

## Ubiquitous Health: Food as Medicine, a "Weighty Matter"

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President-Elect ACLM



Audience  
Question

zipongo®  
EATING WELL MADE SIMPLE

Food Benefits  
Management

*Drives Sustained Engagement To  
Change Eating Behavior, And  
Delivers a Food As Medicine ROI*

# Zipongo Food Benefits Management: Sustained Engagement & Food As Medicine ROI

## ❖ Engage: *Eating well made simple*

-  **Cooking and Meal Delivery**
-  **Health**
-  **Restaurants**

**Drive sustained engagement with your employees to change eating behavior**

## ❖ FoodScripts : *Food as Medicine / FBM*

**Prescriptive Meal Plan, Customized To The Individual  
Clinical Workflow, EMR Integration, Clinician Dashboard**

# Deeply Integrated to Drive Daily Success

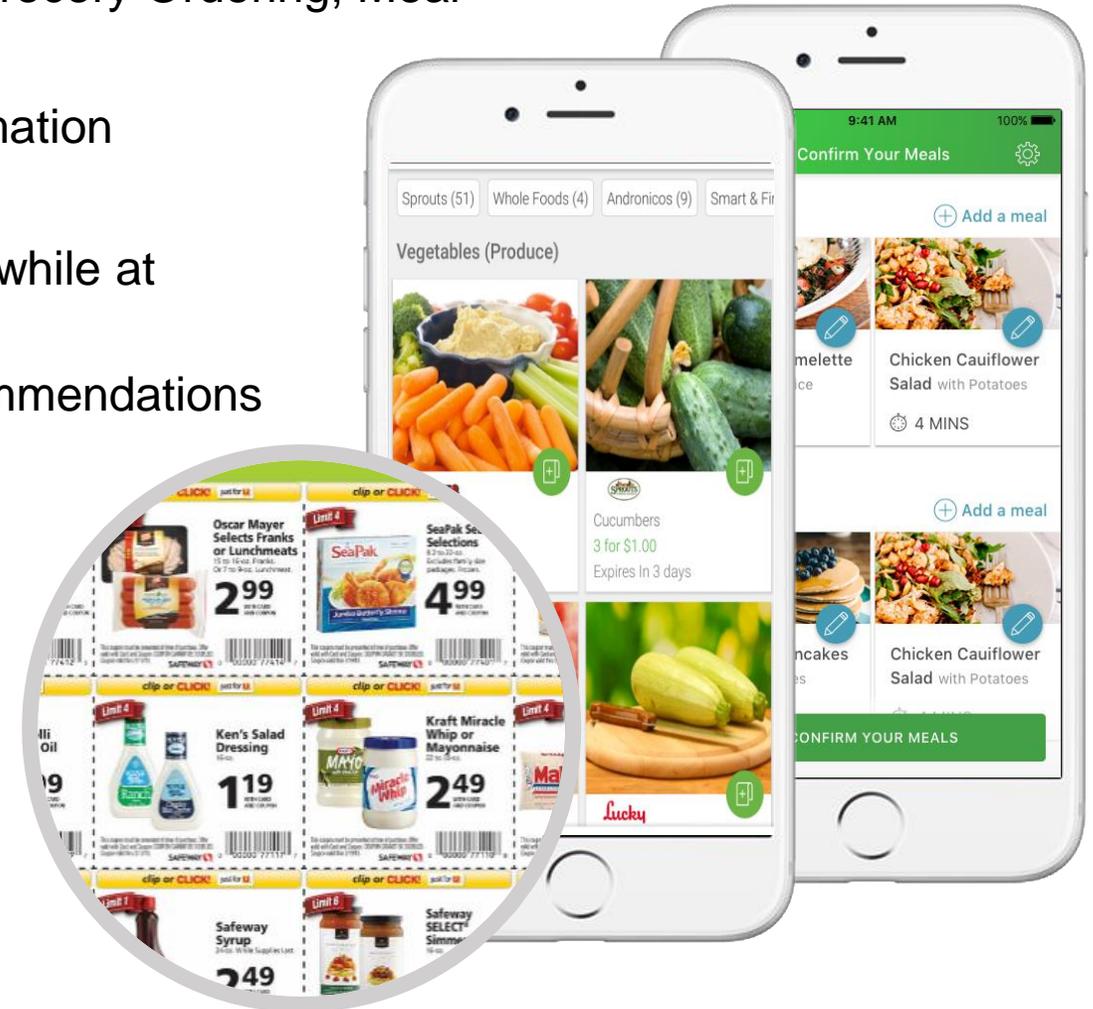
Zipongo's comprehensive solution creates healthy eating habits and routines.

- ✓ **Cooking** – Makes it easy, tasty, and affordable to eat at home
  - Recipes & Meal Planning, Grocery List, Grocery Ordering, Meal Kit Ordering, Grocery Discounts
- ✓ **Health** – Drives personalization and habit formation
  - NutriQuiz, Biometrics, Rewards
- ✓ **Restaurants** – Makes it easy to stay on track while at work and on-the-go
  - Menu Guidance & Workplace Café Recommendations



“The **deals feature** is cool and will help me stick to my grocery budget at my favorite stores.”

– Zipongo User



# The NutriQuiz Provides Actionable Insight On Population Health



# Zipongo NutriScore Essentials

Our NutriScore Essentials were curated from leading nutrition sources in the academic and medical communities. These guide personalization and recommendations across Zipongo.

## How You Eat

- ▶ **Focus on Balance & Nutrient Density**
- ▶ **Learn from Our Ancestors and Rely on Science**
- ▶ **Personalize for Tastes, Biology, Timing, and Location**

## What You Eat

### Eat Plenty of Vegetables & Fruits



5 servings of vegetables/day  
+ 4 servings of fruit/day

### Enjoy Lean Proteins; Limit Red and Processed Meats



White Meat & Plant Proteins  $\geq 4$   
Red & Processed Meats

### Eat Carbs with Lower Glycemic Load



Total Carbohydrates  $\leq 10$   
Total Fiber

### Stay Hydrated



1500 mL + (20 mL x weight) + Extra fluid needs per exercise regimen<sup>6</sup>

### Focus on Healthy Fats



Polyunsaturated fatty acids  $\geq 1$   
Saturated fats + Trans fat

### Limit Sodium and Flavor with Spices



2,300 mg sodium per day<sup>1</sup>

***Our food environment is overwhelming***

***And, overwhelmingly unhealthy!***

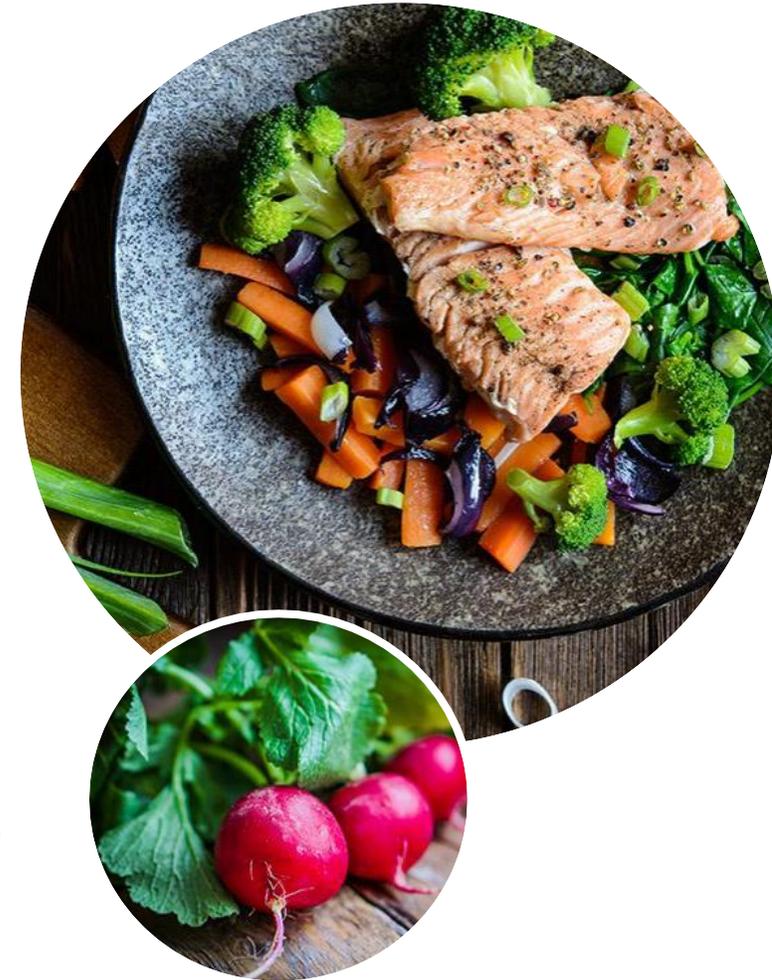


# Inquiring Minds Want to Know...

## Today's Objectives

Ubiquitous Health: Food as  
Medicine, a "Weighty Matter"

- 1** Why are we struggling to win the fight against Common Chronic Diseases?
- 2** Why aren't we winning the battle against Obesity?
- 3** Why can some people eat more than others and NOT gain weight?



