Helping Children with Obesity: Context, Understanding, Tools

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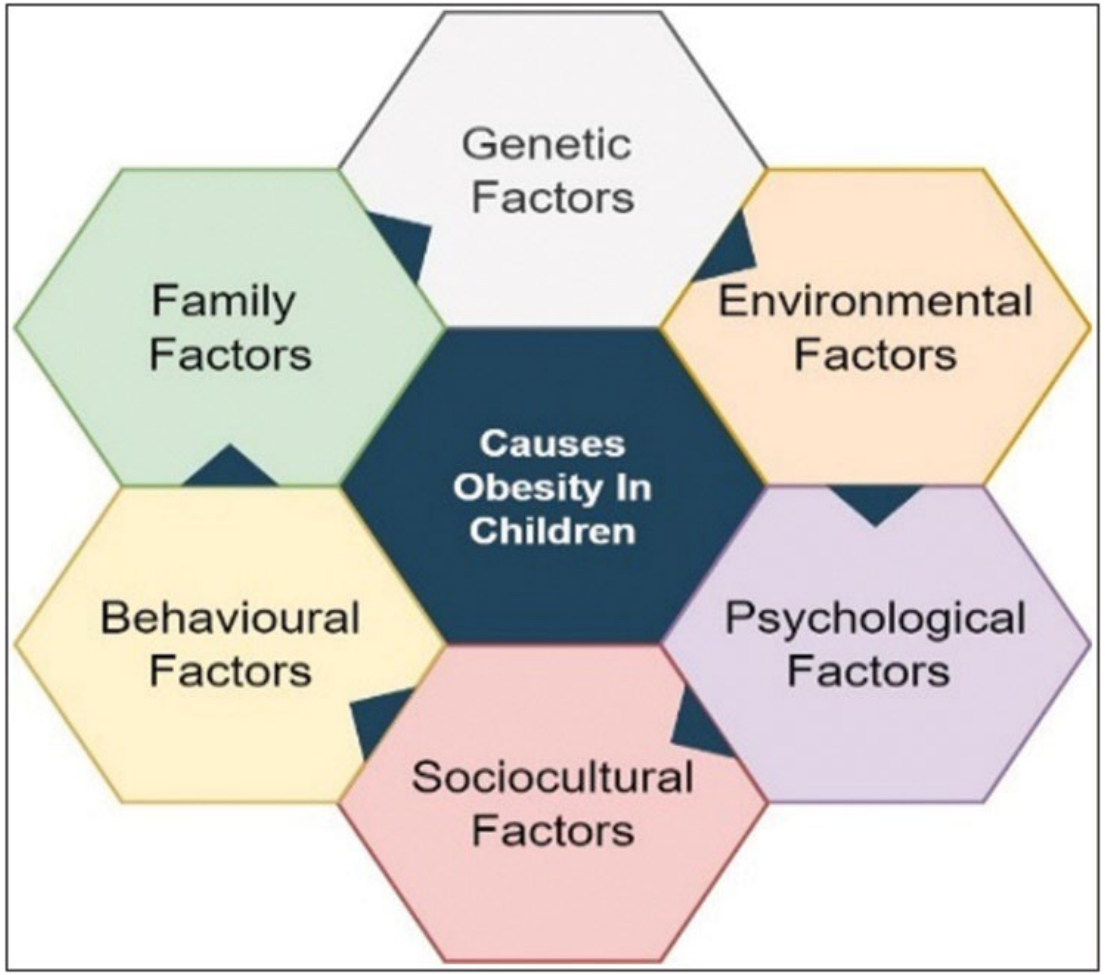
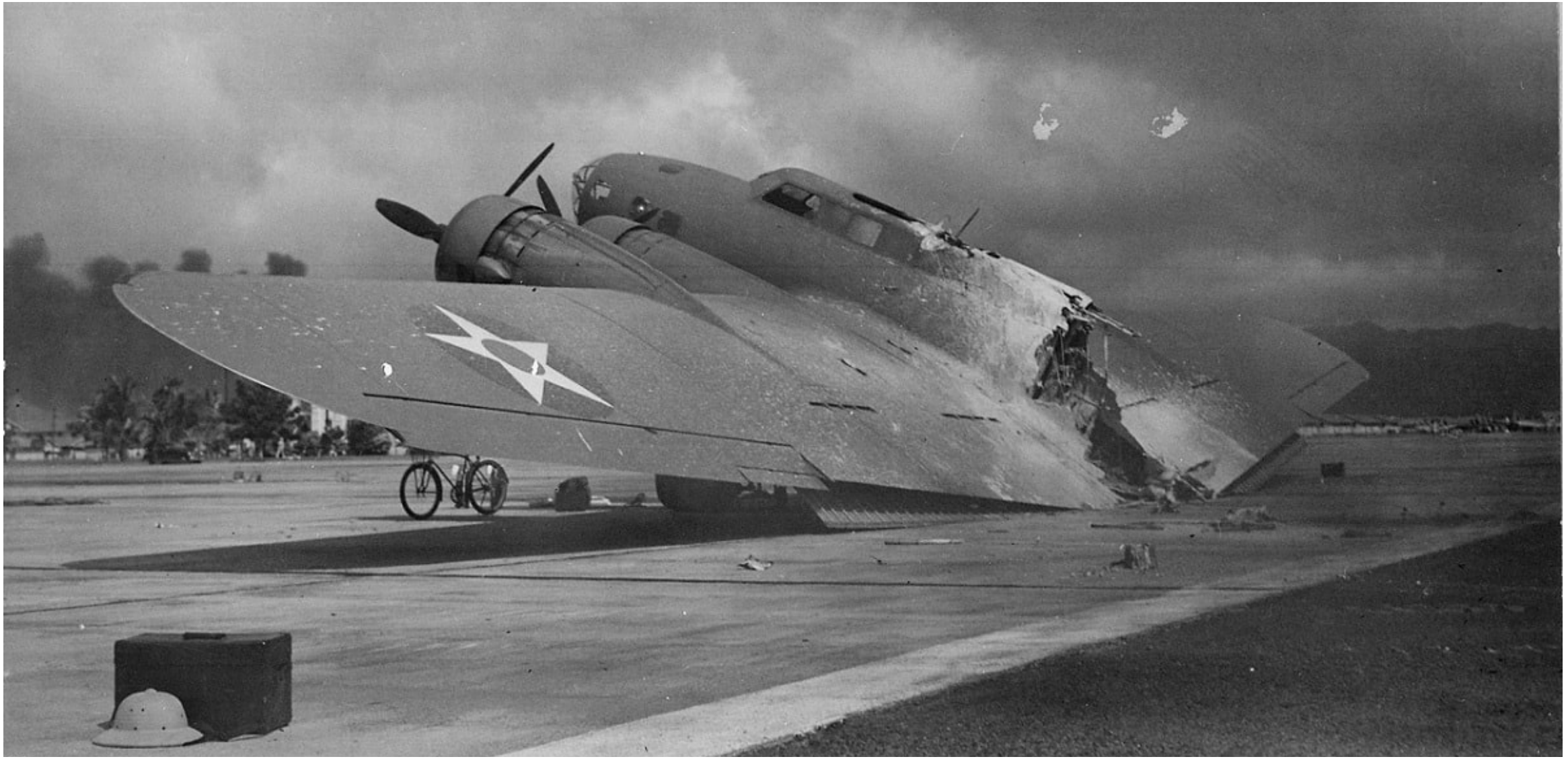
Childhood Obesity Through a Quality Improvement Lens

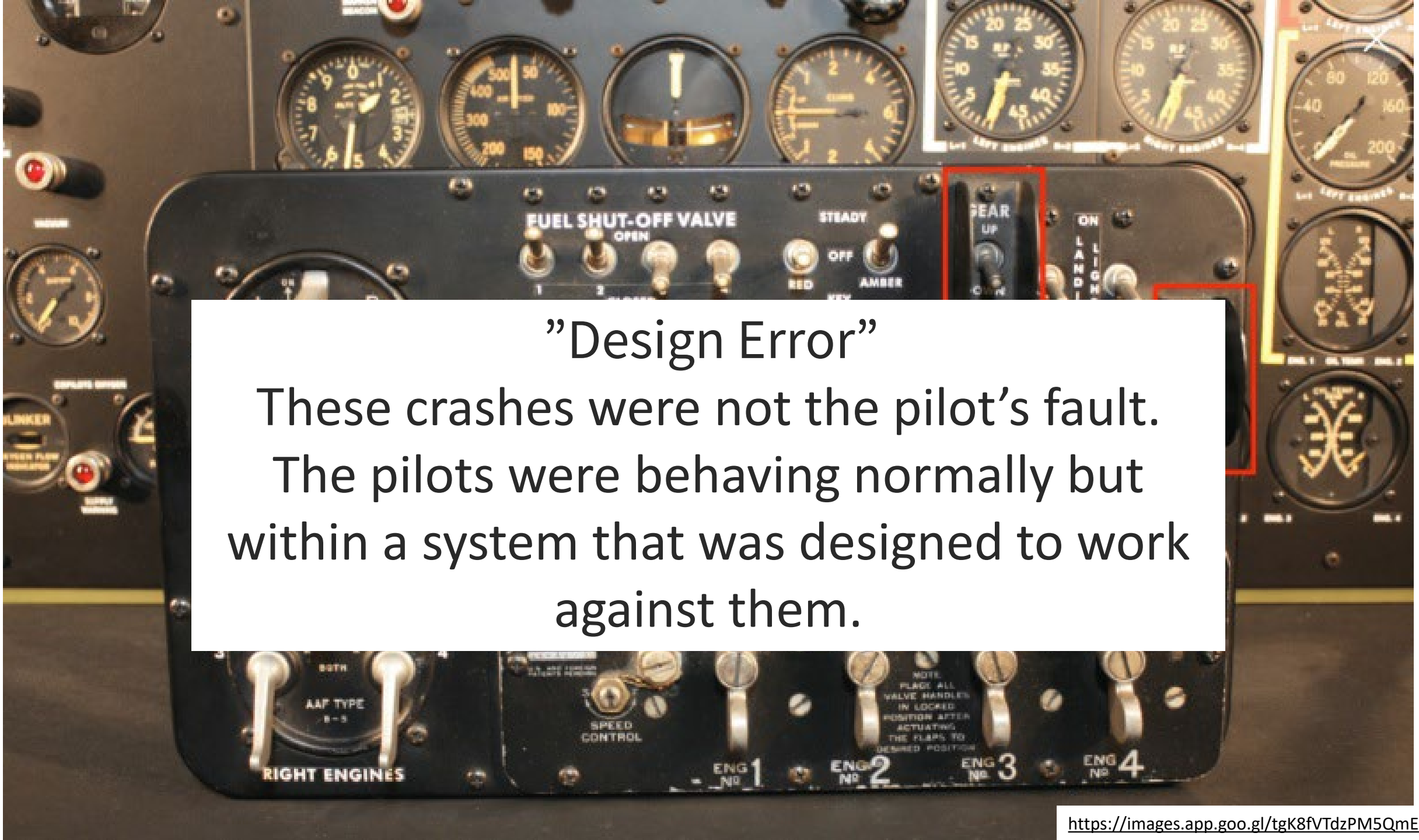
- Context:
  - "Human centered engineering" approach to addressing stigma
- Reframing our Approach:
  - "The 5 Whys"
  - Why obesity is important to address
  - Why more education is not the answer
- Tools:
  - Coaching and intrinsic motivation
    - PDSA to support autonomy
    - Competence & parenting skills



Amin, Bhat Ulfat. Childhood obesity: Causes, comorbidities, prevention, and management. Jimph. 2022; 1 (2)34-41

Context: Human Centered Engineering





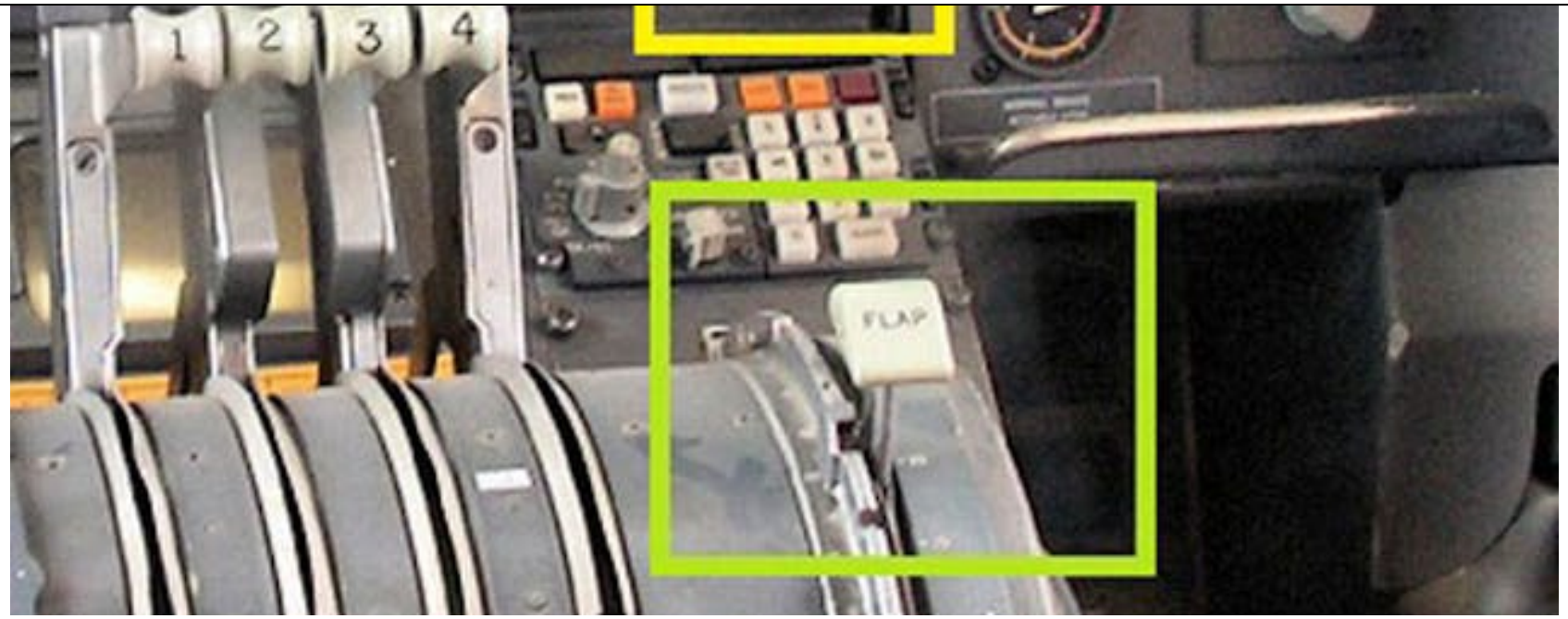
”Design Error”

These crashes were not the pilot’s fault.

The pilots were behaving normally but within a system that was designed to work against them.

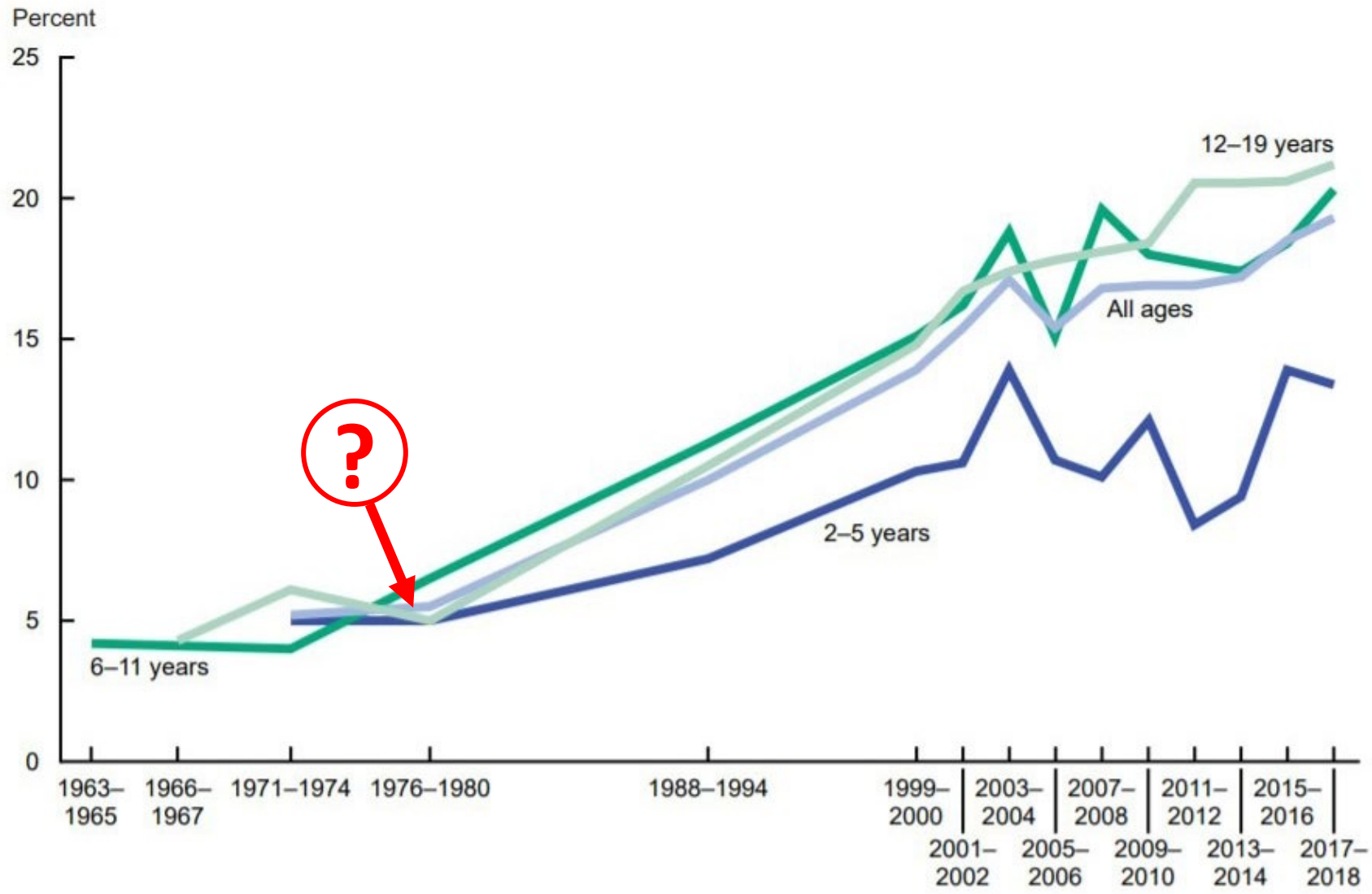
https://images.app.goo.gl/tgK8fVTdzPM5QmEs8

