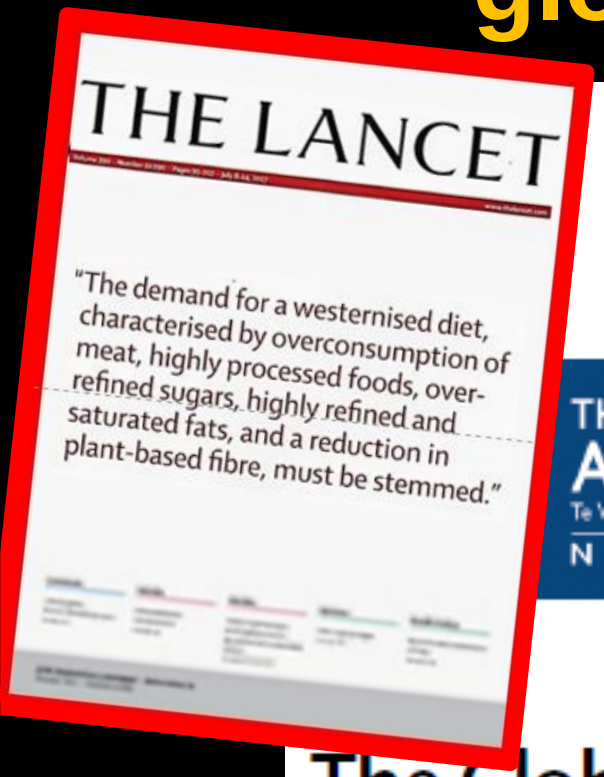
What's Hot in Pediatric Gastroenterology?

William F. Balistreri, M.D.

Cincinnati Children's
changing the outcome together

Global Nutrition

Series of reports in **The Lancet** on **global nutrition** initiatives & health issues



THE LANCET

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

WORLD OBESITY

Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

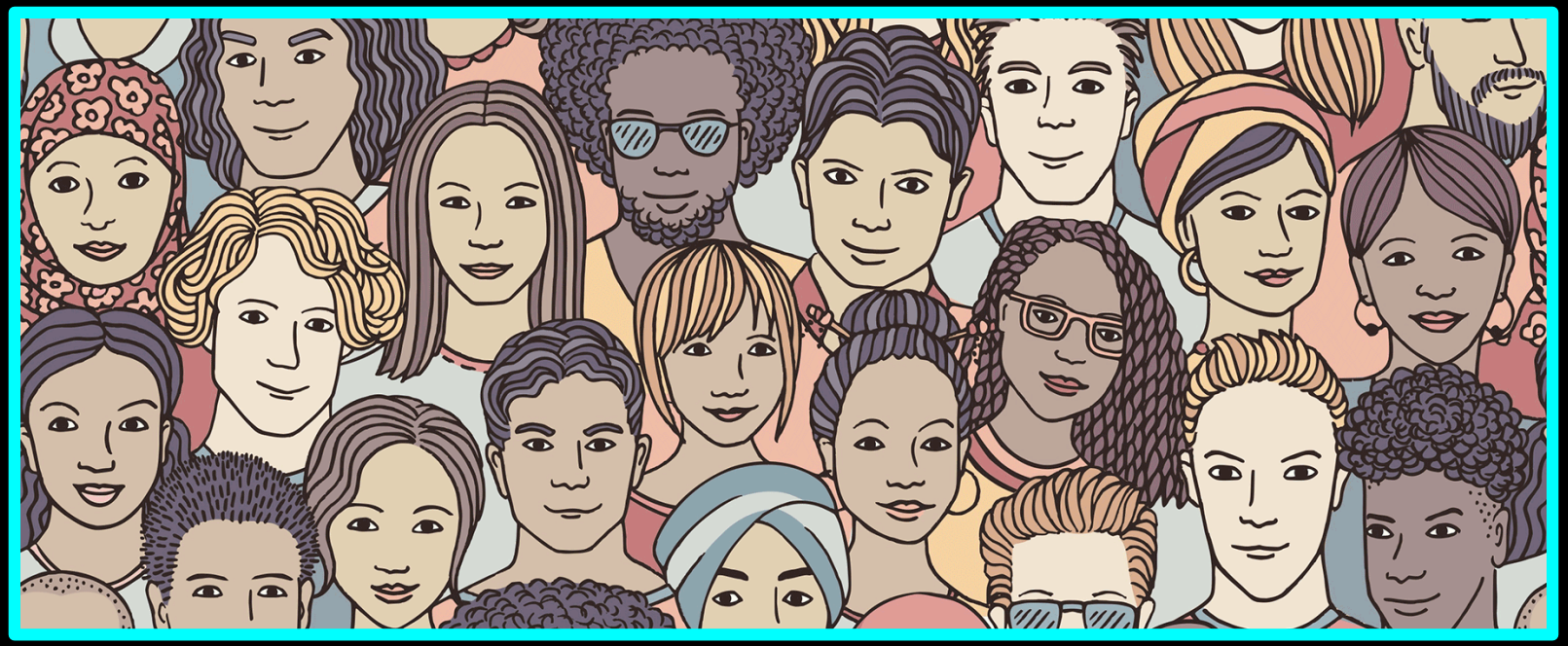
The Global Syndemic of Obesity, Undernutrition, and Climate Change: *The Lancet* Commission report

Global Nutrition

1. LANCET Commission on Global Syndemic *(Obesity, Undernuturition, and Climate Change)*
2. EAT- LANCET Commission on Healthy Diets

Global Nutrition

- Provide picture of impact of suboptimal diets on Morbidity & Mortality worldwide
- Offer a clear imperative and a strong rationale for improving diets across nations



What in the World is going on with global nutrition?

Food for Thought!

Imagine a scenario in which the “world” walks into a clinic for an annual health check:

"Civilisation is in crisis. We can no longer feed our population a healthy diet while balancing planetary resource."

– Tamara Lucas, Richard Horton

#EATLancet

Comment: The 21st-century great food transformation

THE LANCET

The best science for better lives

The Lancet 393:386, 2019

"For the first time in 200,000 years of human history, **we are severely out of synchronization with the planet**... This crisis is accelerating, stretching Earth to its limits, and threatening human and other species' sustained existence"

The 21st-century great food transformation

Lucas & Horton, The Lancet 393:386, 2019

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The Global Syndemic of Obesity, Undernutrition, and Climate Change: *The Lancet* Commission report

These Lancet articles raise a series of questions:

1. What is the Scope of the Problem?

"State of Food Security & Nutrition in the World"

www.fao.org/3/I9553EN/i9553en.pdf

- In 2017, world hunger increased for 3rd consecutive year
- Number classified as "undernourished" increased from 804 million in 2016 to 821 million in 2017

DaSilva, The Lancet 393:e30, 2019

Irony!

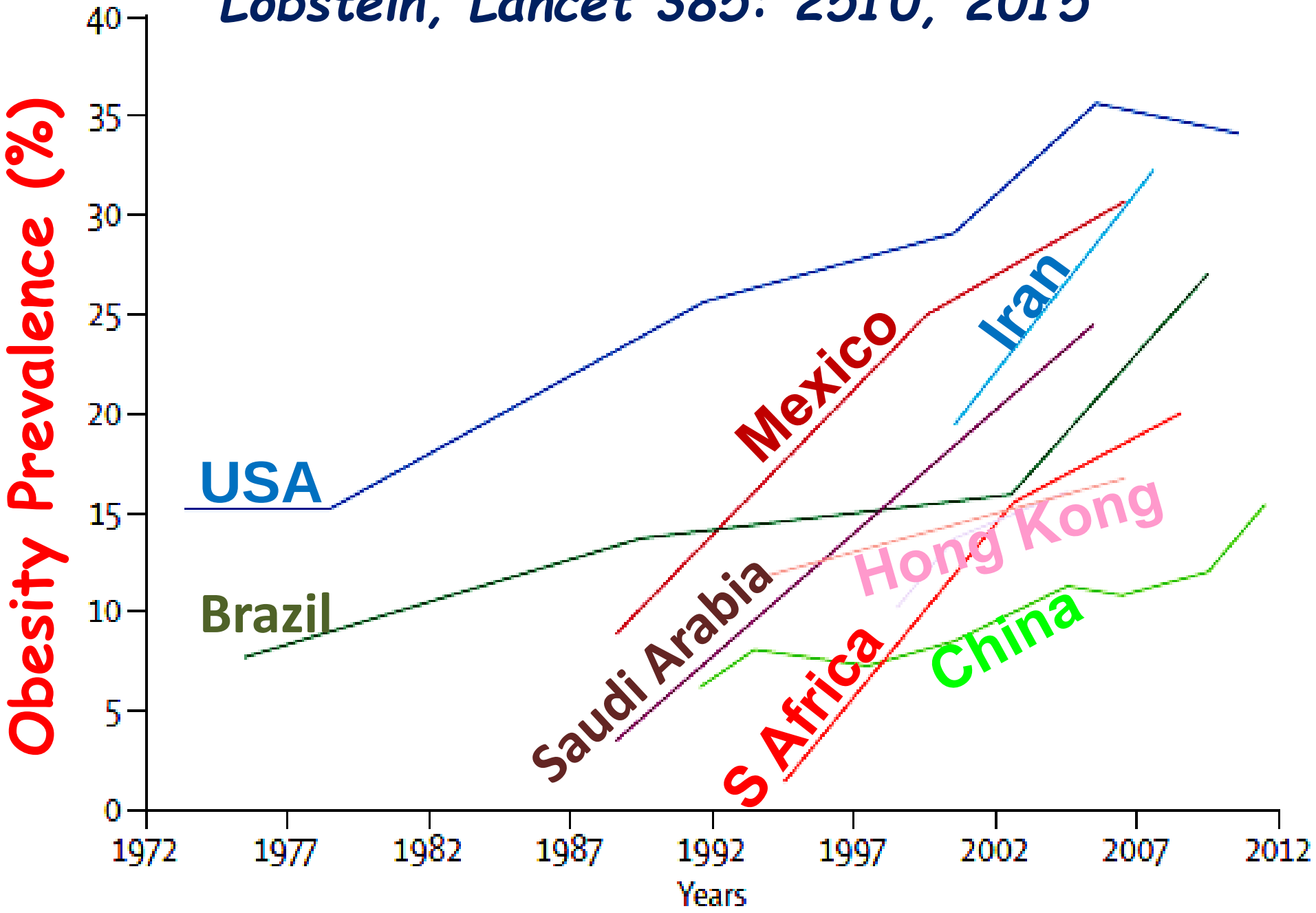
"undernourished" refers to both extremes

The Scope of the Problem:

- **Obesity** increasing in most countries
- > 670 million adults
- > 38 million children <5 yo

- *www.fao.org/3/I9553EN/i9553en.pdf*
- *DaSilva, The Lancet 393:e30, 2019*

Lobstein, Lancet 385: 2510, 2015



Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults

NCD Collaboration, The Lancet 390:2627, 2017

"Over the past 4 decades, mean BMI and obesity in children & adolescents have increased in most countries"

Summary

Background

consequenc

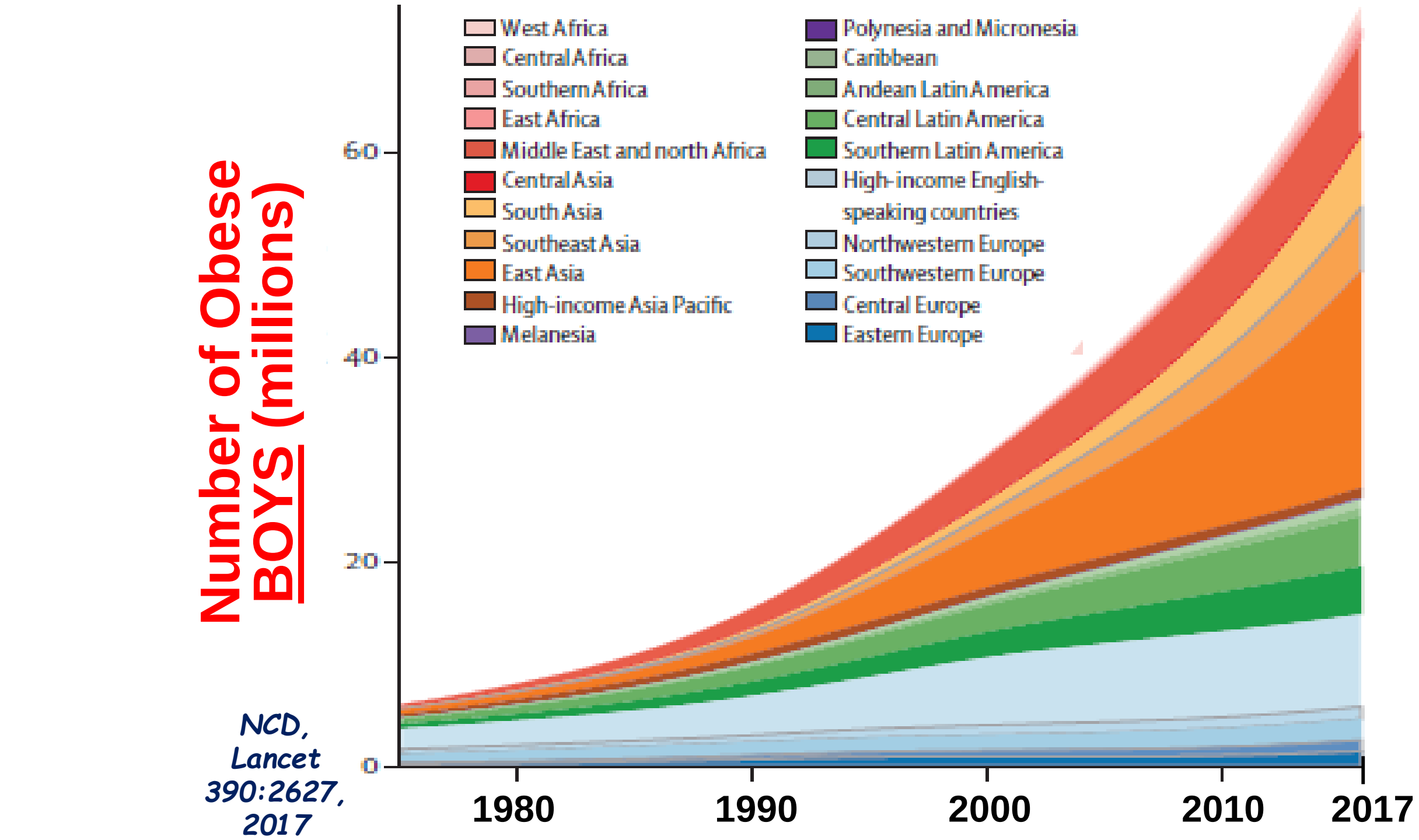
and a comp

compare tre

adverse health

ass index (BMI)

escents, and to



NCD, Lancet 390:2627, 2017

The Scope of the Problem:

- Most rapid rise in rates of obesity:
- Africa – areas traditionally associated with malnutrition

- *www.fao.org/3/I9553EN/i9553en.pdf*
- *DaSilva, The Lancet 393:e30, 2019*

2. What is the Cause of the Problem?

- Key contributors to widespread hunger:
  - –Inability of food systems to deliver healthy diets
  - –Climate change and conflicts
- Both directly affect food availability & access

- *www.fao.org/3/I9553EN/i9553en.pdf*
- *DaSilva, The Lancet 393:e30, 2019*

The New York Times

Opinion

August 26, 2019

Our Food Is Killing Too Many of Us

Improving American nutrition would make the biggest impact on our health care.

By Dariush Mozaffarian

THE LANCET

Volume 390 · Number 10 090 · Pages 95–202 · July 8–14, 2017 www.thelancet.com

"The demand for a westernised diet, characterised by overconsumption of meat, highly processed foods, over-refined sugars, highly refined and saturated fats, and a reduction in plant-based fibre, must be stemmed."