**What's the  
Definition of  
Insanity????**

# The Definition of Insanity when it comes to Chronic Disease

- **Chronic Disease – Failure to Focus on Root-cause**

**80% of chronic disease is preventable by Lifestyle means**

# Food and health

It is estimated that nearly one half of all death due to heart disease, stroke, and type-2 diabetes in the United States are linked to diet and poor nutrition

- JAMA March 2017

This makes diet the largest risk factor (root-cause), overtaking other causes such as tobacco, for driving chronic disease rates and death in the U.S.

# Food as medicine

- Goes **beyond healthy eating** for preventing disease and promoting general wellness
- It is food used along with (or in some cases without medicines or surgery) as a **prescribed intervention**, for the treatment and cure of many diseases, thereby placing it within an accepted standard of care, introducing the concept of **Food Benefits Management**.

If a poor diet caused the problem...

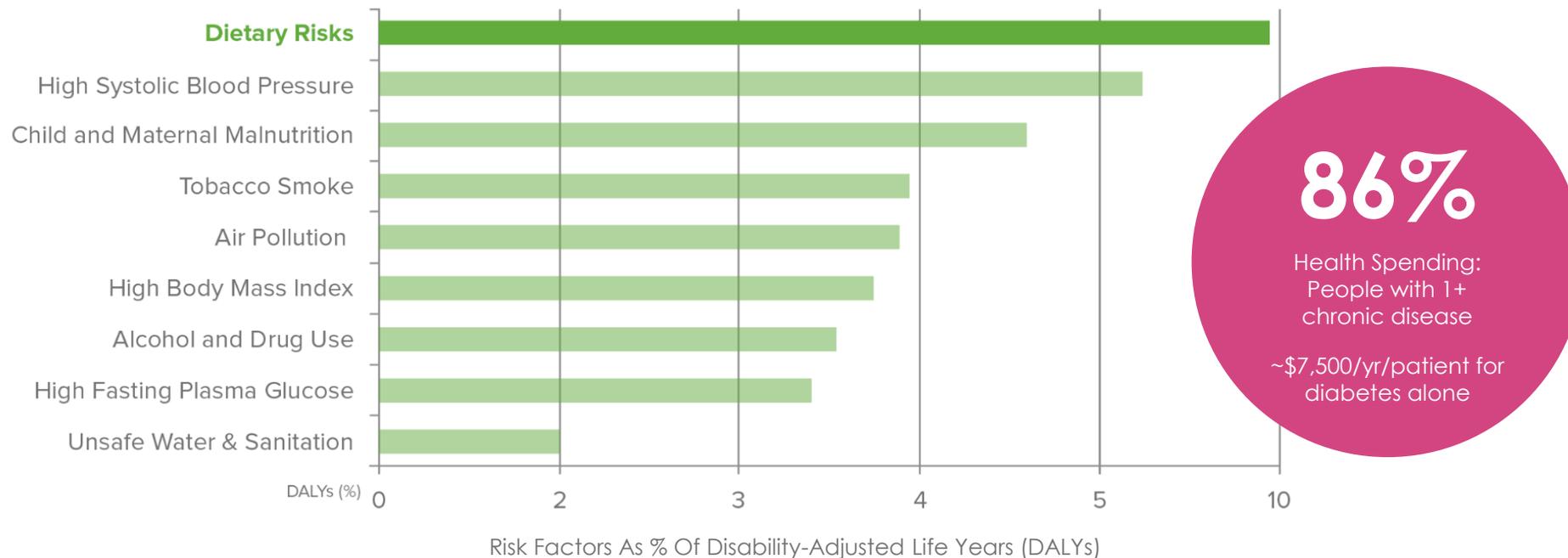


A healthy diet can **correct** the problem

# Diet is the leading cause of chronic disease and disability

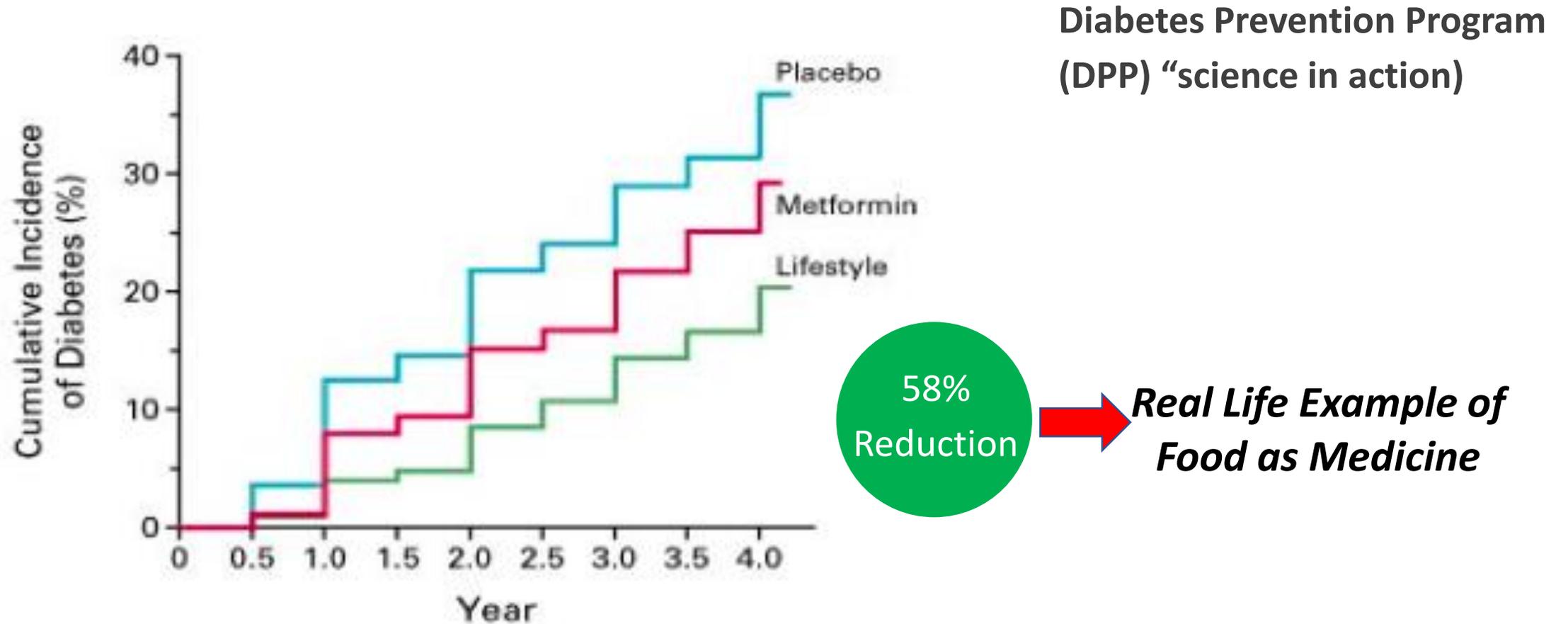
*“The most important dietary risks in the United States are diets low in fruits, low in nuts and seeds, high in sodium, high in processed meats, low in vegetables, and high in trans fats”<sup>1</sup>*

**- These risks are the leading cause of chronic disease, not other common culprits**



<sup>1</sup>The State of US Health, 1990-2010. Burden of Diseases, Injuries, and Risk Factors. JAMA. 2013; 310(6):591-606. doi:10.1001/jama.2013.13805; CDC FastStats on overweight and obesity, 2017; CDC National Diabetes Statistics Report, 2017; Zipongo Analysis

# The Evidence Is Convincing --- Diet and Lifestyle have the power to prevent and reverse disease



# Everyday examples of food as medicine

- **Harvard Medical School:** Potassium lowers blood pressure—the Standard American Diet delivers too much sodium (salt) and too little potassium. Reversing this imbalance would lead to fewer heart attacks, strokes, and death from heart disease
- Two cups of **hibiscus tea** every morning was as effective in lowering blood pressure as a starting dose of 25mg of captopril taken twice a day

## Comparison Of Dietary Flax Seeds To Common Blood Pressure Medications

<b>Flaxseeds</b>	<b>10-15-point reduction</b>
<b>Vasotec (ACE Inhibitor)</b>	<b>8-point reduction</b>
<b>Norvasc (Calcium Channel Blocker)</b>	<b>5-point reduction</b>
<b>Cardizem (Calcium Channel Blocker)</b>	<b>3-point reduction</b>

# *The evidence is convincing*

## **The American Journal of Clinical Nutrition:**

Scientists find the relationship between sugar and white Blood cell function

**Role of sugars in human neutrophilic phagocytosis** Albert Sanchez J. L. Reeser H. S. Lau P. Y. Yahiku R. E. Willard P. J. McMillan S. Y. Cho A. R. Magie U. D. Register

*The American Journal of Clinical Nutrition*, Volume 26, Issue 11, 1 November 1973, Pages 1180–1184, <https://doi.org/10.1093/ajcn/26.11.1180>

**100 grams of sugar renders your white blood cells 40 percent less effective at killing germs.**

These data suggest that the function and not the number of phagocytes was altered by ingestion of sugars. This implicates glucose and other simple carbohydrates in the control of phagocytosis and shows that the effects last for at least 5 hr. On the other hand, a fast of 36 or 60 hr significantly increased ( $P < 0.001$ ) the phagocytic index.