Human Centered Engineering: A design and engineering process that focuses on understanding people and their contexts to solve problems



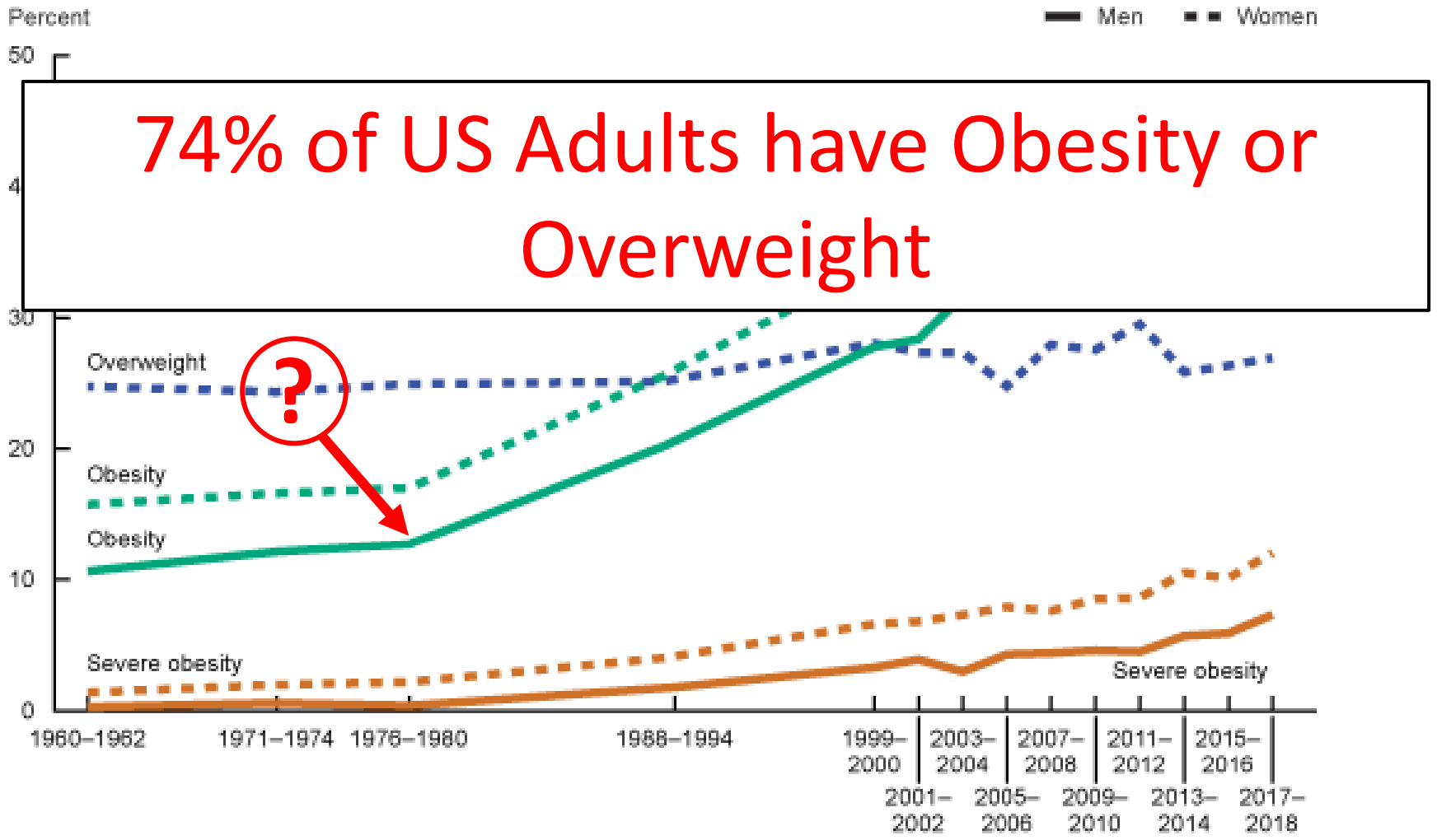
https://www.machinedesign.com/community/article/21143885/human-factors-engineers-unsung-partners-in-design

Trends in obesity among US children and adolescents ages 2–19 years



https://www.niddk.nih.gov/health-information/health-statistics/overweight-obesity

Age-adjusted trends in overweight, obesity, and severe obesity among men and women aged 20–74



https://www.cdc.gov/nchs/data/hestat/obesity-adult-17-18/obesity-adult.htm#Figure

Human Centered Engineering Lens & Stigma

- Just like the pilots, when three-quarters of people struggle with a system, the cause is not with the people. It is with the system which is working against them.
  - Our society (including healthcare) routinely attributes obesity to insufficient willpower, effort, education, or strength.
  - We do not recognize the “design error” in our system.
  - Compassionate, non-stigmatizing care should be grounded in this understanding.

Evaluation of Patients With Overweight or Obesity

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

Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity

Non-stigmatizing conversation about weight with patients and families:

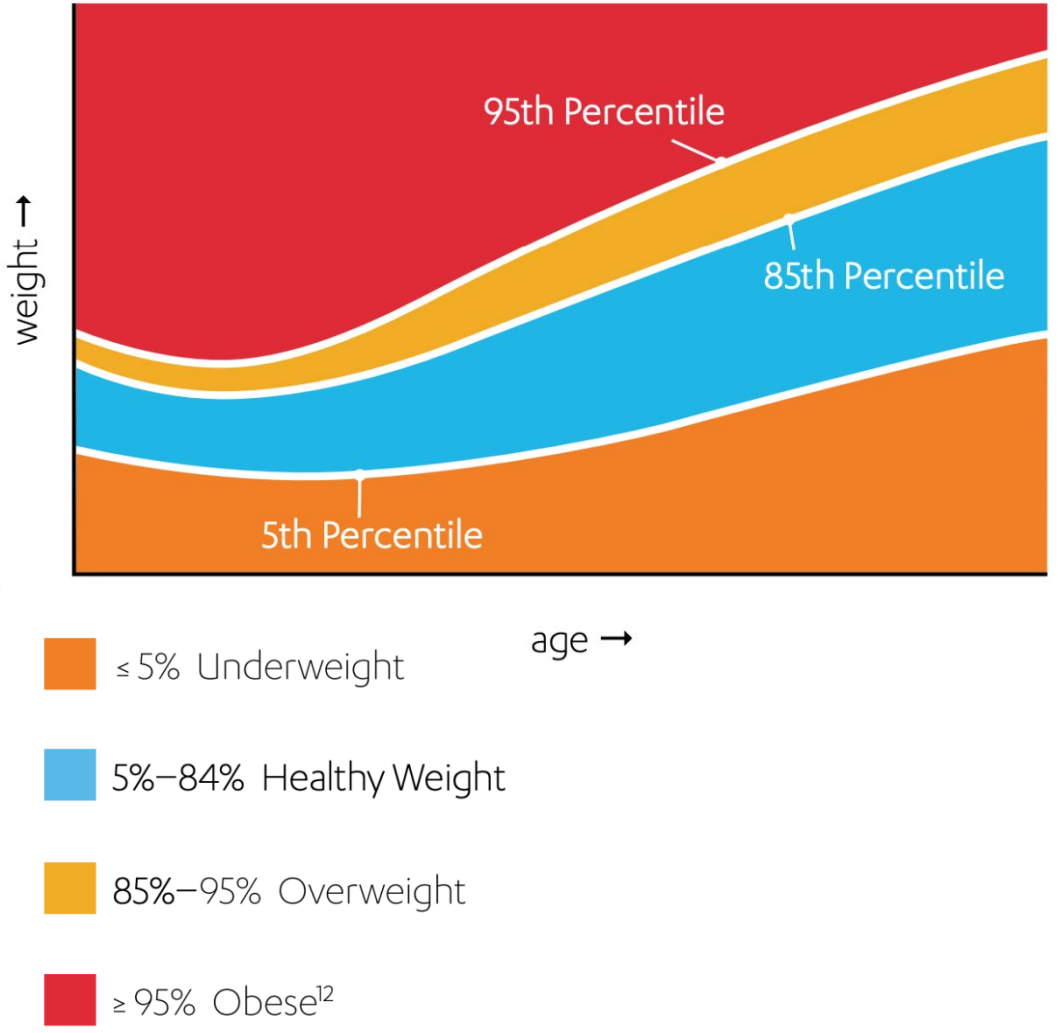
1. **Ask permission** to discuss the patient's BMI and/or weight.
2. **Avoid labeling** by using person-first language ("Child with obesity"; not "obese child" or "my patient is affected by obesity; not "my patient **is** obese").
3. Use words that are **perceived as neutral** by parents, adolescents, and children (e.g. "unhealthy weight, gaining too much weight for age, height, or health)."

Addressing Stigma

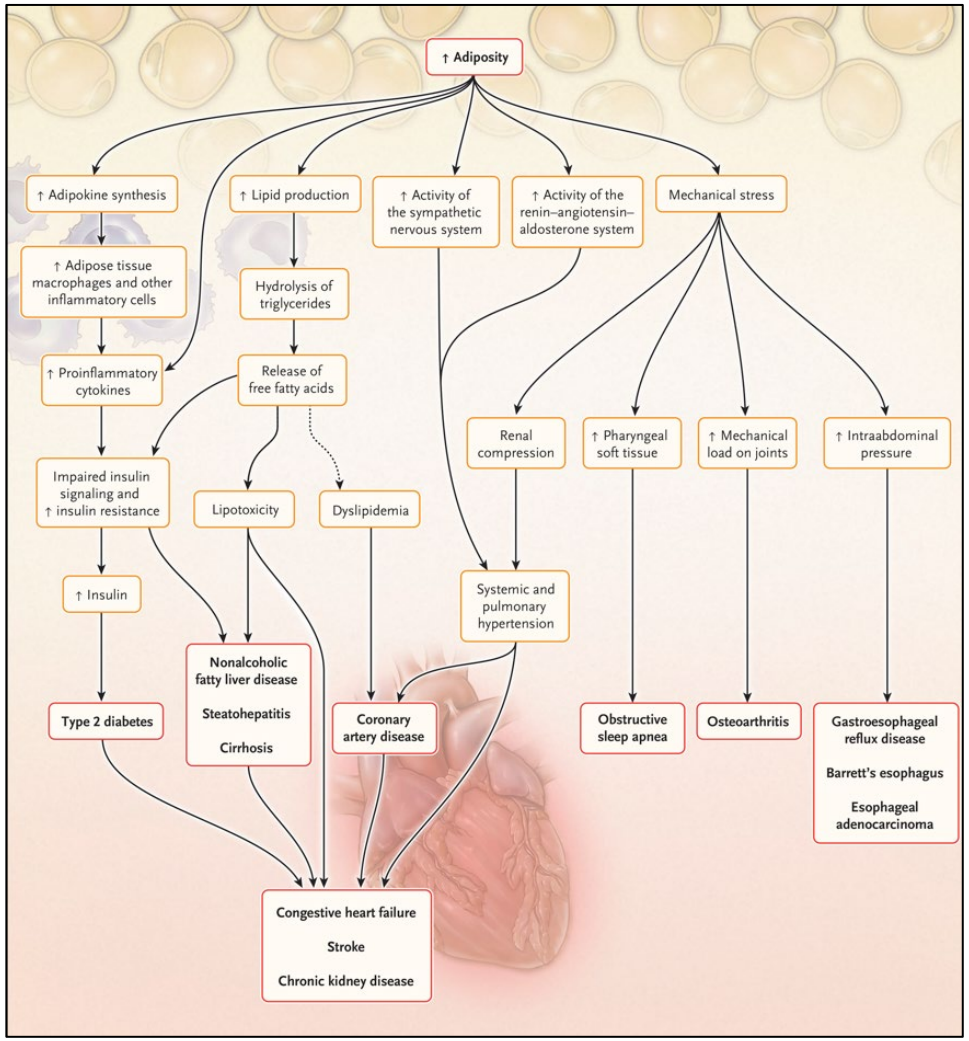
- Common patient perspective:
  - “One of the reasons why it’s been so hard is that for a long time I thought my extra weight made me a bad person. And it made me forget all the things that I like about me.”
- It is critical for providers to understand that our words and body language may be received through a filter of shame.
  - Avoid any sense of blame
  - Keep comments positive

Focus on Wellbeing, not Weight

- Focus on health not weight
- Encourage open dialogue
- Keep it strength based
  - Traditional wisdom and heritage
- Recognizing the age of the patient (parents vs teens)
- Valuing autonomy, competence, relatedness
- Resources: https://www.eatright.org/health/wellness/weight-and-body-positivity/how-to-talk-to-kids-about-weight



Why It's important to address obesity… even though it's difficult



Heymsfield, S, Wadden, T. Mechanisms, Pathophysiology, and Management of Obesity. *NEJM*, 376:254-266 (2017). DOI: 10.1056/NEJMra1514009

Health Effects of Childhood Obesity

- Meta-analysis of four prospective cohort studies involving 6328 children followed for a mean of 23 years.
- Subjects with obesity or overweight from childhood to adulthood had an increased risk of:
  - Type 2 diabetes (relative risk, 5.4)

Importantly, children with obesity in childhood who were a healthy weight in adulthood showed no increased risk.

  - Carotid-artery atherosclerosis (increased intima–media thickness of the carotid artery) (relative risk, 1.7)

    P≤0.002 for all comparisons

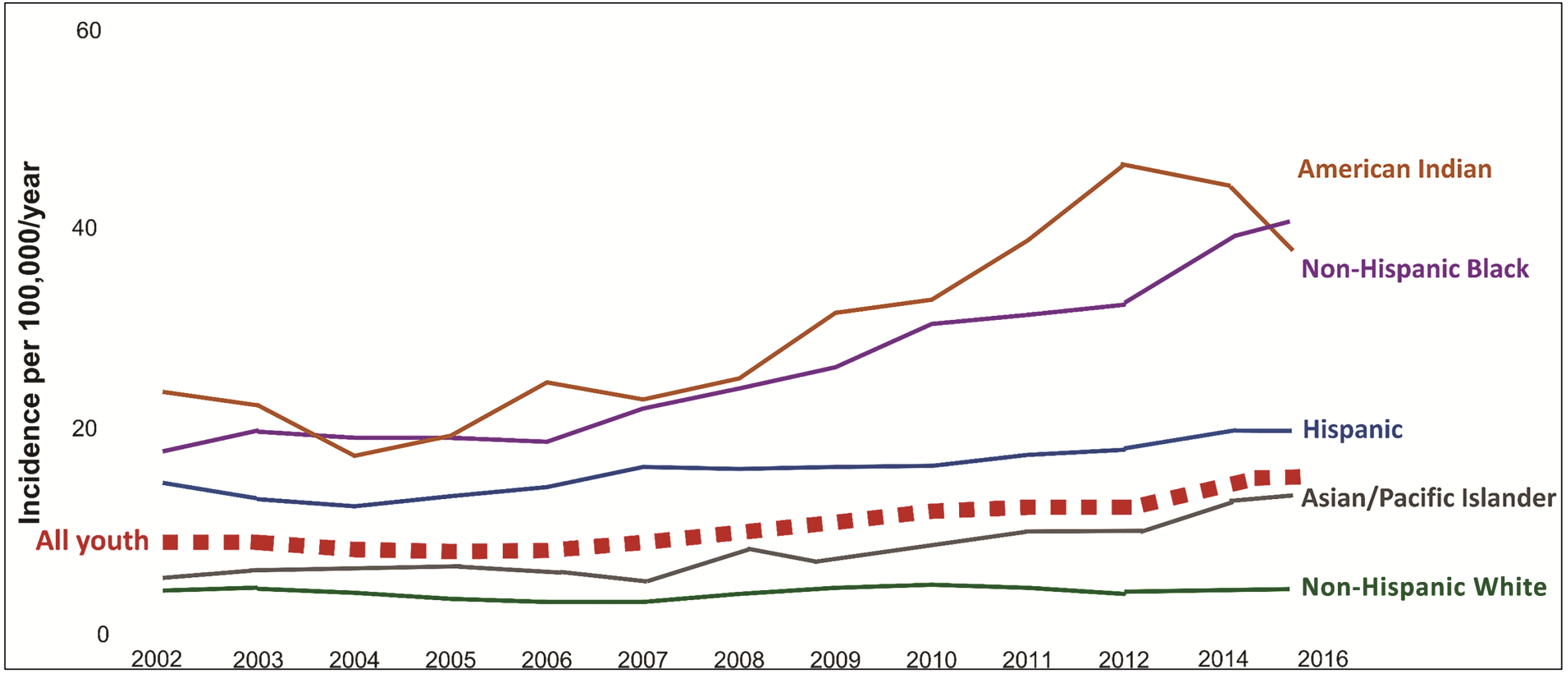
Juonala M, Magnussen CG, Berenson GS, et al. Childhood adiposity, adult adiposity, and cardiovascular risk factors. *N Engl J Med* 2011;365:1876-1885.