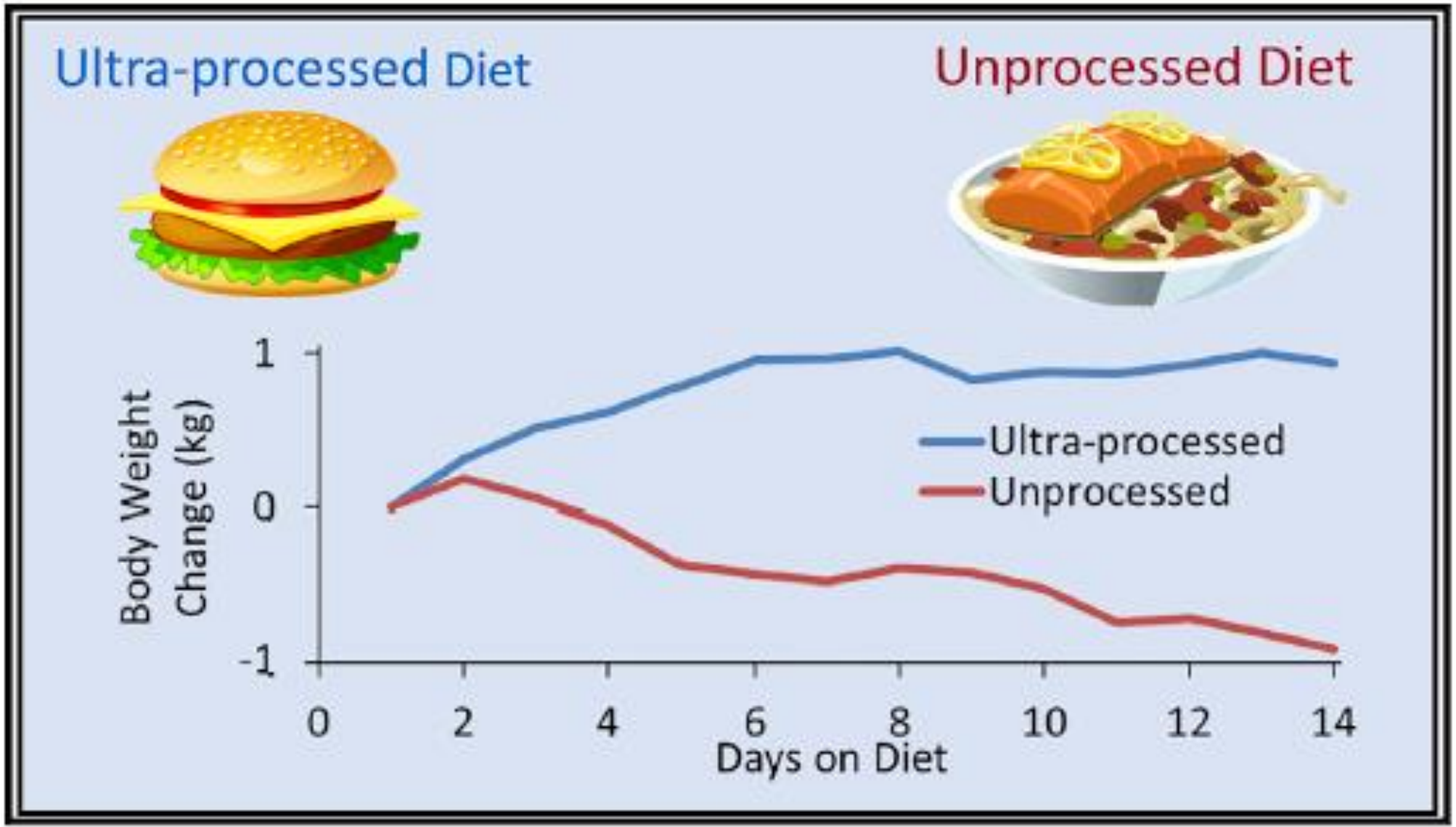
Ultra-Processed Foods:

Hall, Cell Metabolism 30: 11, 2019

- Not only encourage excess caloric intake
- Also lead to dramatic and rapid weight gain
- Subjects consumed an extra 500 cal/d;
  - avg gain = 2 lbs in 2 weeks

Ultra-Processed Foods:

Hall, Cell Metabolism 30: 11, 2019



Ultra-Processed Foods:

Hall, Cell Metabolism 30: 11, 2019

- **Mechanism:**
- **Ultra-Processed - caused a rise in hunger hormones (ghrelin)**
- **Minimally processed diet - levels of PYY increased & ghrelin fell**

3. The Other Factors:

Coexistence of obesity & stunting in children in the same country a clear alarm signal

DaSilva, The Lancet 393:e30, 2019

Diarrhea, Dehydration, and the Associated Mortality in Children with Complicated Severe Acute Malnutrition: A Prospective Cohort Study in Uganda

Benedikte Grenov, PhD[1], Betty Lanyero, MD[2], Nicolette Nabukeera-Barungi, PhD[3], Hanifa Namusoke, PhD[2], Christian Ritz, PhD[1], Henrik Friis, PhD[1], Kim F. Michaelsen, DMSc[1], and Christian Mølgaard, PhD[1]

Grenov, Journal of Pediatrics 210:26, 2019

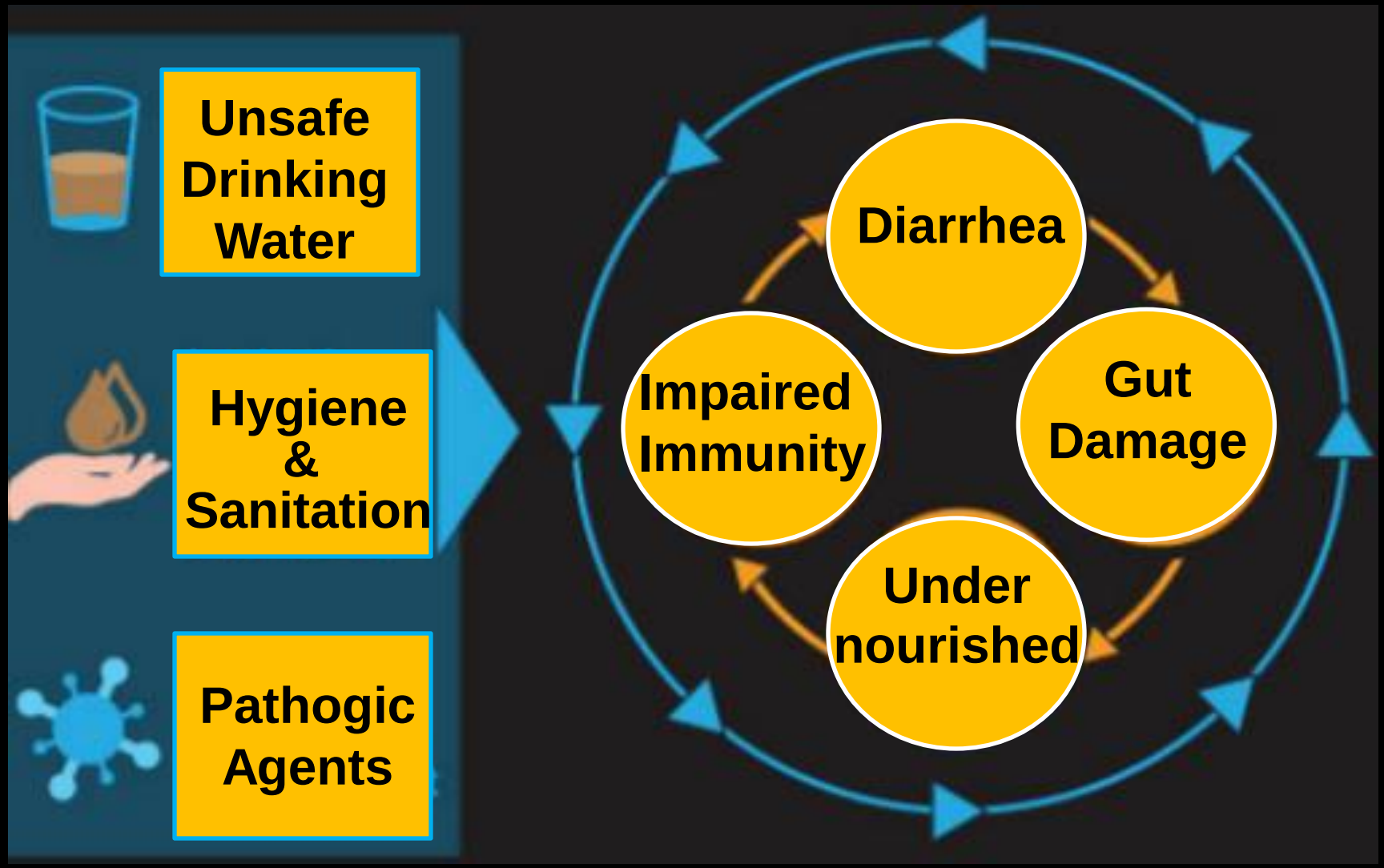
Objective To assess predictors of diarrhea and dehydration and to investigate the role of diarrhea in mortality among children with complicated severe acute malnutrition.

Study design A prospective cohort study, nested in a probiotic trial, was conducted in children with complicated severe acute malnutrition. Children were treated according to World Health Organization and national guidelines, and d els were u ion was us

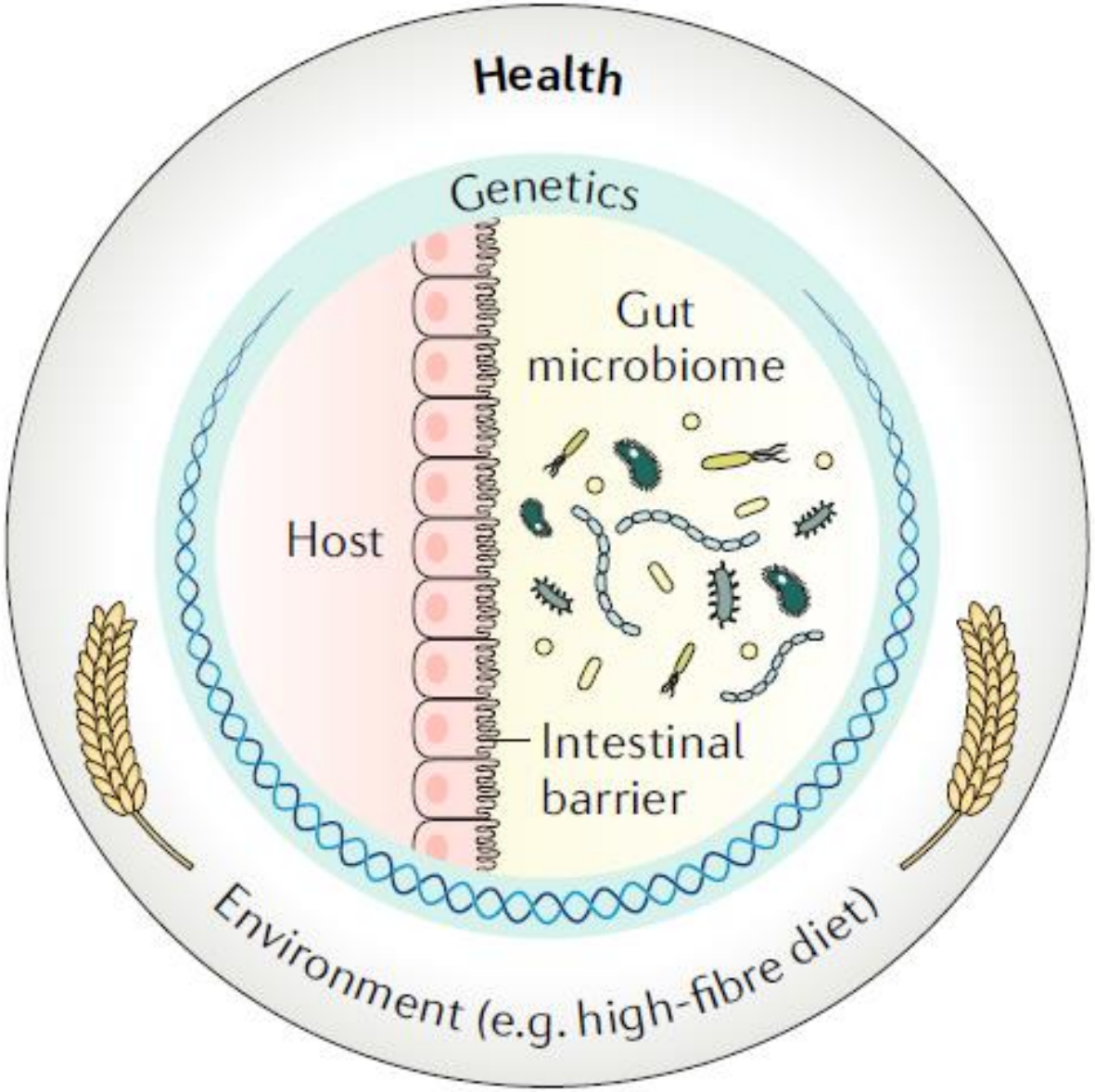
Resu ys, and 61 ays with d Of 592 d ing hospitalization, young age was associated with days with diarrhea, and young age and HIV infection were associated with dehydration. Both days with diarrhea and dehydration predicted duration of hospitalization as

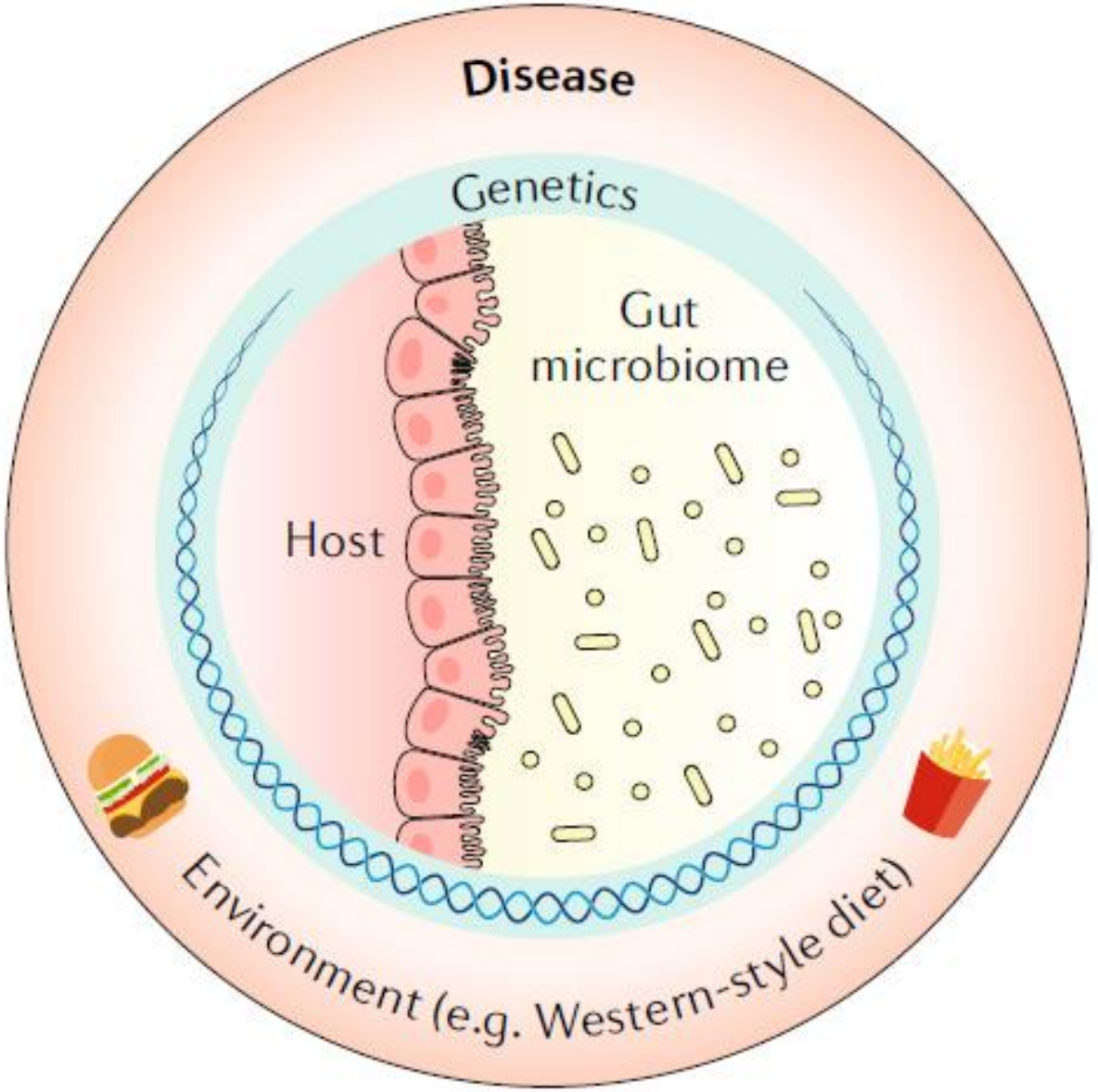
"Diarrhea - a strong predictor of mortality among children with complicated severe acute malnutrition"

A key contributing factor in children: Diarrhea-Malnutrition Cycle



Host–diet–microbiota interplay





Reimer. NATURE REVIEWS/GASTRO & HEPATOL 16:86, 2019

Blanton, Science 352:1533, 2016

Childhood undernutrition, the gut microbiota, and microbiota-directed therapeutics

Laura V. Blanton, Michael J. Barratt, Mark R.
Tahmeed Ahmed, Jeffrey I. Gordon*

BACKGROUND: Childhood undernutrition is a global health challenge. Undernutrition in early life is associated with a number of adverse outcomes, including persistent stunting, immune dysfunction, and neurocognitive defi-

Box 1. A hypothesis about gut microbiota development and the pathogenesis of undernutrition.

Pennisi, Science 365:109, July 12, 2019

BIOMEDICINE

Gut microbes may help malnourished children

Commonplace foods restore bacteria that can improve health

By **Elizabeth Pennisi**

Even after starving children get enough to eat again, they often fail to grow. Their brains don't develop properly, and they remain susceptible to diseases, even many years later. Two studies, on pp. 139 and 140, now suggest fostering the right gut microbes may help these children recover. The work also pinpoints combinations of foods that nurture the beneficial microbes.

Most of the experiments were in animals, but a small group of malnourished children

A malnourished child in Bangladesh will get special food supplements to help recover.

growth in the microbiota," Gordon says. Milk powder and rice, standard components of food aid, did little to foster maturation, but chickpea, banana, and soy and peanut flours helped the microbiomes mature.

The researchers then fed mice and piglets supplements that combined all four foods and saw that the animals' microbiomes matured, and their growth improved. "This study points to the importance and utility of thoughtfully selected nutrients to support key members of a microbiota," Relman says.

