 2013 ovwt & obese
- Increasing prevalence of Type 2 or adult-onset diabetes in children (7yrs)

Possibly facing the first generation who would die before their parents….

International Conference on Obesity 2006

Economic Burden: Treatment costs for preventable disease

Rule of 75/80:

- 75 - 80% adult adm to general wards
- 75-80% of general surgery for NCD
- 75-80% in Renal Dialysis Unit due to NCD

Social Burden

Worsens poverty

- treatment cost exceed 25% of household income,
- women leave work to be carers,
- children leave school to care and/or supplement household incomes
- Money spent on tobacco is money NOT SPENT on other needs

Reduce tobacco use

Reduce physical inactivity

Reduce unhealthy diet

Reduce harmful use of alcohol

Causes/ Determinants/ Drivers

Healthy Trade or Trading Health?

- I have figured out that the only way to prevent myself from eating mutton flap is for it not to be served ….. *Govt Leader*
- "These are the contradictions we have to face—where health is compromised for the sake of trade and development," Samoa's Dir General of Health.
- We only sell 5% of mutton flap to the pacific, most goes to China ……*NZ Meat Industry*

Mutton Flap

Turkey tail

The story of a physician trying to explain the dilemmas of the modern practice of medicine…

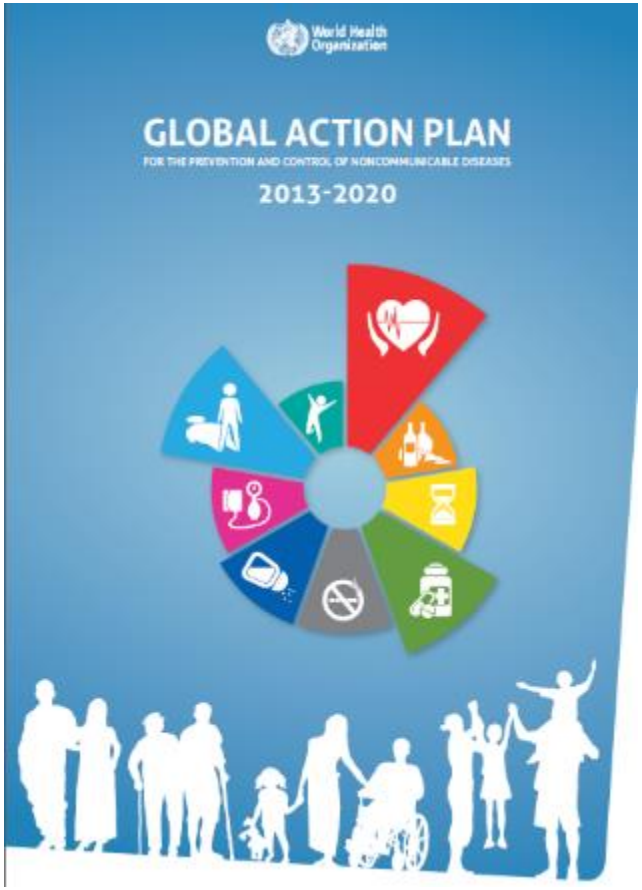
"You know", he said, " sometimes it feels like this:

There I am standing by the shore of a swiftly flowing river and I hear the cry of a drowning man. So I jump into the river, put my arms around him, pull him to shore and apply artificial respiration and then just as he begins to breathe, another cry for help.

So back in the river again, reaching, pulling applying, breathing and then another yell. Again and again without end, goes the sequence.

You know, I am so busy jumping in, pulling them to shore, applying artificial respiration, that I have no time to see who the hell is upstream pushing them all in".

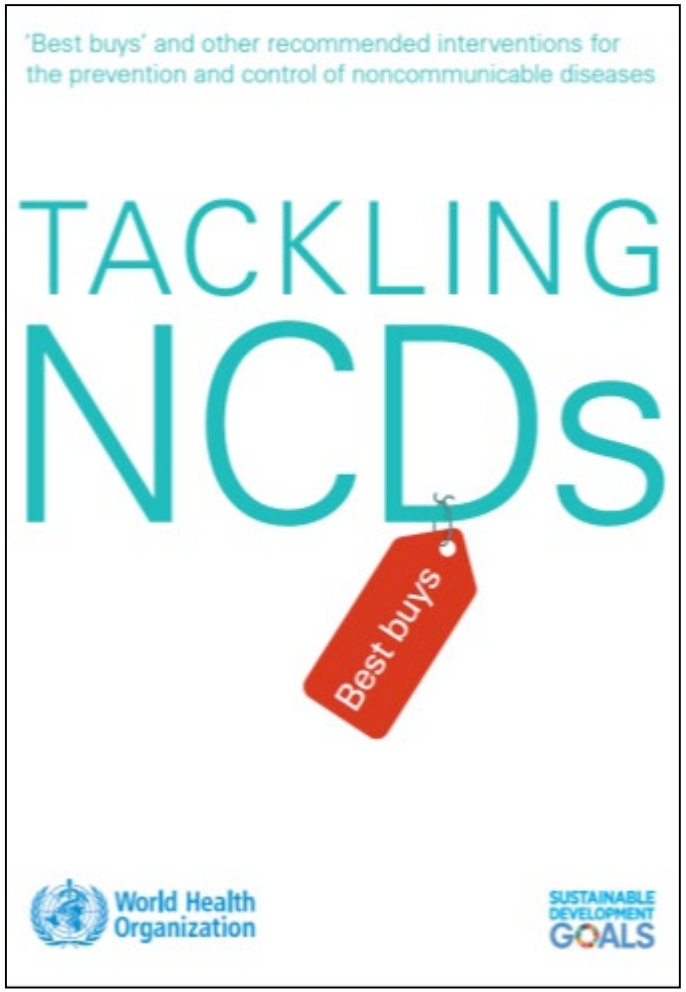
Irving Zola 1970



- A 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases
- At least 10% relative reduction in the harmful use of alcohol
- A 10% relative reduction in prevalence of insufficient physical activity
- A 30% relative reduction in mean population intake of salt/sodium
- A 30% relative reduction in prevalence of current tobacco use
- A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances
- Halt the rise in diabetes and obesity
- At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes
- An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major noncommunicable diseases in both public and private facilities