Pre-Diabetes Among Youth

- At least one in five adolescents now have prediabetes[1]
- The prevalence of prediabetes among US youths:
  - 1999-2002: 11.6%
  - 2015-2018: 28.2%[2]
- Adolescents with obesity have roughly twice the risk of pre-DM compared to those with normal weight.[1]

1. Andes LJ, Cheng YJ, Rolka DB, Gregg EW, Imperatore G. Prevalence of prediabetes among adolescents and young adults in the United States, 2005-2016. *JAMA Pediatr* 2020;174:e194498
2. Liu J, Li Y, Zhang D, Yi SS, Liu J. Trends in prediabetes among youths in the US from 1999 through 2018. *JAMA Pediatr* 2022;176:608–611

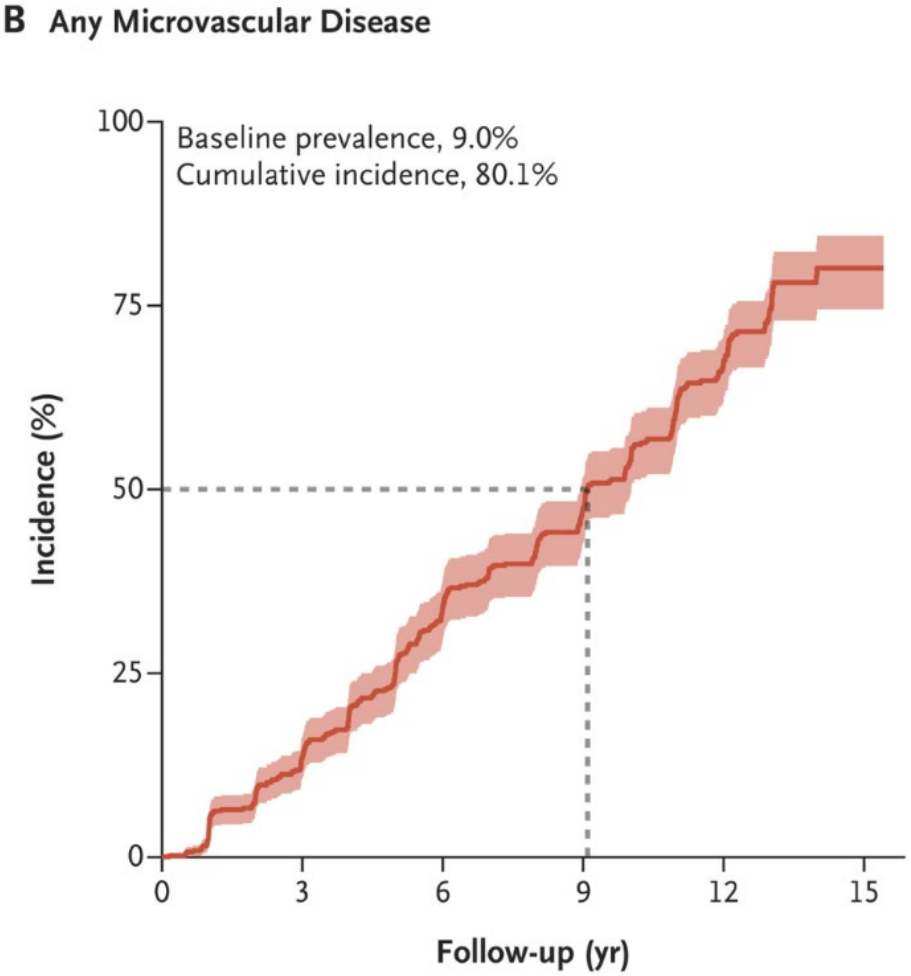
Incidence of Type 2 Diabetes among U.S. youth (2002-2015)



Wei Perng, Rebecca Conway, Elizabeth Mayer-Davis, Dana Dabelea; Youth-Onset Type 2 Diabetes: The Epidemiology of an Awakening Epidemic. *Diabetes Care* 1 March 2023; 46 (3): 490–499. https://doi.org/10.2337/dci22-0046

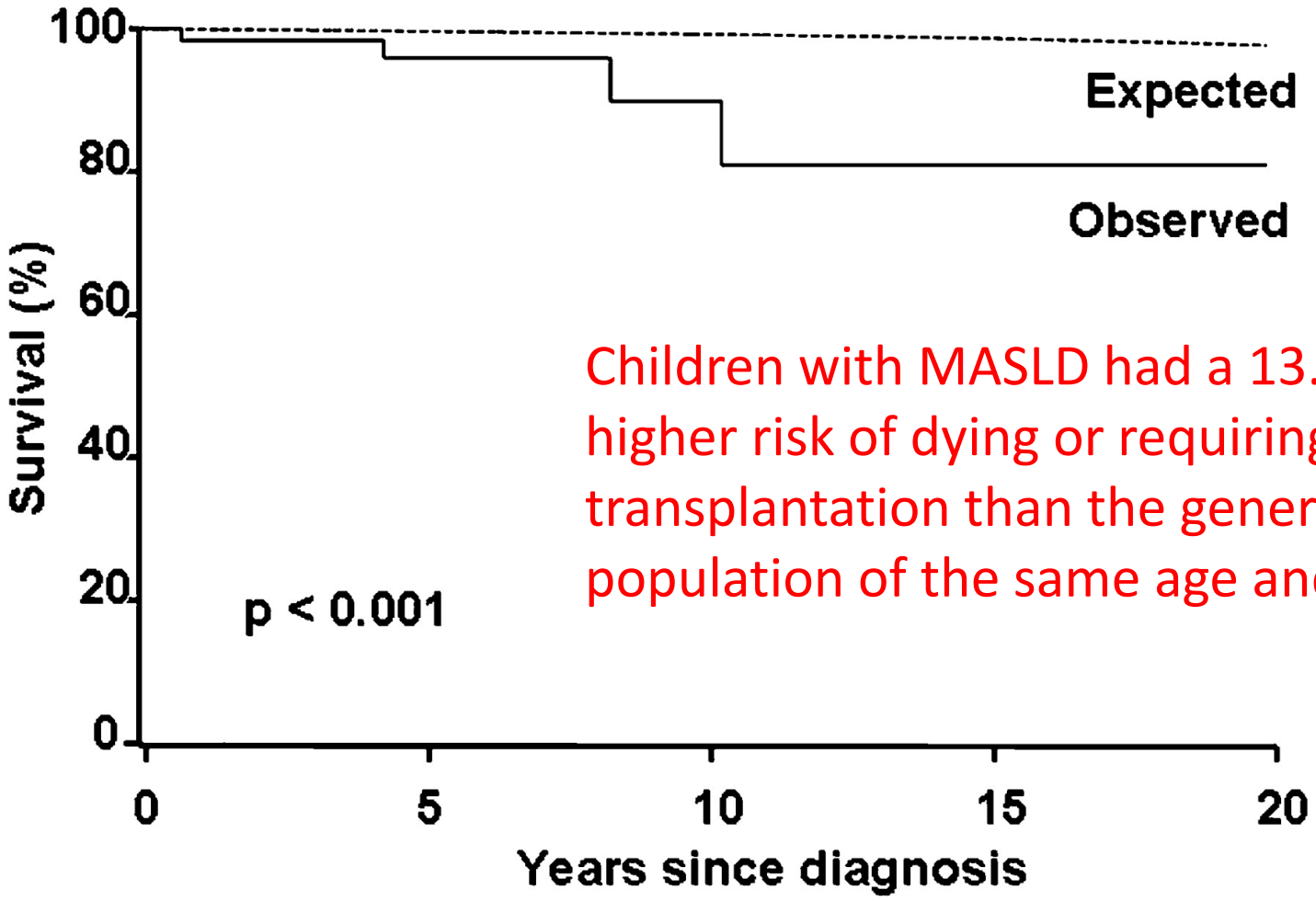
Younger Dx Means Earlier Complications

- 500 youth with DM followed prospectively (mean age of dx= 15 years)
- Mean follow-up= 13.3 years
- At least one microvascular complication developed in 60.1%
  - 50% by 9 years
  - 80% by 15years
- 24.4% of participants had two or more complications of Diabetes



Bjornstad P, Drews KL, Caprio S, et al.; TODAY Study Group. Long-term complications in youth-onset type 2 diabetes. *N Engl J Med* 2021;385:416–426

Kaplan–Meier survival curve of children with metabolic dysfunction-associated steatotic liver disease (n = 66) as compared to the general United States population of same age and sex.



Children with MASLD had a 13.8-fold higher risk of dying or requiring liver transplantation than the general population of the same age and sex

A E Feldstein et al. Gut 2009;58:1538-1544

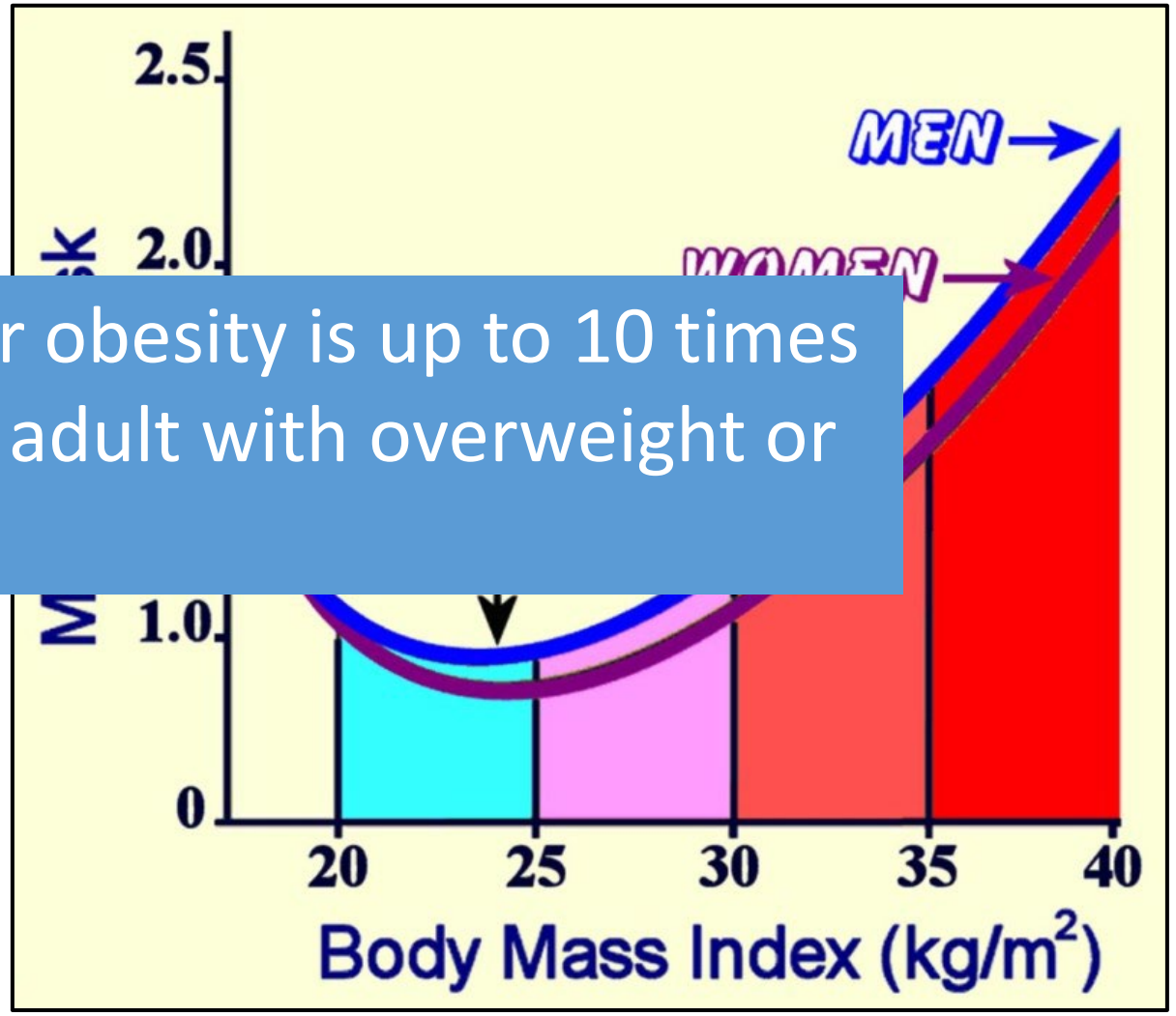
GUT

What's at stake in childhood obesity?

Obesity associated with

- -diabetes
- -hype
- -non
- -dysl
- -obst
- -asthma
- -orthopedic complications
- -anxiety, depression, bullying
- **-shorter life**

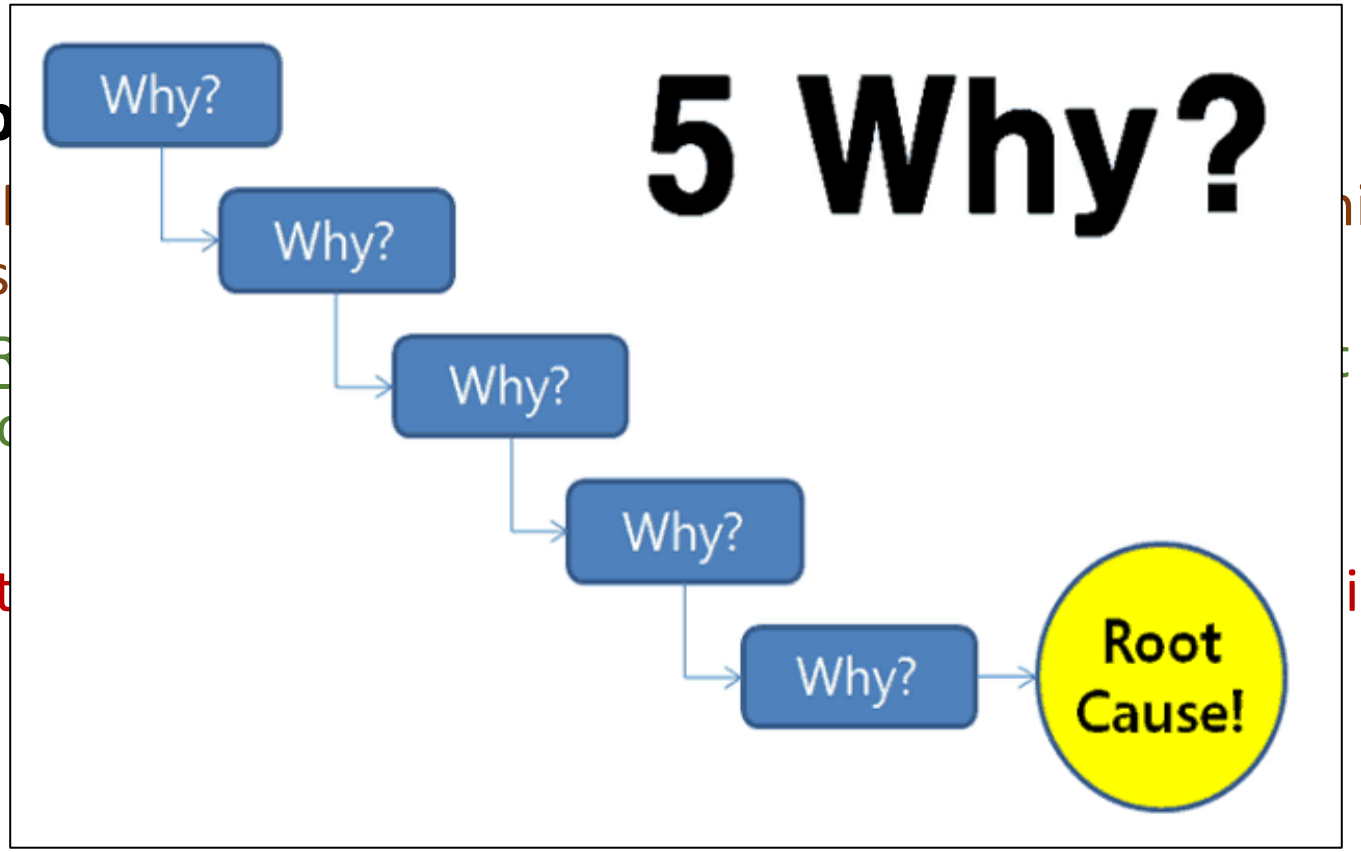
A child with overweight or obesity is up to 10 times more likely to become an adult with overweight or obesity.[2]



1. Kyrou I, Randeva HS, Tsigos C, et al. Clinical Problems Caused by Obesity. [Updated 2018 Jan 11]. In: Feingold KR, Anawalt B, Blackman MR, et al., editors. Endotext. Available from: https://www.ncbi.nlm.nih.gov/sites/books/NBK278973/
2. Singh AS, Mulder C, Twisk JW, et al. Tracking of childhood overweight into adulthood: a systematic review of the literature. Obes Rev. 2008;9:474–488. American Academy of Family Physicians. Recommendations for clinical preventive services. Available at: www.aafp.org/online/en/home/ clinical/exam/k-o.html