As a final proof of principle, Ahmed,

4. What is the Link?

The Global Syndemic:

Swinburn, Lancet 393:791, 2019

- Three **pandemics**:
  - –Obesity
  - –Undernutrition
  - –Climate change

} Clear Link

- Affect most people in every country and region worldwide

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Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

The Global Syndemic of Obesity, Undernutrition, Climate Change: *The Lancet* Commission report

Swinburn, Lancet 393:791, 2019

Boyd A Swinburn, Vivica I Kraak, Steven Allender, Vincent J Atkins, Phillip I Baker, Jessica R Bogard, Hannah Brinsden, Alejandro Calvillo, Olivier De Schutter, Raji Devarajan, Majid Ezzati, Sharon Friel, Shifalika Goenka, Ross A Hammond, Gerard Hastings, Corinna Hawkes, Mario Herrero, Peter S Hovmand, Mark Howden, Lindsay M Jaacks, Ariadne B Kapetanaki, Matt Kasman, Harriet V Kuhnlein, Shiriki K Kumanyika, Bagher Larijani, Tim Lobstein, Michael W Long, Victor K R Matsudo, Susanna D H Mills, Gareth Morgan, Alexandra Morshed, Patricia M Nece, An Pan, David W Patterson, Gary Sacks, Meera Shekar, Geoff L Simmons, Warren Smit, Ali Tootee, Stefanie Vandevijvere, Wilma E Waterlander, Luke Wolfenden, William H Dietz

The Global Syndemic:

Swinburn, Lancet 393:791, 2019

"…*clustering* in time & place, interactions at biological, psychological, or social levels, and common, large-scale societal drivers and determinants"

"…the *paramount health challenge* for humans, the environment, and our planet in the 21st century"

The Link:

- Single syndemic framework will:
  - Focus attention on the urgency to address these combined challenges
  - Emphasize the need for common solutions
  - Underscore the Impact

Swinburn, Lancet 393:791, 2019

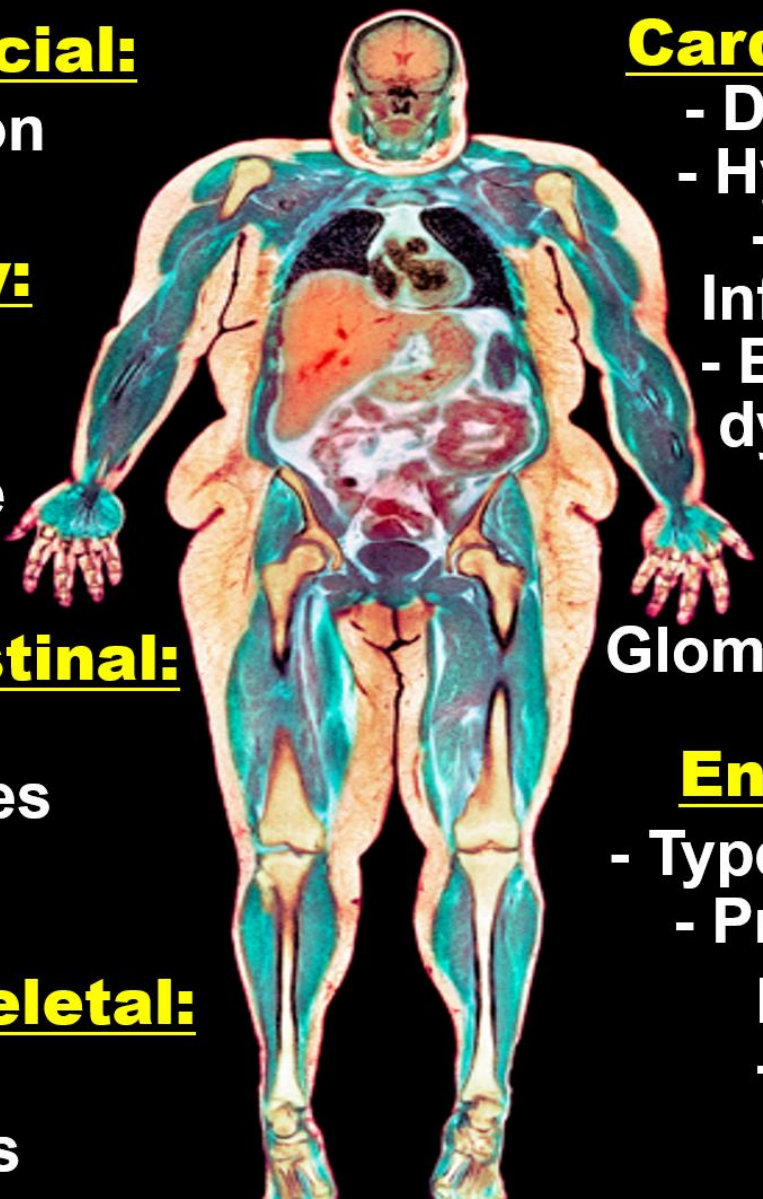
5. What is the Impact?

Psychosocial:
- Depression

Pulmonary:
- OSA
- Asthma
- Exercise intolerance

Gastrointestinal:
FGID
Gallstones
NAFLD

Musculoskeletal:
SCFE
Blount's



Cardiovascular:
- Dyslipidemia
- Hypertension
- Chronic Inflammation
- Endothelial dysfunction

Renal:
Glomerulosclerosis

Endocrine:
- Type 2 diabetes
- Precocious puberty
- PCOS

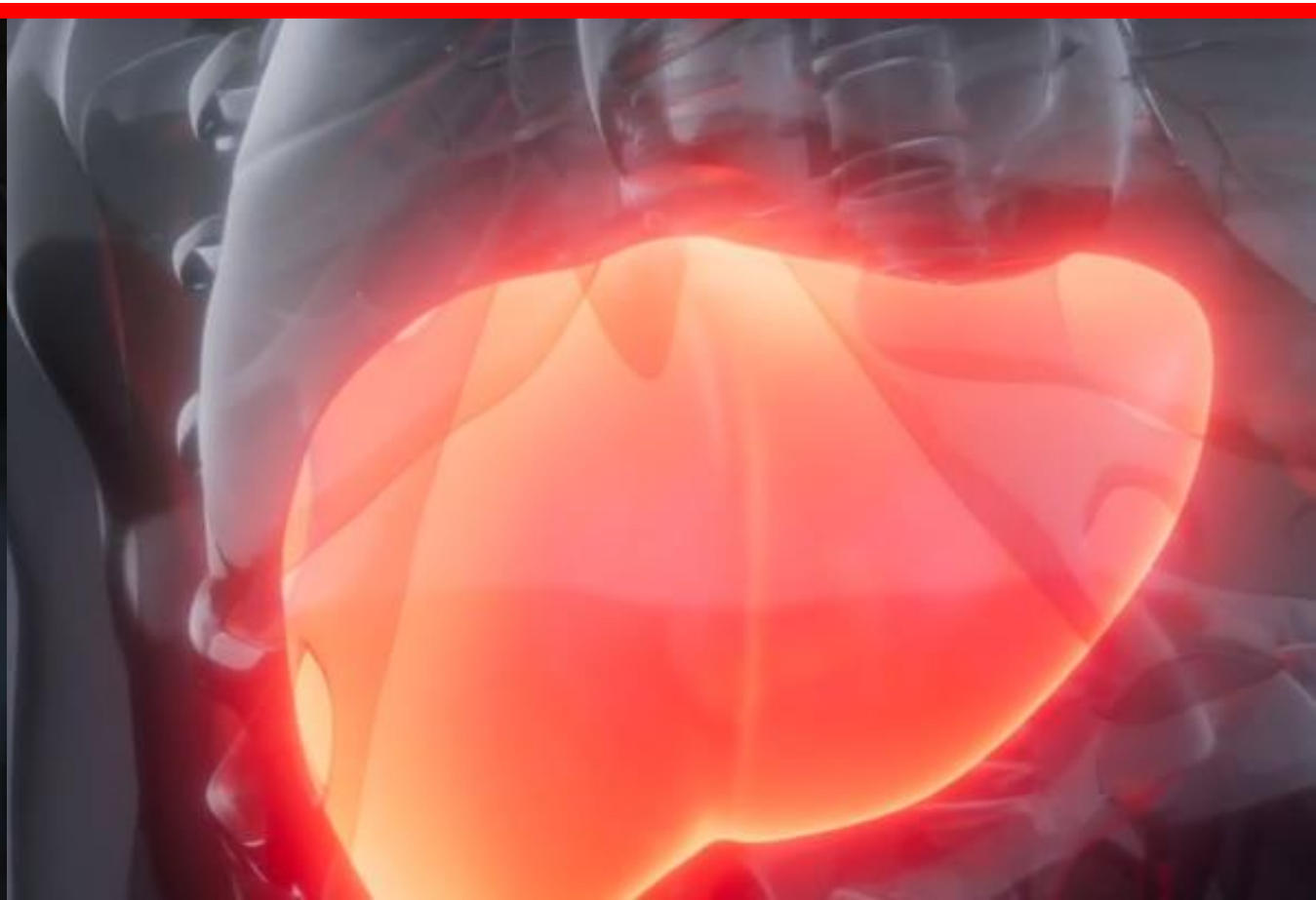
"Left unchecked, obesity will make the current generation of children the first in human history to have a life span shorter than that of their parents…"

David Satcher, MD, PhD
US Surgeon General (1998-2001)

USA TODAY NEWS

July 10, 2019

US life expectancy falls for third year in a row



Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017

GBD 2017 Collaborators, *Lancet 393:1958, 2019*

Funding: Bill & Melinda Gates Foundation

Summary

Background Suboptimal diet is an important pr[illegible] non-communicable diseases (NCDs); however, its impact on the burden of NCDs has not been[illegible] This study aimed to evaluate the consumption of major foods and nutrients across 195 cou[illegible]e impact of their suboptimal intake on NCD mortality and morbidity.

Methods By use of a comparative risk assess[illegible]nated the proportion of disease-specific burden attributable to each dietary risk factor (also re[illegible]ttributable fraction) among adults aged 25 years or older. The main inputs to this analysis inc[illegible] dietary factor, the effect size of the dietary factor on disease endpoint, and the level of intak[illegible]west risk of mortality. Then, by use of disease-specific population attributable fractions, [illegible]-adjusted life-years (DALYs), we calculated the number of deaths and DALYs attributable t[illegible]tcome.

Effects of unhealthy diets - Global Burden of Diseases (GBD) study

GBD 2017 Collaborators, Lancet 393:1958, 2019

- Evaluated consumption of foods & nutrients in 195 countries; quantified impact of suboptimal intake
- ~20% of deaths (~11M) worldwide assoc with poor diets; most deaths due to CV disease, cancer, Type 2DM

The New York Times

Eat Your Veggies: Study Finds Poor Diets Linked to One in Five Deaths

April 3, 2019

One-Fifth Of Deaths Worldwide Tied To Poor Diets

GBD Collaborators, LANCET 393:1958, 2019

"…consuming vegetables, fruits, fish, whole grains was strongly associated with a longer life…"

"People who skimp on such healthy foods more likely to die before their time"

Effects of unhealthy diets - Global Burden of Diseases (GBD) study

GBD 2017 Collaborators, Lancet 393:1958, 2019

Bad Diets Are Responsible For More Deaths Than Smoking, Global Study Finds

npr

August 26, 2019

"Unhealthy diets - larger determinants of ill health than tobacco or hypertension"

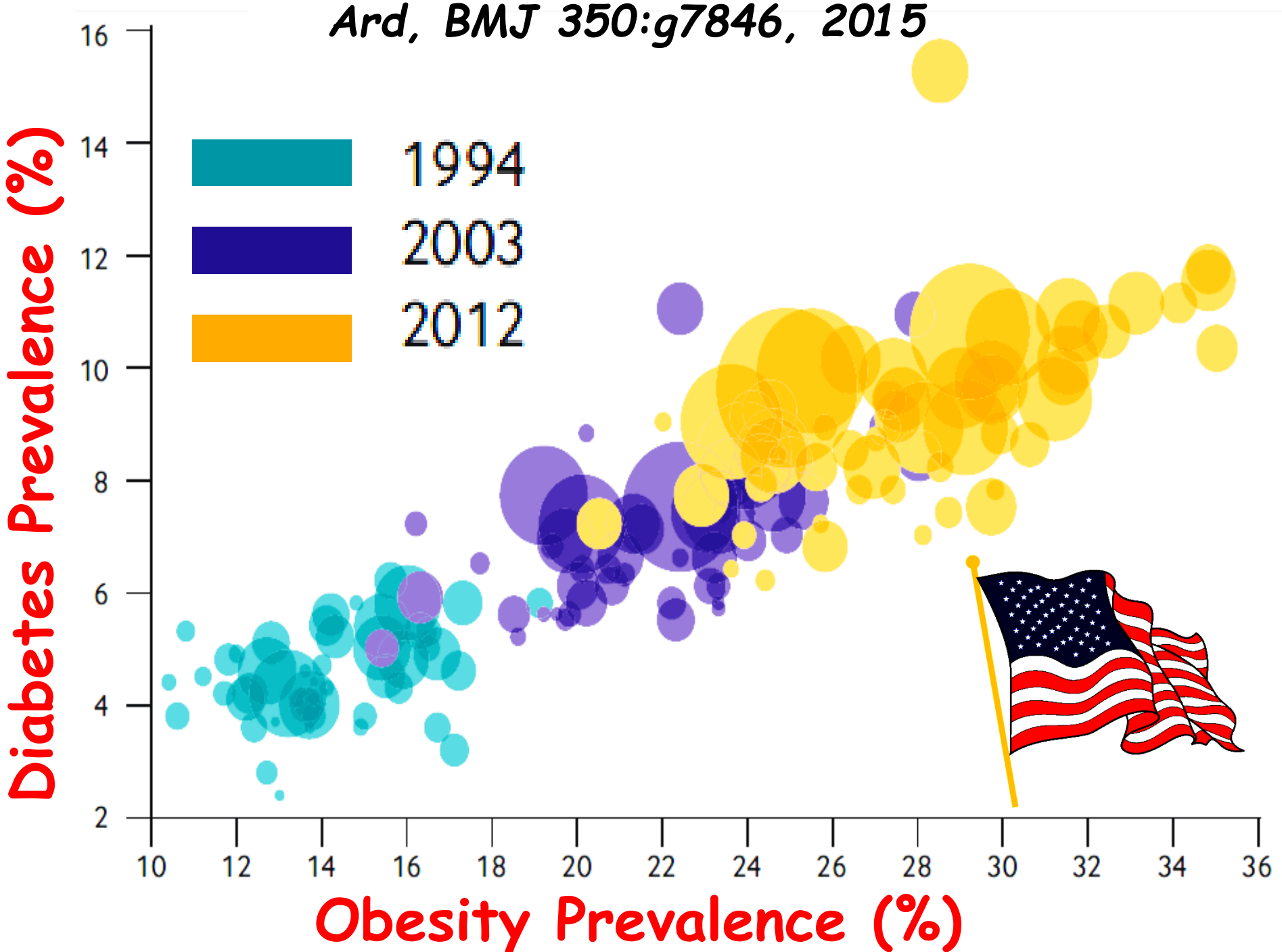
"Obesity is a first step, a gateway to the rest of the chronic diseases"

Dr Osman Galal

Secretary General

International Union of Nutrition Sciences

Ard, BMJ 350:g7846, 2015



6. What can be done?

Food in the Anthropocene: the EAT–*Lancet* Commission on healthy diets from sustainable food systems

Walter Willett, Johan Rockström, Brent Loken, Marco Springmann, Tim Lang, Sonja Vermeulen, Tara Garnett, David Tilman, Fabrice DeClerck, Amanda Wood, Malin Jonell, Michael Clark, Line J Gordon, Jessica Fanzo, Corinna Hawkes, Rami Zurayk, Juan A Rivera, Wim De Vries, Lindiwe Majele Sibanda,

Willett, The Lancet 393:447, 2019

Executive summary

Food systems have the potential to nurture hu…ith a high level of certainty that global adoption and support environmental sustainability; h…ence dietary pattern would provide major health are currently threatening both. Providing a gr…cluding a large reduction in total mortality. population with healthy diets from sust…mmission integrates, with quantification of systems is an immediate challenge. Althoug… healthy diets, global scientific targets for production of calories has kept pace wi…e food systems, and aims to provide scientific growth, more than 820 million people ha…es to reduce environmental degradation caused food and many more consume low-quality d…roduction at all scales. Scientific targets for the micronutrient deficiencies and contribute t…ating space of food systems were established for rise in the incidence of diet-related obesity …arth system processes. Strong evidence indicates non-communicable diseases, including coronary …l production is among the largest drivers of global …mental change by contributing to climate change,

Lancet Commission on healthy diets from sustainable food systems

Willett, The Lancet 393:447, 2019

Los Angeles Times

Obesity, climate change and hunger must be fought as one,

Lancet Commission on healthy diets from sustainable food systems

Willett, The Lancet 393:447, 2019

- Stated goal = provide a healthy diet for all; ensure appropriate caloric intake

In synchrony, develop sustainable food systems that minimize damage to the planet:

–food production improved

–food waste reduced

Lancet Commission on healthy diets from sustainable food systems

Willett, The Lancet 393:447, 2019

- **Ideal:**
  - –variety of plant-based foods
  - –unsat rather than saturated fats
  - –few refined grains, animal-based foods or highly processed foods, and added sugars

Lancet Commission on healthy diets from sustainable food systems

Lucas, The Lancet 393:386, 2019 & Willett, The Lancet 393:447, 2019

- Link red meat to risk of health problems

"eating habits affect the environment"

production takes up land & feed to raise cattle, which also emit greenhouse gas (methane)

Cattle farming, shown here in northern Brazil, is emission-intensive and often accompanies large-scale deforestation.

Schiermeier, Nature 572:291, 2019

CLIMATE CHANGE

Eat less meat: UN climate-change panel tackles diets

Report on climate change and land comes amid accelerating deforestation in the Amazon.