WHO Global NCD Action Plan & Targets

‘Best buys’ interventions for NCD prevention and control



88
Interventions

16
Best-buys

Best buys: Effective interventions with cost effectiveness analysis ≤ I$ 100 per DALY averted in LMICs

Good buys: Effective interventions with cost effectiveness analysis ≥ I$ 100 per DALY averted in LMICs

Other recommended interventions from WHO guidance (cost effective analysis not available)

16 Best buy Interventions for NCD Prevention and Control

TOBACCO

Increase tobacco taxes and prices
Smoke-free policies
Graphic health warnings / plain packaging
Advertising, promotion & sponsorship ban
Mass media campaigns

ALCOHOL

Increase taxes
Restriction on advertising
Regulations on availability and physical access

DIET & PHYSICAL ACTIVITY

Salt

Reformulation of food products
Providing supportive environments
Behavioural change communication
Front-of-pack labelling

Physical Activity

Awareness campaign for PA

CANCER / CVD / DIABETES

Drug therapy and counselling for high-risk persons
HPV vaccination for girls
Cervical cancer screening

Nutrition "Good Buys" and other recommended interventions

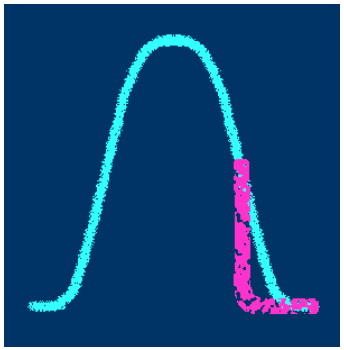
Good buys: Effective interventions with cost effectiveness analysis ≥ I$ 100 per DALY averted in LMICs

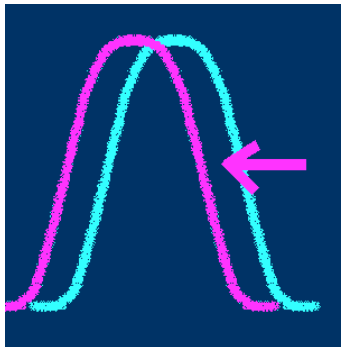
1. Eliminate industrial trans-fats through legislating bans on their use in the food chain
2. Reduce sugar consumption through effective taxation on sugar-sweetened beverages

Other recommended interventions from WHO guidance (cost effective analysis not available)

1. Promote and support exclusive breastfeeding for the first 6 months of life
2. Implement subsidies to increase the intake of fruits and vegetables
3. Replace trans-fats and saturated fats with unsaturated fats through reformulation, labelling, fiscal policies or agricultural policies
4. Limiting portion and package size to reduce energy intake and the risk of obesity
5. Implement nutrition education and counselling in different settings
6. Implement nutrition labelling
7. Implement mass media campaign on healthy diets

High Risk vs. Population Approaches

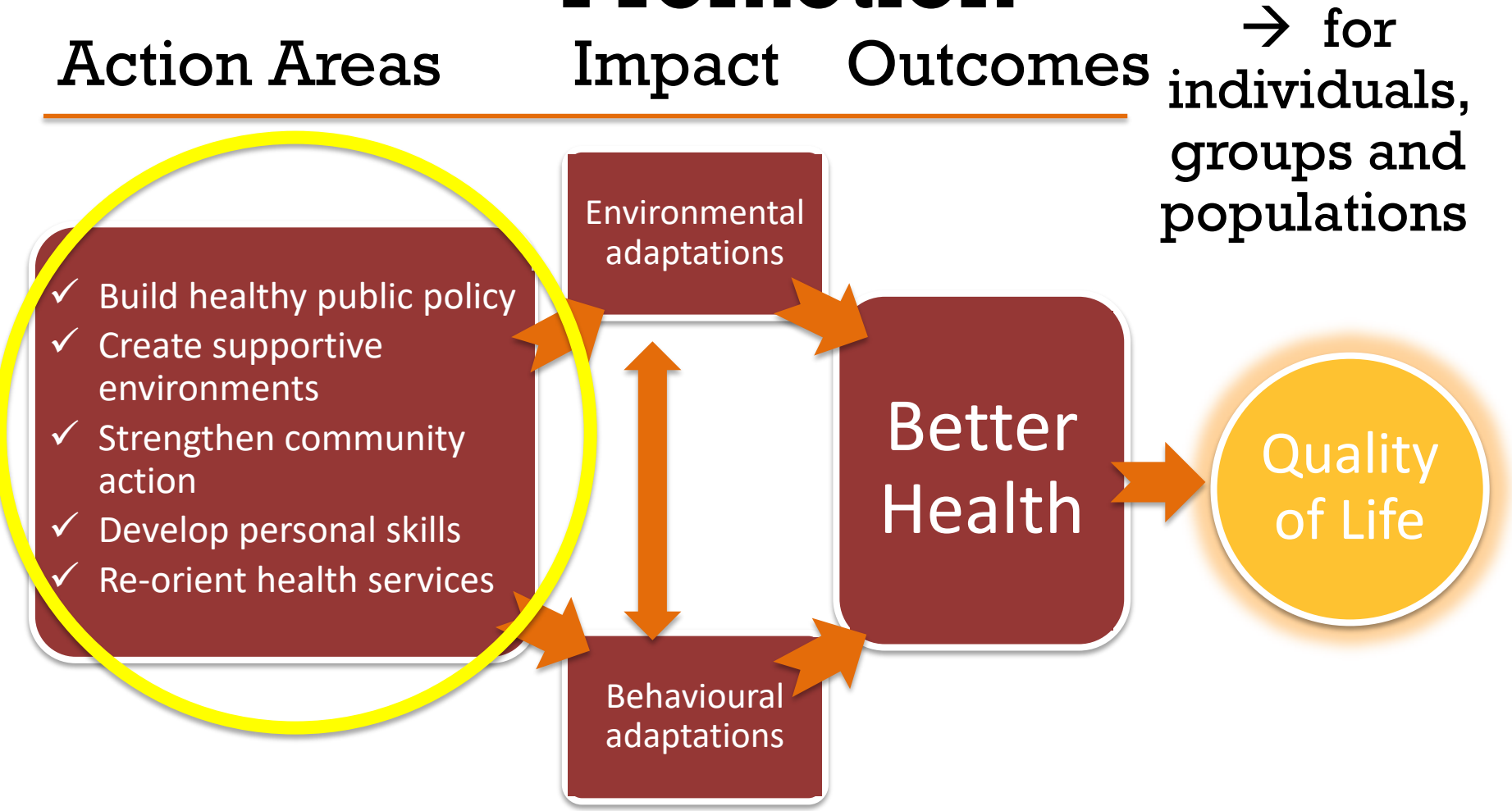




	High-Risk Approach	Population Approach
Benefit is high for…	The individual	The whole population
Subject motivation	High	Low
Doctor motivation	High	Low
Benefit-risk ratio	"Favourable"	"Worrisome"
Screening costs	High	No screening costs
Depth of solution	Palliative, temporary	Radical
Behaviour-Context fit	"Inappropriate"	"Appropriate"