Understanding: The Five Whys

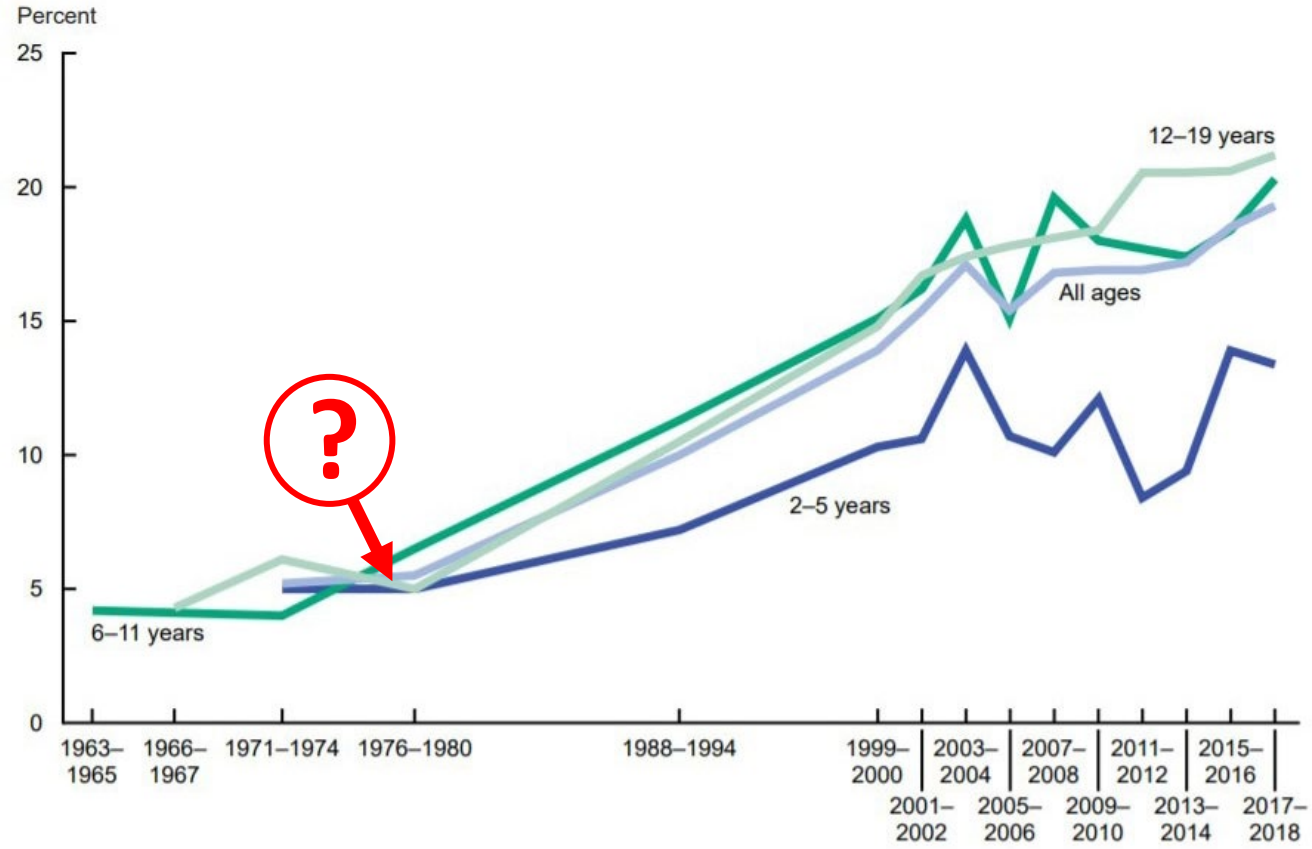
- **Current App**
  - Problem: I … ildren at risk for serious
  - Common R … t what to eat and how to
  - Why isn't t … ing the root cause…

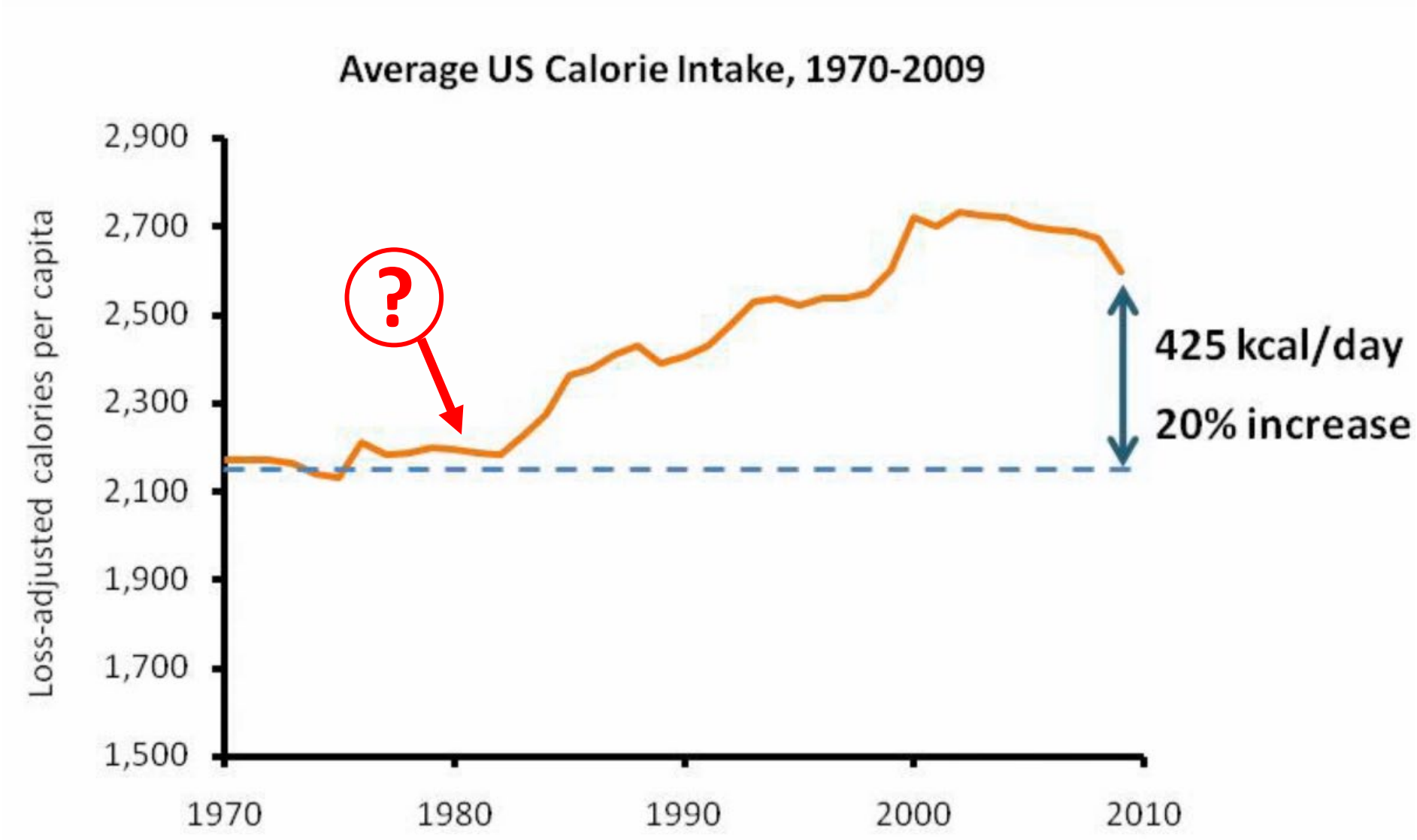


https://expertprogrammanagement.com/2019/05/the-5-whys/

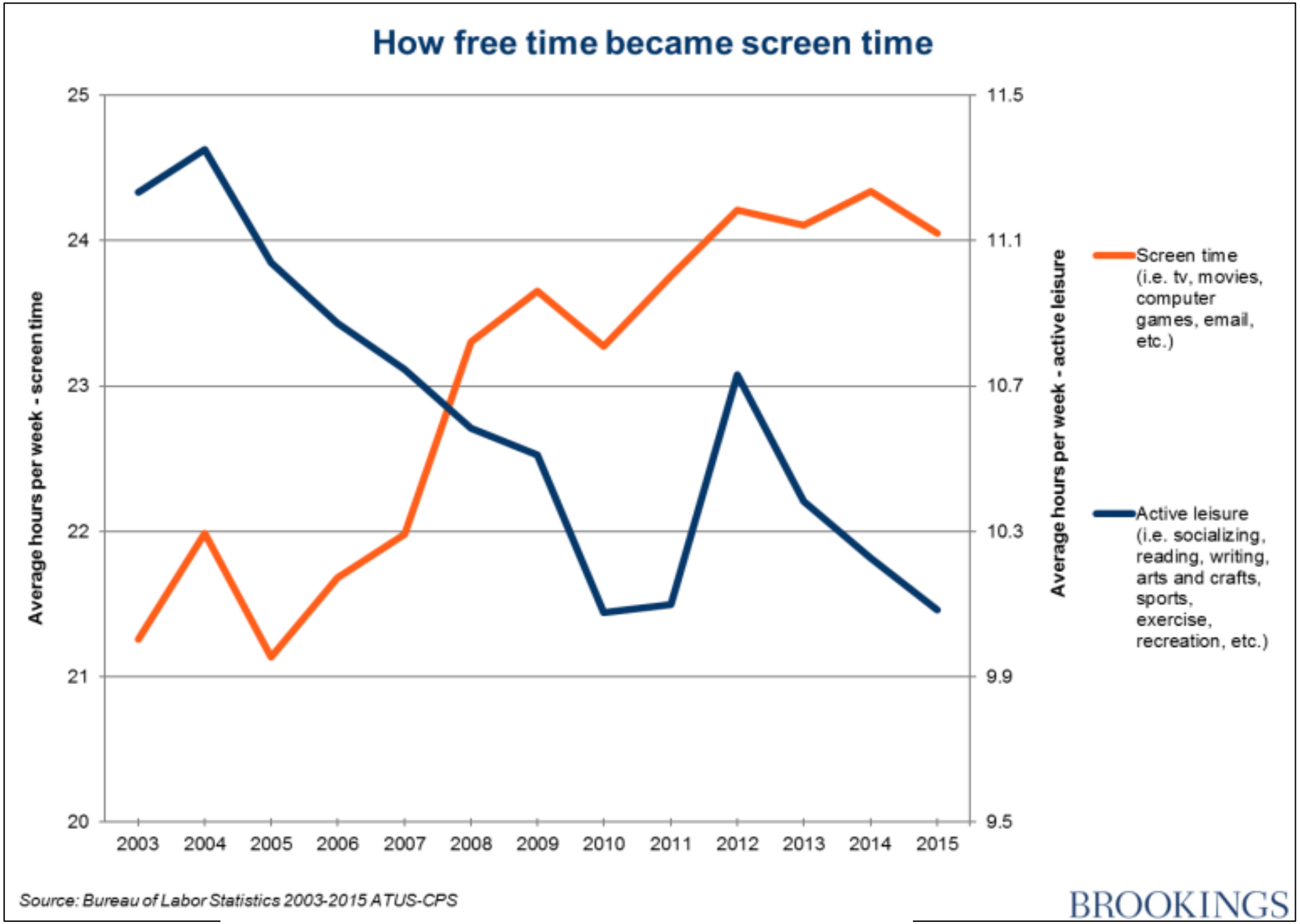
Why #1

- Why is childhood obesity increasing?
  - Because children increasingly have a positive energy balance (consuming more calories and burning fewer calories)





Duffey KJ, Popkin BM. Energy density, portion size, and eating occasions: contributions to increased energy intake in the United States, 1977-2006. PLoS Med. 2011 Jun;8(6):e1001050. doi: 10.1371/journal.pmed.1001050.

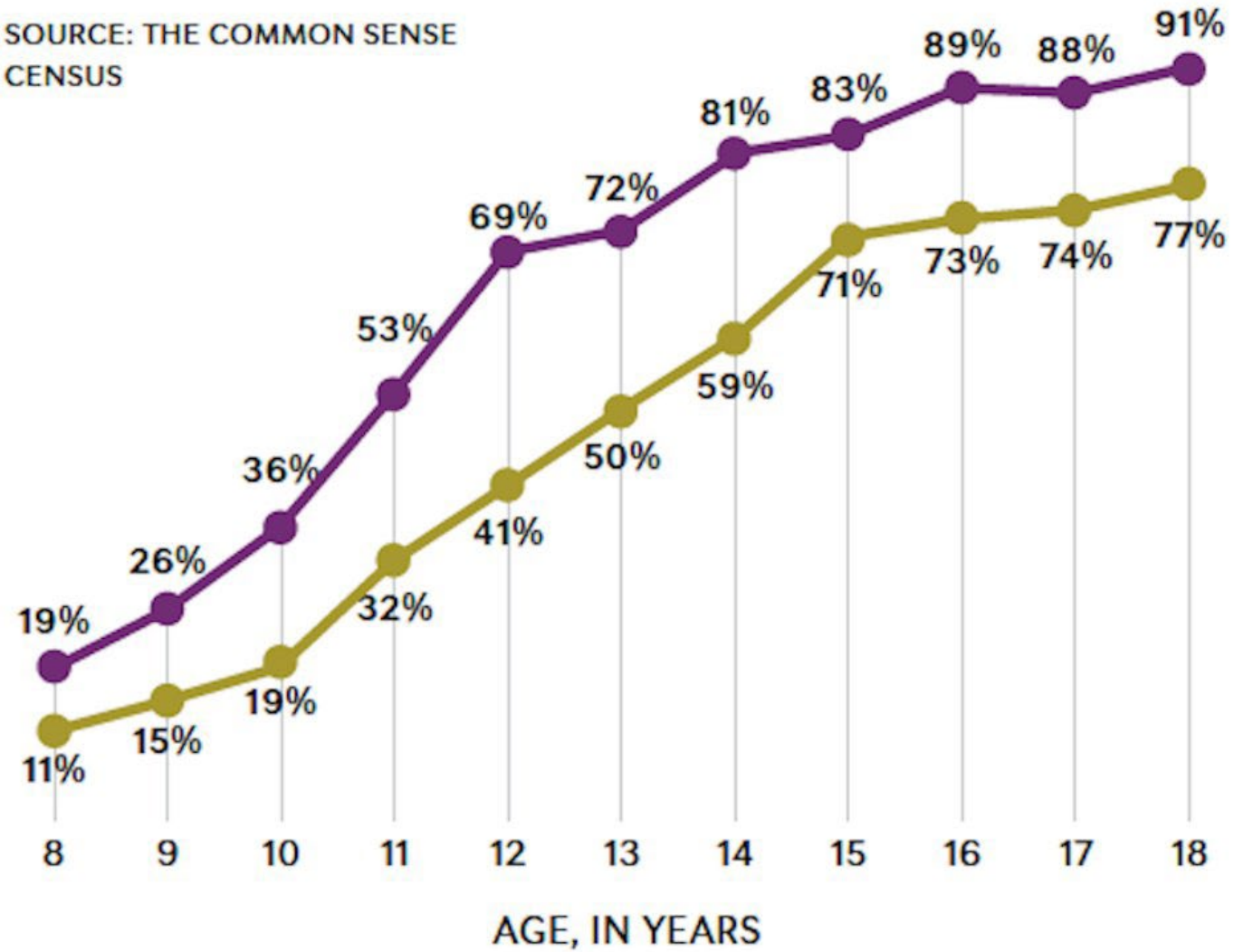


https://www.brookings.edu/articles/how-free-time-became-screen-time/

Smartphone ownership has risen dramatically, even among the youngest tweens.

(Smartphone ownership by age, 2015 vs. 2019)

SOURCE: THE COMMON SENSE CENSUS



Amount of Daily Screen Use

(Not including for school or homework)

TWEENS: 4 hours, 44 minutes

TEENS: 7 hours, 22 minutes

National Education Association: https://www.nea.org/nea-today/all-news-articles/all-scrolling-how-screen-time-impacts-students

Why #2

- Why are kids consuming more calories?
  - Because the food has environment changed to encourage us to eat more (in two fundamental ways)

- In a study offering children Mac and Cheese
  - Increasing portion size by 50% increased consumption by 10-40%
  - Doubling the portion size increased consumption by 61%

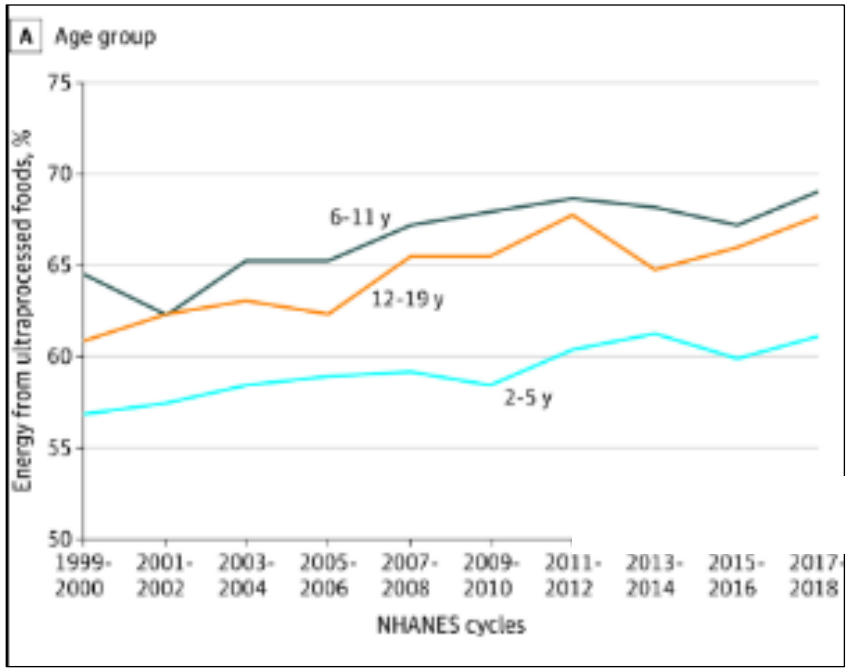
Food	20 Years Ago	Today
Bagel	140 calories (3" diameter)	350 calories (6" diameter)
Muffin	210 calories (1.5 oz)	500 calories (4 oz)
Cheeseburger	333 calories	590 calories
Pasta (Spaghetti & Meatballs)	500 calories	1025 calories
French Fries	210 calories (2.4 oz)	610 calories (6.9 oz)
Soda	85 calories (6.5 oz)	250 calories (20 oz)
Theater Popcorn	270 calories (5 cups)	630 calories (1 tub)
Turkey Sandwich	320 calories	820 calories
Pizza	500 calories (2 slices)	850 calories (2 calories)

https://www.yourweightmatters.org/portion-sizes-changed-time/

1.Hollands GJ, Shemilt I, Marteau TM, Jebb SA, Lewis HB, Wei Y, Higgins JPT, Ogilvie D. Portion, package or tableware size for changing selection and consumption of food, alcohol and tobacco. Cochrane Database of 2.Systematic Reviews 2015, Issue 9. Art. No.: CD011045. DOI: 10.1002/14651858
Livingstone MB, Pourshahidi LK. Portion size and obesity. Adv Nutr. 2014 Nov 14;5(6):829-34. doi: 10.3945/an.114.007104.