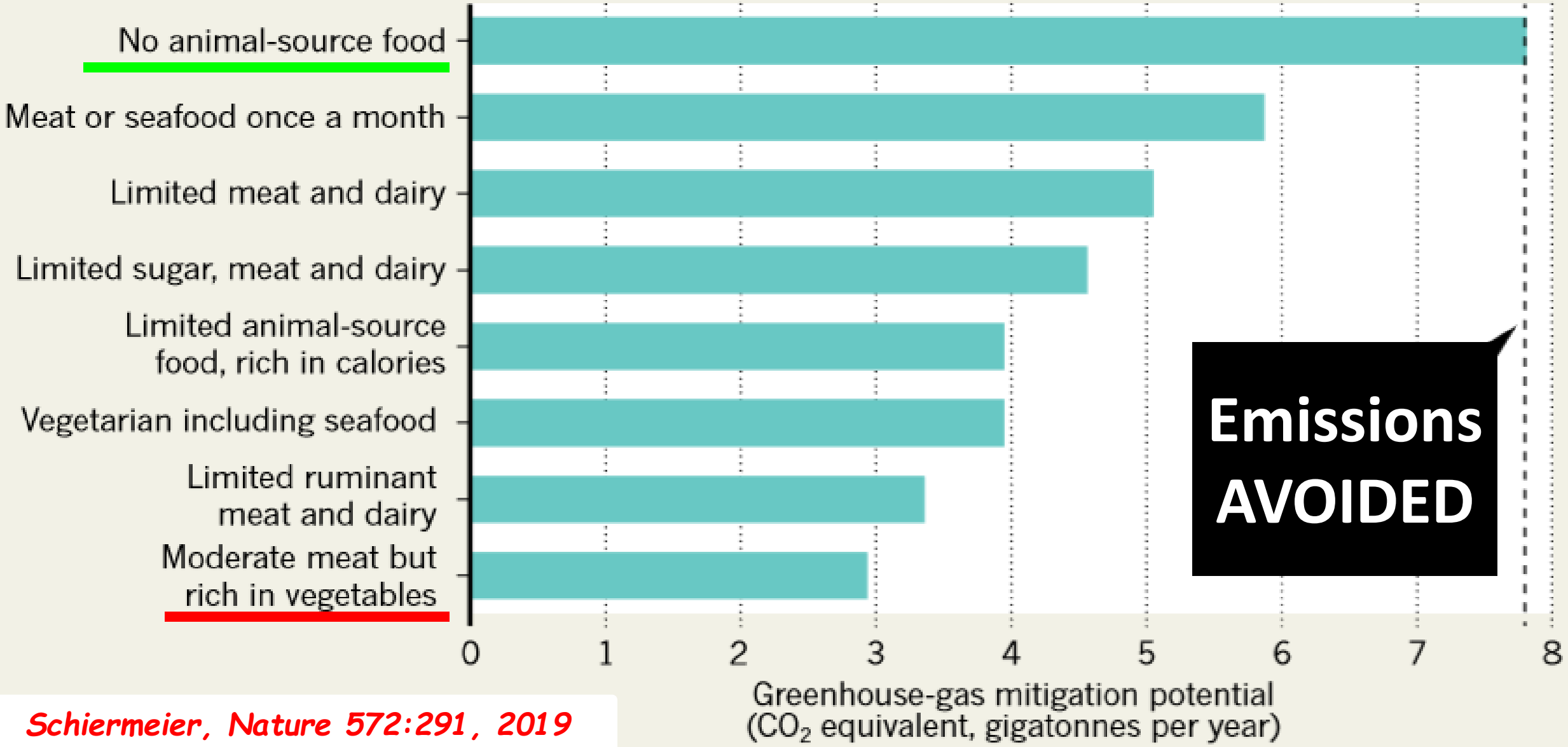
The New York Times

CLIMATE FWD:

What if We All Ate a Bit Less Meat?

WHAT IF PEOPLE ATE LESS MEAT?

The Intergovernmental Panel on Climate Change examined the estimated impact on greenhouse-gas emissions of the world's population adopting a variety of diets.



Schiermeier, Nature 572:291, 2019

World's diet must change radically, report says

Doyle Rice
USA TODAY

Around the world, people eat far too much red meat and sugar, and nowhere near enough nuts, fruits and vegetables, a report said Wednesday.

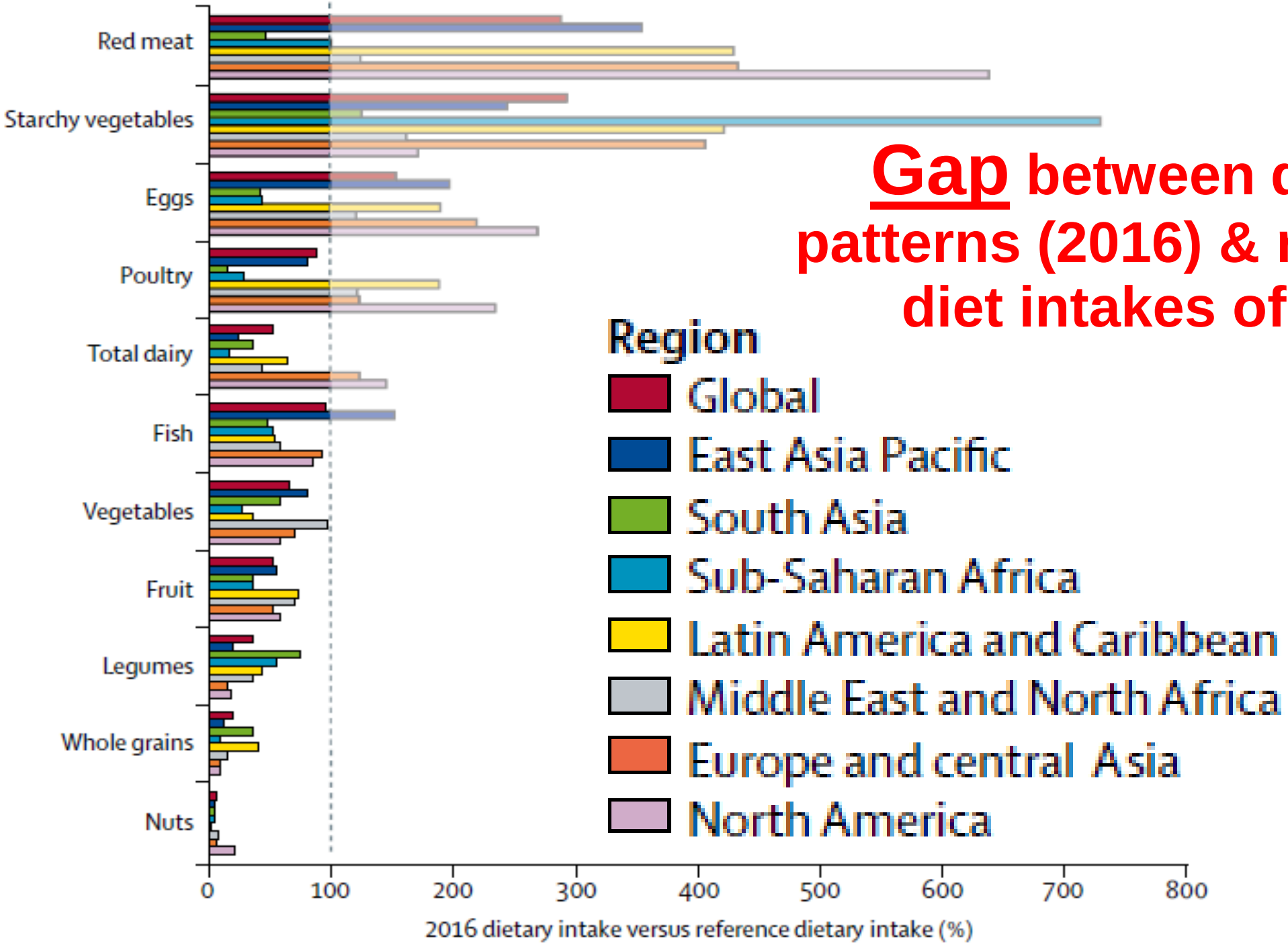
The report, published by the British medical journal The Lancet, said the population's diet and food production must radically change "to improve health and avoid potentially catastrophic damage to the planet."

The Great Food Transformation:

Range of actions taken by all food system sectors across all levels that aim to ensure healthy diets from sustainable food systems

www.thelancet.com/commissions/EAT

Willett, The Lancet 393:447, 2019



Gap between dietary patterns (2016) & reference diet intakes of food

The Great Food Transformation:

If the world followed this diet:

- 11 million premature deaths prevented/year
- greenhouse gas emissions cut
- land, water & biodiversity preserved

www.thelancet.com/commissions/EAT

Lucas, The Lancet 393:386, 2019
Willett, The Lancet 393:447, 2019

Eating Our Way To Better Health

Clues from the Global Burden of Diseases (GBD) study

GBD 2017 Collaborators, Lancet 393:1958, 2019

Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017

GBD 2017 Collaborators, Lancet 393:1958, 2019

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Methods By use of a comparative risk assessmen[illegible] the proportion of disease-specific burden attributable to each dietary risk factor (also referr[illegible] table fraction) among adults aged 25 years or older. The main inputs to this analysis include[illegible] ry factor, the effect size of the dietary factor on disease endpoint, and the level of intake as[illegible] risk of mortality. Then, by use of disease-specific population attributable fractions, mor[illegible] sted life-years (DALYs), we calculated the number of deaths and DALYs attributable to die[illegible] e.

Clues from the Global Burden of Diseases (GBD) study

GBD 2017 Collaborators, Lancet 393:1958, 2019

- The lowest proportion of diet-related deaths occurred in France, Spain and Peru
- United States ranked 43rd
- Predominant dietary pattern of countries with lowest number of diet-related deaths most closely resembled the Mediterranean diet

What is the Mediterranean diet?

- **Primary intake:**
  - unrefined grains/cereals, vegetables & fresh fruit, olive oil, legumes & nuts
- **Moderate intake:**
  - fish / white meat; wine
- **Limited intake:**
  - dairy products, red meat processed meats, sweets

The Mediterranean dietary Model

Benefits of the Mediterranean diet?

- Fatty acid profile
  - –low in saturated fat and cholesterol
  - –high in PUFA / balanced Ω-6: Ω-3 PUFA ratio
- Enriched in polyphenols, vitamins, carotenoids
- High content of complex carbohydrates and fiber

Mediterranean diet - associated with significant health benefits

- Ancel Keys (studies 70 yrs ago) = lower mortality rate from CVD (Obesity/Diabetes) in people living in the Mediterranean regions
  - *Keys, Am J Clin Nutr; 61: 1321S, 1995*
- Confirmed in subsequent studies
- Protective effects attributed to inherent antioxidant and anti-inflammatory properties of components
  - *Boccardi, Nutrition 51:38, 2018*

The Mediterranean dietary model protects against cardiovascular diseases

- American Heart Association advisory group:

"…replacing saturated fat with polyunsaturated vegetable oil reduces incidence of CVD by ~30%"

Sacks, Circulation 136:e1-e23, 2017

Tailoring the Mediterranean diet for NAFLD

BY AMY KARON

MDedge News

Adults with nonalcoholic fatty liver disease (NAFLD) were more likely to implement the Mediterra
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skills, fam
care, and
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Barrier
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of NAFLD

sparked interest in its use for NAFLD disease, but keys to its successful adoption in Northern Europe are not well understood.

Therefore, the researchers recruited 19 NAFLD patients from a
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Issues to Resolve:

- What are costs & ease of access to components?
- What specific components are responsible for favorable effects?
  - Direct benefits?
  - Inherent reduction of excluded foods?
  - Attributed to effect on the gut microflora?

The Bottom Line

- No significant downside to adopting the **Mediterranean Diet** pattern
- BUT…emphasize the role of **exercise** as a component of the healthy lifestyle
  - *Tindall, J Nutr, 148:1402, 2018*
  - *Bajaj, Hepatology 68:234, 2018*

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The Global Syndemic of Obesity, Undernutrition, and Climate Change: *The Lancet* Commission report

These Lancet articles raise a series of questions:

Why was Physical Inactivity not listed as a GLOBAL factor?

"Lack of activity destroys the good condition of every human being while movement and methodical physical exercise save it and preserve it"

Plato (5TH Century BC)

Sitting for More Than 13 Hours a Day May Sabotage the Benefits of Exercise

People who sat for long periods and took fewer than 4,000 steps a day developed metabolic problems, even if they exercised.

TIME

Want to Live Longer? For Just 30 Minutes a Day, Do Anything Else But Sit

JAMA | Original Investigation

Trends in Sedentary Behavior Among the US Population, 2001-2016

Yang, JAMA 321:1587, 2019

Lin Yang, PhD; Chao Cao, MPH; Elizabeth D. Kantor, MPH, PhD; Long H. Nguyen, MD, MS; Xiaobin Zheng, MD; Yikyung Park, ScD; Edward L. Giovannucci, MD, ScD; Charles E. Matthews, PhD; Graham A. Colditz, MD, DrPH; Yin Cao, MPH, ScD

IMPORTANCE Prolonged sitting, particularly watching television or videos, has been associated with increased risk of multiple diseases and mortality. However, changes in sedentary behaviors over time have not been well described in the United States.

OBJECTIVE To evaluate patterns and temporal trends in sedentary behaviors and sociodemographic and lifestyle correlates in the US population.

DESIGN, SETTING, AND PARTICIPANTS A serial, cross-sectional analysis of the US nationally representative data from the National Health and Nutrition Examination Survey (NHANES) among children aged 5 through 11 years (2001-2016); adolescents, 12 through 19 years (2003-2016); and adults, 20 years or older (2003-2016).

TIME

Americans Are Not Getting the Message About Exercising More and Sitting Less

Average sitting time increasing among Americans

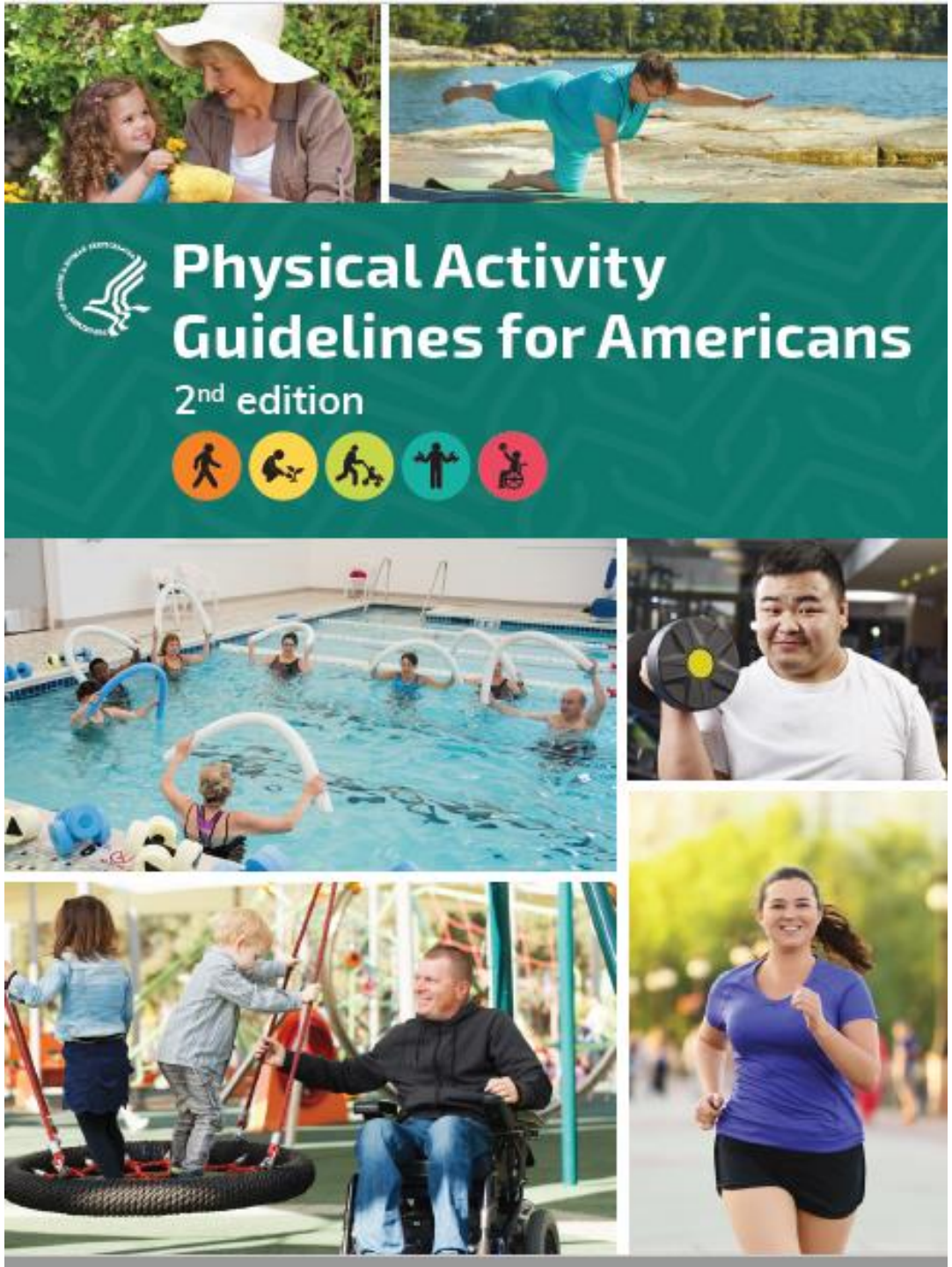
Yang, JAMA 321:1587, 2019

- Past decade in the USA - the average daily sitting time has increased:
  - –to 8 hours for U.S. teens
  - –to 6.5 hours for U.S. adults
- >50% of Americans spent at least one hour of leisure time daily using computers

The New York Times

Keep It Moving

The curse of the chair



U.S. Department of Health and Human Services. Physical Activity Guidelines for Americans, Department of Health and Human Services

https://health.gov/paguidelines/

Original Article
EPIDEMIOLOGY/GENETICS

Obesity

Physical Activity Energy Expenditure and Total Daily Energy Expenditure in Successful Weight Loss Maintainers

Danielle M. Ostendorf [1,2], Ann E. Caldwell[1], Seth A. Creasy [2], Zhaoxing Pan[3], Kate Lyden[4], Audrey Bergouignan [1,2,5,6], Paul S. MacLean[2], Holly R. Wyatt[1], James O. Hill[1]

Ostendorf, Obesity 27:496, 2019

Objective: The objective of this study was to compare physical activity energy expenditure (PAEE) and total daily energy expenditure (TDEE) in successful weight loss maintainers (WLM) with normal weight controls (NC) and controls with overweight/obesity (OC).