# *The evidence is convincing*



## **Journal Nature Communications:**

Scientists reveal the relationship between sugar and cancer

Flanders Institute for Biotechnology (VIB) news |  
October 18, 2017 <https://www.nature.com/articles/s41467-017-01019-z>

### **Findings:**

Positive correlation between sugar and cancer, which may have far-reaching impacts on tailor-made diets for cancer patients.

## **The Warburg Effect**

Prominent feature of cancer cells -- to use sugar significantly more effectively than normal cells.

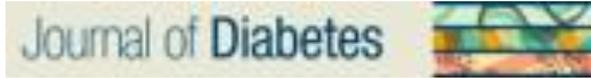
“Our research reveals how the hyperactive sugar consumption of cancerous cells leads to a vicious cycle of continued stimulation of cancer development and growth.

...This link between sugar and cancer has sweeping consequences.”

– Prof. Johan Thevelein (VIB-KU Leuven)

*Nine-year study conducted by VIB, KU Leuven and VUB*

# *The evidence is convincing*



## **Journal of Diabetes:**

Trans fatty acid concentration independently linked to diabetes in US adults

Journal of Diabetes | February, 2018

Liu B, et al. J Diabetes. 2018;doi:10.1111/jdb.12652

## **Findings**

U.S. adults with a diet high in trans fatty acids are **more than 2x** as likely to develop type 2 diabetes than adults with a diet low in trans fatty acids

- **3,801 adults**; mean age of 50
- **No differences** after adjusting for age, race or sex

*National Health and Nutrition Examination Survey*

# *The evidence is convincing*

## **Blueberries and Brain Health:**

Recent studies shows that dietary blueberry improves cognitive performance in mice, and men, and children

Whyte AR, Schafer G, Williams CM. **Cognitive effects following acute wild blueberry supplementation in 7- to 10-year-old children.** Eur J Nutr. 2016;55(6):2151-62.

Eur J Nutr. 2018 Apr;57(3):1169-1180. doi: 10.1007/s00394-017-1400-8. Epub 2017 Mar 10. **Dietary blueberry improves cognition among older adults in a randomized, double-blind, placebo-controlled trial.**

Miller MG<sup>1</sup>, Hamilton DA<sup>2</sup>, Joseph JA<sup>1</sup>, Shukitt-Hale B

“Blueberry treatments have shown positive effects on cognition in both” rats and adult humans. But, do those these “benefits transfer to children”—human children?

How about a randomized, double-blind placebo-controlled study comparing about one cup of blueberries, to two cups, to zero cups. What did they find? “Cognitive performance improvements across all measures,” and the more berries, the better. And, this wasn’t after twelve weeks of eating berries, but within hours of just a single blueberry meal. Sounds like a good breakfast any day our kids are having their exams.

# *The evidence is convincing*

## **Journal of Pathology and Oncology Research:**

New Study shows that adding blueberry extract to radiation therapy can boost treatment outcomes

School of Medicine at the University of Missouri-Columbia  
December 29, 2017  
<https://www.ncbi.nlm.nih.gov/pubmed/28963664>

## **Findings**

Blueberry extract makes cancer cells more sensitive to radiation and also reduces the abnormal cell growth that fuels cancer development.

- Radiation therapy alone = cancer cell reduction by **20%**
- Blueberry extract + radiation therapy = cancer cell reduction by roughly **70%**

The researchers say that further studies are needed, but their findings indicate that blueberries may be a promising treatment strategy for cervical cancer and other cancer types.

*Blueberry extract on human cancer cell lines for their latest study. The extract was tested both alone and in combination with radiation therapy.*

# *The evidence is convincing*

**JAMA** The Journal of the  
American Medical Association

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## **JAMA:**

### Vitamin and mineral supplements

JAMA. Published online February 5, 2018.  
doi:10.1001/jama.2017.2101

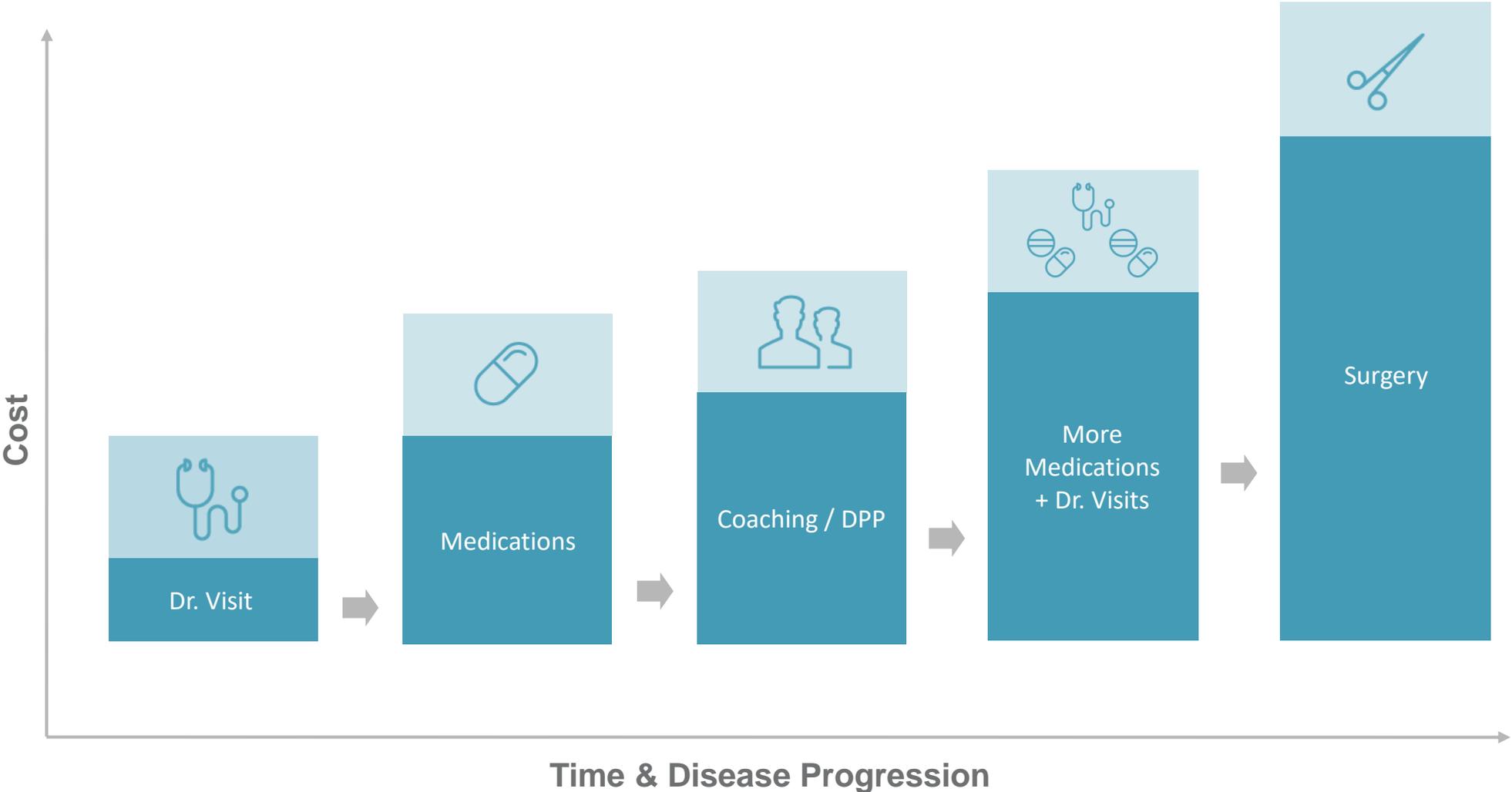
## **Findings**

Vitamin and mineral supplements have not demonstrated clear benefits for primary or secondary prevention of chronic diseases.

Clinicians should counsel their patients that **supplementation is not a substitute for a healthful and balanced diet**, and, in most cases, provides little if any benefit beyond that conferred by a healthy diet.

Some trials suggest that micronutrient supplementation may have harmful effects

# Unfortunately, Food Is Not Part Of The Standard Treatment Progression Today



# Healthcare leaders are implementing food as medicine programs

## Geisinger Health System - Fresh Food Farmacy

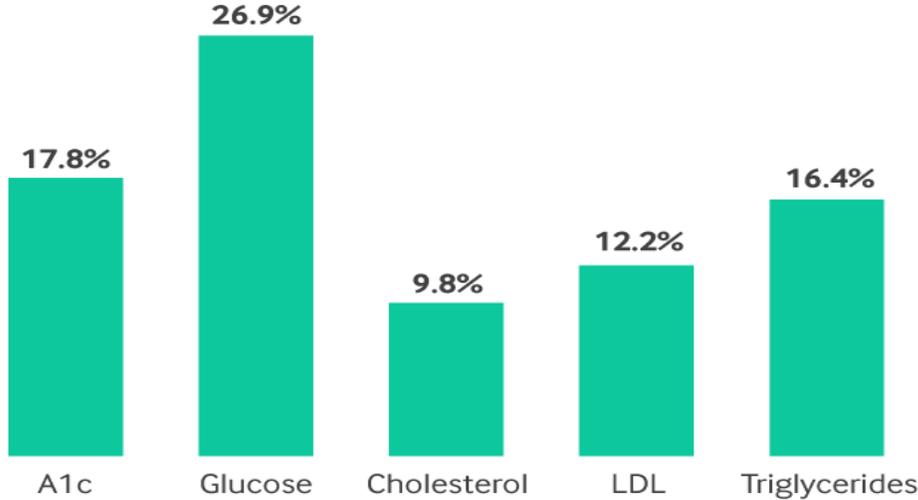
Patients who are identified as having HBA1C levels greater than 8 and as being food insecure are given a referral by their primary care physician for the Fresh Food Farmacy. Once enrolled, they have access to at least 10 fresh and healthy meals per week and are provided with diabetes education and consultations with dietitians and pharmacists.