It's not Just the Amount of Food … The Nature of Food has Changed

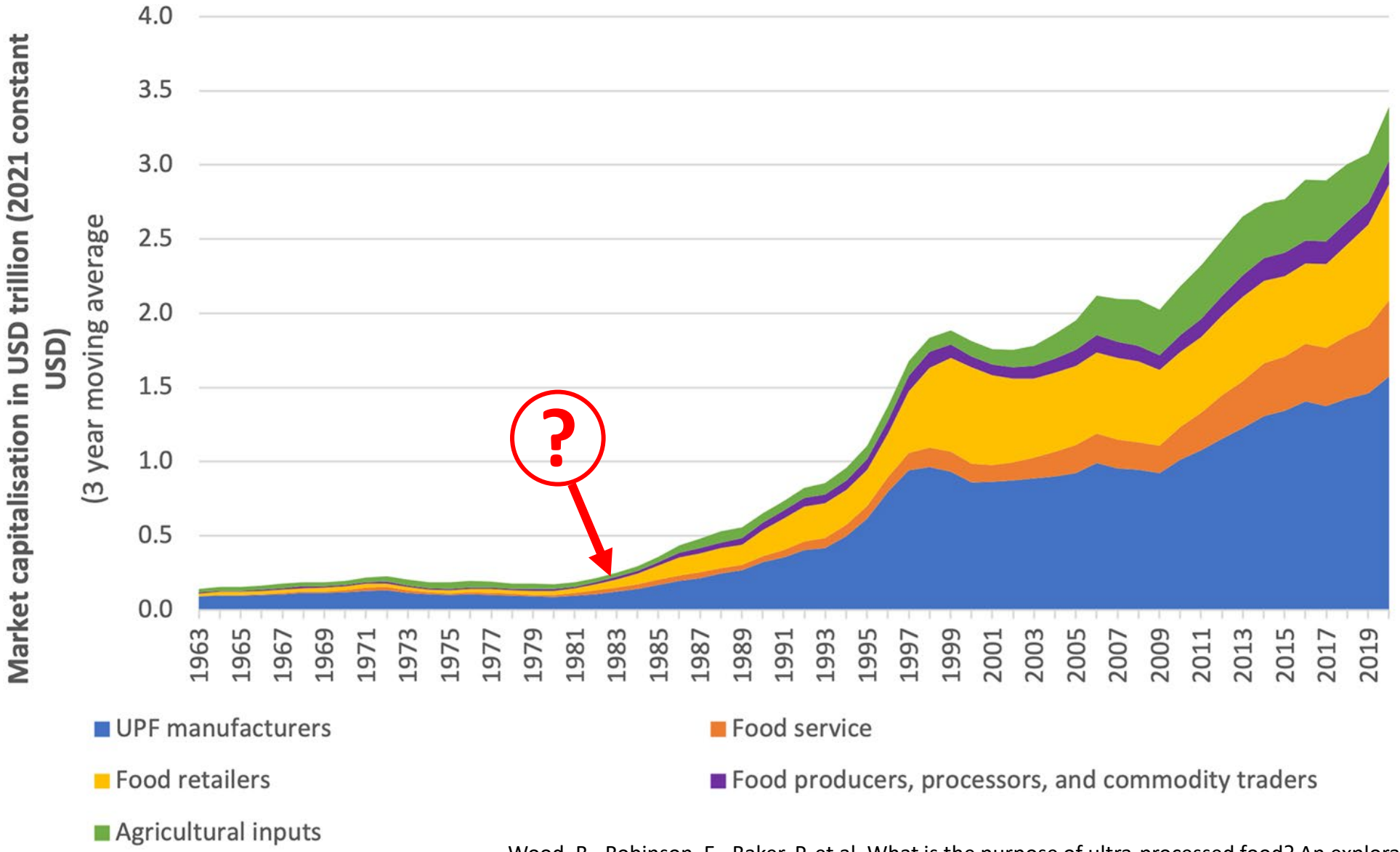
- In 2010, ultra-processed foods (UPF) comprised 57.9% of the US diet[1]
- 1999 – 2018: That % among adolescents increased from 61% → 67%[2]
  - Consumption of unprocessed or minimally processed foods decreased from 28.8% to 23.5% (P < .001 for trend)[2]



1. Martínez Steele E, Baraldi LG, Louzada MLDC, *et al.* Ultra-processed foods and added sugars in the US diet: evidence from a nationally representative cross-sectional study. *BMJ Open* 2016;**6:**e009892. doi: 10.1136/bmjopen-2015-009892

2. Wang L, Martínez Steele E, Du M, Pomeranz JL, O'Connor LE, Herrick KA, Luo H, Zhang X, Mozaffarian D, Zhang FF. Trends in Consumption of Ultraprocessed Foods Among US Youths Aged 2-19 Years, 1999-2018. JAMA. 2021 Aug 10;326(6):519-530. doi: 10.1001/jama.2021.10238. PMID: 34374722; PMCID: PMC8356071.

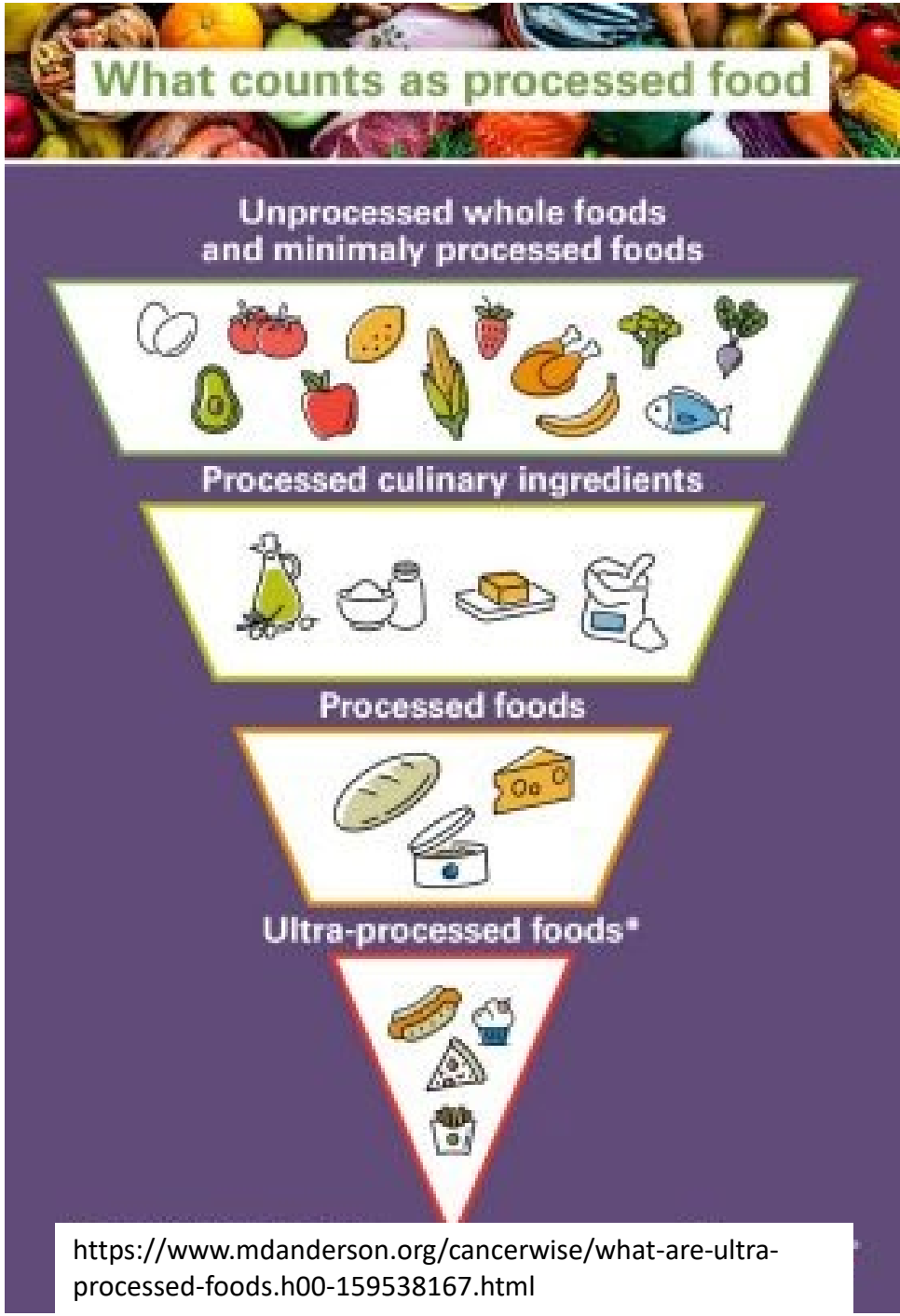
Growth of the Food Industry



Wood, B., Robinson, E., Baker, P. et al. What is the purpose of ultra-processed food? An exploratory analysis of the financialisation of ultra-processed food corporations and implications for public health. Global Health 19, 85 (2023)

What are Ultra-Processed Foods?

- “Industrial formulations made entirely or mostly from substances extracted from foods (oils, fats, sugar, starch and proteins), derived from food constituents (hydrogenated fats and modified starch), or synthesized in laboratories from food substrates or other organic sources (such as flavor enhancers, colors and food additives).”
  - “Hyperpalatable”
  - Convenient to prepare
  - Shelf-stable
  - Inexpensive



https://www.mdanderson.org/cancerwise/what-are-ultra-processed-foods.h00-159538167.html

https://openknowledge.fao.org/server/api/core/bitstreams/5277b379-0acb-4d97-a6a3-602774104629/content

NOVA Classification System

Unprocessed or minimally processed foods

Processed foods

My Favorite Definition:

"Anything your great-grandmother would not recognize as food."

M. Pollan

Group 2

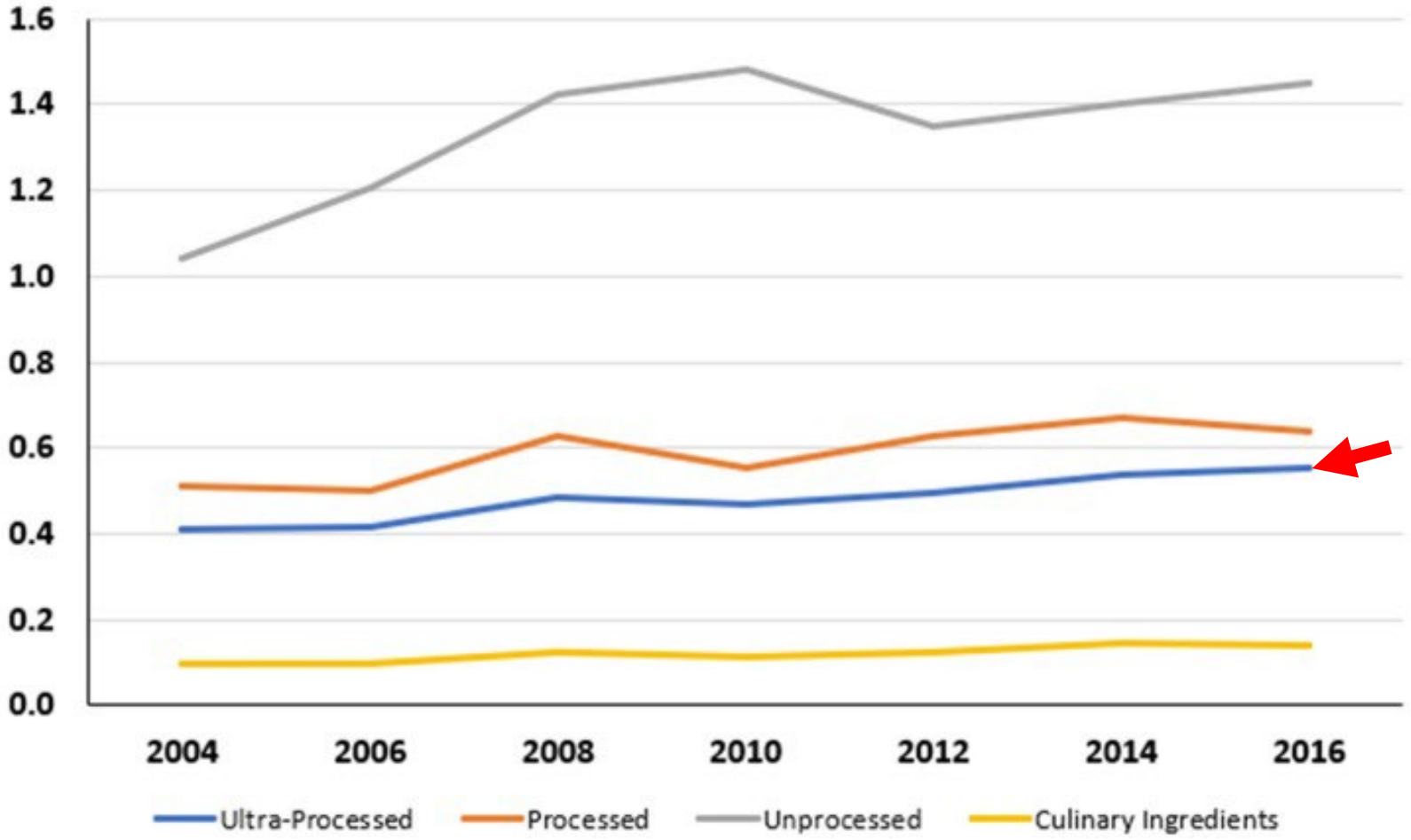
Home-baked apples

Group 4

Packaged apple puff snacks

https://openknowledge.fao.org/server/api/core/bitstreams/5277b379-0acb-4d97-a6a3-602774104629/content

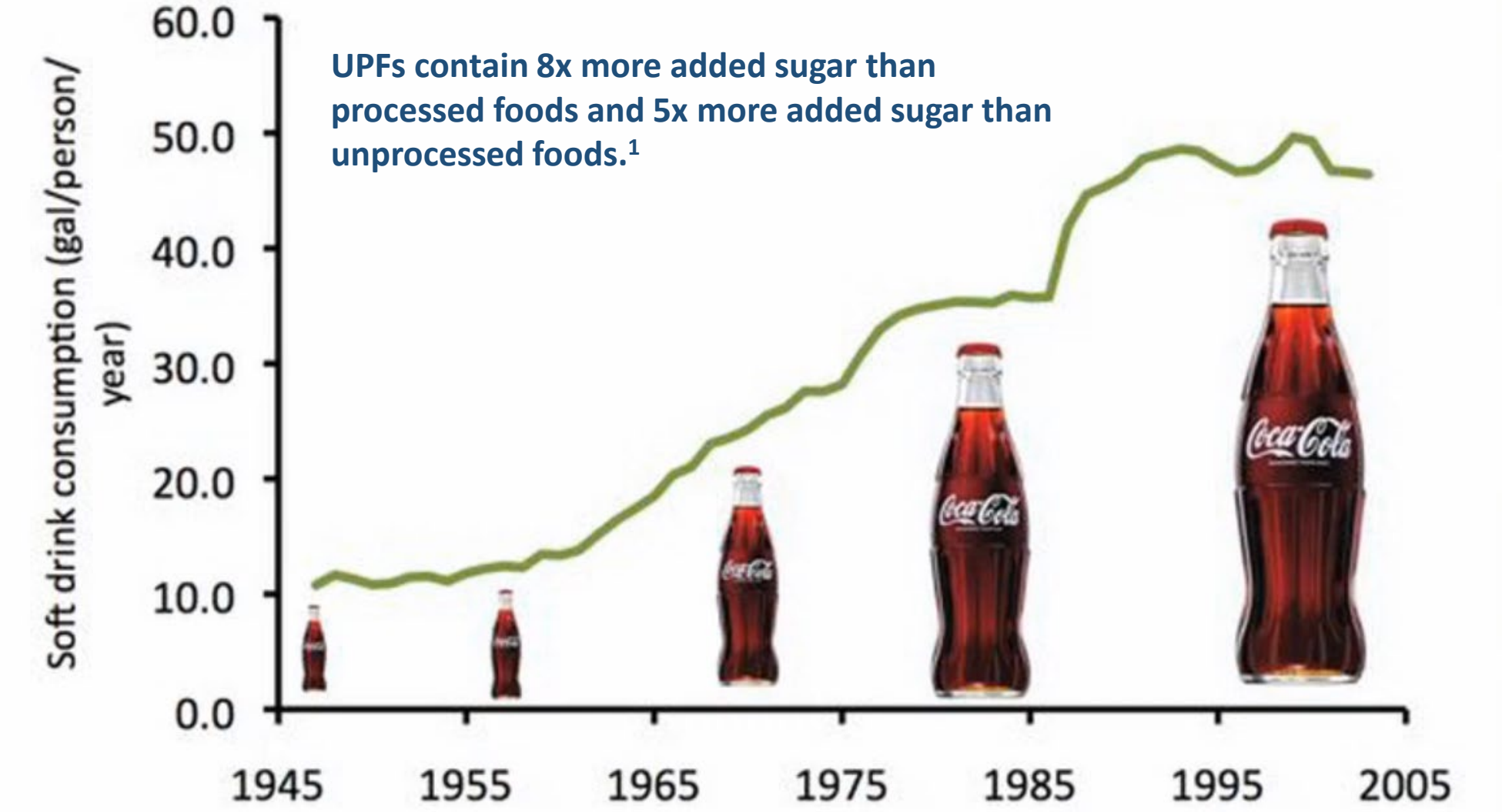
Relative Food Costs ($/100 kcal)