Methods: Participants were recruited in three groups: WLM ($n = 25$, BMI 24.1 ± 2.3 kg/m^2; maintaining ≥ 13.6-kg weight loss for ≥ 1 year), NC ($n = 27$, BMI 23.0 ± 2.0 kg/m^2; similar to current BMI of WLM), and OC ($n = 28$, BMI 34.3 ± 4.8 kg/m^2; similar to pre–weight loss BMI of WLM). TDEE was measured using the doubly labeled water method. Resting energy expenditure (REE) was measured using indirect calorimetry. PAEE was calculated as (TDEE – [0.1 × TDEE] – REE).

Physical Activity - Key To Maintaining Weight Loss

"Stay physically active rather than restrict calories - key to keeping the pounds from creeping back after successful weight loss"

Ostendorf, Obesity 27:496, 2019


CHILDREN
AT PLAY

Circulation

AHA SCIENTIFIC STATEMENT

Sedentary Behaviors in Today's Youth: Approaches to the Prevention and Management of Childhood Obesity

A Scientific Statement From the American Heart Association

Barnett, Circulation 138:e142, 2018

"Stand Tall"

Middle School in NY

SCIENTIFIC REPORTS

Vol 9:7730, 2019

Spending at least 120 minutes a week in nature is associated with good health and wellbeing

Mathew P. White[1], Ian Alcock[1], James Grellier[1], Benedict W. Wheeler[1], T
Sara L. Warber[1,3], Angie Bone[1], Michael H. Depledge[1] & Lora E. Fleming[1]

environments can benefit health and well-being, but ex
esearched. We examined associations between recreatio
elf-reported health and well-being. Participants (n = 19,
ent with the Natural Environment Survey (2014/15–2015
. Weekly contact was categorised using 60 min blocks. A
nd other neighbourhood and individual factors. Compare
of reporting good health or high well-being became sign
120–179 mins: ORs [95%CIs]: Health = 1.59 [1.31–1.92];
ociations peaked between 200–300 mins per week with
cross key groups including older adults and those with lo
0 mins of contact a week was achieved (e.g. one long *vs.* s
tudinal and intervention studies are a critical next step in
guidelines comparable to those for physical activity.

THE LANCET

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

WORLD OBESITY

Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

The Global Syndemic of Obesity, Undernutrition, and Climate Change: *The Lancet* Commission report

These Lancet articles raise a series of questions:

Why were other “environmental factors” not listed?

1. Sleep
2. Sugar!
3. Drugs:
   - Antimicrobials
   - PPIs
4. Viral Illnesses

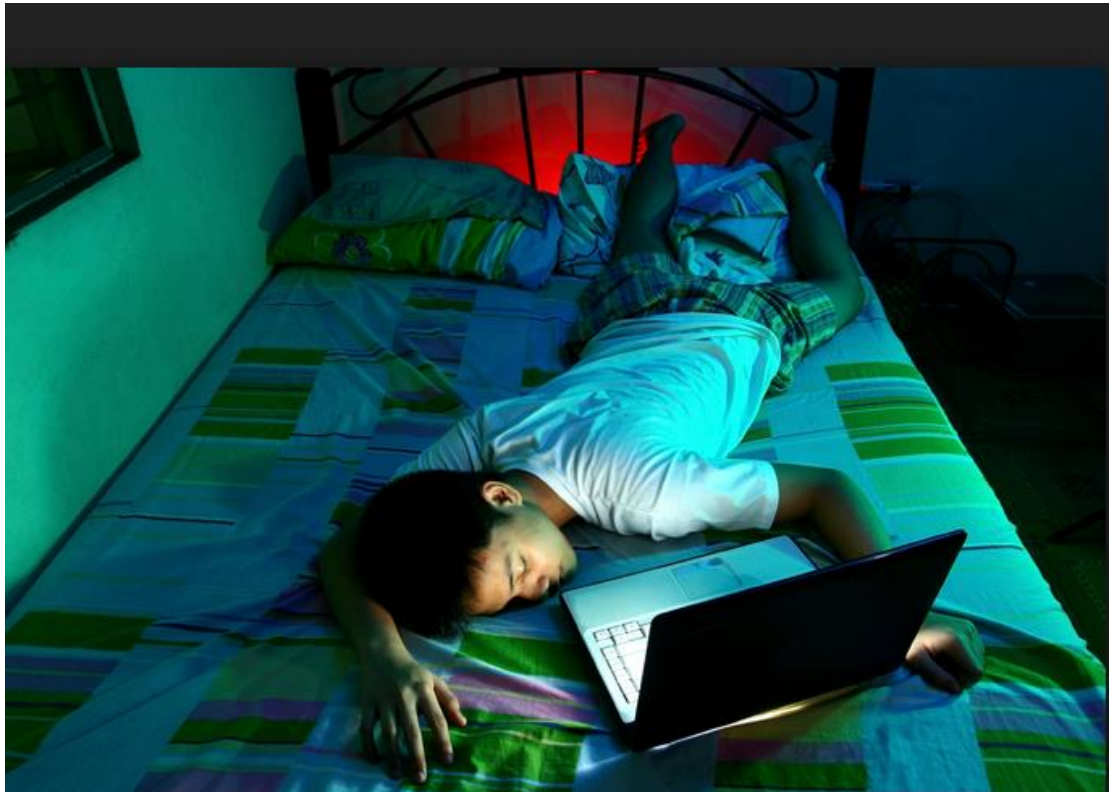
Short sleep duration in early childhood independently associated with obesity

Bonuck, J. Pediatr. 166:632, 2014

Halal, J. Pediatr. 168:99, 2016

By ASHLEY WELCH / CBS NEWS / October 2, 2015, 6:14 PM

Late bedtimes for teens could lead to weight gain over time



THE JOURNAL OF PEDIATRICS • www.jpeds.com ORIGINAL ARTICLES

Tuchino, J Pediatr xx:1, 2019

Short Sleep Duration and Later Overweight in Infants

Tuuli Tuohino, B Med[1,2], Isabel Morales-Muñoz, PhD[2,3], Outi Saarenpää-Heikkilä, MD, PhD[4], Olli Kiviruusu, PhD[2], Tiina Paunio, MD, PhD[2,5], Petteri Hovi, MD, PhD[2,6], Kirsi H. Pietiläinen, MD, PhD[7,8], and E. Juulia Paavonen, MD, PhD[1,2]

Objective To provide further knowledge about the longitudinal association between sleep duration and overweight in infants.

Study design The data for this study are from the CHILD-SLEEP birth cohort (n = 1679). The sleep data are based on parent-reported total sleep duration collected at 3, 8, 18, and 24 months. For a subgroup of 8-month old participants (n = 350), an actigraph recording was also made. Growth data were derived from the child health clinic records. A logistic regression model was used to study the association between sleep duration and later weight development.

Results Shorter sleep duration in 3-mo[illegible]nally associated with lower weight-for-length/height (all *P* values ≤ .026) and b[illegible]038). Moreover, short sleep duration at the age of 3 months was associated wit[illegible] z score at the age of 24 months (aOR 1.56; 95% CI 1.02-2.38) as well as with a predisposition to gain excess weight between 3 and 24 months of age (aOR 2.61; 95% CI 1.75-3.91). No significant associations were found between sleep duration at 8, 18, or 24 months and concurrent or later weight status. Actigraph-measured short night-time sleep duration at the age of 8 months was associated with greater weight-for-length at the age of 24 months (aOR 1.51; 95% CI 1.02-2.23).

Conclusions Short total sleep duration at the age of 3 months and short night-time sleep duration at the age of 8 months are associated with the risk of gaining excess weight at 24 months of age. *(J Pediatr 2019; ■:1-7)*.

Starts early

The New York Times

Sleeping With the Lights on Tied to Weight Gain

Women who slept with the lights or TV on had a higher risk for obesity.

JAMA Internal Medicine | Original Investigation

Association of Exposure to Artificial Light at Night While Sleeping With Risk of Obesity in Women

Park, JAMA Intern Med (on line 6-10-19)

Yong-Moon Mark Park, MD, PhD; Alexandra J. White, PhD; Chandra L. Jackson, PhD, MS; Clarice R. Weinberg, PhD; Dale P. Sandler, PhD

IMPORTANCE Short sleep has been associated with obesity, but to date the association between exposure to artificial light at night (ALAN) while sleeping and obesity is unknown.

"…slept with TV or light on - 22% more likely to be overweight and 33% more likely to be obese than women who slept in total darkness"

daytime sleepers, or pregnant at baseline were included in the analysis. Data were analyzed from September 1, 2017, through December 31, 2018.

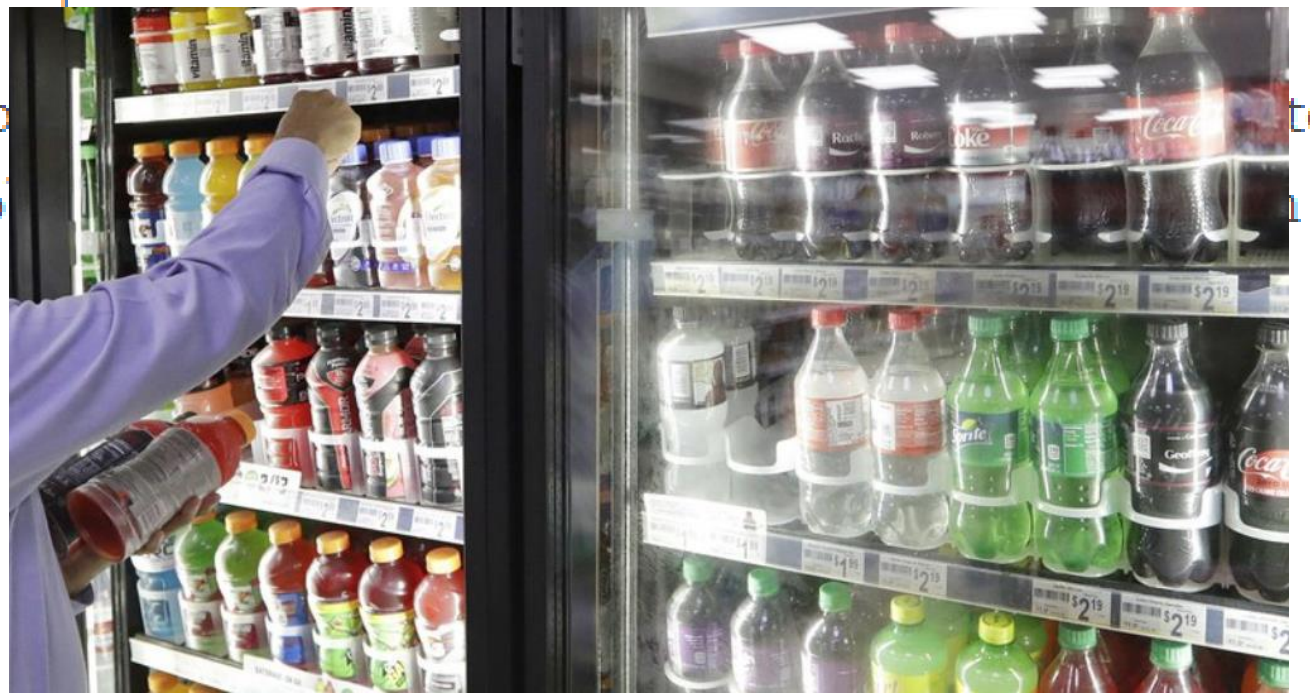
Do Adolescents Meet Recommendations for Sleep, Screen Time, Physical Activity?

- British adolescents = 9.7%
  - *Pearson, JAMA Pediatrics, 173:993, 2019*
- US adolescents = 5%
  - *Roman-Viñas, Int J Behav Nutr Phys Act 13:123, 2016*

A spoonful less sugar, tad more fat: US diets still lacking

CHICAGO (AP) — Americans' diets are a little less sweet and a little crunchier but there's still too much sugar, white bread and artery-clogging fat, a study suggests.

Overall, the authors estimated there was a modest improvement over 16 years on the government's healthy eating index, from estimated scores of 56 to 58. That's hardly cause for celebration — 100 is the top score.



Diets are still too heavy o tes, obesity and other prevalent U.S. health pro researcher at Tufts University near Boston.

JAMA Network Open

Collin, JAMA Network Open, 2:e193121, 2019

Original Investigation | Nutrition, Obesity, and Exercise

Association of Sugary Beverage Consumption With Mortality Risk in US Adults

A Secondary Analysis of Data From the REGARDS Study

Lindsay J. Collin, MPH; Suzanne Judd, PhD; Monika Safford, MD, PhD; Viola Vaccarino, MD, PhD; Jean A. Welsh, RN, MPH, PhD

Abstract

"…higher consumption of sugary beverages is associated with increased all-cause mortality"

OBJECTIVE To assess the association of SSBs and 100% fruit juices, alone and in combination (sugary beverages), with mortality.

POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

Muth, Pediatrics
143:e20190282, 2019

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Ditch juice box, pick up water bottle to boost prevention

Public Policies to Reduce Sugary Drink Consumption in Children and Adolescents

Natalie D. Muth, MD, MPH, RDN, FAAP,[a,b] William H. Dietz, MD, PhD, FAAP,[c] Sheela N. Magge, MD, MSCE, FAAP,[d] Rachel K. Johnson, PhD, MPH, RD, FAHA,[e] AMERICAN ACADEMY OF PEDIATRICS, SECTION ON OBESITY, COMMITTEE ON NUTRITION, AMERICAN HEART ASSOCIATION

The New York Times

What Should Young Children Drink? Mostly Milk and Water, Scientists Say

Infants and toddlers should not be given soda, chocolate milk or other sweetened drinks, according to strict new guidelines.

September 23, 2019

Well
PARENTING
The New York Times

October 21, 2015

Frequent Antibiotics May Make Children Fatter

By TARA PARKER-POPE OCTOBER 21, 2015 2:32 PM 75 Comments

Is There a Causal Link Between Antibiotic Exposure During Infancy and Risk for Obesity?

Antti Saari, MD, PhD, Ulla Sankilampi, MD, PhD

Saari, Pediatrics 142:e20182692, 2018

In recent decades, obesity has surged to epidemic proportions in the developed world, and it has become

YES - "..independent association between early-life antibiotics and greater weight"

adults.[1] An initial observation, made in 2008, was that antibiotic use in infancy

plausibility, coherence, experiment, and analogy), together with the contemporary understanding of

between early-life antibiotic exposure and obesity.

Antibiotic and acid-suppression medications during early childhood are associated with obesity

Christopher M Stark,[1,2] Apryl Susi,[3] Jill Emerick,[2,3] Cade M Nylund[2,3]

Stark, Gut 68:62, 2019

ABSTRACT

Objective Gut microbiota alterations are associated with obesity. Early exposure to medications, including acid suppressants and antibiotics, can alter gut biota and may increase the likelihood of developing obesity. We investigated the association of antibiotic, histamine-2 receptor antagonist (H2RA) and proton pump inhibitor (PPI) prescriptions during early childhood with a diagnosis of obesity.

Design We performed a cohort study of US Department of Defense TRICARE beneficiaries born from October 2006 to September 2013. Exposures were defined as

Significance of this study

What is already known on this subject?

- Obesity has been linked to variations in the native gut microbiota.
- Several commonly prescribed paediatric medications are known to cause alterations in the native gut microbiota.
- There is conflicting evidence about the role of exposure to microbiota-altering medications and the development of childhood obesity.

Endobariatrics: A Primer

Andrew C. Storm, Barham K. Abu Dayyeh, and Mark Topazian

Storm, Clinical Gastro and Hepatol 16:1701, 2019

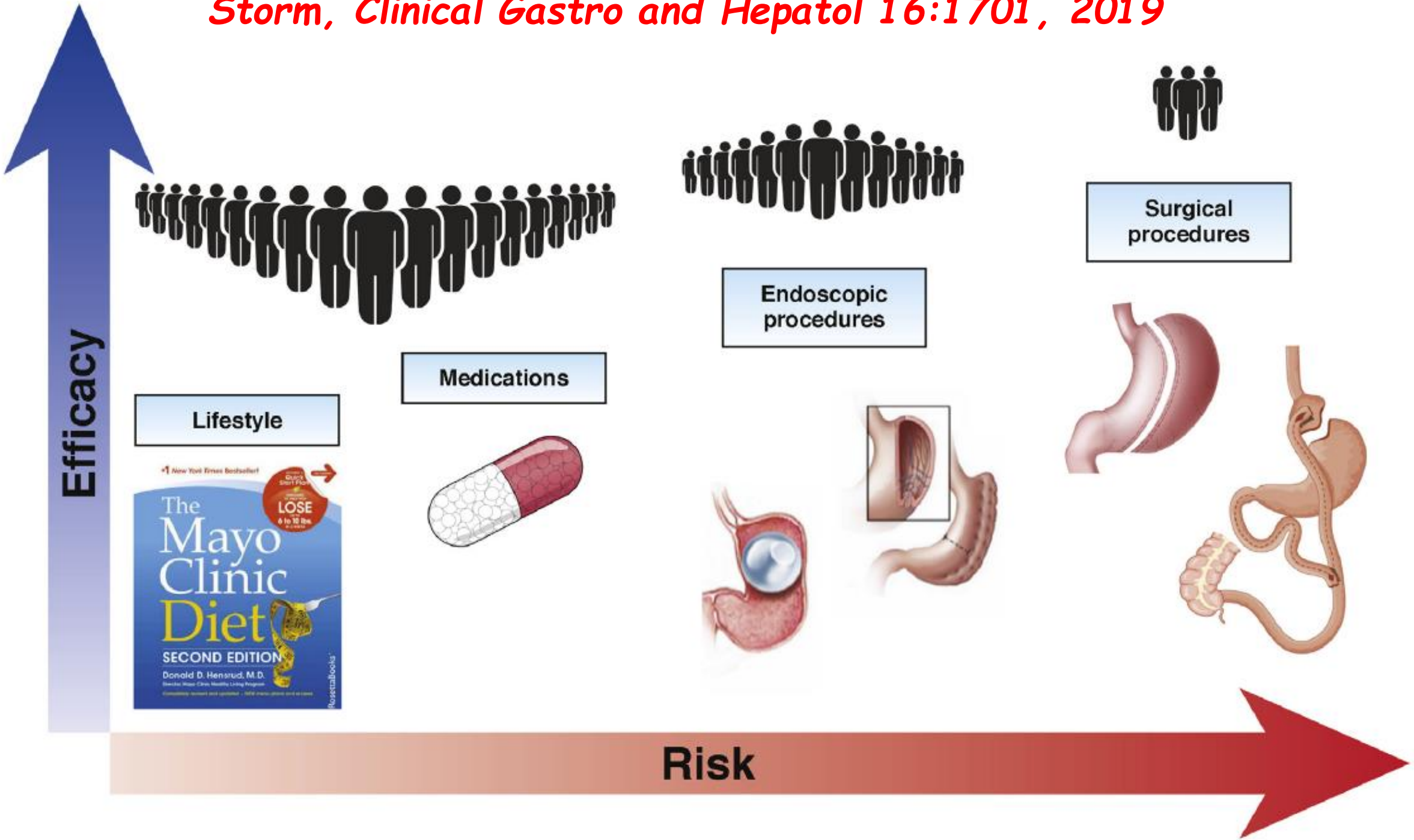
Flexible gastrointestinal endoscopy offers an ever-expanding menu of minimally invasive alternatives to surgical interventions, most recently through procedures developed to address the obesity epidemic. Gastroenterologists are well positioned to manage obesity given their broad-based medical knowledge, understanding of gastrointestinal physiology, and training in endoscopic technique. The field of endobariatrics has emerged out of several recently Food and Drug Administration (FDA)-approved technologies.[1] This review focuses on techniques and FDA-approved devices used for endoscopic management of obesity, acknowledging that endobariatrics is in its infancy with many new devices and techniques in the pipeline, and much data still are needed.

use FDA-approved devices are not discussed at length in this review.