Source: Rose G. "Sick Individuals and Sick Populations" IJE 2001;30:427-432

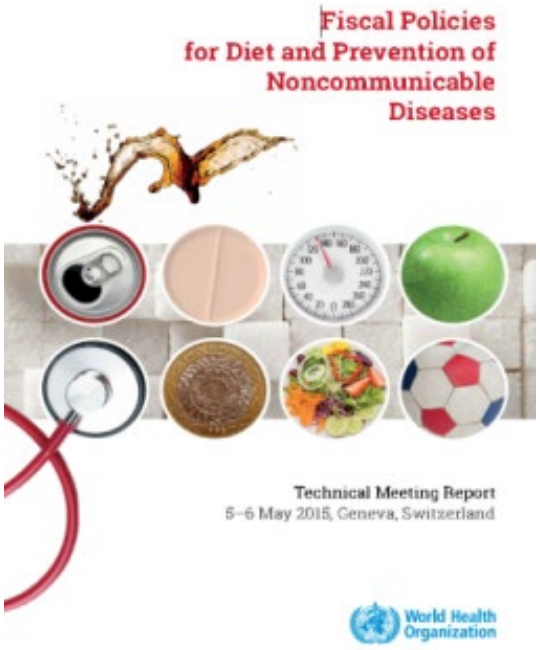
Framework for Health Promotion



Healthy Public Policy

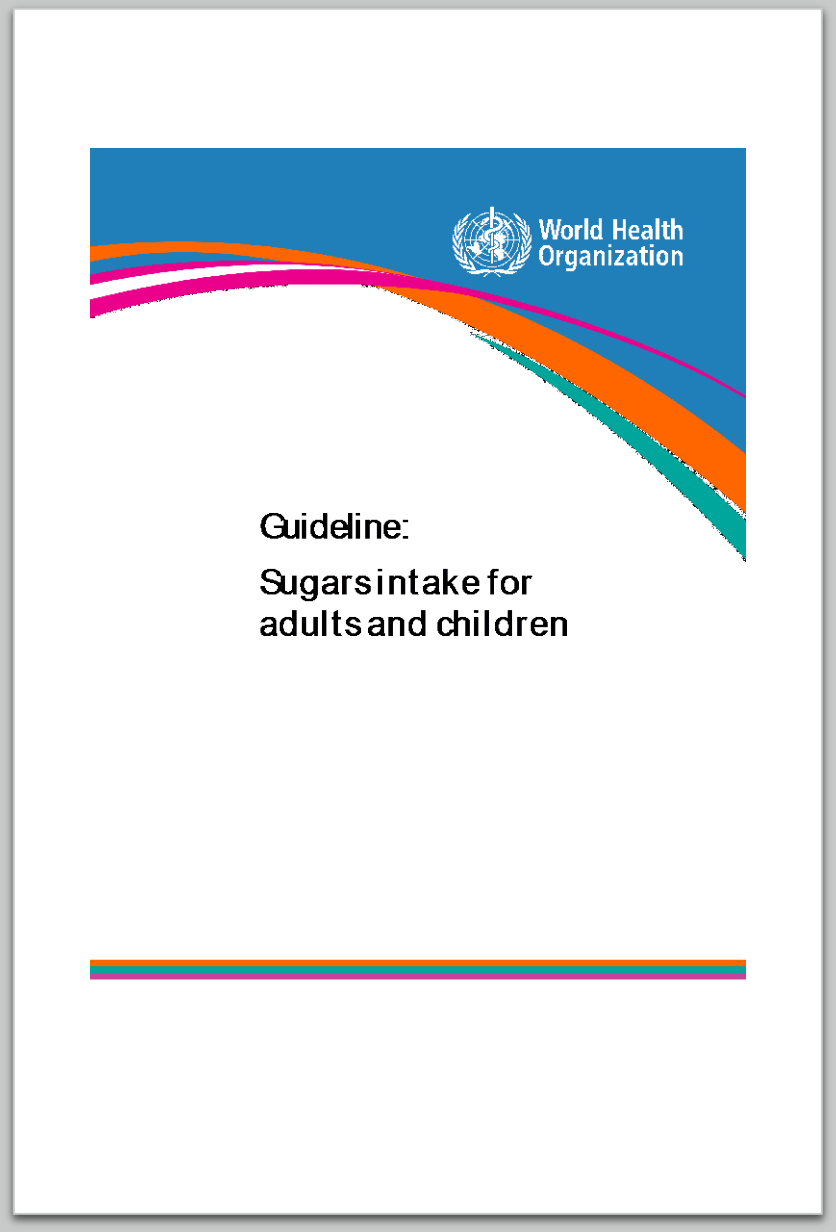
1. Fiscal Policies on Diet and Prevention of NCD

- **Appropriately designed fiscal policies** have considerable potential for promoting healthier diets and improving weight outcomes
- **Taxes that raise the prices of sugar sweetened beverages (SSB) by 20 % or more** could lead to more than proportional reductions in SSB consumption and net reductions in caloric intake
- **Subsidies for fresh fruits and vegetables that reduce their prices by 10 to 30 %** are effective in increasing fruit and vegetable consumption. The combination of such subsidies and taxation has greater effect
- Taxation of other unhealthy foods and non-alcoholic beverages, **appears promising**

