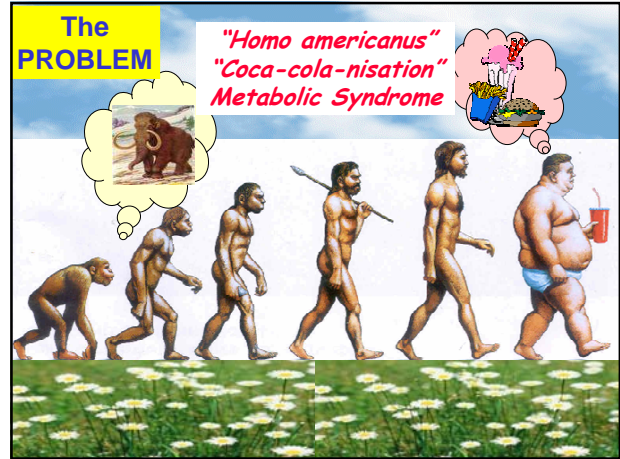


 **Mediterranean Diet - including citrus fruits - & Obesity**
Elliot M Berry MD, FRCP
*Head, Dept of Human Nutrition & Metabolism
 Braun School of Public Health
 Hebrew University-Hadassah Medical School,
 Jerusalem, Israel*
Director, WHO Collaborating Center in Capacity building

Citrus & Health: Wholesome Citrus for European Consumers
Valencia, March 2010

The Joseph H. and Belle R. Braun Hebrew University-Hadassah School of Public Health and Community Medicine

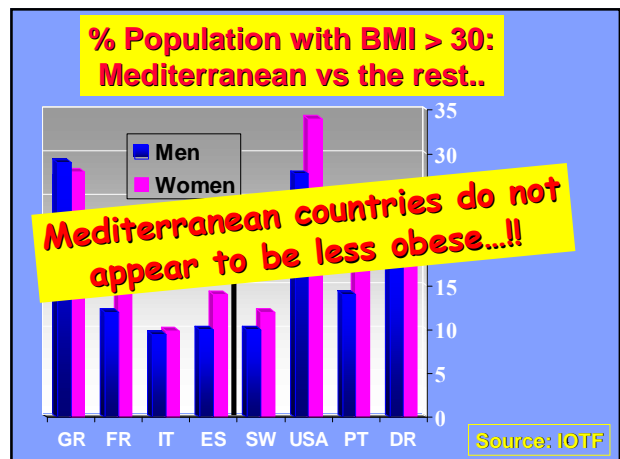
בית הספר לבריאות הציבור ורפואה קהילתית של האוניברסיטה העברית-הדסה ע"ש יוסף ובלה בראון

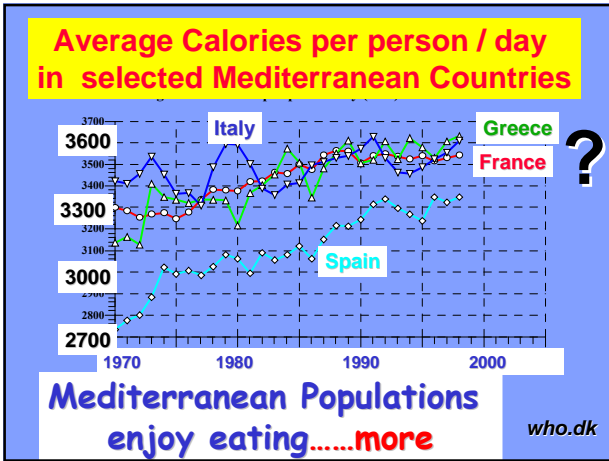


Mediterranean Diet & Obesity: 5 Qs ?

1. Does Mediterranean Diet "protect" against Obesity?
2. Does the Mediterranean Diet help weight loss?
3. Does the Mediterranean Diet help compliance and disease risk?
4. How do the Mediterranean countries fare on the Nutrition Index?
5. What is the way to make the Mediterranean diet more acceptable - Positive Deviance?