80% cheaper than unprocessed food

Gupta S, Hawk T, Aggarwal A, Drewnowski A. Characterizing Ultra-Processed Foods by Energy Density, Nutrient Density, and Cost. Front Nutr. 2019 May 28;6:70. doi: 10.3389/fnut.2019.00070

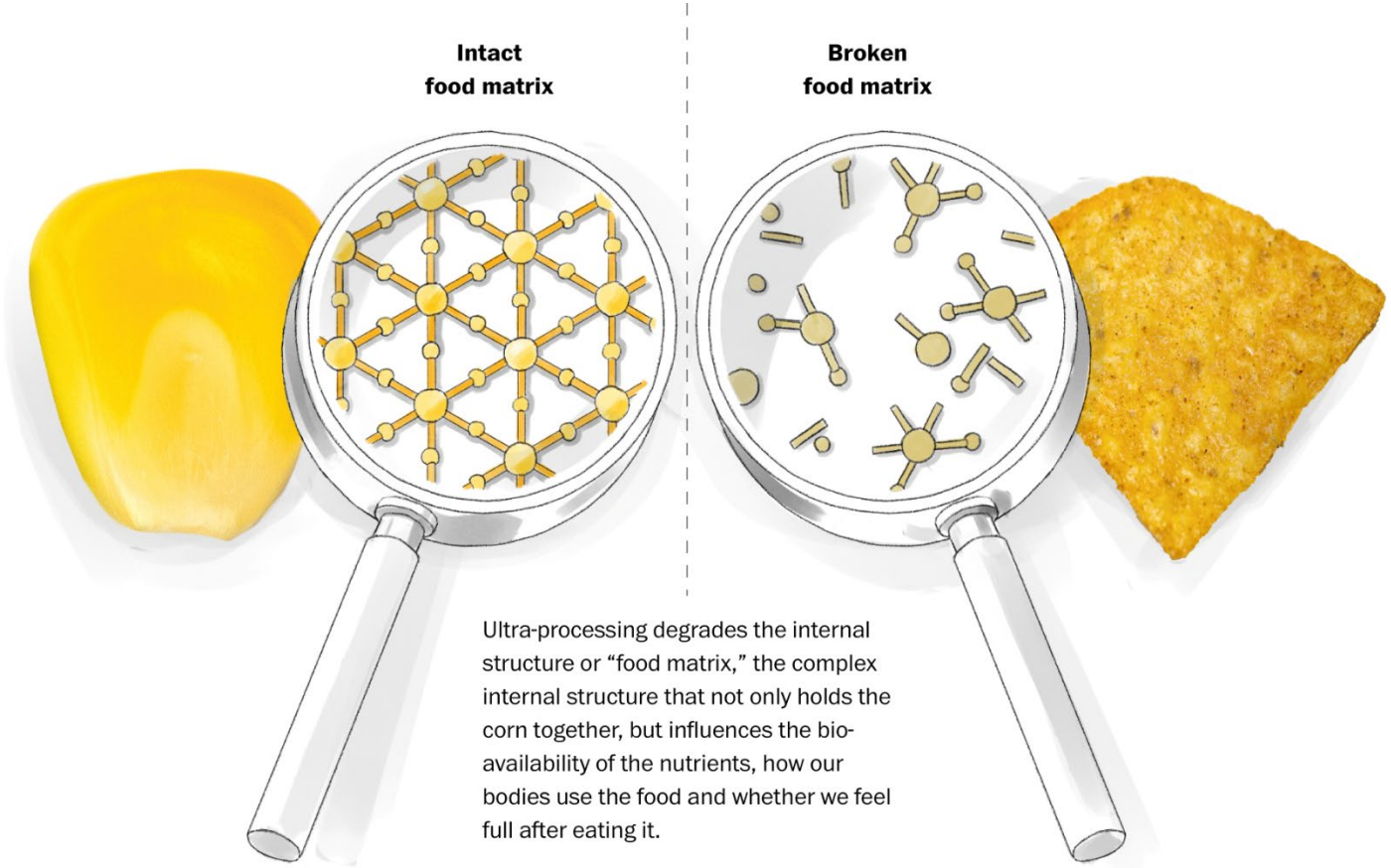
Soda Consumption



https://www.ers.usda.gov/data-products/eating-and-health-module-atus/ 1.Martínez Steele E, Baraldi LG, Louzada MLDC*, et al.* Ultra-processed foods and added sugars in the US diet: evidence from a nationally representative cross-sectional study. *BMJ Open* 2016;**6:**e009892. doi: 10.1136/bmjopen-2015-009892

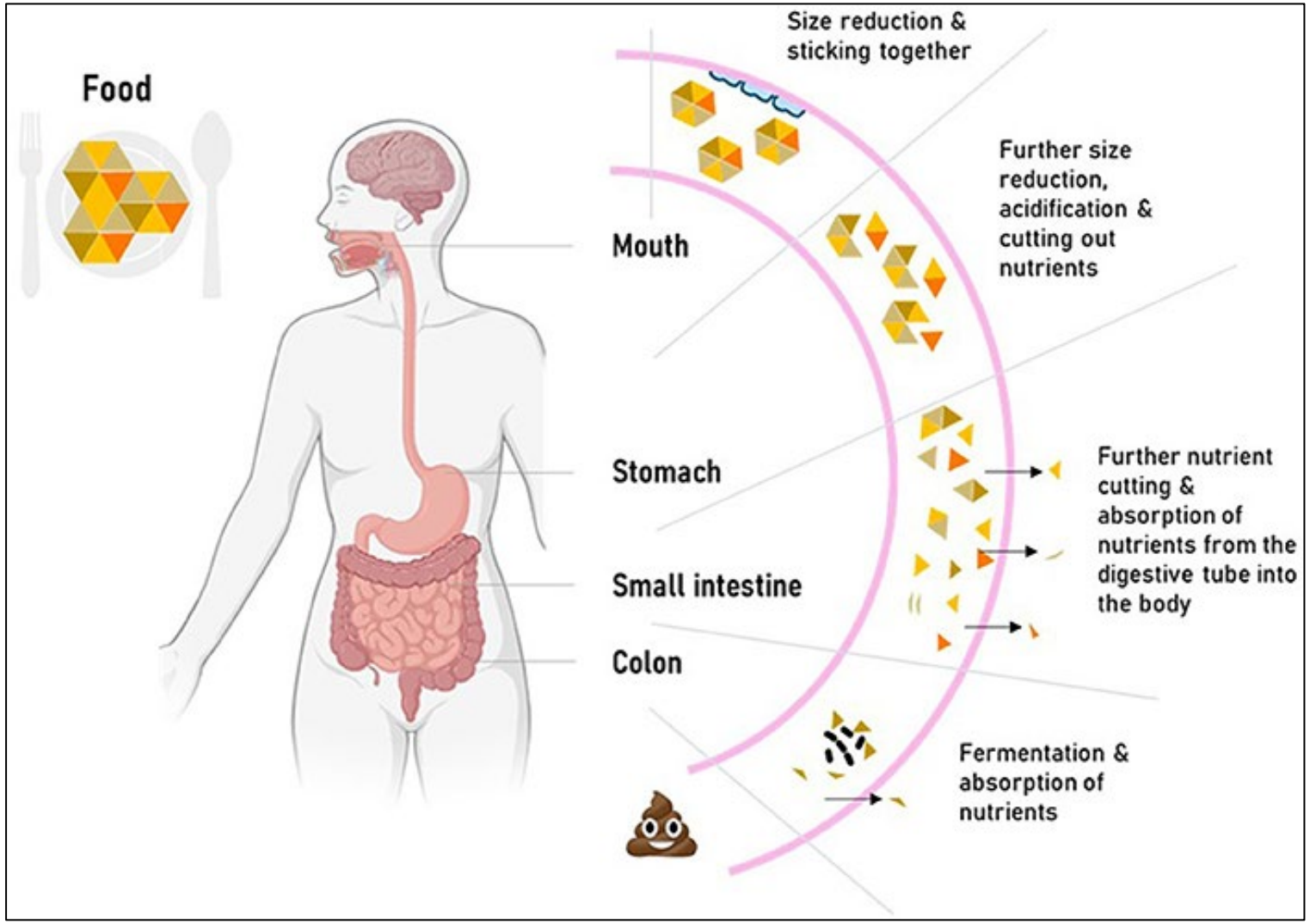
Why #3

- How do ultra-processed foods contribute to obesity?
  - Because ultra-processed foods are like pre-digested foods



https://www.washingtonpost.com/wellness/2023/06/27/ultra-processed-foods-predigested-health-risks/

Normal Digestion



https://kids.frontiersin.org/articles/10.3389/frym.2024.1386116

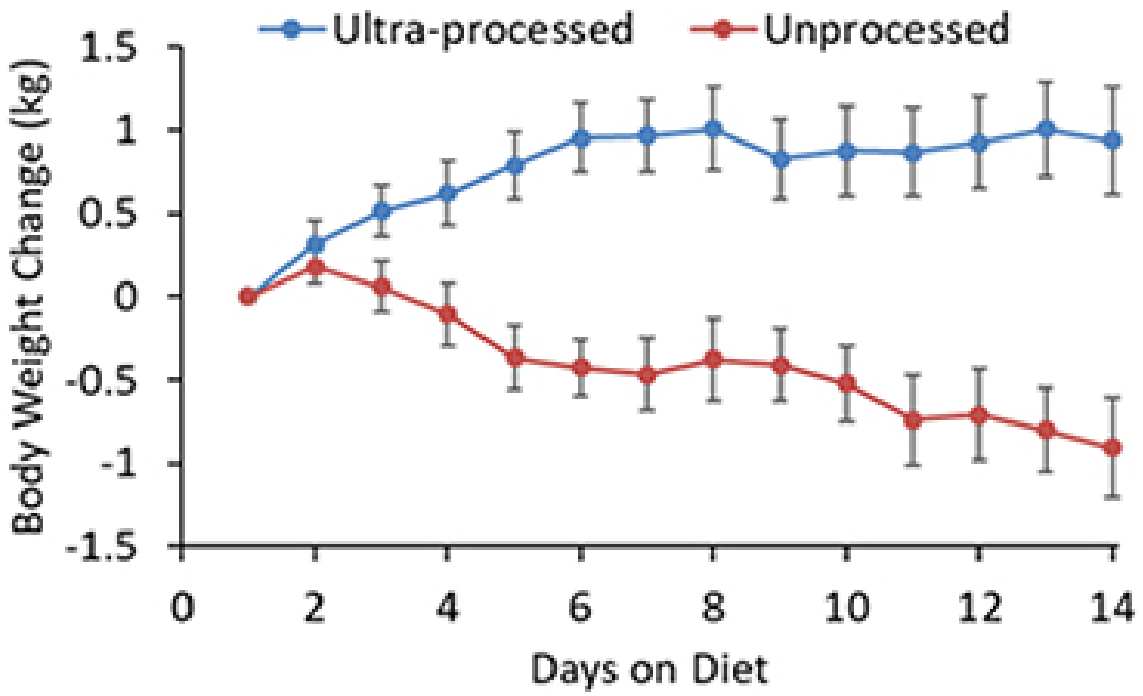
Implications for Health

- Ultra-Processesing removes many of the healthly compounds associated with the plant or animal (vitamins, fiber, antioxidants).
- Rapid spikes in glucose
- Powerful stimulation of the brain's reward center (rapid dopamine release)
  - Stimulating a renewed sense of "hunger" when the dopamine spike subsides
- Lack of nutrients for the microbiome

https://www.science.org/content/article/ultraprocessed-foods-may-make-you-eat-more-clinical-trial-suggests

Body weight Body weight and composition changes and composition changes n=20

A



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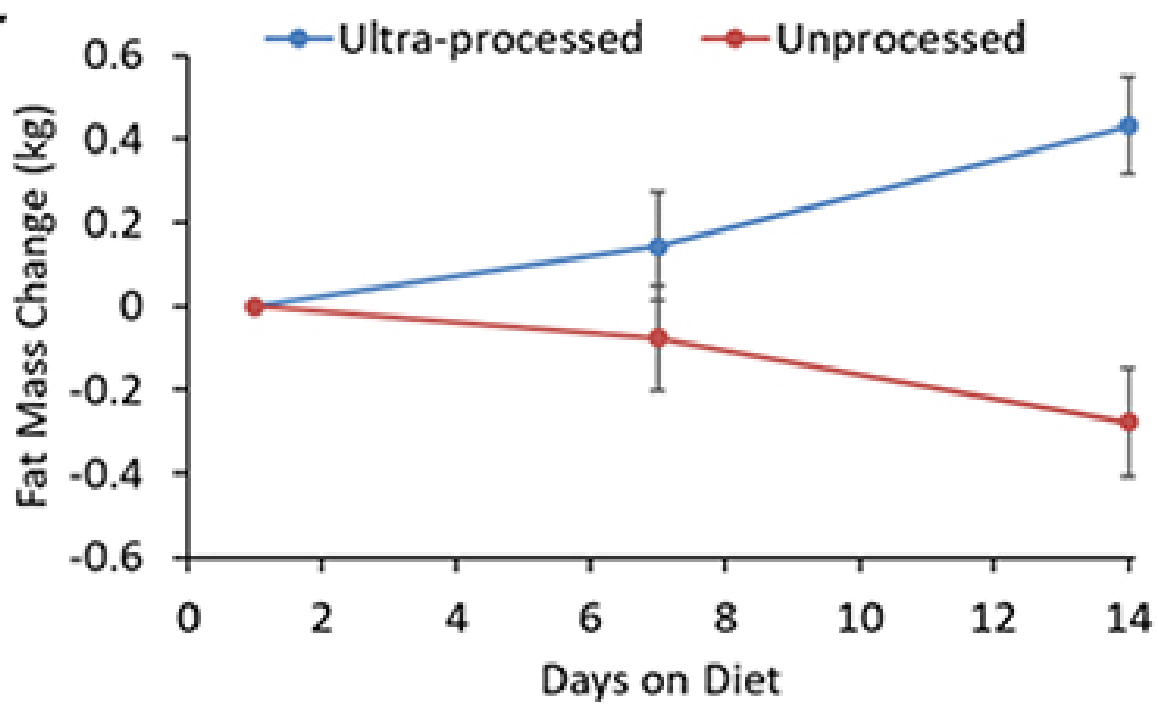


Hall KD, Ayuketah et al. Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient Randomized Controlled Trial of Ad Libitum Food Intake. Cell Metab. 2019 Jul 2;30(1):67-77.e3. doi: 10.1016/j.cmet.2019.05.008.

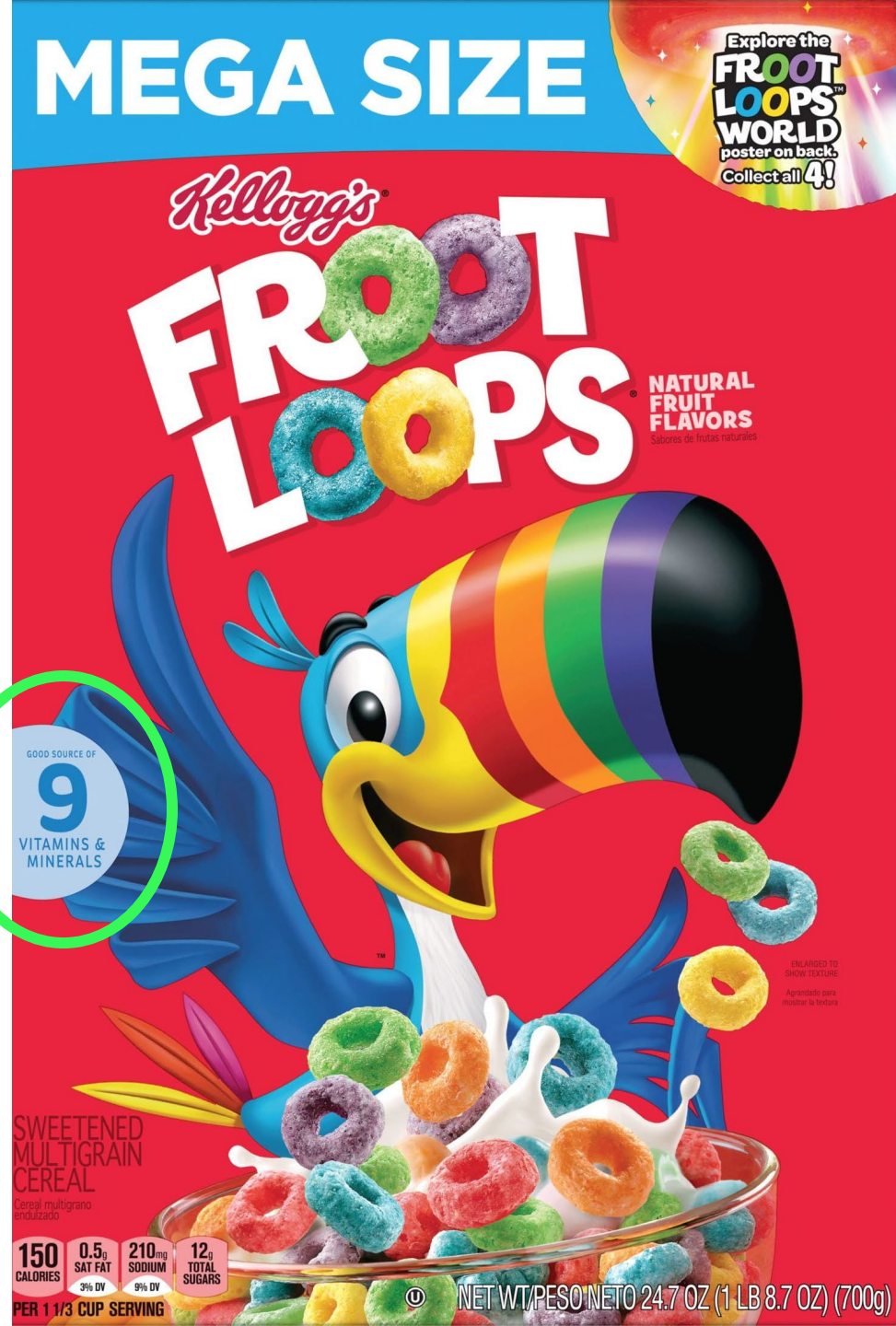
Why #4

- Why don’t people avoid ultra-processed foods or eat less, especially if they know it’s bad for them?
  - Because these foods are designed to illicit craving and addiction