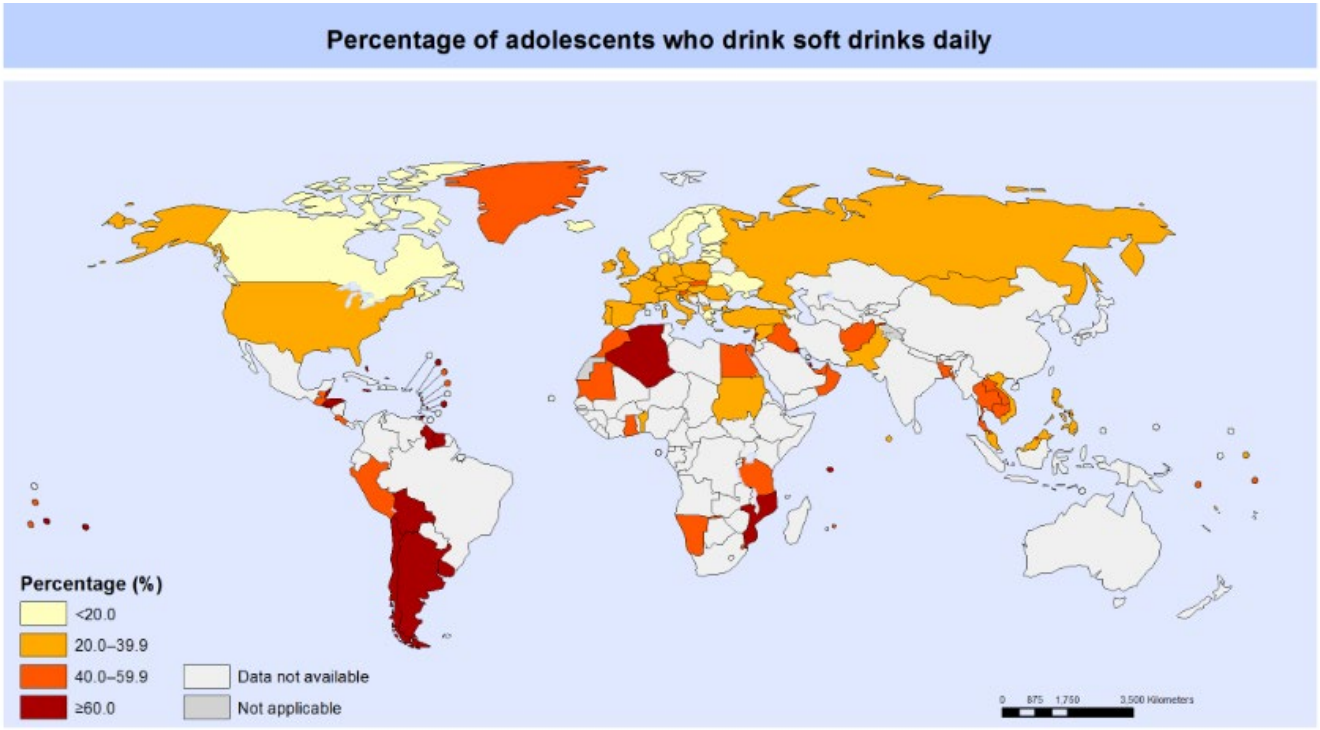


Sugar Intake Guidelines

- WHO recommends a reduced intake of free sugars throughout the lifecourse (*strong recommendation*1).
- In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake 2 (*strong recommendation*).
- WHO suggests a further reduction of the intake of free sugars to below 5% of total energy intake (*conditional recommendation*3).



Global consumption of SSBs in adolescents



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Sources: Global School-based Student Health Survey; Health Behaviour in School-aged Children (HBSC) Study: International Report from the 2009/2010 Survey.

Map Production: Information Evidence and Research (IER) World Health Organization