CAUTION: HAZARDOUS WAIST

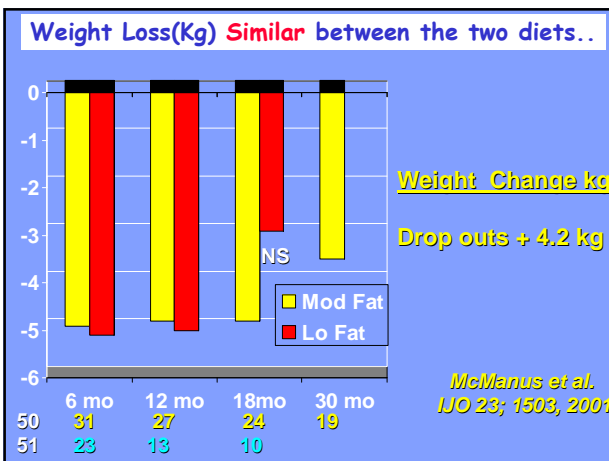





RCT of Moderate Fat vs Low Fat diets in Obesity
McManus et al. IJO 23; 1503, 2001

	Moderate Fat 50	Lo-Fat 61
Energy kcal	1200-1500	1200-1500
% FAT	35	20
SFA %	5	5
MFA %	15-20	15-20
% Carbohyd	45-50	60-65
Cholesterol mg	< 200	< 200
Fiber g	25	25

"Mediterranean style" diet



Comparison of weight loss Diets with different compositions of Fat, Protein and Carbohydrates

THE ULTIMATE STUDY!!!!

811 Overweight subjects 2 years follow up

Weight Loss @ 2 years - kg	Lo	High
Lo Prot 15% vs Hi Prot 25%	3.0	3.6
Lo Fat 20% – Hi Fat 40%	3.3	3.3
Lo CHO 35% – Hi CHO 65%	3.4	2.9

p > 0.2 for comparisons: No Significant Differences!!

- Compliance, satiety, hunger and satisfaction

NO DIFFERENCES

- 80% completed av -4.0 kg, ~15% lost at least 10% of weight
- Lipids and fasting insulin improved irrespective of diets

Sacks et al. NEJM 360: 859, 2009

Comparison of weight loss Diets with different compositions of Fat, Protein and Carbohydrates



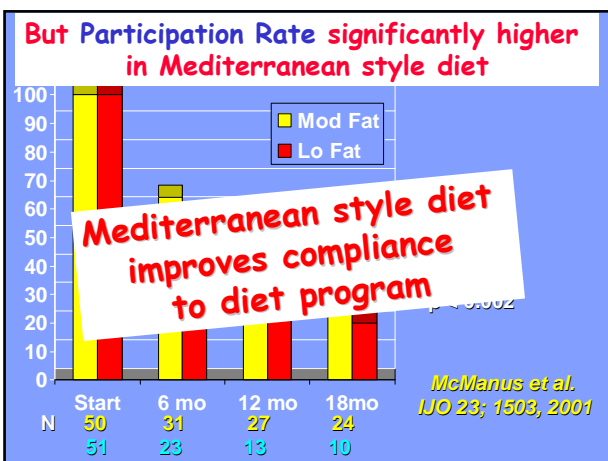
ght subjects 2 year

Conclusions:
"Reduced-calorie diets result in clinically meaningful weight loss regardless of which macronutrients they emphasize"

My Conclusions – for weight loss
A calorie is a calorie is a calorie.....
Quantity is more important than Quality
"We have seen the enemy and it is Us"

Mediterranean Diet & Obesity: 5 Qs ?