**80%**  
Drop in costs seen in pilot program over 18 months

### Biometric Outcomes for Fresh Food Farmacy Enrollees

Patients included below are those who enrolled and received food as part of the Fresh Food Farmacy program AND had both a baseline and follow-up reading for the applicable biometric.

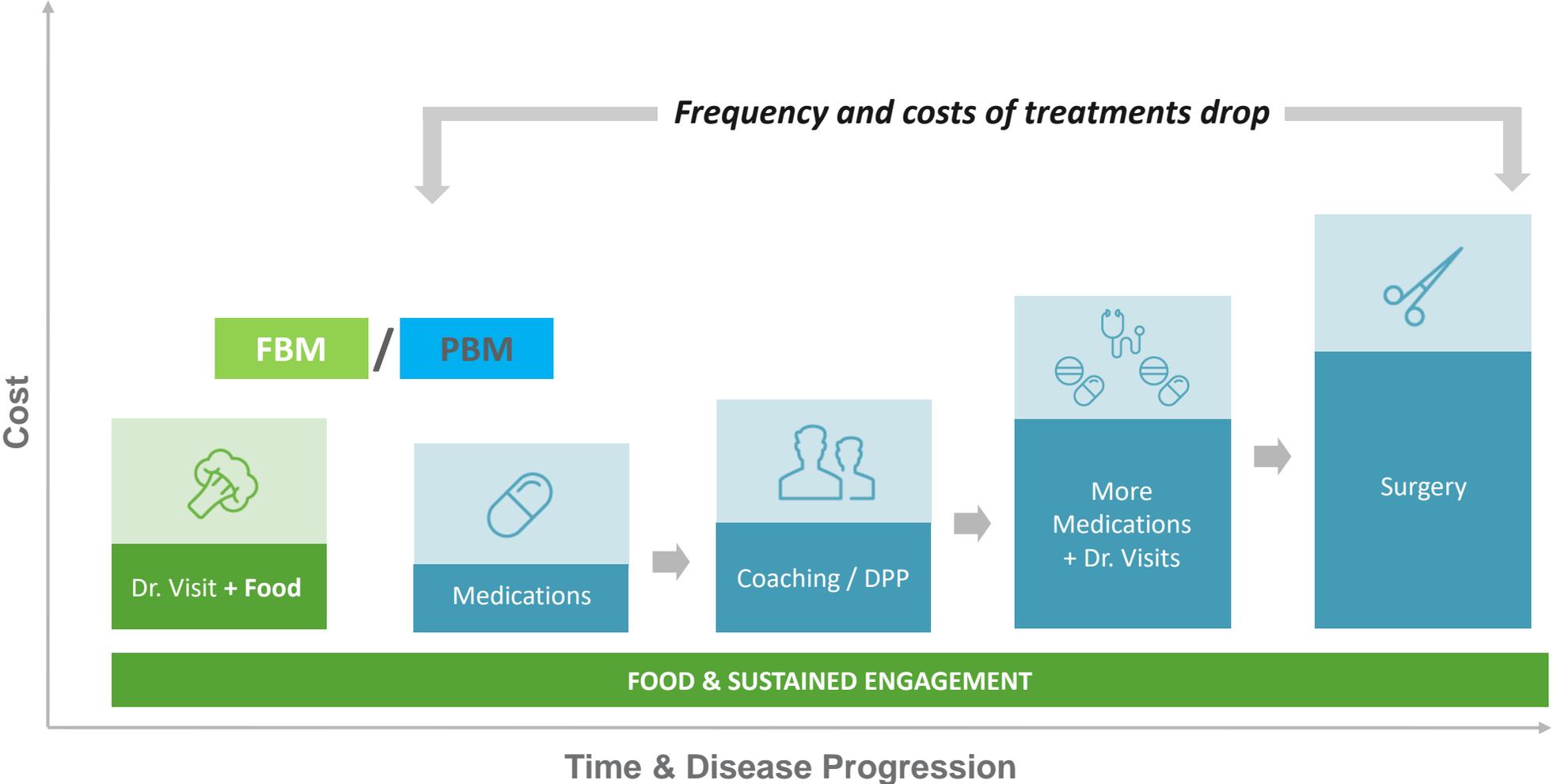
Percent Decrease from Baseline to Current by Measure



Baseline Reading- biometric value at time of enrolled in FFF  
Current Reading- most recent biometric value  
Data as of 3/01/2018

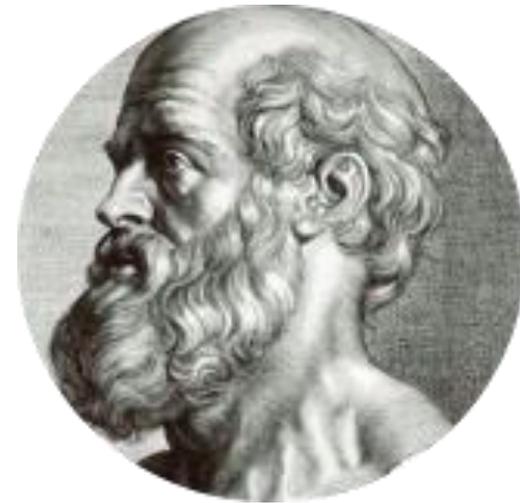
Source: Authors and Geisinger Clinical Informatics  
NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

# Zipongo FoodScripts Provides The Tools To Make Food As Medicine Real





***“Let food be thy  
medicine...”***



**Hippocrates**  
-The Father of Medicine-  
460 BC – 370 BC

**What about our ongoing battle  
to win the fight of Obesity???**

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**How are we doing?**



Population Health Solutions

## *Healthier Indiana*

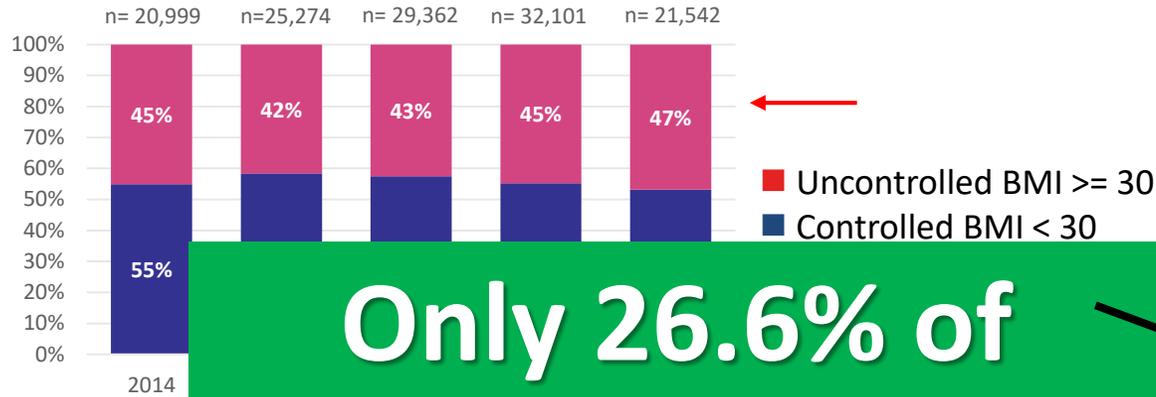
August 2018 Population Health Report  
Data through June 2018

Includes data for: 33 employers located in Indiana.

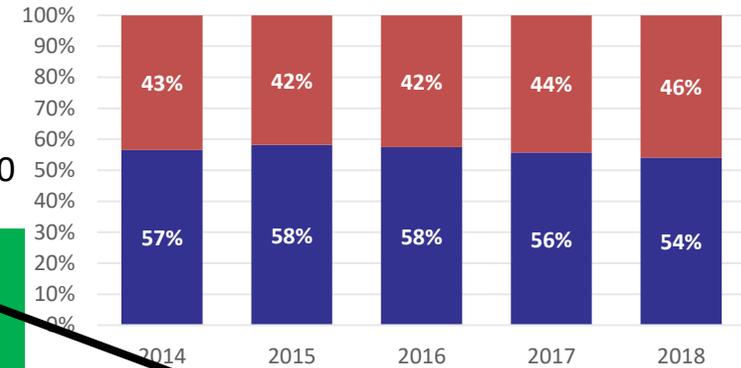


# Biometric Risk - BMI

Indiana Area

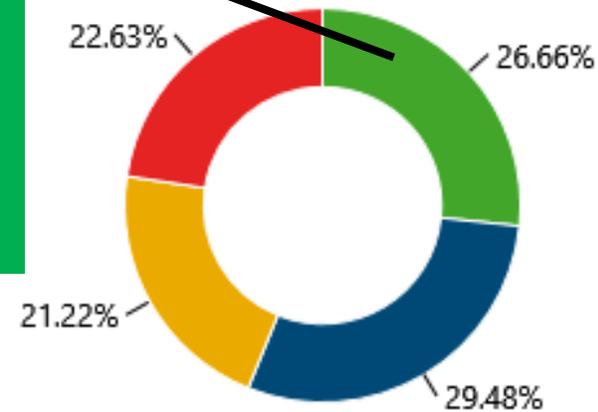


Vital Incite Benchmark



**Only 26.6% of employees are of normal weight**

	2014	2015	2016	2017	2018
Healthy in 2017 (3477)					
Overweight in 2017 (4150)					
Obese in 2017 (3195)					
Morbidly Obese in 2017 (3746)	18	43	338	3,347	
2018 Total	3,388	4,149	3,233	3,798	