World Health Organization

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Soft drinks growth globally

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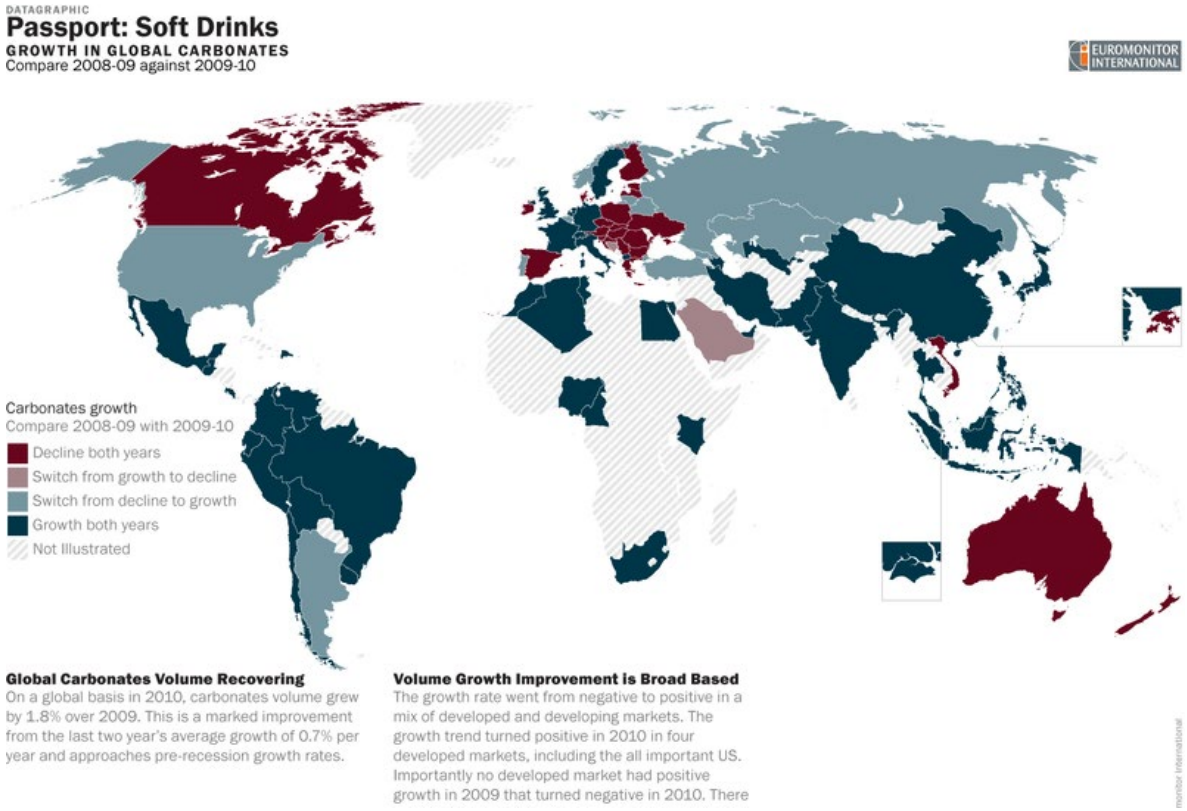
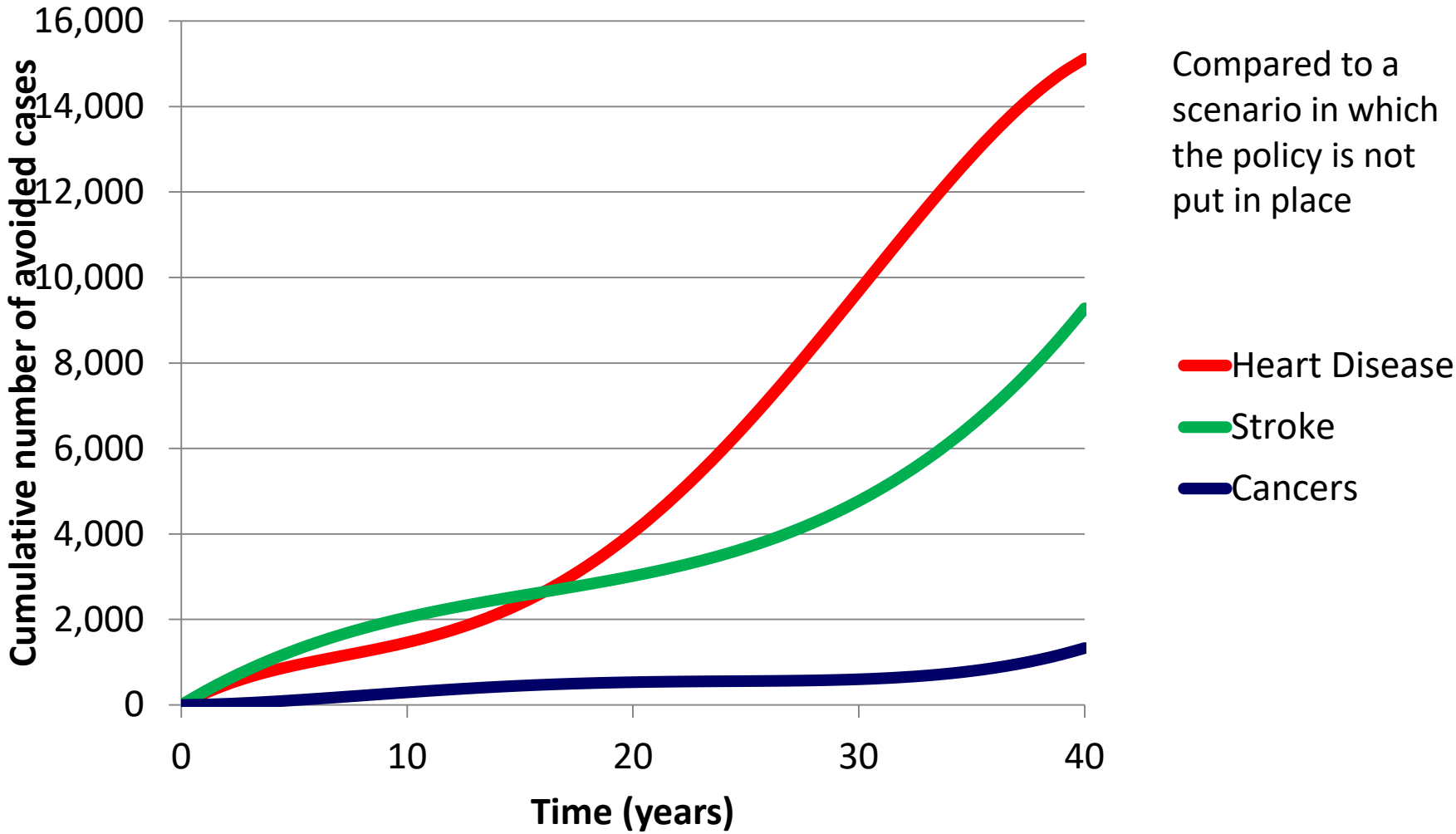


E.g Modelling Work for South Africa



SSB tax will prevent 477,680 deaths over 40 years in South Africa

Source: OECD/WHO CDP Model, 2017

Mexico evaluation

Starting 1 Jan 2014: 1 peso/liter excise tax

Pre-post comparison of purchases using observation data showed showed an average reduction of 7.6% in the purchase of taxed sugary drinks during 2014 and 2015, with greater reductions in 2015.

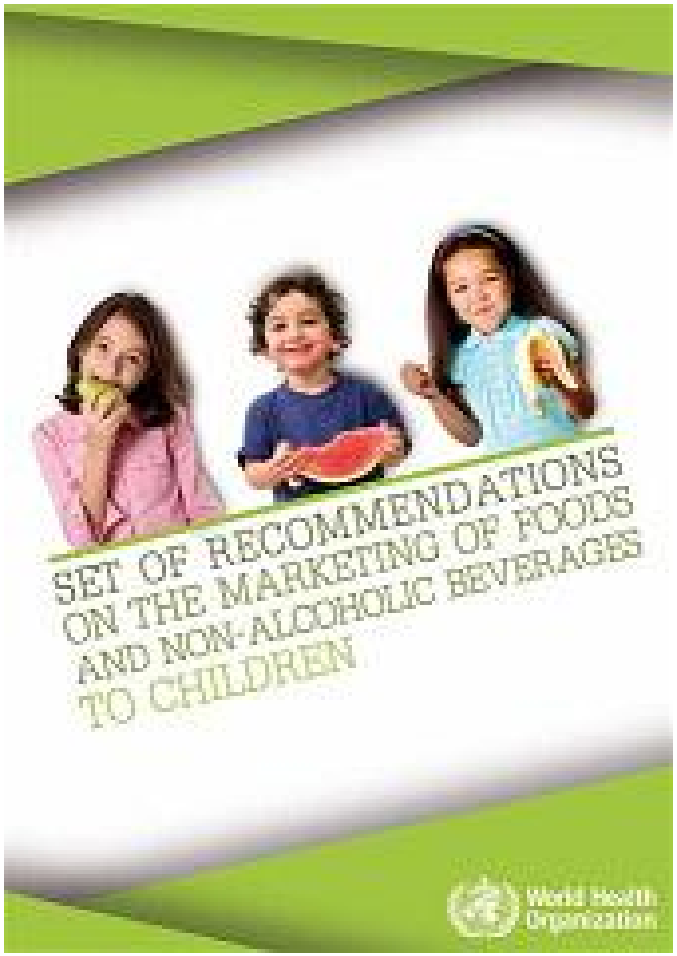
Households with the fewest resources had an average reduction in purchases of 11.7%.