Engineered Food

- Engineered to hit the “Bliss Point”
  - “The ideal balance of salt, sugar, and fat that makes food taste just right and triggers the brain's reward system”
  - Encourage buying more
  - Providing healthy nutrients is not a primary consideration
    - … leading to micronutrient deficiency

https://www.theatlantic.com/health/archive/2013/04/the-language-of-junk-food-addiction-how-to-read-a-potato-chip/275424/



Addictive Potential

- Highly palatable foods are naturally rewarding and reinforcing (Salt, Sugar, & Fat).
- Just like drugs of abuse, they act on the brain's dopamine reward circuits.
- Experimental animals will seek out UPFs nearly as compulsively as cocaine.[1]
- A rat that just was fed will continue to eat these processed foods, even if it knows the food has been poisoned and will make it sick.[1]

1967 Fritos Frito Lay's Potato Chips Ad[2]

1. Domingo-Rodriguez L, Ruiz de Azua I, Dominguez E, Senabre E, Serra I, Kummer S, Navandar M, Baddenhausen S, Hofmann C, Andero R, Gerber S, Navarrete M, Dierssen M, Lutz B, Martín-García E, Maldonado R (2020) A specific prelimbic-nucleus accumbens pathway controls resilience versus vulnerability to food addiction. Nat Commun. https://doi-org.ezproxyhhs.nihlibrary.nih.gov/10.1038/s41467-020-14458-y
2. https://enjoyinghisgrace.wordpress.com/2019/06/03/betcha-cant-eat-just-one/

Why #5

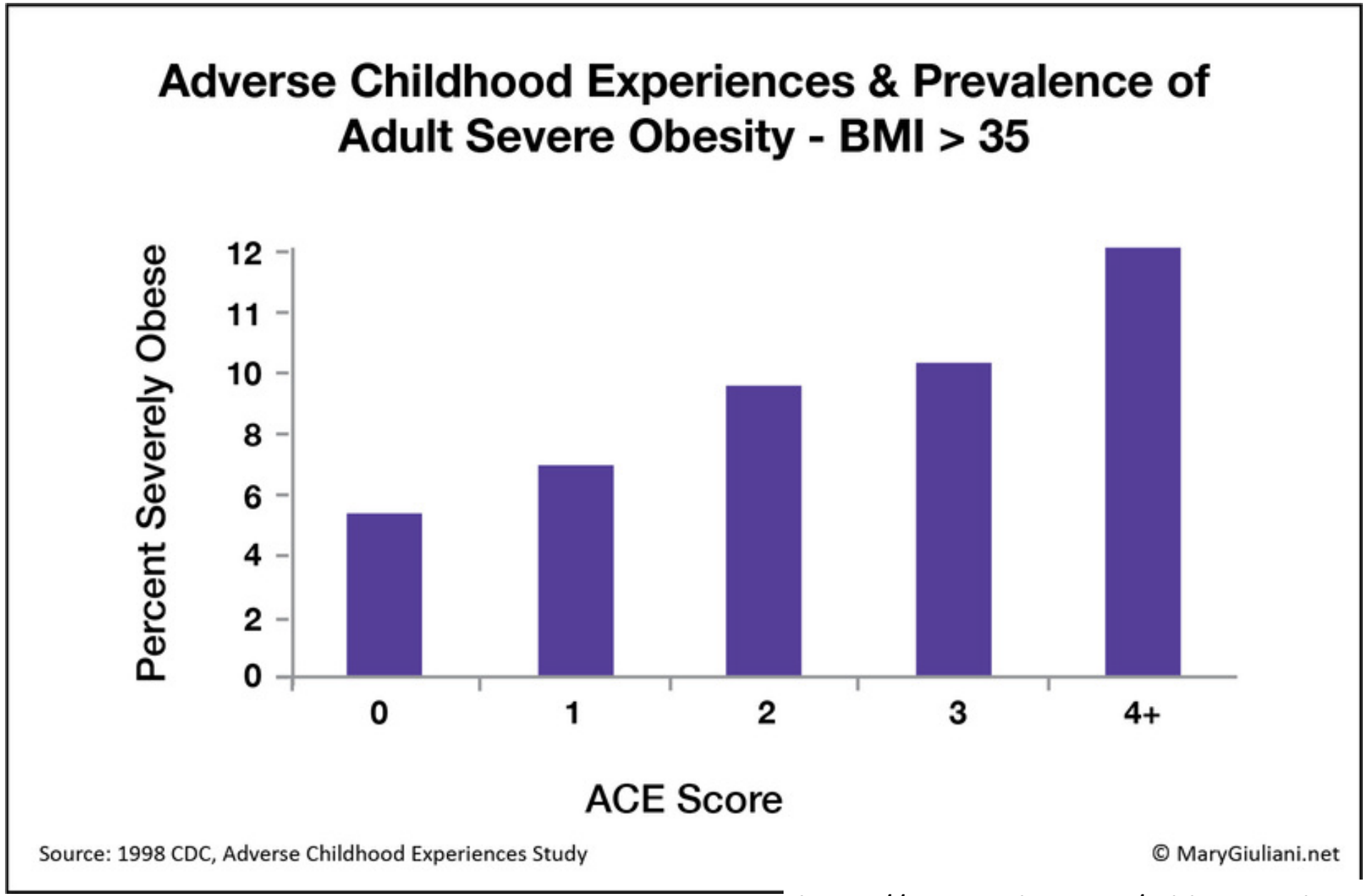
- If the changing food and activity environment encourages higher energy balances for everyone, why are obesity rates rising faster in AIAN communities?
  - Because of the complex interplay of historical trauma, the environment, and neurophysiology

Legacy of Historical and Intergenerational Trauma

- Violent loss of land and food sovereignty
- Systematic destruction of culture, traditional wisdom, parenting skills
- Intergenerational trauma
- Forced dependance on unhealthy commodities
- Introduction of alcohol
- Poverty
- Racism

https://www.heraldnet.com/news/tulalip-woman-helped-uncover-dark-history-of-indian-boarding-schools/

- “My grandparents were raised in a boarding school. They had my parents when they were pretty much kids themselves, and they didn’t know how to be parents- how could they know? My mom made a lot of mistakes, but she did the best she could. I also made a lot of mistakes with my kids … but fewer than she did. I see my granddaughter growing up now, and she’s surrounded with love… It’s like our ancestors said, it may take seven generations to turn something around.”
  - Cheyenne elder, 2024.



https://marygiuliani.net/addiction-obesity-ace-study/

The healthy choice is rarely the easy choice

- Working, single mother of 4 children living on a remote reservation community
- Weekly budget for groceries: $400
- As she does her weekly shopping at the store 25 miles from home, 85% of the food sold is ultra-processed

What would you choose?

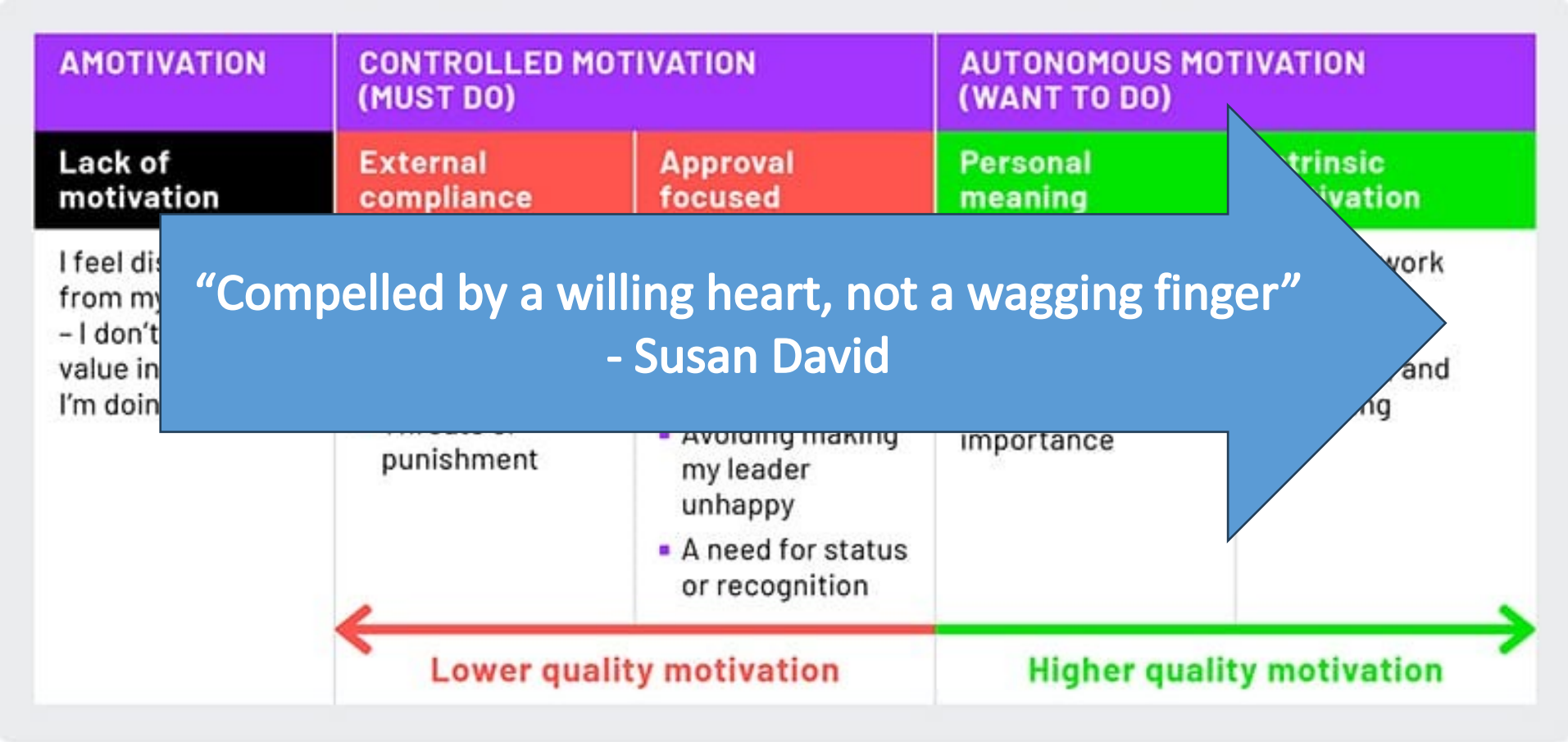
- <u>Option A</u>
- Hamburger Helper
- Cost: $17
- Prep Time: 30 minutes
- Kid's reaction:

"Thanks mom!"

- <u>Option B</u>
- Baked chicken with green beans and brown rice
- Cost: $35
- Prep Time: 60 minutes
- Kid's Reaction:

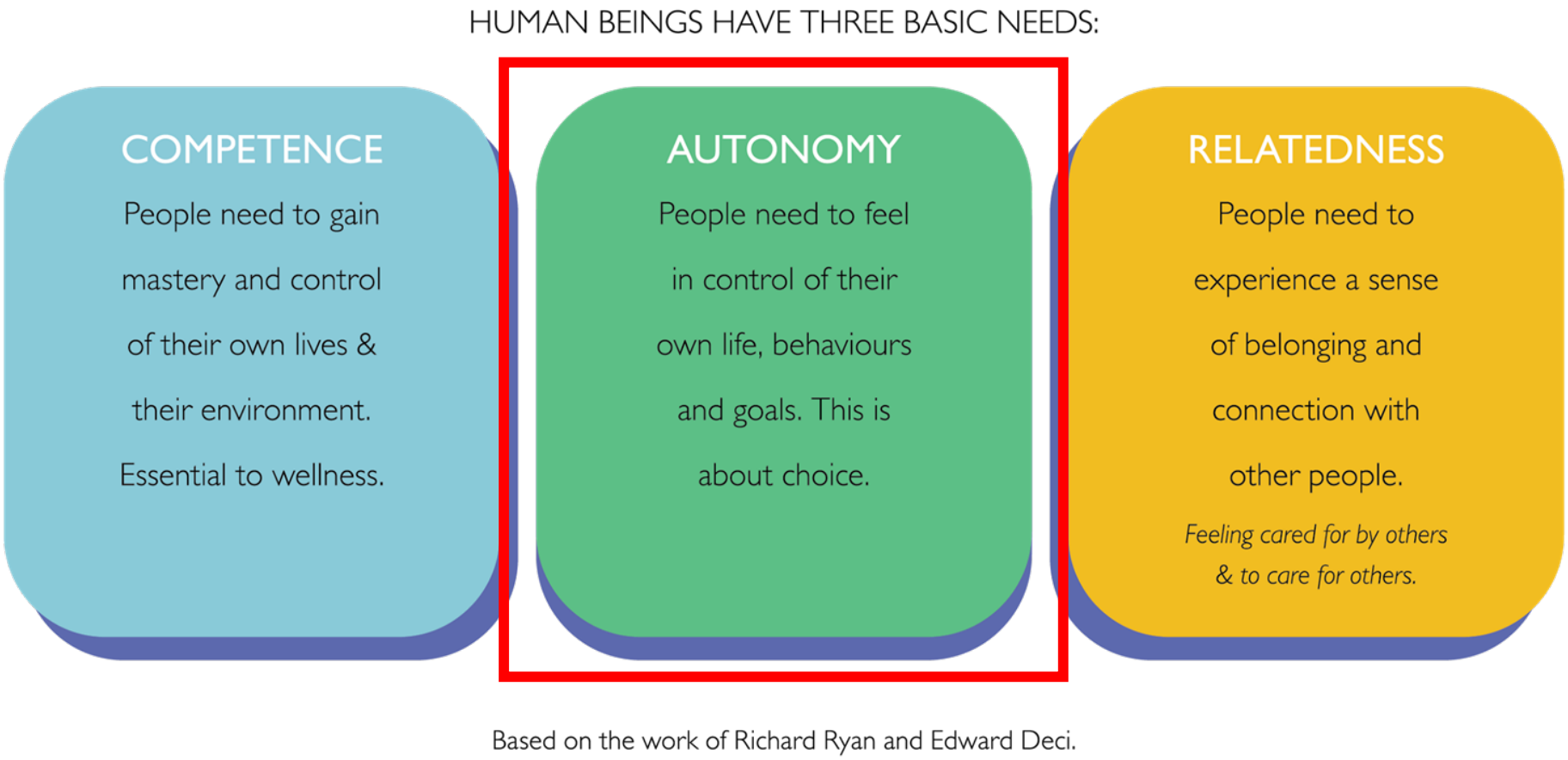
"What's this? Do we have anything else?"

Tools: The Motivation Spectrum



A continuum of employee motivation, adapted from Deci and Ryan (2000). Note: this is a simplified version of the full Self-Determination Theory continuum.

Self-Determination Theory
Psychological Needs for Motivation

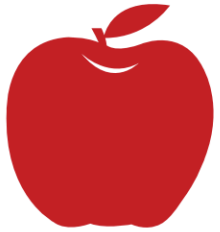


Based on the work of Richard Ryan and Edward Deci.