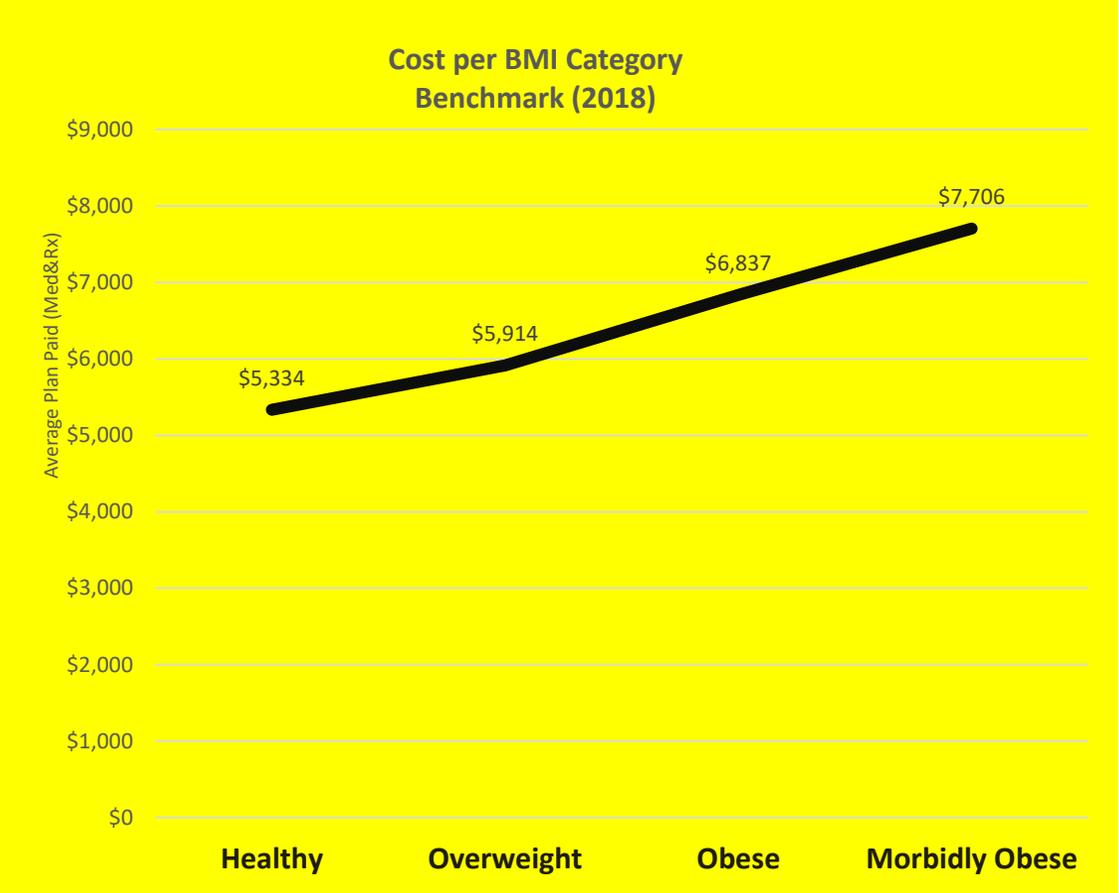
12% of those with a BMI >=30 in 2017 have improved their BMI category in 2018.

Healthy	< 25
Overweight	25.0 – 29.9
Obese	30 – 34.9
Morbidly Obese	35 +

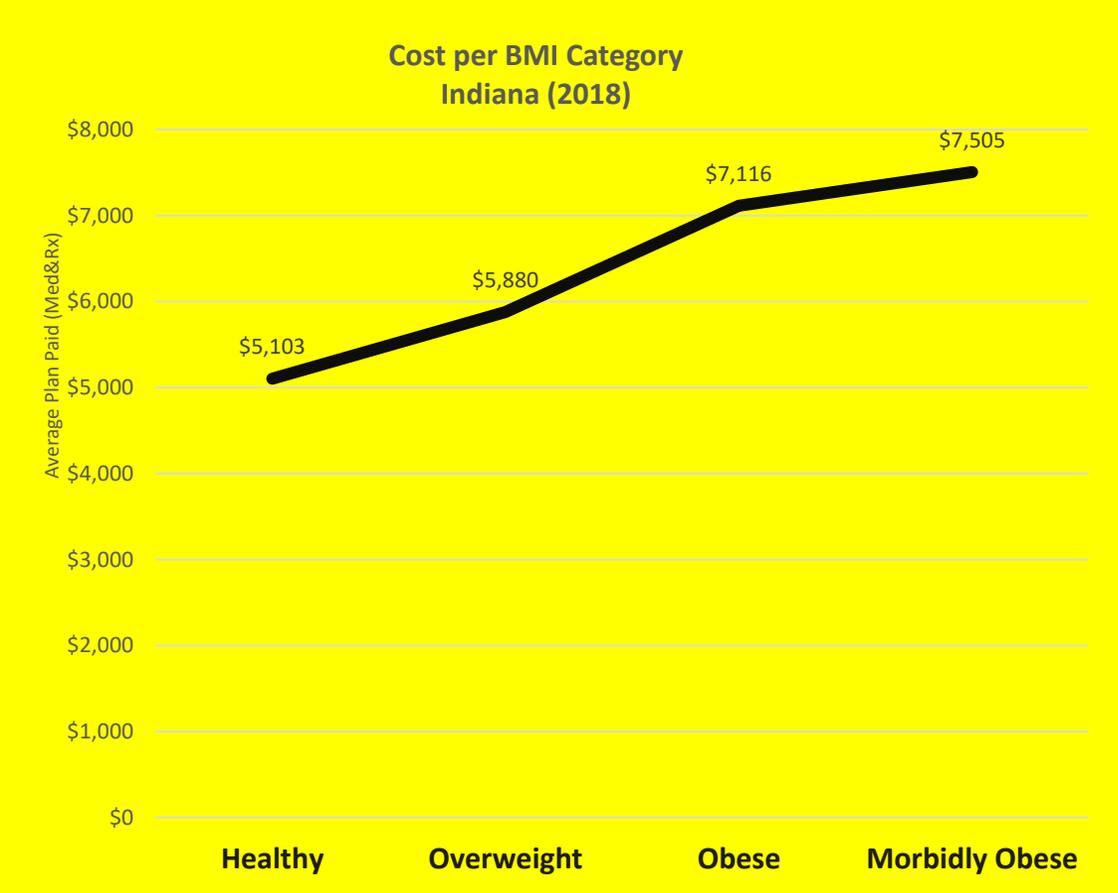
HEALTHY: 15,557  
OVERWEIGHT: 17,202  
OBESSE: 12,383  
MORBIDLY OBESSE: 13,205

Data represents the individuals with a biometric in 2017 and the current risk period (7/1/2017-6/30/2018)

# Cost – BMI Correlation (2018)



Benchmark



Indiana Area

We have proved the following...

**WE ARE GETTING FATTER!!!**

**Peano's Existence Theorem.** Instead of proving non-negativity and boundedness of solutions directly, we will identify a positively invariant set  $X$  of System 1. The set is such that if the initial conditions lie in  $X$ , then so do the corresponding solutions, which must then be non-negative and bounded because of the structure of the set  $X$ .

This shows that  $(S(t^{\sim}), E(t^{\sim}), I_1(t^{\sim}), I_2(t^{\sim}), I_3(t^{\sim})) \in \mathbb{R}_+^5$  for  $t < t^{\sim} < t + \delta$  for some  $\delta > 0$ .

At the same time,  $\Sigma(t) = S(t) + E(t) + I_1(t) + I_2(t) + I_3(t)$  gives  $\Sigma'(t) = (D + \rho R)(N - \Sigma(t)) - \rho I_1(t)$ . If  $(S(t), E(t), I_1(t), I_2(t), I_3(t)) \in X$  and  $D \leq D_0$ , then  $\Sigma'(t) \leq (D + \rho R)N - (D + \rho R)\Sigma(t)$ .

Solving this differential inequality for  $t^{\sim} \geq t$  yields  $\Sigma(t^{\sim}) \leq \Sigma(t)e^{-(D+\rho R)(t^{\sim}-t)} + N(1 - e^{-(D+\rho R)(t^{\sim}-t)})$

From here we can see that  $\Sigma(t) \leq N$  implies  $\Sigma(t^{\sim}) \leq N$ . Thus,  $(S(t), E(t), I_1(t), I_2(t), I_3(t)) \in X$  implies that  $(S(t^{\sim}), E(t^{\sim}), I_1(t^{\sim}), I_2(t^{\sim}), I_3(t^{\sim})) \in X$  for  $t < t^{\sim} < t + \delta$  for some  $\delta > 0$ . Consequently,  $X$  is a positively (also forward) invariant set.