Which Patients to Consider for Endobariatric Therapy

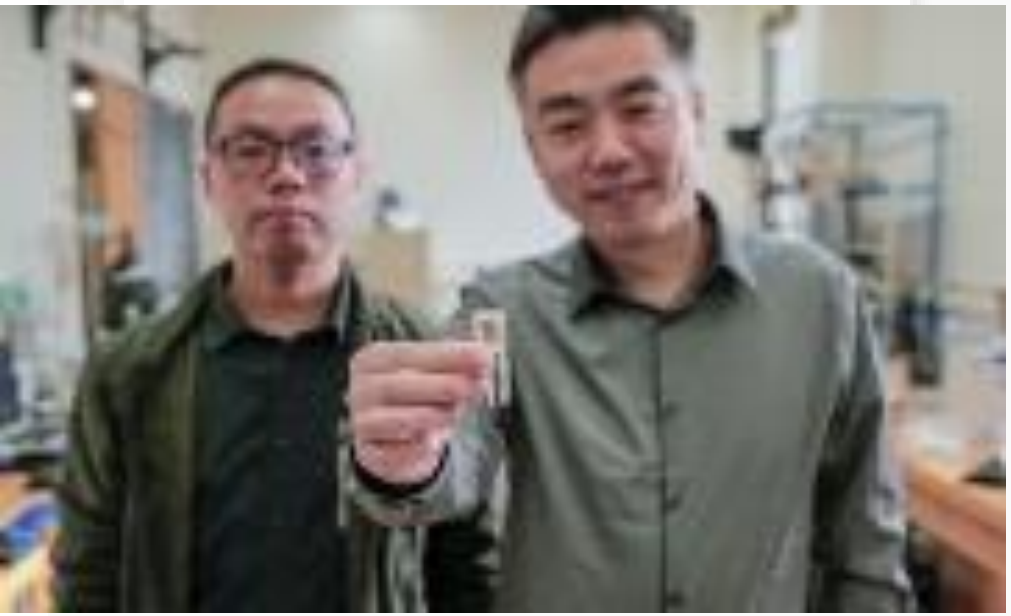
Generally speaking, endobariatric procedures may be considered as alternatives to bariatric surgery. Patients with a low risk tolerance may prefer endoscopic to surgical interventions after learning about these options. Similar to surgery, endobariatric procedures require evaluation by a multidisciplinary team that includes detailed evaluation of dietary habits, eating behaviors, and medical or psychological contraindications. These

Storm, Clinical Gastro and Hepatol 16:1701, 2019



Battle of the bulge goes high-tech: UW scientists devise innovative implantable weight-loss device

Meg Jones, Milwaukee Journal Sentinel Published 4:00 p.m. CT Dec. 17, 2018



Just in time for the holiday snacking and buffet season, University of Wisconsin-Madison scientists have invented an innovative weight-loss device that someday may be implanted in people's stomachs.

The battery-free devices are about one-third the size of a copper penny and generate gentle electric pulses from the stomach's natural churning motions. Those pulses are delivered to the vagus nerve that links brains to stomachs.

nature COMMUNICATIONS

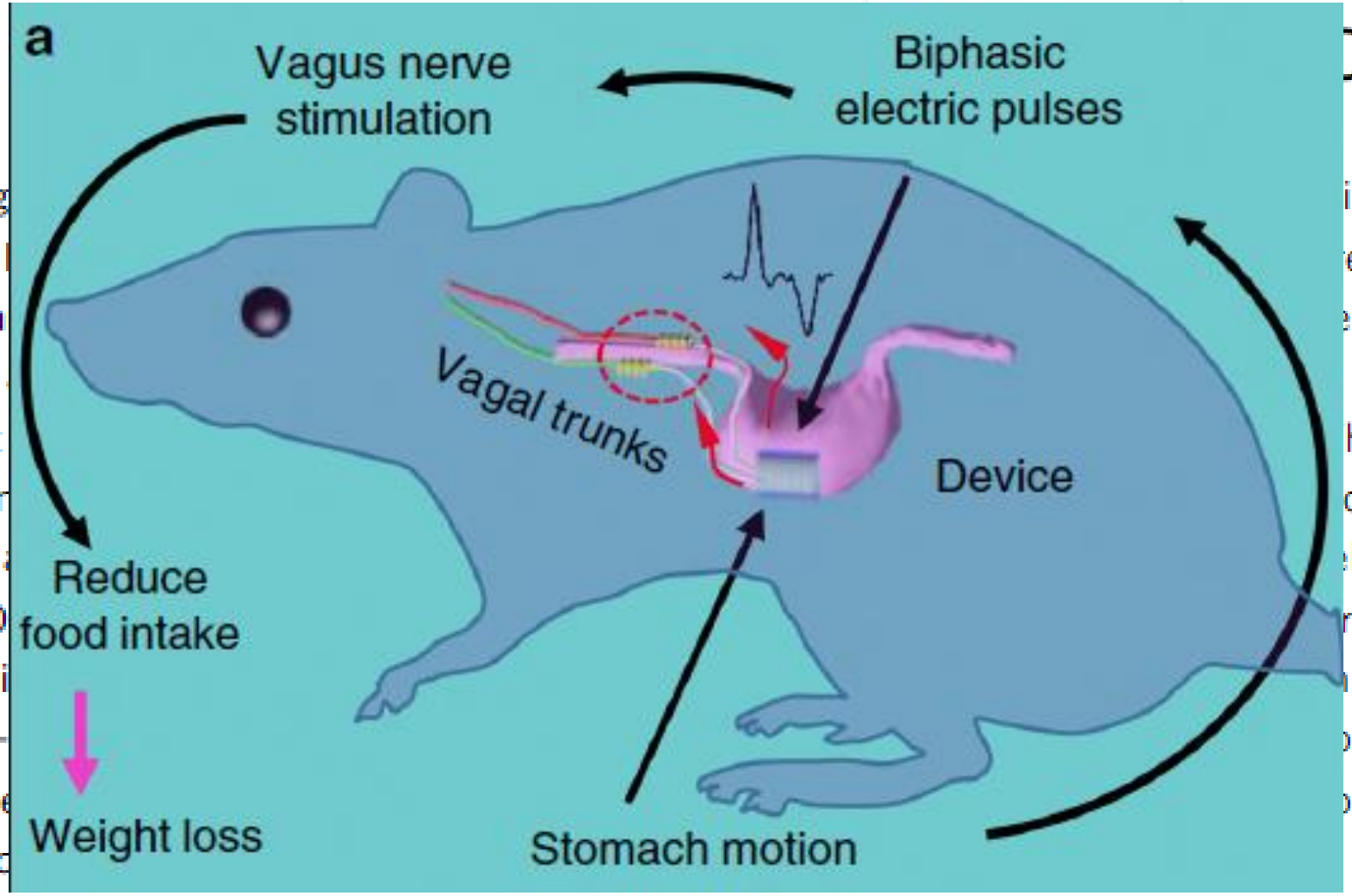
Effective weight control via an implanted self-powered vagus nerve stimulation device

Yao, Nature Communications 9:5349, 2018

In vivo vagus nerve stimulation holds great promise in regulating food intake for obesity treatment. Here we present an implanted vagus nerve stimulation system that is battery-free and spontaneously responsive to stomach movement. The vagus nerve stimulation system comprises a flexible and biocompatible nanogenerator that is attached on the surface of stomach. [illegible] ach. The electric sig[illegible] uce food intake and[illegible] models. Within 10[illegible] e control groups. Th[illegible] rough a smart, sel[illegible] his work also provi[illegible] ted from coordinate[illegible]

nature COMMUNICATIONS

Effective weight control via an implanted self-powered



In vivo vag
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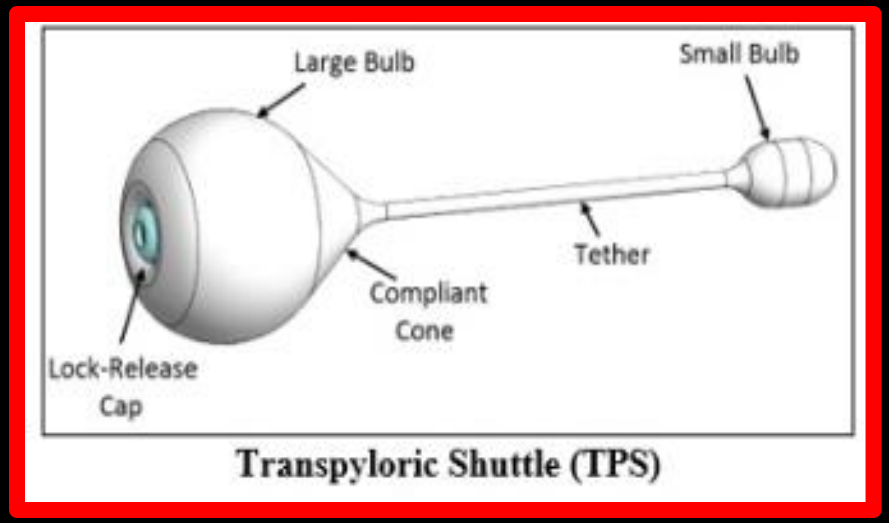
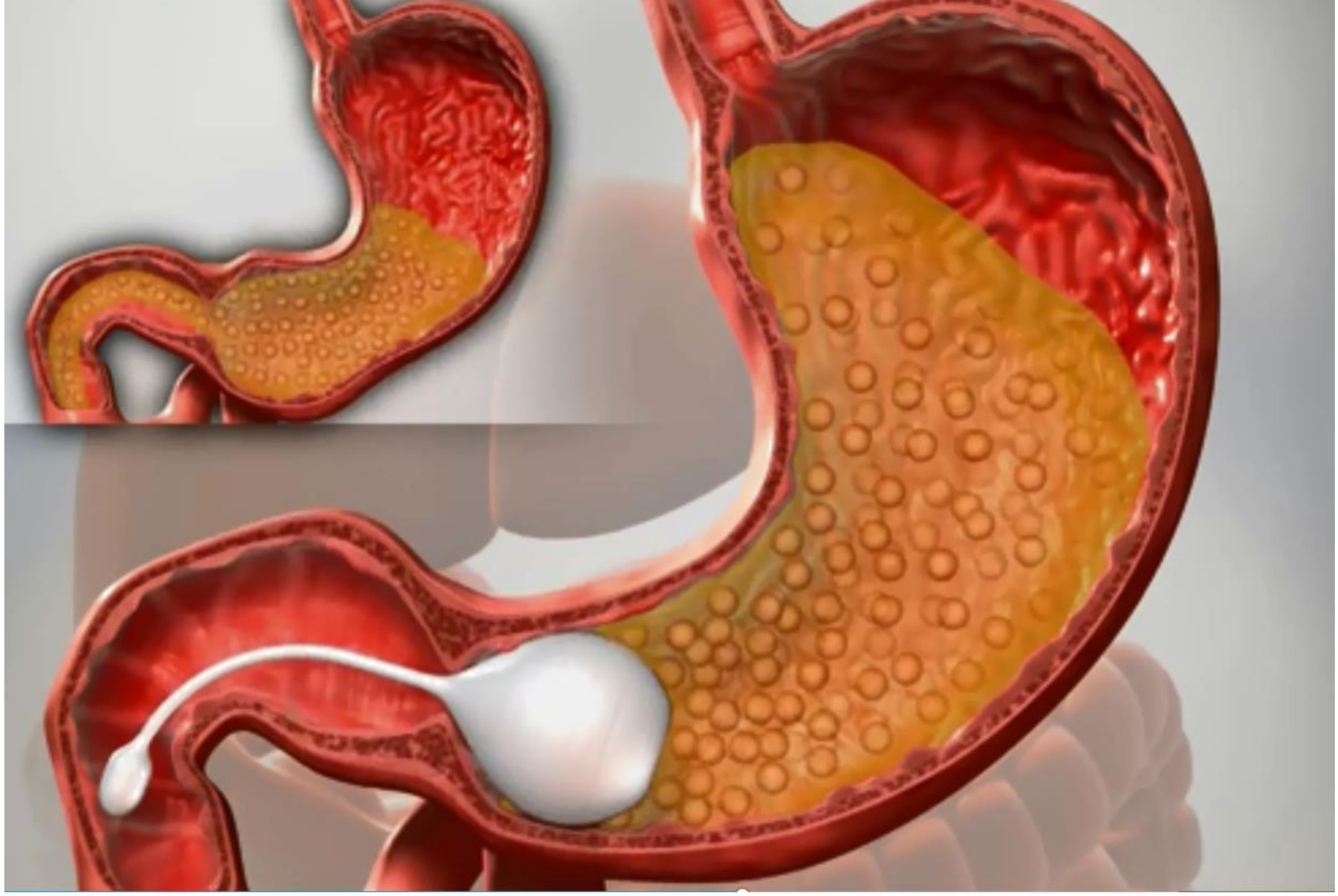
Within 100
groups. Thi
smart, self-
also provide
coordinated

FDA approves non-surgical weight loss device for obesity *(April 24, 2019)*

- TransPyloric Shuttle (TPS) Device
- BARONova
- Delivered & retrieved endoscopically
- Smaller than fluid-filled balloons



Transpyloric Shuttle (TPS)

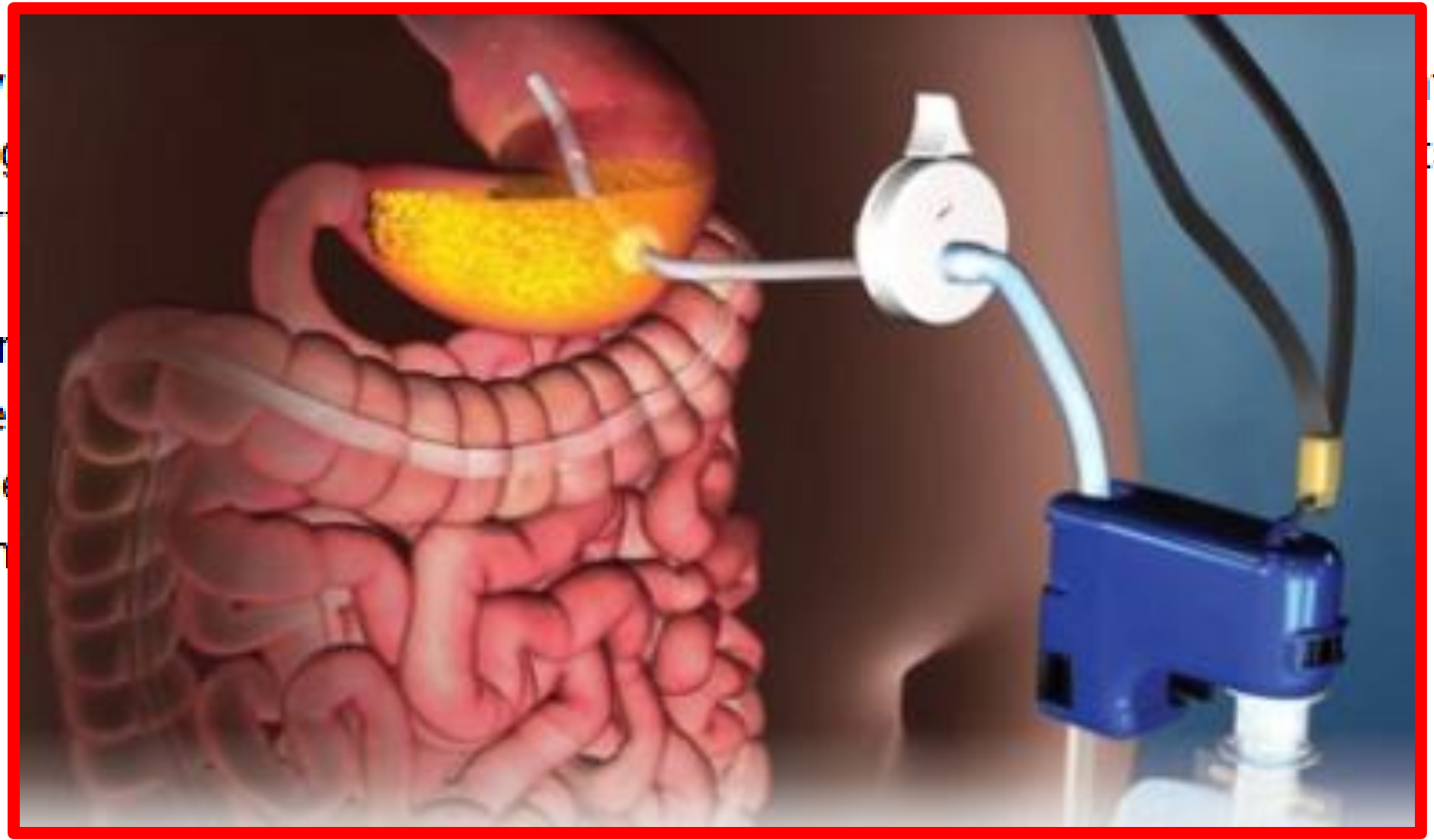


ENDObesity® II Trial

Rothstein, Obesity Week T-P 3277, 2018

- Randomized, double-blind and sham-controlled trial (n = 270 pts)
- 67% >5% their body weight
- % loss @ 12 mos:
  - –9.5% TPS device
  - –2.8% sham-control group *(p< .0001)*

Longer-Term Aspiration Therapy Effective for Obesity



A dev ts
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Effect of Aspiration Therapy on Obesity-Related Comorbidities

Jirapinyo, Freston Conference; Arlington, Aug. 18, 2018.