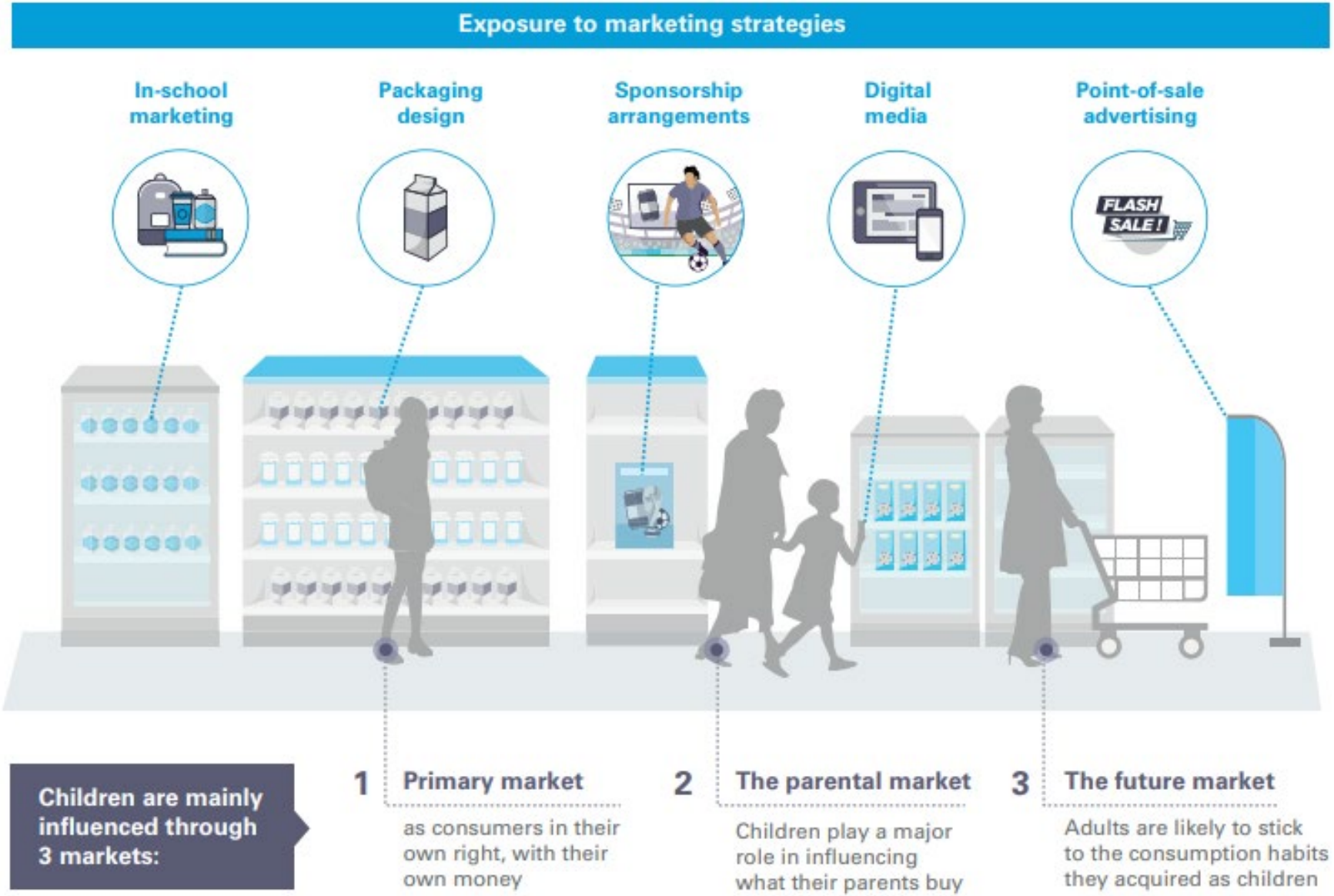
The studies showed a 2.1% increase in purchases of untaxed beverages, particularly purchased bottled water.

Colchero MA, Popkin BM, Rivera JA, Ng SW. Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. BMJ, 2016 Jan 6;352:h6704.
Colchero MA, Rivera J, Popkin, BM, Ng SW. In Mexico, Evidence of sustained consumer response two years after implementing a sugar-sweetened beverage tax. Health Affairs, 2017 Feb 23;36:3.

2. Restriction of Marketing to Children

- 12 recommendations
- **Main purpose:** ….in order to reduce the impact on children of marketing of foods high in saturated fats, trans-fatty acids, free sugars, or salt."





Source: A child rights-based approach to food marketing: a guide for policy makers. UNICEF 2018

Places where children gather

Schools, sports events etc

BREAKING NEWS /

ca Cola Games: RKS takes title afte
years

MOVONO | 21 April, 2018, 7:19 pm

than two decades later ... Ratu Kadavulevu School will take home the boys Coca Cola Games title. Picture:
SA NAISUA

Kadavulevu School will take home the Coca Cola Games boys division title afte
[Story & Video]Following two successive 4x400m wins in the intermediate ar
grade, the rugby giants earned the extra two gold medals necessary to remov
as to their athletics supremacy.

t Brothers High School will take second place and defending champions Natabu
School will go home with the third place.