**What's the  
Definition of  
Insanity????**

# Traditional Approaches to Weight Control

- **Increasing Daily physical Activity?**
- **Portion Control?**
- **Mediterranean Diet?**
- **Low fat diet?**
- **Low Carb diet?**
- **Competitive Challenges?**

# Current strategies for managing diet fall short

Trying Hard, but **FAILING!**



90%

Of people who lose weight on diets **gain it back and more**

Branded diet programs, weight-loss drugs, and other wellness programs all work – *but only temporarily*

Seamless Lifestyle and Environmental changes are required to achieve and sustain outcomes

# 6 Years after *The Biggest Loser*, Metabolism Is Slower and Weight Is Back Up

*The work provides new insights into why it is difficult to keep off the pounds*

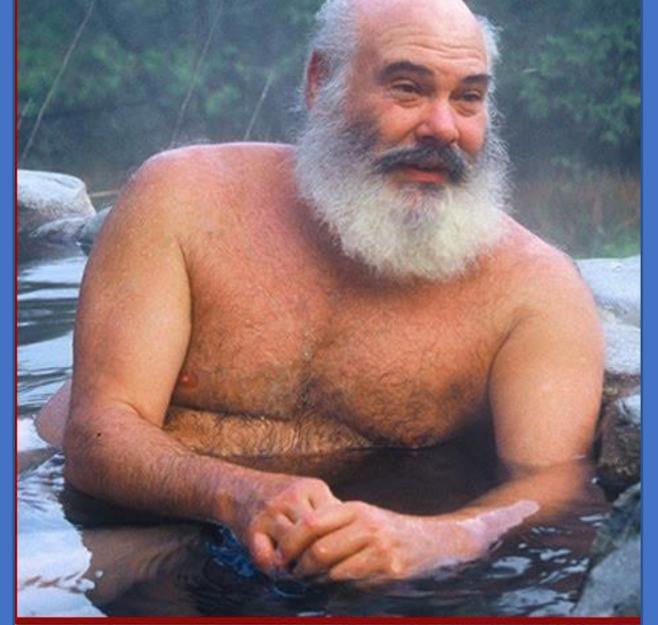
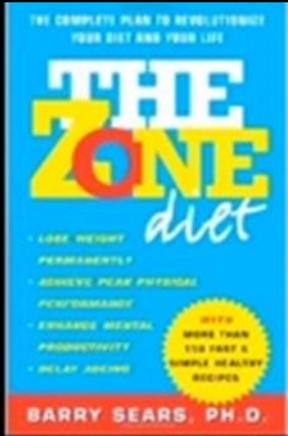


Six years later, when the six men and eight women went to the National Institutes of Health for follow-up measurements, their weight, on average, was back up to 290 pounds. Only one participant hadn't regained any weight - and on top of that, their metabolism had slowed and they were burning fewer calories every day than they did before their stint on the show.

The group as a whole on average burned 2,607 calories per day at rest before the competition, which dropped to about 2,000 calories per day at the end.

The only weight loss method that seems to avoid metabolic pitfalls is gastric bypass surgery. People who undergo Roux-en-Y gastric bypass surgery experience a similar dip in metabolic rate along with massive weight loss at the six month point, but after one year they have the expected metabolic rate for their size, rather than the much reduced rate of Biggest Loser contestants.

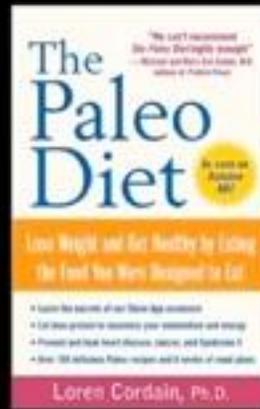


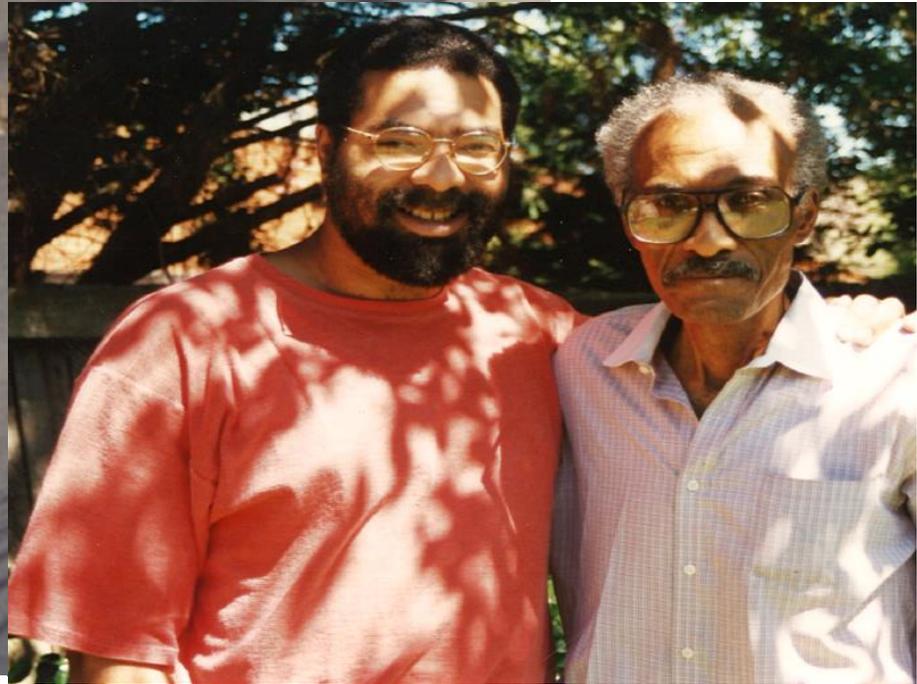


Professor John Funder  
Chief of Obesity Australia  
Commission.

Says carbs make you  
fat and give you diabetes.

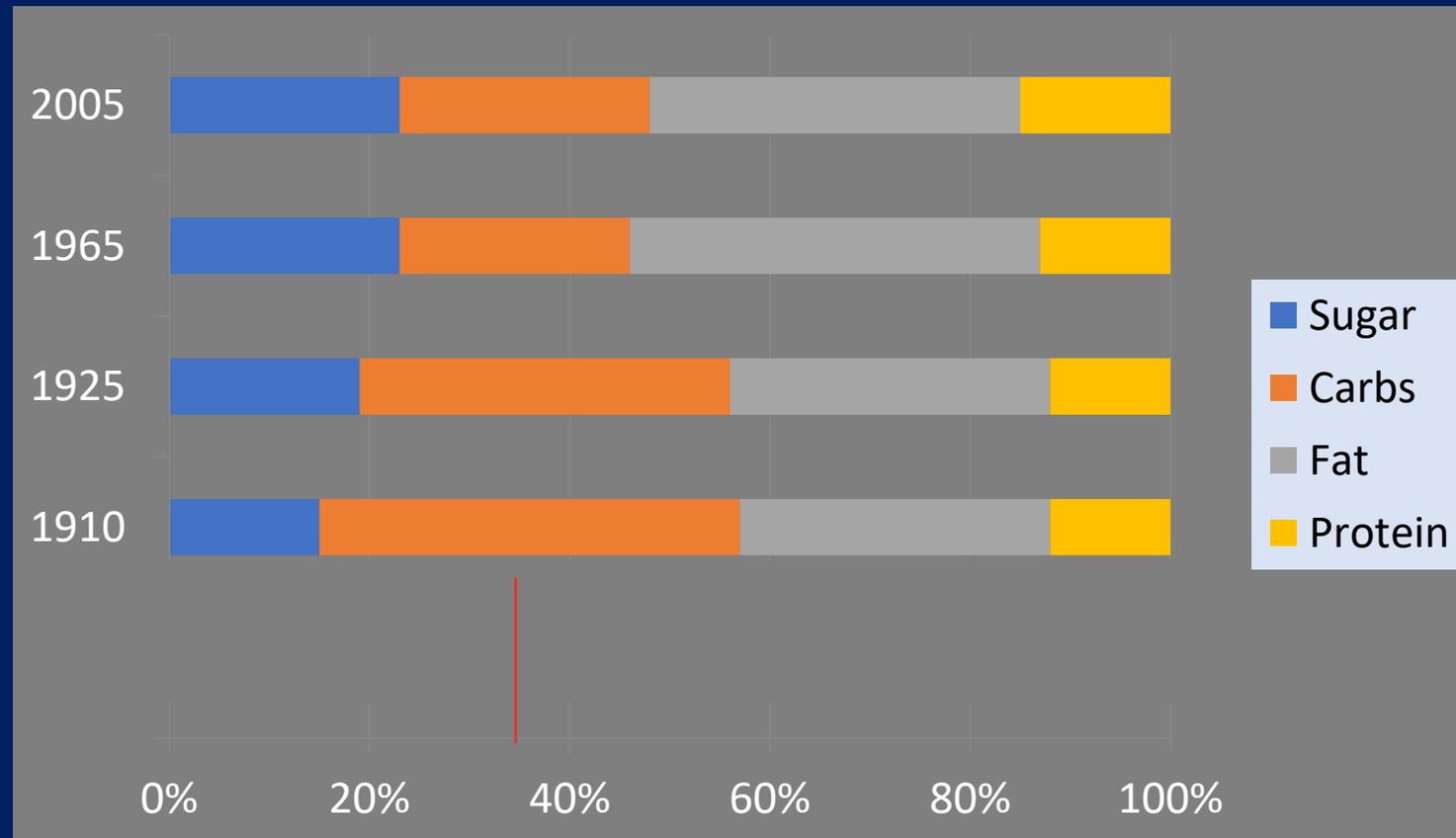
Never cured anyone of  
obesity or diabetes.