- **AspireAssist** - endoscopically placed GT; external drain **(~30% of ingested calories)**
- Obesity-related comorbidities (BP, cholesterol levels, T2DM, NAFLD) improved @ one year
- Significant weight loss persists up to at least four years after implantation

THE LANCET

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NEW ZEALAND

WORLD OBESITY

Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

The Global Syndemic of Obesity, Undernutrition, and Climate Change: *The Lancet* Commission report

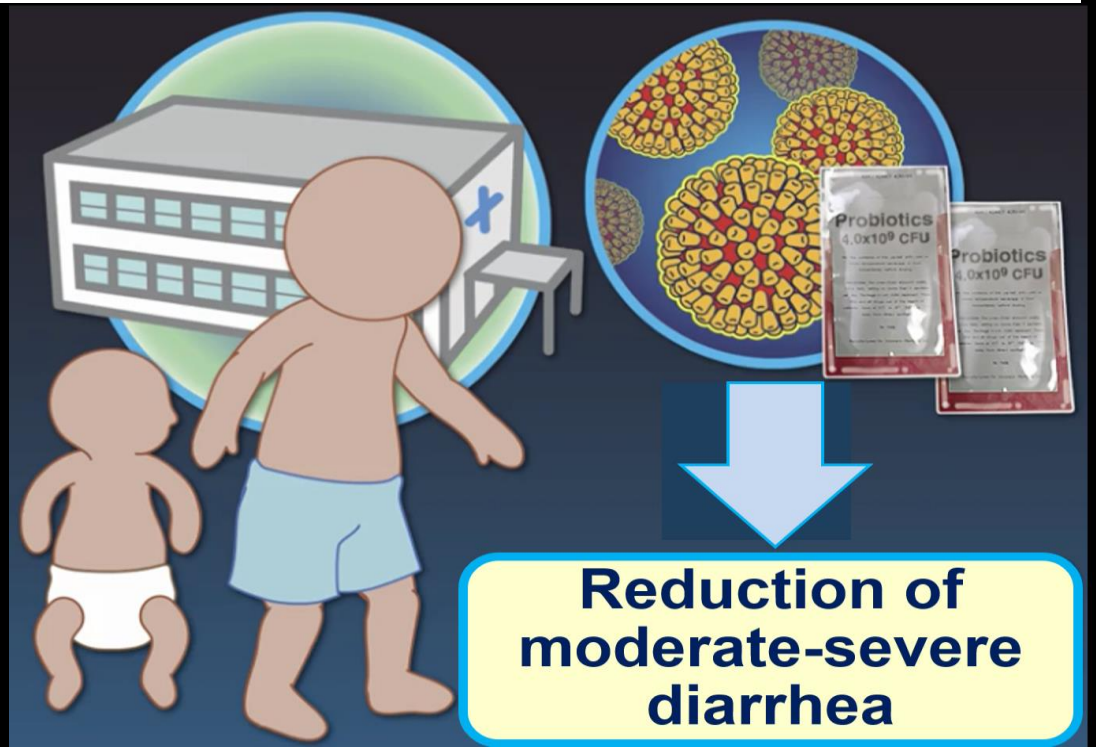
These Lancet articles raise a series of questions:

What to do about DIARRHEA?

Prevention
Acute & Chronic Care

Rotavirus Vaccination

Management



Kotloff, Lancet Glob Health 7:e568, 2019

The incidence, aetiology, and adverse clinical consequences of less severe diarrhoeal episodes among infants and children residing in low-income and middle-income countries: a 12-month case-control study as a follow-on to the Global Enteric Multicenter Study (GEMS)

- **Even children with less severe diarrhea experience adverse clinical and nutritional outcomes**
- **Intervene - targeting rotavirus, Shigella, ET-EC & Cryptosporidium to reduce nutritional faltering**

less-severe diarrhoea (LSD) seeking care at health centres serving six GEMS sites.

Morbidity and Mortality Weekly Report

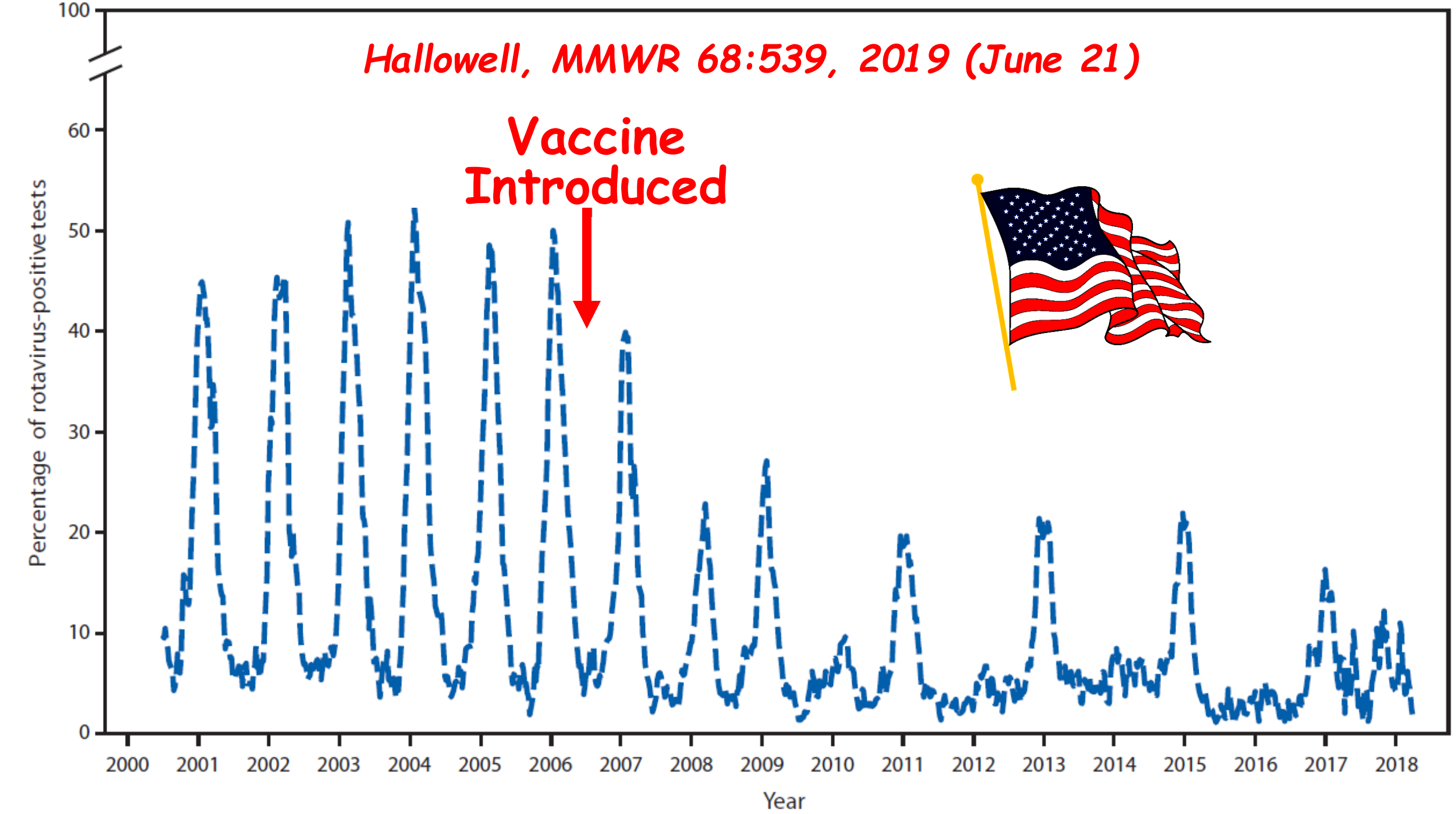
Hallowell, MMWR 68:539, 2019 (June 21)

Trends in the Laboratory Detection of Rotavirus Before and After Implementation of Routine Rotavirus Vaccination — United States, 2000–2018

Benjamin D. Hallowell, PhD[1,2]; Umesh D. Parashar, MD[1]; Aaron Curns, MPH[1]; Nicholas P. DeGroote, MPH[1]; Jacqueline E. Tate, PhD[1]

Before the introduction of rotavirus vaccine in the United States in 2006, rotavirus infection was the leading cause of severe gastroenteritis among U.S. children (*1*). To evaluate the long-term impact of rotavirus vaccination on disease prevalence and seasonality in the U
national laboratory testing data f
ries participating in CDC's Natio
Viruses Surveillance System (NR
cine (2000–2006) and postvacc
Nationally, the median annual pe
rotavirus declined from 25.6% (
prevaccine period to 6.1% (range
cine period. When compared with the prevaccine period, the first reporting year after vaccine introduction (July 2006–June 2007), which is considered a transitional year with low vaccination coverage, were excluded from the analysis. To examine trends in rotavirus testing and detection during the
periods, analyses were restricted
continuously reported rotavirus
s of each reporting year during
vere aggregated by week and are
ving average for the total number
and the number of positive test
ctices over time were evaluated
rder correlation for the annual
number of tests conducted and the Cochran-Armitage test for

Hallowell, MMWR 68:539, 2019 (June 21)



Rotavirus Vaccination and the Global Burden of Rotavirus Diarrhea Among Children Younger Than 5 Years

Christopher Troeger, MPH; Ibrahim A. Khalil, MD; Puja C. Rao, MPH; Shujin Cao, MS; Brigette F. Blacker, MPH; Tahmeed Ahmed, MD; George Armah, PhD; Julie E. Bines, MD; Thomas G. Brewer, MD; Danny V. Colombara, PhD; Gagandeep Kang, MD; Beth D. Kirkpatrick, MD; Carl D. Kirkwood, PhD; Jason M. Mwenda, PhD; Umesh D. Parashar, MD; William A. Petri Jr, MD; Mark S. Riddle, MD; A. Duncan Steele, PhD; Robert L. Thompson, PhD; Judd L. Walson, MD; John W. Sanders, MD; Ali H. Mokdad, PhD; Christopher J. L. Murray, DPhil; Simon I. Hay, FMedSci; Robert C. Reiner Jr, PhD

Troeger, JAMA Pediatr 172:958, 2018

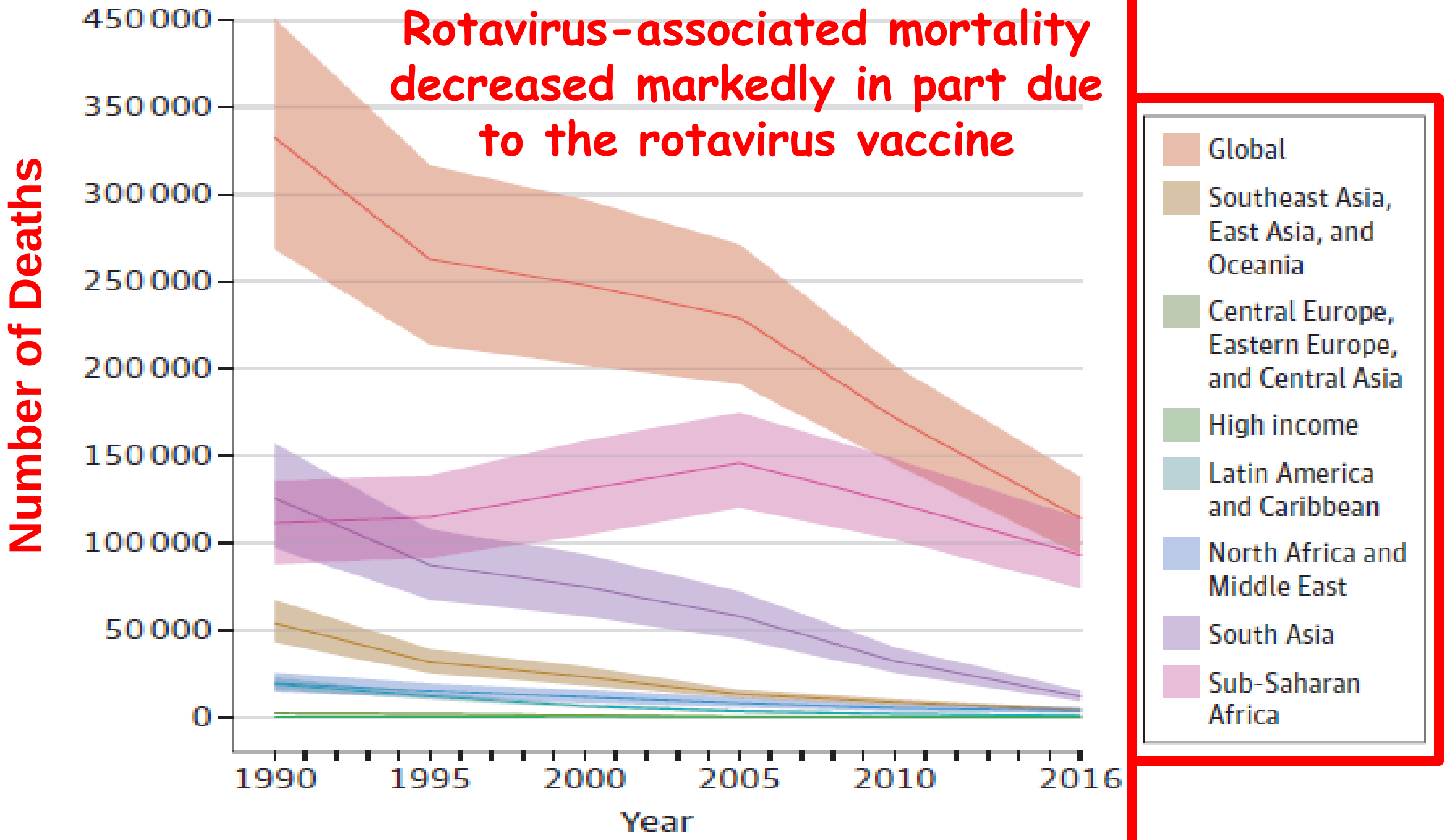
IMPORTANCE Rotavirus infection is the global leading cause of diarrhea-associated morbidity and mortality among children younger than 5 years.

OBJECTIVES To examine the extent of rotavirus infection among children younger than 5 years by country and the number of deaths averted because of the rotavirus vaccine.

DESIGN, SETTING, AND PARTICIPANTS This report builds on findings from the Global Burden of Disease Study 2016, a cross-sectional study that measured diarrheal diseases and their etiologic agents. Models were used to estimate burden in data-sparse locations.