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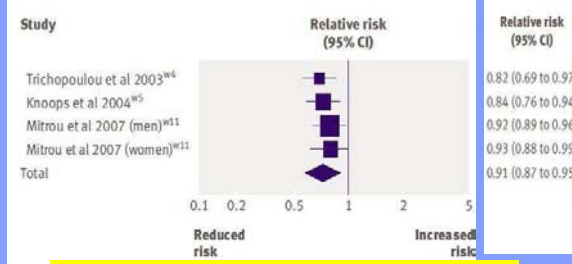



Adherence to Mediterranean diet decreases risk of Diabetes Type 2

Adherence Level	No in group	Unadjusted cumulative incidence of type 2 diabetes (%)
Low (score 0-2)	2253	0.40 X 3
Moderate (score 3-6)	9604	0.23
High (score 7-9)	1523	0.13

M A Martinez-Gonzalez et al. Adherence to Mediterranean diet & risk of developing Diabetes: prospective cohort study. BMJ 2008;336;1348

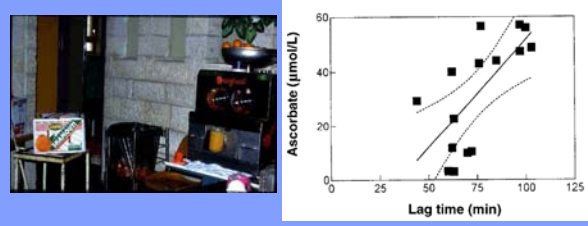
**2 point Increase in Mediterranean score
Decreased Cardiovascular Mortality by 9%**



So also for all-cause mortality, cancer, Alzheimer and Parkinson's disease...

Sofi F. et. al, Adherence to Mediterranean diet and health status: meta-analysis. *BMJ*. 2008;337:1344

Citrus fruit supplementation reduces lipoprotein oxidation in young men ingesting a diet high in saturated fat: presumptive evidence for an interaction between vitamins C & E *in vivo*



Correlation between plasma ascorbate & lag time for in vitro LDL oxidation
 $r = 0.735$ ($p < 0.0012$)

Harats et al. *Am J Clin Nutr*. 1998, 67: 240

Multivitamin supplements have NOT been shown to reduce cardiovascular disease or mortality....



or



And according to the World Health Report 2002, low fruit & vegetable intake is estimated to cause about **31% of cardiovascular disease & 11% of stroke, worldwide....**

Mediterranean Diet & Obesity: 5 Qs ?

1. Does Mediterranean Diet "protect" against Obesity?
2. Does the Mediterranean Diet help weight loss?
3. Does the Mediterranean Diet help Compliance?
4. How do the Mediterranean countries fare on the Global Nutrition Index?
5. What is the way to make the Mediterranean diet more acceptable - Positive Deviance?

CAUTION: HAZARDOUS WAIST



Global Nutrition Index

- **Nutrient Deficits**
DALYs lost per 100,000 due to nutritional deficits (Global Burden of Disease Group)
- **Nutrient Excess**
Obesity - % women obese, aged 15-100 (WHO, age-standardized)
- **Food Security**
% of population undernourished (FAO)
- **Weightings one-third for each**

Rosenbloom JI, Nitzan-Kaluski D, and Berry EM.
A Global Nutrition Index. Food & Nutrition Bulletin 29; 266, 2008

Global Nutrition Index: Developed Countries (Partial listing)

Rank	Country	GNI	Rank	Country	GNI
1	Japan	0.987	17	Germany	0.830
2	France	0.942	18	Iceland	0.811
3	Denmark	0.936	19	Australia	0.806
5	Ireland	0.924	20	UK	0.800
6	Belgium	0.920	21	Israel	0.798
7	Sweden	0.911	22	Greece	0.796
8	Netherlands	0.905	26	New Zealand	0.751
9	Italy	0.894	27	Canada	0.736
10	Spain	0.869	28	Malta	0.720
13	Finland	0.855	29	Singapore	0.685
14	Switzerland	0.848	30	Cyprus	0.678
15	Austria	0.836	31	United States	0.570

Germany: \$500 (!!!)