Today we are consuming *fewer* carbs than we did at the turn of the century, yet obesity was NOT a problem

## Dietary Trends % Calories



Source: USDA

# How Our Diet Has Changed



Less Red meat



More poultry  
More seafood



Much More Fat 61%

- Added Fat—220%
- Vegetable Oils—225%
- Cheese —300%
- Mozzarella —800%

**20% more calories!!**

Source: USDA

# Successful Weight Loss: The Evidence and the Science are Absolutely Clear

**Don't EAT!!!**

**Just Do It!!!**

# The Definition of Insanity when it comes to Obesity

- **Obesity – Too much Focus on Weight Loss**
  - Relying too heavily on “will-power”

***Focusing on Weight Loss is a failed Strategy  
for achieving sustained weight loss!!***

***Why not try some thing different?***

# Weight management is complicated and Success requires a comprehensive approach

1. Physical Activity (MR and Muscle Mass)
2. Diet (calories and glycemic load)

---
3. Microbiome
4. Chronic Stress (cortisol)
5. Sleep (effect on Leptin and Ghrelin, and IR)
6. Medications (up to 10%; antibiotics)
7. Eating Frequency (intermittent fasting; 16:8, 5:2, EOD)

---
8. Resiliency
9. Social Determinants

**Traditional Approach**  
(Calories in/Calories out)

**Additional elements of a Comprehensive Approach**

# Weight management is complicated and Success requires a comprehensive approach

1. Physical Activity (MR and Muscle Mass)

**2. Diet** (Calorie Density / Glycemic Load)

**3. Microbiome**

4. Chronic Stress (cortisol)

5. Sleep (effect on Leptin and Ghrelin, and IR)

6. Medications (up to 10%; antibiotics)

7. Eating Frequency

8. Resiliency

9. Social Determinants

# Calorie Density

Food Category

Calories/#

Fruits

100

Vegetables

300

Whole Grains

500

Beans/Legumes

600

**Fiber  
Rich**

**Nutrient  
Rich**

Animal Protein

1000

Refined Grains

1400

Processed Foods/Junk Foods

2300

Nuts and Seeds

2800

Oils and Fats

4000



# Major Phytochemical Groups

## Nutritional Density

Class/Compound	Source	Benefits
<p><b><i>Carotenoids</i></b></p> <ul style="list-style-type: none"> <li>•Beta-carotene</li> <li>•Lutein</li> <li>•Lycopene</li> </ul>	<ul style="list-style-type: none"> <li>•carrots, various fruits</li> <li>•kale, collards, spinach, corn, citrus</li> <li>•tomatoes</li> </ul>	<ul style="list-style-type: none"> <li>• neutralizes free radicals which damage cells; bolsters cellular antioxidant defenses</li> <li>• contribute to healthy vision</li> <li>• promotes prostate health</li> </ul>
<p><b><i>Flavonoids</i></b></p> <ul style="list-style-type: none"> <li>•Anthocyanidins</li> <li>•Flavanols—Catechins, Epicatechins, &amp; Procyanidins</li> <li>•Flavanones</li> <li>•Flavonols</li> <li>•Proanthocyanidins</li> </ul>	<ul style="list-style-type: none"> <li>•berries, cherries, red grapes</li> <li>•tea, cocoa, chocolate, apples, grapes</li> <li>•citrus foods</li> <li>•onions, apples, tea, broccoli</li> <li>•cranberries, cocoa, apples, strawberries, grapes, wine, peanuts, cinnamon</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of brain health</li> <li>• Maintenance of heart health</li> <li>• Maintenance of urinary tract health</li> </ul>
<p><b><i>Isothiocyanates</i></b></p> <p>Sulforaphane</p>	<ul style="list-style-type: none"> <li>• cauliflower, broccoli, brussels sprouts, cabbage, kale, horseradish</li> </ul>	<ul style="list-style-type: none"> <li>• neutralizes free radicals which damage cells; bolsters cellular antioxidant defenses</li> </ul>
<p><b><i>Phenols</i></b></p> <p>Caffeic acid, Ferulic acid</p>	<ul style="list-style-type: none"> <li>• Apples, pears, citrus fruits, some vegetables</li> </ul>	
<p><b><i>Sulfides/Thiols</i></b></p> <ul style="list-style-type: none"> <li>• Diallyl sulfide, Allyl methyl trisulfide</li> <li>• dithiolthiones</li> </ul>	<ul style="list-style-type: none"> <li>• Garlic, onions, leeks, scallions</li> <li>• Cruciferous vegetables, collards, bok choy</li> </ul>	<ul style="list-style-type: none"> <li>• Enhance detoxification and promote healthy immune function and repair</li> </ul>

## 2.5 lbs. of food per day = Satiety

- **Aver. diet of 550 calories/#** = 1375 cal./2.5 lbs.
- **Aver. diet of 1000 calories/#** = 2500 cal./2.5 lbs.

- ✓ **Water**
- ✓ **Fiber**
- ✓ **Bulk**

<u>Food Category</u>	<u>Calories/#</u>
Fruits / Vegetables	100-300
Whole Grains	500
Beans/Legumes	600
Animal Protein	1000
Refined Grains	1400
Processed Foods/Junk Foods	2300
Nuts and Seeds	2800
Oils and Fats	4000

# Fabulous Fiber

- Creates bulk
- Lowers cholesterol
- Stabilizes blood sugar
- Feeds our Gut Microbiome

- |                                 |                         |
|---------------------------------|-------------------------|
| • Glass of Orange Juice (8 oz.) | 120 calories / 0g fiber |
| • 2 whole oranges               | 124 calories/ 7g fiber  |

## Soluble fiber, exercise fight visceral fat, study says

Soluble fiber found in fruits, vegetables and beans may help people lose visceral fat that wraps around internal organs and is linked to chronic disease.

For each 10-gram increase in soluble fiber consumed daily, visceral fat dropped by 3.7% over five years and adding in moderate exercise increased that to 7.4%.

[HealthDay News](#) (07/01/11)

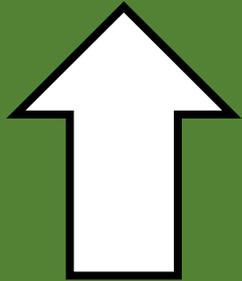
# ***The Gut Microbiome***

- **Why is this important**
- **What does this mean**

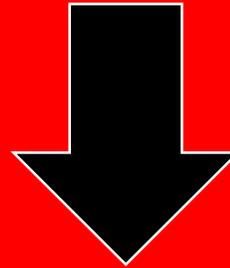
# The Gut Microbiome and Why It's Important

- The human microbiome is a community of over 100 trillion microbes (bacteria, viruses and fungi); the majority are located in the gut
- The microbiome is dynamic and changes
- When out-of-balance leads to disease – “dysbiosis”
- Plays an important role in controlling body mechanisms: metabolism, resistance to infection and inflammation, prevention against autoimmunity as well as an effect on the gut–brain axis.
- High diversity is a predictor of better health
- People consuming a high fiber diet had higher diversity in gut microbiome
- People who took probiotics, ironically had a lower diversity of biome
- Use of antibiotics had a lower diversity of biome, which is associated with worse responsiveness and lower diversity
- Microbiome is a predictor of whether a person can maintain a healthy weight
- Obese people have lower diversity and more
- Microbiota transfer caused condition transfer amongst mice
- Microbiota transfer in mice also resulted in weight loss or gain

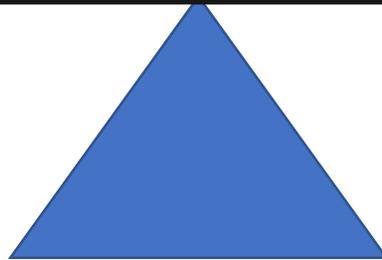
# Gut Microbiome “neighborhood”



**Good Microbes**



**Bad Microbes**

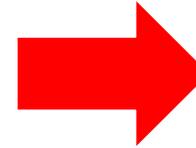


Lifestyle  
& Diet

Early  
Colonization  
and Childhood  
Exposures

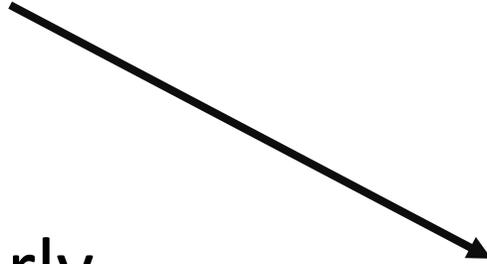
Medical  
Practices

**“Dysbiosis”**  
Alterations in  
Gut Microbiota  
Results in  
Disease



- Reduced Immunological Tolerance and Dysregulated Immune Response
- Production of proinflammatory metabolites
- Reduced Insulin Sensitivity
- Altered Bile Acid Metabolism
- Altered Mucosal Barrier – Leaky gut
- Increased Pathogenic Strains and more Bacterial Toxins