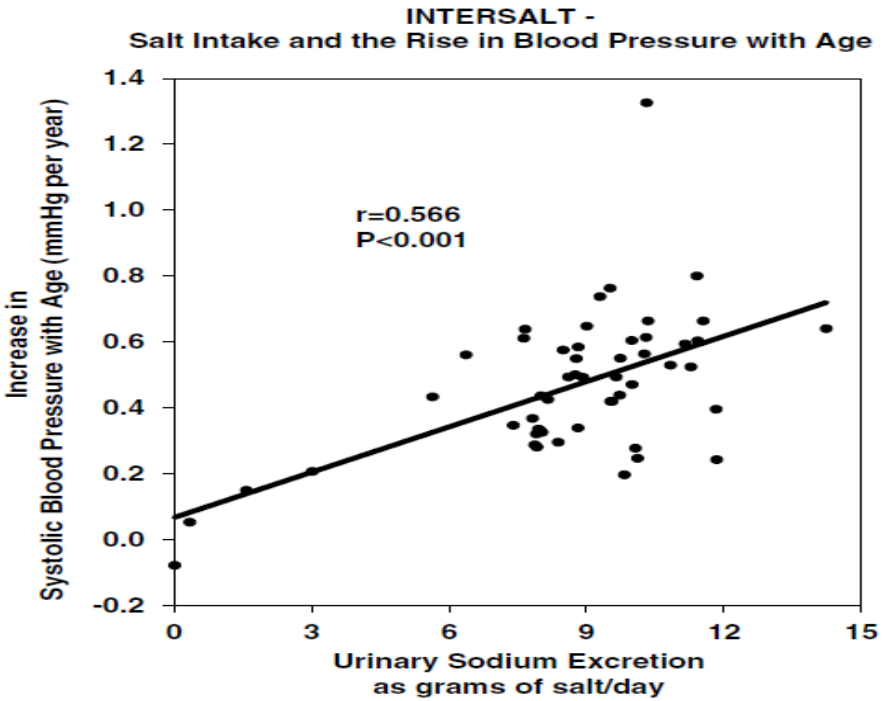
ADVERTISED TARGETING CHILDREN UNDER 14 YEARS OLD IN CHILE

It will be considered that advertising is directed to children when:

1. uses elements targeting children
   - Characters and child figures, animations, cartoons, toys, children's music, people or animals that are attractive to children under 14 years old, statements or fantastic arguments about the product or its effects, children voices, children's own expressions or language or situations that represent daily life of children, such as school, the recess, or playground, interactive applications, games, contests.
   - Commercial hooks such as toys, accessories, adhesives or other incentives.
2. is broadcasted on channels, programs or websites targeting children:
   - Because their target are children e.g. discovery kids, cars, etc
   - Or they have more than 20% of children audience

3. Reformulation of products to contain less salt, fats & sugars

Strong evidence for the link between salt and health



Primarily linked with CVD

- Sodium consumption increases BP
- BP increases CVD risk
- Age, sex and baseline BP specific effects

Source: He et al. J Human Hypertension, 2008

SALT (Sodium) Guidelines

For adults: WHO recommends that **adults consume less than 5 g (just under a teaspoon) of salt per day.**

For children: WHO recommends that the recommended maximum intake of salt for adults be **adjusted downward for children aged two to 15 years** based on their energy requirements relative to those of adults.

All salt that is consumed should be iodized or "fortified" with iodine

Reformulation

- Set salt targets in categories of foods
- Agreement with stakeholders
- Implement targets through voluntary agreements or legislation

South Africa first country in the world to regulate salt levels in a comprehensive range of processed foods (30 June 2016)

Department of Health. Regulations relating to the reduction of sodium in certain foodstuffs and related matters. Government Gazette, 20 March 2013, no 36274.

Examples of Targets - South Africa

Food Category	Max sodium per 100g food	Date on which target becomes effective
Bread	400mg Na 380mg Na	30 June 2016 30 June 2019
All breakfast cereals and porridges	500mg Na 400mg Na	30 June 2016 30 June 2019
All fat spreads and butter spreads	550mg Na 450mg Na	30 June 2016 30 June 2019
Ready to eat savoury snacks	800mg Na 700 mg Na	30 June 2016 30 June 2019
Flavoured potato crisps, excluding salt-and-vinegar flavoured	650mg Na 550 mg Na	30 June 2016 30 June 2019
Salt-and-vinegar flavoured	1000mg Na 850mg Na	30 June 2016 30 June 2019

Create Supportive Environment

A NEW ROAD MAP FOR ALL COUNTRIES

GOAL TO REDUCE PHYSICAL INACTIVITY

Website: www.who.int/lets-be-active/en/

BY 2025

10%

BY 2030

15%

FOUR POLICY ACTION AREAS

Global Recommendations on Physical Activity: 2010

- To provide guidance on dose response relation between frequency, duration, type and total amount of PA needed for NCD prevention
- Three age-groups:
  - 5-17 year olds; **at least 60 minutes of moderate to vigorous intensity physical activity daily**
  - 18-64; **at least 150 minutes of moderate intensity PA spread throughout the week**
  - 65+ ; **same as adults but more** and specific to enhance balance & strengthen muscle

Create Supportive Environments

- Considering social/group and personal levels
- Improve built environment
  - Footpaths/walkways
  - Safe and accessible public spaces

Create Supportive Environments

- Structural/ policy level
  - Healthy canteens in school
  - Smoke Free Policy
  - Healthy Meeting Guideline
  - Require fitness facilities in workplace

Healthy lifestyle

Make it

EASY

EVERYWHERE

EXCITING AND ENJOYABLE

EARLY

Strengthen Community Action

Healthy Settings

- Engage community resources where they live, work and play
- Strengthen competencies, collaboration and participation.

Examples

- Health Promoting Schools
- Health Promoting Workplace

Health Promoting Schools e.g. Fiji

- Memorandum of Understanding b/w MOH and MOE signed by respective secretaries in April 2009
- Shift to education
- National Policy: Fruit and Water Day
- Local implementation : Pilot schools to initiate or build on current work

MEMORANDUM OF UNDERSTANDING

Between

The Ministry of Education, National Heritage, Culture & Arts and the Ministry of Health, Women and Social Welfare in the Fiji Islands

Preamble:

This Memorandum of Understanding (MOU) fully acknowledges the inextricable link between Health and Education. It recognises that health is an integral part of holistic education and promotes better understanding of a shared vision and of each other's roles. The MoU, under the Health Promoting School framework, promotes the five dimensions of life: physical, mental, social, spiritual and emotional well being of school children to enhance cognitive performance and good citizenship.