Rank	Group	Country	Deficiency	Obesity	Security	GNIg
24	1	Germany	82	20.4	2.5	0.909

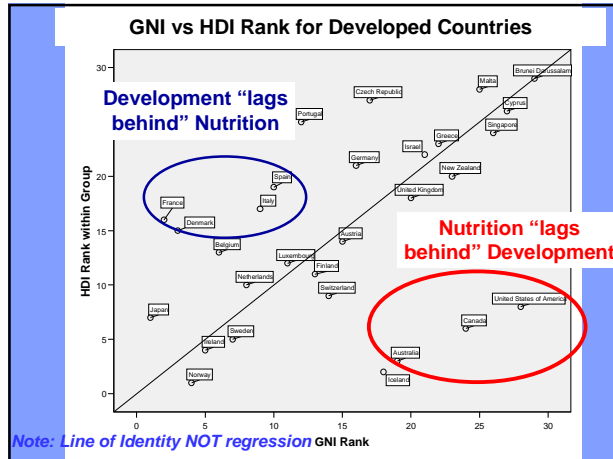
Italy: € 214 (\$260)



Rank	Group	Country	Deficiency	Obesity	Security	GNIg
11	1	Italy	83	12.6	2.5	0.942

Human Development Index (HDI)	Global Nutrition Index (GNI)
<ul style="list-style-type: none"> Life Expectancy Education GDP 	<ul style="list-style-type: none"> Nutrient Deficits Nutrient Excess Food Security

Weightings one-third for each



Mediterranean Diet & Obesity: 5 Qs ?

- Does Mediterranean Diet "protect" against Obesity?
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The Power of Positive Deviance (PD)

Solutions before our very eyes!!

The Premise:

In every community there are certain individuals whose uncommon practices/behaviors enable them to find better solutions to problems than their neighbors who have access to the same resources


The Key Question?

What enables these individuals ("Positive Deviants") to find the better solutions???

Marsh et al. BMJ 329, 1177, 2004

Malnutrition in Vietnam

PD Inquiry (PDI)
How are some children well – nourished?????

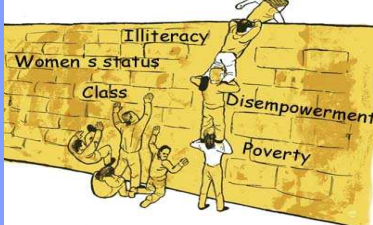


PD Behaviors
Behaviors
Behaviors
Accessible to All

Gathering vegetables	
“Stealing”	“TBU”
Money from outside	“TBU”
“Choosing” your parents	“TBU”
Breast feeding etc	


PD Enables us to Act TODAY

Although most problems have complex, underlying causes



Positive Deviants enables finding successful solutions TODAY before all the underlying causes are addressed!

PD Focus on Practice Rather than Knowledge



“It’s easier to **ACT** your way into a new way of THINKING, than to THINK your way into a new way of ACTING”

The road to Positive Deviance

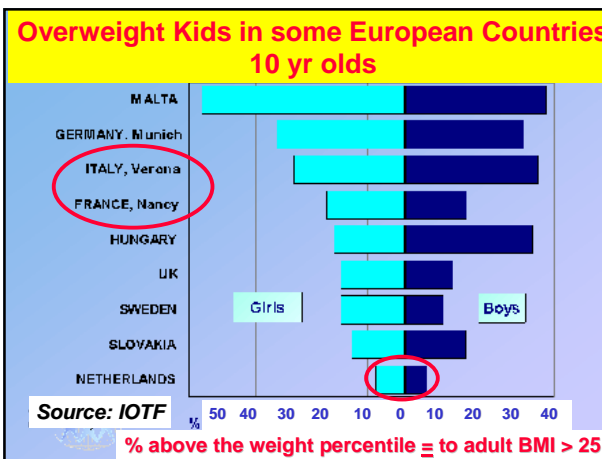
Community valid
Solution already WORKS!!!