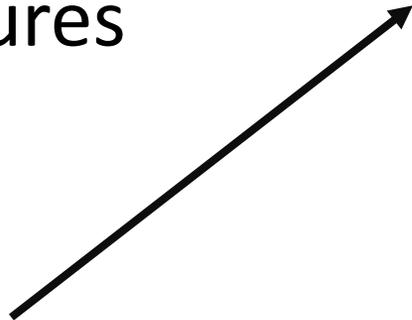
Diet &  
Lifestyle



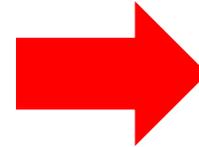
Early  
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**“Dysbiosis”**  
Alterations in  
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Disease



**OBESITY**

The microbiome is a  
predictor of whether a  
person can maintain a  
healthy weight

# Factors Related to Body Weight and Adiposity

Diet: Disrupted Gut Microbiome (Firmicutes/Bacteroides Imbalance)

*90% of your microbiome is made up of two phylum's, the **Firmicutes**, and the **Bacteroides**. There is a lot of research going into these two bacteria because the more we learn about gut health, the more links there are to obesity and disease epidemics. Within Western culture it seems obesity is becoming more common, and evolution has shown that its not our genes changing as this takes a very long time, however it is our lifestyles that are changing which is affecting our out flora.*

The microbiota in obese subjects shows an elevated proportion of *Firmicutes* and a reduced population of *Bacteroides*. Conversely, a decreased *Firmicutes/Bacteroidetes* ratio has been directly related to weight loss.

Ley RE, Turnbaugh P, Klein S, Gordon JI: Microbial ecology: human gut microbes associated with obesity. *Nature*. 2006, 444: 1022-1023. 10.1038/4441022a

# How can we improve the Firmicutes/Bacteroidetes ratio?

## Good Microbes

- Fiber
- Inulin
- Polyphenols

## Bad Microbes

- Fat
- Sugar

The class of phytonutrients, called polyphenols, do two things: they preferentially feed Bacteroidetes, while at the same time suppressing the growth of Firmicutes.

The weight-lowering properties of fruits, green tea, and wine vinegar in obese people may be partly related to the polyphenol content of them— which consequently changes the gut flora, which may consequently alter the balance between the two groups of Bacteroidetes and the Firmicutes bacteria, in the favor of Bacteroidetes

# Fiber Content of Foods

**New Strategy:  
Counting Fiber vs. Carbs**

Food Item	Fiber (g/kg)
Blueberries	15.2
Brussels Sprouts	13.5
Oat Flakes	13.5
Pumpkin	12.0
Cooked Carrot	9.6
Brown Rice	8.1
Swiss Chard	6.8
Lettuce	6.3
Cucumber	5.7
Applesauce	5.3

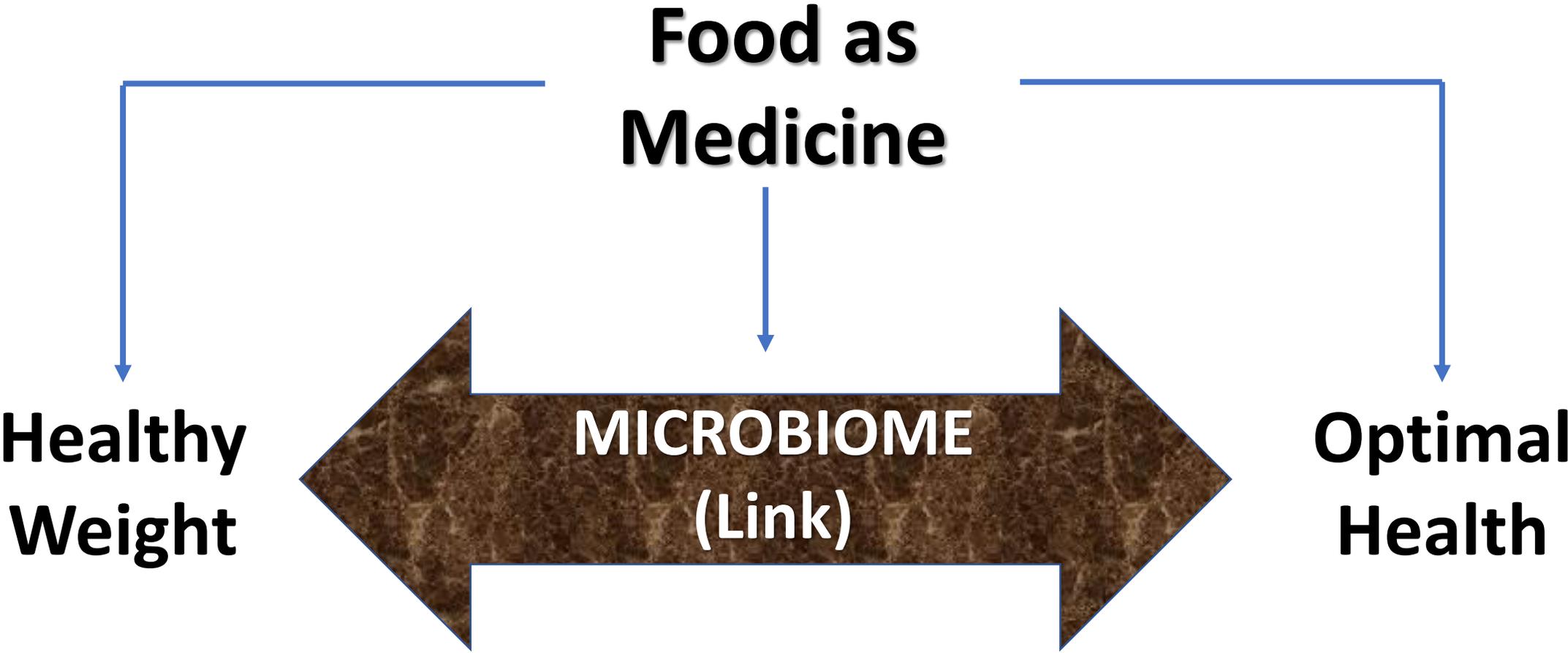
Food Item	Fiber (g/kg)
Ground Beef	0
Sirloin Steak	0
Lamb Chops	0
Pork Chops	0
Chicken	0
Ocean Perch	0
Salmon	0
Cheddar Cheese	0
Whole Milk	0
Eggs	0

**The American  
College of  
Lifestyle  
Medicine  
(ACLM)  
Recommends a  
Minimum of 40  
grams of Fiber  
Daily**

# Key Take-Aways

- **Eat Whole Foods (unprocessed)**
- **Eat more vegetables and fruit (fiber-rich foods); count daily fiber**
- **Eat to improve glycemic control – complex carbs; whole grains and legumes (lentils, peas, peanuts, alfalfa, clover, beans, garbanzos)**
- **Eat more high quality fats – unrefined fats and oils; seeds and nuts**
- **Avoid processed sugar, high fructose corn syrup, artificial sweeteners**
- **Eat more prebiotic foods and probiotic foods**
- **Avoid the Medicine Cabinet**
- **Don't be a germaphobe, especially with children**

# The Best Diet for Optimal Health is also the Best Diet for maintaining a healthy weight





Now is the time to invest in nutrition.



A top-down view of various fresh ingredients including a red onion, tomatoes, garlic, herbs, and spices on a dark wooden surface. The ingredients are arranged around a central green banner with the text "THANK YOU!".

THANK YOU !

# Food Matters

## You are what you eat

*"Health is not luck. We have an innate ability to maintain good health if we establish the optimal environment for healing."*

Joel Fuhrman, MD

### Repair and Renewal

# Prebiotic Rich Foods

## *“Soluble Fiber / Resistant Starch”*

Artichokes

Onions / Chives / Leeks

Chicory

Garlic

Leeks

Bananas

Fruit

Soybeans

Asparagus

Jicama

Sea Vegetables

Algae

Peas

Legumes --

Eggplant

Honey

Green Tea

Yogurt / Kefir

Mushrooms

Cocoa

Radishes

# Probiotic Rich Foods

## *“Fermented Anything”*

Yogurt/Kefir

Miso

Natto

Tempeh

Sauerkraut

Kim Chee

Raw Pickles

Root and Ginger Beers

Olives

Pulke

Kombucha

Fermented Vegetables

Buttermilk

Raw Whey

Raw Vinegars

Sourdough

Beer

Wine

# Dietary Polyphenols

## *Colorful Foods... eat a rainbow*

- Have a huge effect on the microbiome
- Promote the growth of Probiotics microbes
- Lactobacilli and Bifidobacteria break them down into SCFA...main source for the colon energy and repair

## Herbs and Spices

- Stimulate enzymatic reactions and help break down sugars

Green Tea  
Red Wine  
Apples  
Onions  
Legumes  
Chocolate  
Panax ginseng

Capsaicin  
Coriander  
Curcumin / Cumin  
Fennel  
Ginger