It takes advantage of the immense opportunity for the Ministry of Education, National Heritage, Culture & Arts and the Ministry of Health, Women and Social Welfare to work collaboratively for every school community's health and wellbeing.

Under the Health Promoting School banner, this MoU provides a platform within which detailed strategies and areas of cooperation and responsibility are outlined is based on the principles of good governance, (accountability, transparency, compliance, openness, equality, total partnership, reciprocity, commitment and mutual benefit).

Health Promoting Workplace

Develop Personal Skills

Develop Personal Skills

- Enable individuals to:
  - Understand and critically use health information
  - Develop skills to assess health needs and improve health
- Done through health education and counselling
- Health literacy

Re-orient Health Services

WHO International Health Promotion Conferences

1986 Ottawa	Health Promotion
1988 Adelaide	Healthy Public Policy
1991 Sundsvaal	Supportive environments
1997 Jakarta	New partners for a new era
2000 Mexico	Bridging the Equity Gap
2005 Bangkok	Health Promotion
2009 Helsinki	Health Literacy
2016 Shanghai	Health Promotion in the SDGs

Reorient Health Services

- **Infrastructure and resources** for health promotion programmes
- Adapting clinical services to include **health promotion** and early intervention components
  - E.g. Doctors discuss benefits of healthy diet and physical activity with diabetes patients.
- Little focus on systems re-orientation
  - Hospital to Community

Partnership Paradox

A strengthening partnership with other sectors but widening gap at times within health between clinical and public health

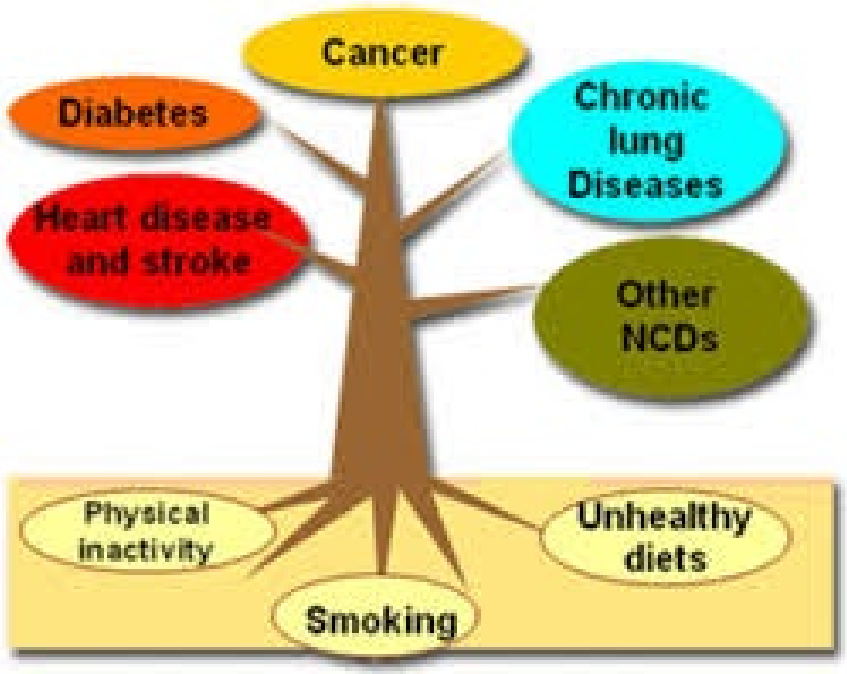
Health promotion is more important than ever

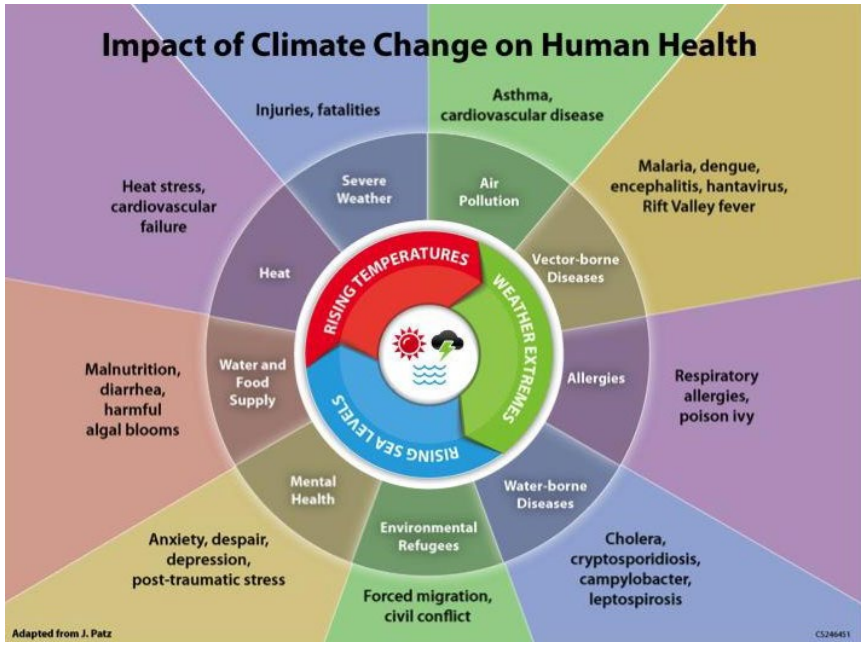
Challenging Complex Landscape

- **Tobacco, Food and beverage industries raising a variety of arguments that:**
  - question the effectiveness of taxation
  - highlight concerns about the regressivity of consumption taxes
  - create negative economic consequences (i.e. job losses, increased inflation, harm to small businesses, tax avoidance and evasion)
  - in some cases, threaten to move their production facilities to other jurisdictions

Health Promoting Systems OR Systems for Promoting Health

- Governance
- Finance
- Workforce
- Information
- Technology
- Services





Role of Health Promotion:

Putting out the Last fire and Preventing The Next Crisis?

World Health Organization

THANK YOU

waqanivalut@who.int