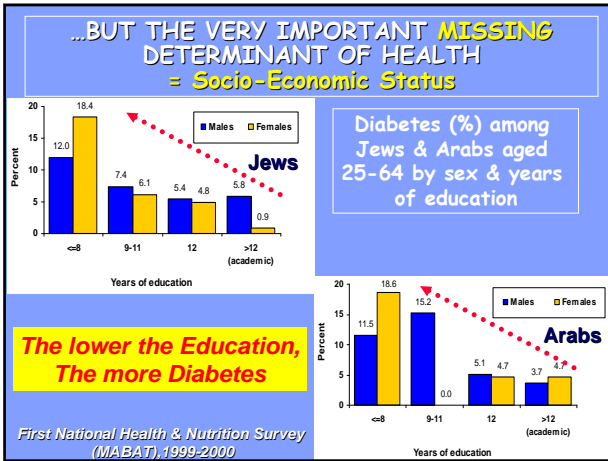
Design & Do
Discover
Determine Deviants
Define Problem

TRADITIONAL vs POSITIVE DEVIANCE PROBLEM SOLVING APPROACH	
<u>TRADITIONAL</u>	<u>POSITIVE DEVIANCE</u>
Deficit Based: "What's WRONG here?"	Asset Based: "What's RIGHT here?"
Analysis of underlying causes of PROBLEM	Analysis of successful SOLUTIONS
Externally Driven (by "experts" or external authority)	Internally Driven (by "people like us", same culture & resources)
Top-down, Outside-in	Bottom-up, Inside-out

- Q: How could we apply PD to the following Public Health problems....????:
- Childhood Obesity
 - Compliance to the Mediterranean Diet
 - Better Diabetic control
 - Road Traffic Accidents
 - Smoking / alcohol cessation
 - Regular physical activity
 - Immigrant workers' conditions
 - Health of Lower socio-economic classes
 - Violence in Schools Etc, etc

- Q: How could we apply PD to improving Compliance to the Mediterranean Diet...???
- Select the Mediterranean countries with the least Obesity (in women >15 yrs) = FR
 - Select the Mediterranean countries with the highest Global Nutrition Index = FR, IT, ES
 - Determine the Diet & Lifestyle
 - Discover the Population Behavior
 - Design & Do CULTURALLY APPROPRIATE interventions...
 - BUT not so SIMPLE...**
 - Situation is Dynamic, especially with problem of Childhood Obesity... where HOLLAND is "best"...





NOT just the Mediterranean DIET - rather the Mediterranean LIFESTYLE.....

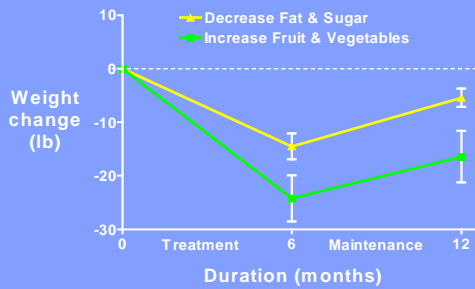
Where you eat
With whom you eat
When you eat
What you eat & drink..

and
How much you are
ACTIVE
from childhood

Attempts at LIFESTYLE MODIFICATION.....

I tried to give up smoking, drinking & women until I came to the conclusion that it is easier to give up my doctor....

Positive messages about what can be eaten are more effective than **restrictive messages**



Epstein et al., Obesity Research, 9: 171-178, 2001

Mediterranean Diet & Obesity: Answers

- Does Mediterranean Diet "protect" against Obesity?
NO
- Does the Mediterranean Diet help weight loss?
? YES
- Does the Mediterranean Diet help Compliance and reduce disease risk?
YES
- Mediterranean countries & Nutrition Index Ranking
Room for Improvement
- How to improve Compliance & Lifestyle?
Positive Deviance



Mediterranean Diet & Lifestyle, Citrus fruits & Obesity : The CHALLENGE



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