Troeger, JAMA Pediatr 172:958, 2018

Rotavirus-associated mortality decreased markedly in part due to the rotavirus vaccine



Prophylactic use of probiotics for gastrointestinal disorders in children

Celine Perceval, Hania Szajewska, Flavia Indrio, Zvi Weizman, Yvan Vandenplas

Perceval, Szajewska, Lancet Child Adolesc Health Published Online July 3, 2019

The gastrointestinal microbiome is a hot topic in clinical research. Beneficial effects of selected probiotics in the prevention of gastrointestinal disorders are mainly restricted to acute gastroenteritis, antibiotic-associated diarrhoea, infantile colic, and necrotising enterocolitis. However, no broad consensus exists to recommend the use of probiotics in the prevention of these conditions, mainly because of the different design of the studies done so far, resulting in little eviden eeded before recommenda outine use of probiotics in

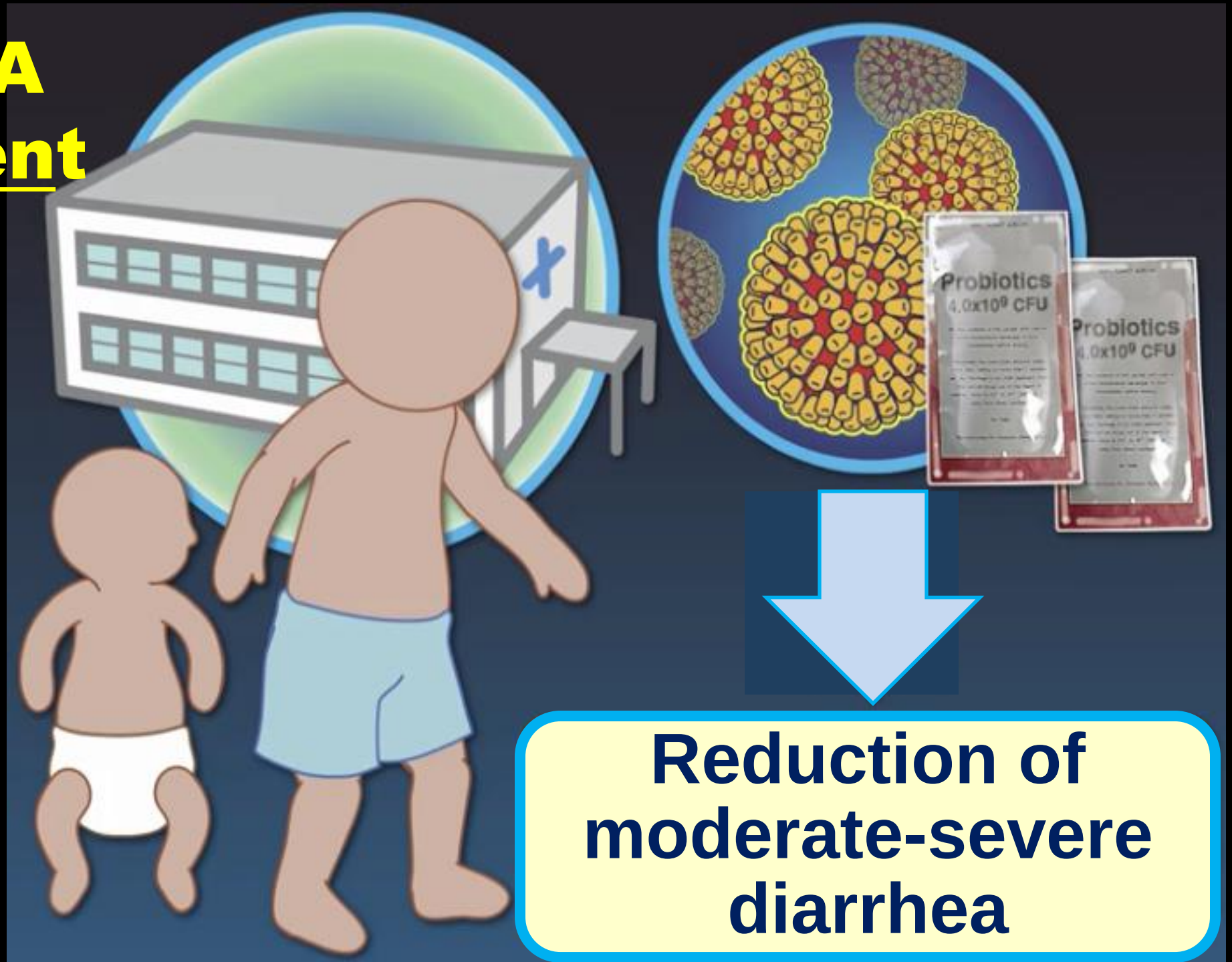
"...the evidence is insufficient to recommend the routine use of probiotics in infants and children for the prevention of GI disorders"

Introductio

A balanced r ms that when health, where nfer a health related to a lo m Denmark,[10] the gastrointestinal tract. The question arises immediately: do we know the optimal balance of the gastrointestinal microbiota of the healthy infant and child? At this stage, the answer to this question is still unknown.

some parents define probiotics as a kind of medicine they only use if their child is ill. According to the same study,[10] parents worry that probiotics might cause an imbalance in the microbiome of a young child. Parental

DIARRHEA
Management



Reduction of moderate-severe diarrhea

Acute gastroenteritis:

Current treatment options

Guarino, J Clin Gastroenterol 49:S1:S37, 2015

- Limited to:
  - Control symptoms; maintain nutrition
  - Prevent dehydration
  - Prevent secondary infections (contacts)
- Parents and caregivers often offer probiotics to treat these acute intestinal infections
  - Published guidelines endorse this strategy

Probiotic Therapy for Gastroenteritis In Young Children

- Two studies (US & Canada); children with AGE
- Administration of *Lactobacillus rhamnosus*

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Lactobacillus rhamnosus GG versus Placebo for Acute Gastroenteritis in Children

David Schnadower, M.D., M.P.H., Phillip I. Tarr, M.D., T. Charles Casper, Ph.D.,

Schnadower, N Engl J Med 379:2002, 2018

Multicenter Trial of a Combination Probiotic for Children with Gastroenteritis

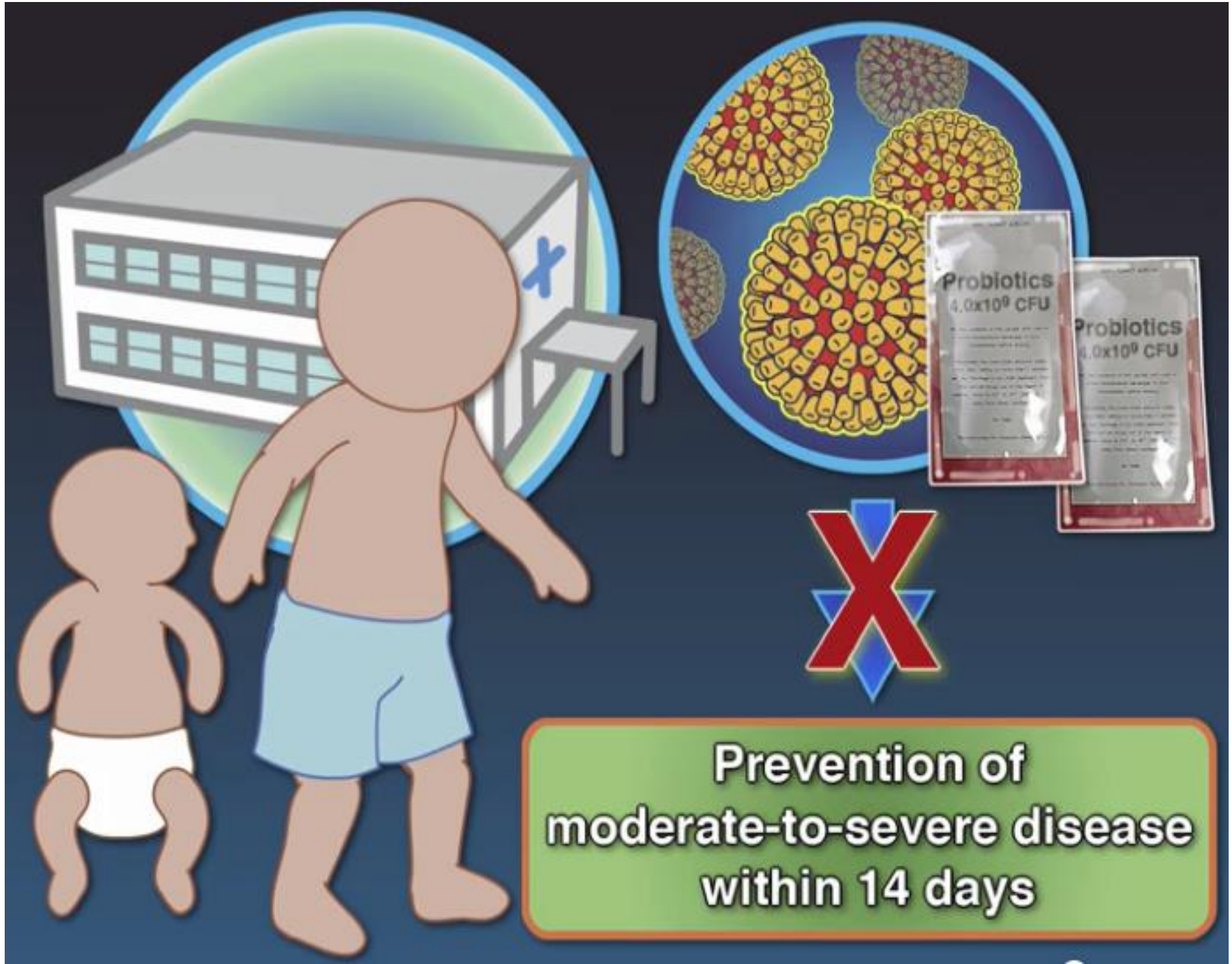
Stephen B. Freedman, M.D.C.M., Sarah Williamson-Urquhart, B.Sc.Kin.,
Ken J. Farion, M.D., Serge Gouin, M.D.C.M., Andrew R. Willan, Ph.D.,

Freedman, N Engl J Med 379:2015, 2018

Prospective, randomized, double-blind trials:

Schnadower, N Engl J Med 379:2002, 2018
Freedman, N Engl J Med 379:2015, 2018

- Children <4 yo with AGE; geographically diverse pediatric EDs in the USA or Canada
- Received PLACEBO or *L. rhamnosus* GG (+/- *L. helveticus*)
- Dose ~ 1×10^{10} CFU bid x5


Probiotics
4.0x10⁹ CFU
Probiotics
4.0x10⁹ CFU
Prevention of
moderate-to-severe disease
within 14 days

The Trials - Results:

- Subjects who received *L. rhamnosus* GG **did not have better** outcomes than those who received placebo
- Trials **do not** support use of probiotics containing *L. rhamnosus* to **treat** mod-to-severe gastroenteritis in children

Systematic review with meta-analysis: *Lactobacillus rhamnosus* GG for treating acute gastroenteritis in children – a 2019 update

Szajewska, Aliment Pharmacol Ther. 49:1376, 2019

Hania Szajewska[1] | Maciej Kołodziej[1] | Dorota Gieruszczak-Białek[1] | Agata Skórka[1] | Marek Ruszczyński[1] | Raanan Shamir[2]

Summary

Ba... ne-
ga... s in
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Ai... ritis
in...

- Pointed out limitations of the studies
- Their meta-analysis:

"…overall, L rhamnosus GG reduced the duration of diarrhea and hospitalization"

Editorial

LaMont, NEJM 379:2076, 2018

"…large number of probiotics available…various mechanisms of action, abilities to colonize…"

"… thus, possibility that probiotics other than *L. rhamnosus* might be effective…"

"…caution - these results should not elicit the generalization that probiotics do not work"

What can we do in our kitchen, our community, and in our practices?

1. Educate:

Couple dietary recommendations with consistent efforts to achieve physical activity & sleep duration goals

Barnard, JAMA Int Med – Pub online July 1, 2019

PERSPECTIVE

LESS IS MORE

Ignorance of Nutrition Is No Longer Defensible

Neal D. Barnard, MD
Adjunct Faculty, George Washington University School of Medicine and Health Sciences, Washington, DC; Physicians Committee for Responsible Medicine, Washington, DC; and Barnard Medical Center, Washington, DC.

It was the middle of the night, and the patient's intravenous (IV) line was clogged. Having refused the recommended foot amputation, the patient was receiving IV antibiotics to fight a festering infection, a complication of longstanding diabetes.

During the few minutes it took to replace the IV cath

ete

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jus

patient was only delaying the inevitable. But I was wrong. The patient eventually left the hospital, foot still attached.

My guess is that the patient eventually lost the

A patient with diabetes receives a few obligatory diet-planning sessions shortly after diagnosis but is never again asked about diet, even as the patient's insulin doses escalate and complications worsen.

A patient with a heart complication is told that butter and

iovascular disease risk,

t does not matter, and

damage.

a prior physician who

ducts increase the risk

t avoids them despite

erse is true.

This is not to suggest that physicians are not interested in nutrition. A 2012 survey of primary care physicians[3] showed strong support for additional train-

"...medical community should take advantage of current knowledge for patient benefit, as well as their own"

Jirapinyo, Gastroenterology 157:9, 2019

How to Incorporate Bariatric Training Into Your Fellowship Program

Pichamol Jirapinyo and Christopher C. Thompson

Division of Gastroenterology, Hepatology and Endoscopy, Brigham and Women's Hospital, and Harvard Medical School, Boston, Massachusetts

Since 2013, obesity has been recognized by the American Medical Association as a chronic disease as opposed to a chronic condition to alert the medical community to be more active in addressing this epidemic.[1] In 2016, approximately 39.8% of US adults met the

well as to serve as a general guide for training programs moving forward.

Goals of Training

Bariatric training for gastroenterology fellows may be divided into 2 levels. Level 1 represents basic training in obesity medicine that should be provided to all trainees. Level 2 represents advanced training for fellows who are interested in specializing in obesity medicine and include those who plan on practicing obesity medicine with or without bariatric endoscopy.

What can we do in our kitchen, our community, and in our practices?

2. Support:

Local, National (and international) policies and programs

What can we do in our kitchen, our community, and in our practices?

3. Recommend:

- reduced intake of processed foods
- reduced intake of animal-based foods
- increased intake of plant-based foods
- avoid excess sugar, refined grains, salt

The New York Times

Getting Your Protein From Plants May Help You Live Longer

Japanese men and women who consumed the most plant proteins had a lower rate of cardiovascular death and stroke.

By Nicholas Bakalar

Sept. 3, 2019

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Getting your protein from plants instead of animals could prolong your life, a new study suggests.

JAMA Internal Medicine | Original Investigation

Association of Animal and Plant Protein Intake With All-Cause and Cause-Specific Mortality

Sanjeev Budhathoki, PhD; Norie Sawada, MD, PhD; Motoki Iwasaki, MD, PhD; Taiki Yamaji, MD, PhD; Atsushi Goto, MD, PhD; Ayaka Kotemori, RD, PhD; Junko Ishihara, RD, PhD; Ribeka Takachi, RD, PhD; Hadrien Charvat, MD, PhD; Tetsuya Mizoue, MD, PhD; Hiroyasu Iso, MD, PhD; Shoichiro Tsugane, MD, PhD; for the Japan Public Health Center–based Prospective Study Group

Budhathoki, JAMA Intern Med 179:1335, 2019

Large prospective study higher plant protein intake associated with lower total and CVD-related mortality

The New York Times

Cutting 300 Calories a Day Shows Health Benefits

Calorie restriction led to weight loss, lower cholesterol and less inflammation. Whether it extends life span and wards off disease long-term remains unproven.

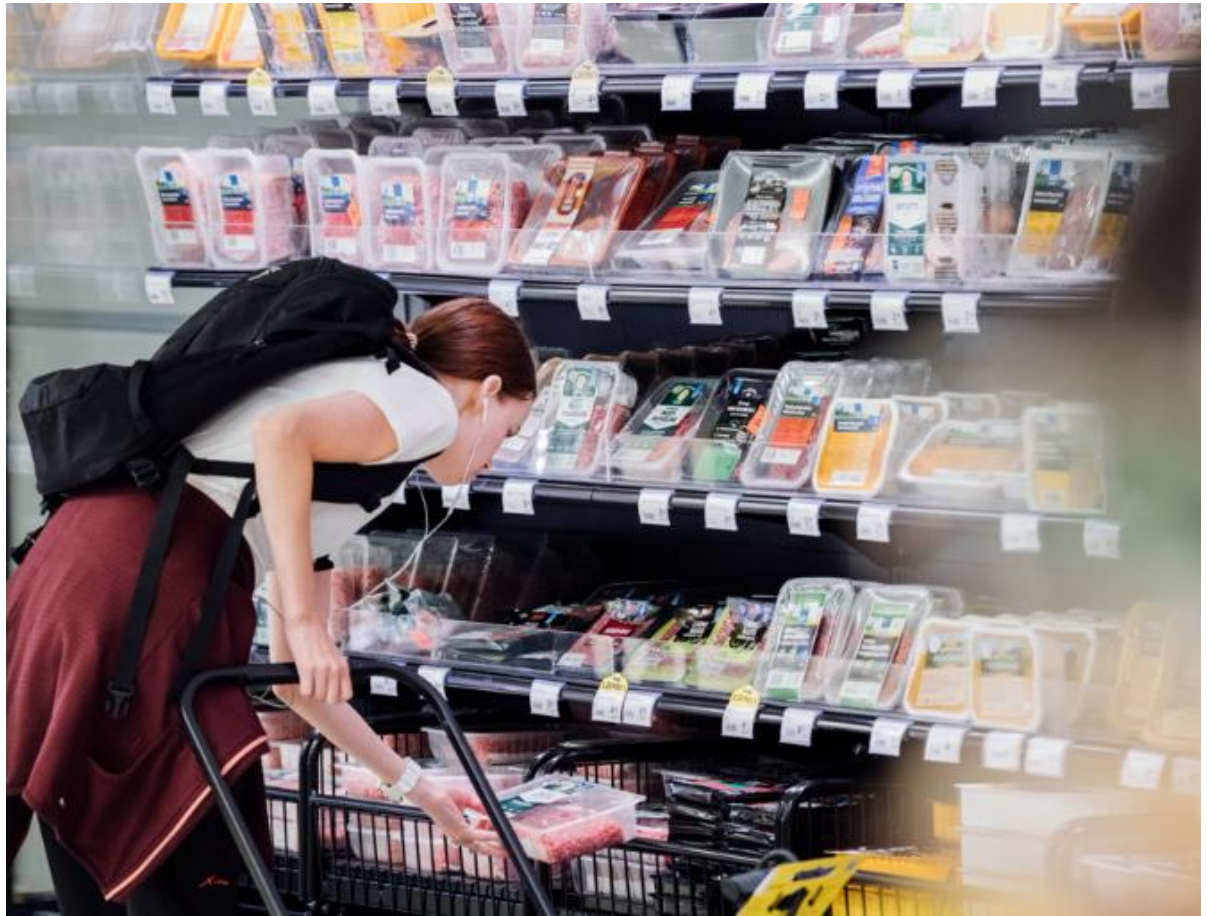
What can we do in our kitchen, our community, and in our practices?

4. Foster:

- increased consumption of fresh fruits, vegetables, whole grains, legumes, nuts, and other plant-based foods
- prudent stewardship - reduce food waste

The New York Times

The World Wastes Tons of Food. A Grocery 'Happy Hour' Is One Answer.



What can we do in our kitchen, our community, and in our practices?

1. Educate
2. Support
3. Recommend
4. Foster

Sounds simple, yet clearly a dauting task…but the world is depending on us!