Fostering Autonomy: Coaching not Lecturing

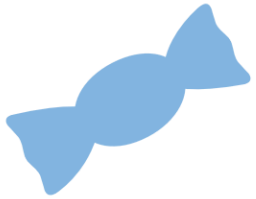
- <u>Motivational Interviewing</u>
  1. Establish the goal that's meaningful to them
  2. Identify **small, manageable changes that will help make things better**
- Four pillars of wellness:
  - Healthy Diet
  - Physical Activity
  - Adequate Sleep
  - Peaceful Mind (dealing with stress)

Preparing family meals together



Increasing the amount of fruits and vegetables you eat

Increasing the number of minutes of being active in a day



Limiting the number of sweets (foods and beverages) you eat a week

Increasing amount of outdoor play time and limiting screen time

Increasing the number of meals that the family sits down and eats together

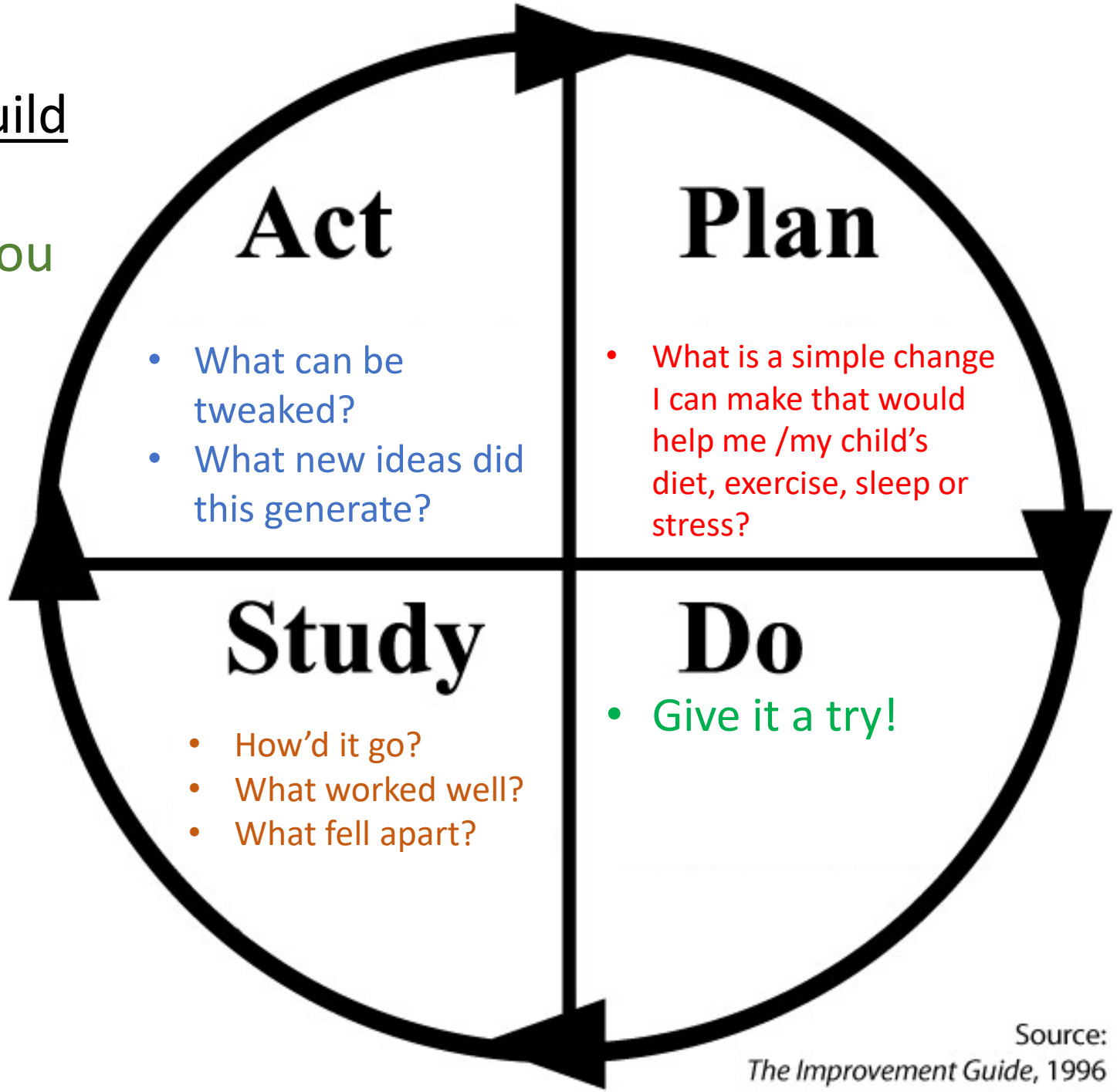
Creating family play time

Shopping for healthy foods together

https://www.apa.org/obesity-guideline/discussing-weight

Tools that Build Autonomy:

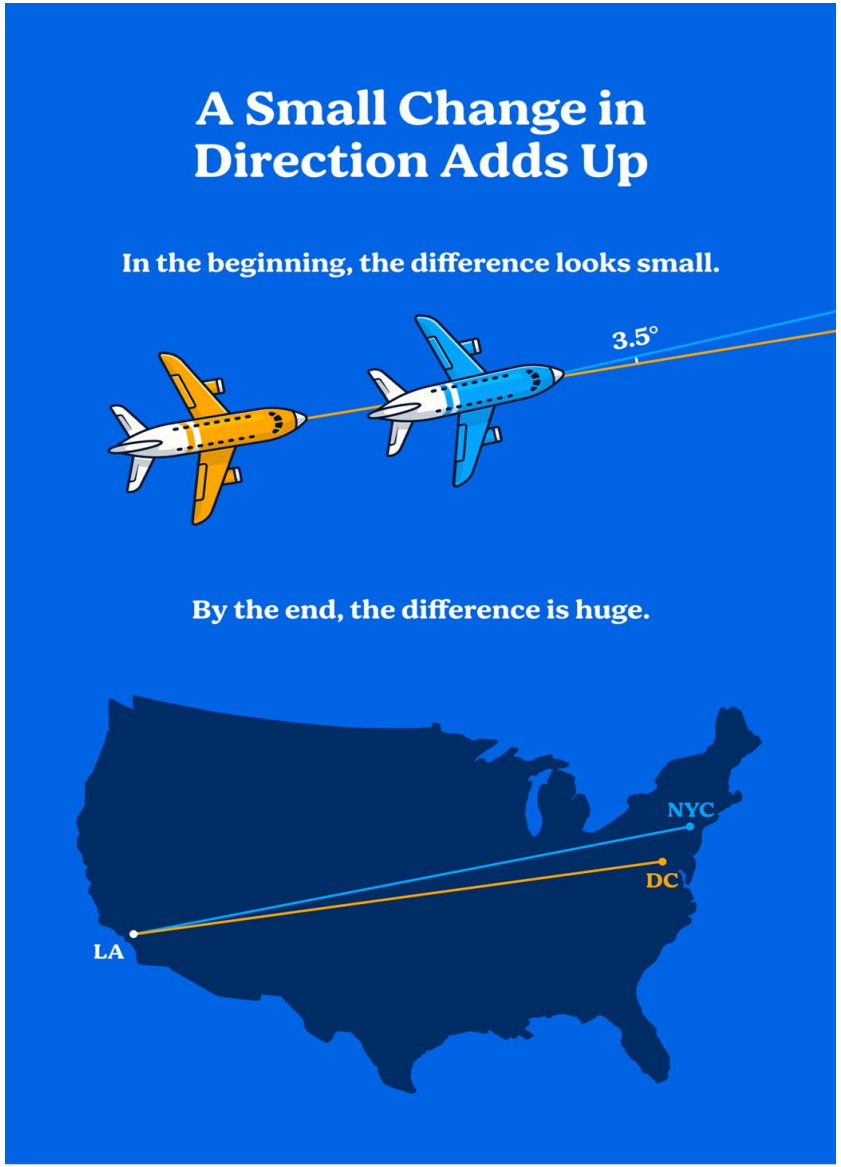
"What can you do by next Tuesday?"



Source:
The Improvement Guide, 1996

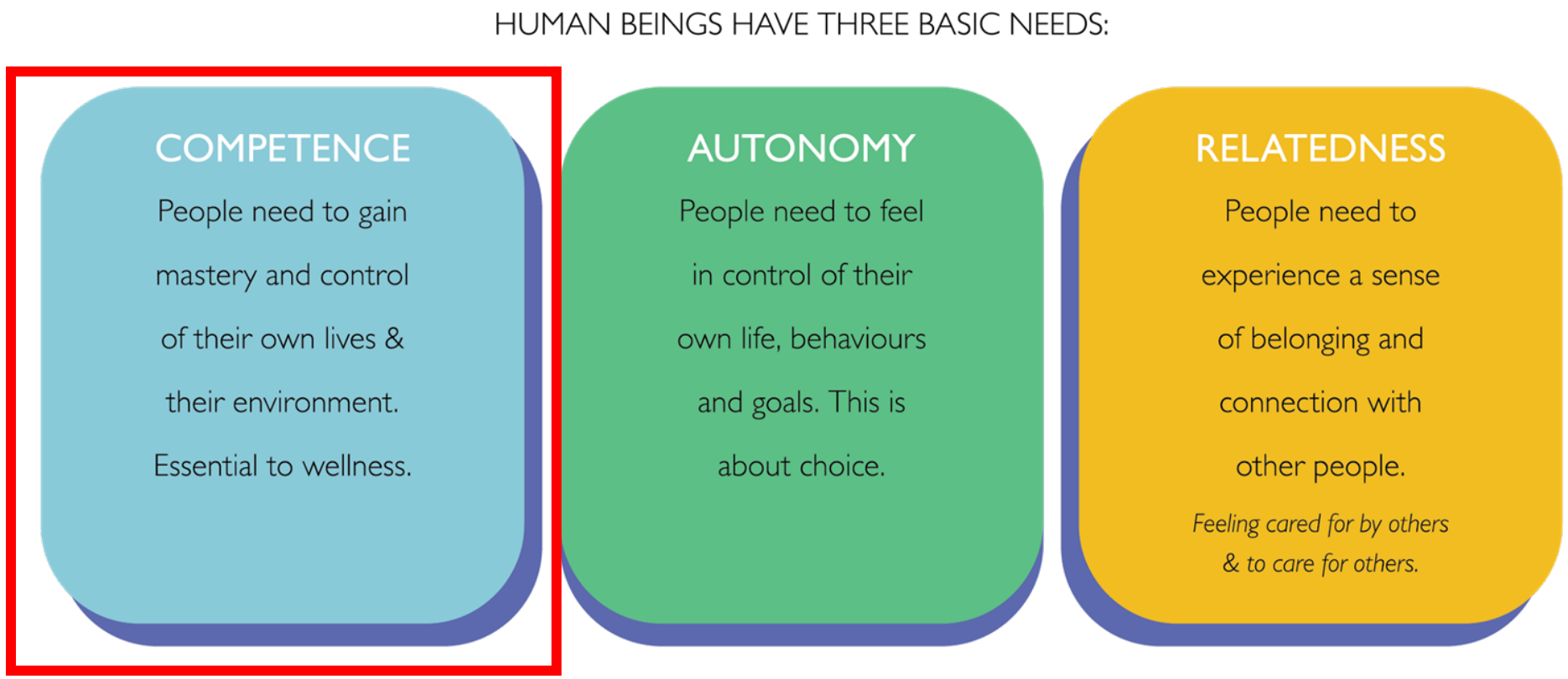
Don’t forget the Power of Tiny Tweaks

- Your current trajectory is more important that your current status.
- Habits are the compound interest of self-improvement
- “Compound interest is the 8th wonder of the world. He who understands it, earns it … he who doesn't … pays it.”
  - Albert Einstein



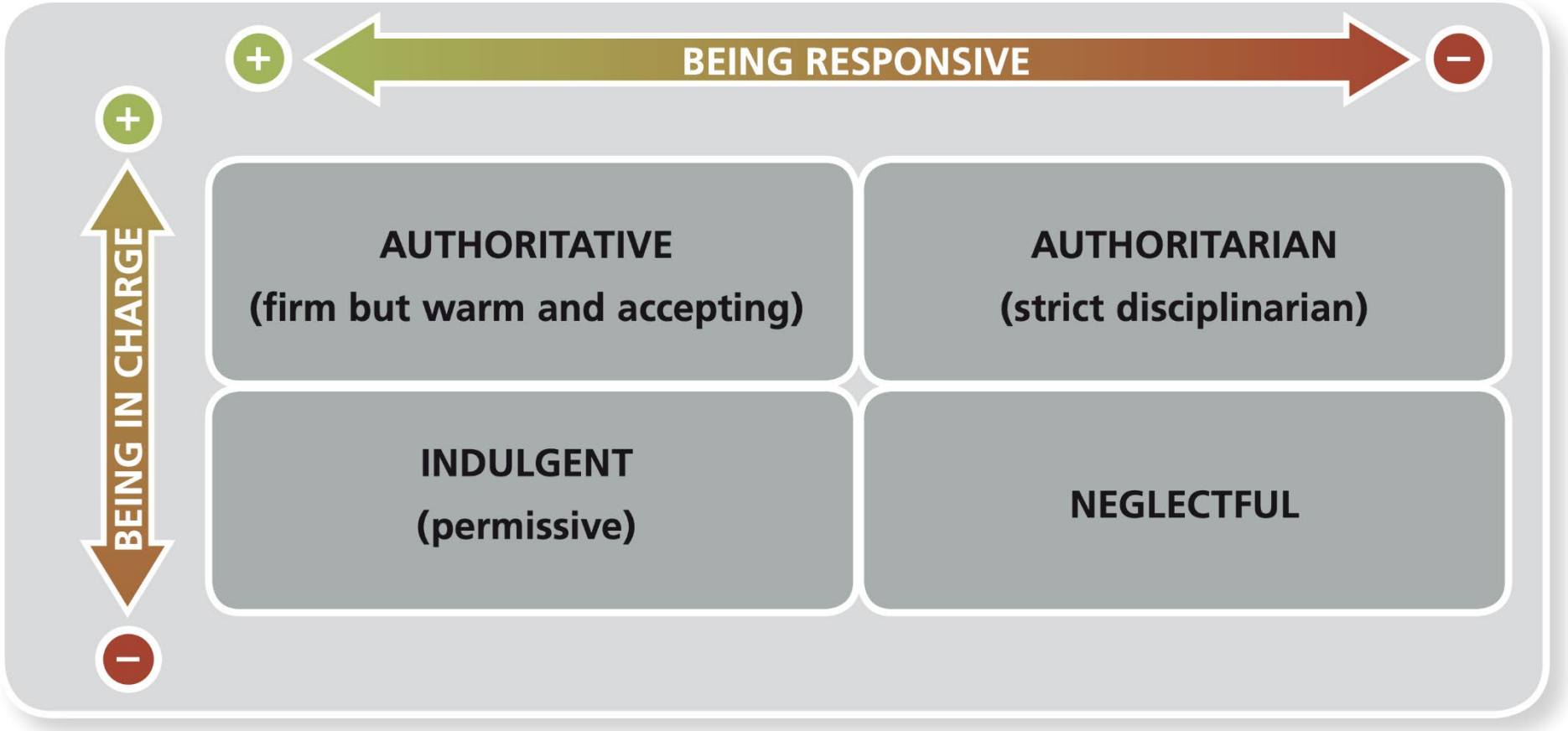
James Clear: https://jamesclear.com/atomic-habits

Tools for Helping Kids with Obesity Should Build One or More of These



Fostering Healthy Parenting Skills

- Authoritative approach towards their children's lifestyles
  - "Parent provides and child decides"



The HENRY Approach	
The message: a healthy lifestyle	**The messenger: creating conditions for change**
• Parenting skills • Healthy family routines • Balanced diet • Physical activity and sleep • Emotional wellbeing • Breastfeeding	• Relationships based on trust and respect • Working in partnership with families • Empathy • Strengths-based • Solution-focused • Building motivation for change

https://www.henry.org.uk/henryapproach

Development of healthy lifestyle	
PARENTING	1. Encourage parents and carers to model a healthy lifestyle 2. Help parents enhance their parenting skills and develop an authoritative approach to shaping their children's lifestyles 3. Encourage parents and carers to take a whole family approach
EATING & FEEDING BEHAVIOUR	4. Encourage responsive feeding 5. Encourage positive family mealtimes 6. Find alternatives to food for comfort and to encourage good behaviour
NUTRITION	7. Encourage exclusive breast feeding for 6 months 8. Introduce solid foods at 6 months 9. Ensure portion sizes are appropriate for age 10. Increase acceptance of healthy foods – including fruit and vegetables 11. Reduce availability and accessibility of energy dense foods in the home 12. Reduce consumption of sweet drinks and increase consumption of water
PLAY, INACTIVITY AND SLEEP	13. Encourage active play 14. Create safer play-space at home 15. Reduce sedentary behaviour and screentime 17. Ensure children get a good night's sleep

https://www.henry.org.uk/sites/default/files/2017-11/Framework-for-Action-tackling-child-obesity-through-the-Healthy-Child-Programme.pdf

CLINICAL PRACTICE GUIDELINE Guidance for the Clinician in Rendering Pediatric Care

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

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Eva
and

Sarah E. H
Sarah E. B
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Eneida Me
Eduardo R
Ashley E. W

Greetings

You have in your hands, or at your
American Academy of Pediatrics cl
management of children and adole
Putting together this guideline was
grateful to the efforts of all the pro
production of this document. This
and dedication to combatting child
obesity.

The Subcommittee responsible for
diverse group of professionals fro
governmental entities and private
a common desire to provide the fi
children and adolescents with ove
several months, the members of th
reports produced from the study r
the Key Action Statements and Exp
contained within this guideline. Th
the Subcommittee members, to ali
appropriate emphasis on each stat

While representing such a broad s
this committee are all keenly awar
that patients and their families fac
access to treatment, but their abili
Whereas some patients are able to
habitualize elements of their presc
struggle to do so for a wide variety
Subcommittee understand all of th
and overcoming these barriers, gu
related to barriers to treatment ha
the course of their work, members
although so much has been learne
adolescents with overweight and obesity, there is still so much we have yet

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PEDIATRICS Volume 151, number 2, February 2023:e2022060640

FROM THE AMERICAN ACADEMY OF PEDIATRICS

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

Clinical Practice Guideline for the
n and Treatment of Children
escents With Obesity

Evaluation and Treatment of Childhood Obesity

Indian Health Service Division of Diabetes Treatment & Prevention

SIX Sessions in this Series:

3pm ET/2pm CT/1pm MT/12pm PT/11am AKT

March 6, 2025	Evaluation of Obesity
March 13, 2025	Evaluation & Initial Management of Obesity Comorbidities
April 3, 2025	Motivational Interviewing
April 10, 2025	Goal Setting
May 1, 2025	Health Behavior & Lifestyle Treatment
May 8, 2025	Pharmacotherapy & Bariatric Surgery

Target Audience
Physicians, Pharmacists, Nurse Practitioners, Physician Assistants, Physical Therapists, Nurses, Registered Dietitians, and Behavioral Health Providers

Continuing Education
In support of improving patient care, IHS Clinical Support Center is jointly accredited by the

JOINT ACCREDITATION™
INTERPROFESSIONAL CONTINUING EDUCATION

Course Series Objectives:

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revention of

Hampl SE, Hassink SG, Skinner AC et al. Clinical practice guideline for the evaluation and treatment of children and adolescents with obesity. *Pediatrics.* 2023; 151e2022060640

Thank You