



**How Global Nutrition Collaborations Impact Change: Lessons from Four Continents**

Richard J. Deckelbaum MD, CM, FRCP(C)  
 Departments of Pediatrics and Epidemiology  
 Institute of Human Nutrition (IHN), Columbia University

### International Collaborations



Map showing international collaborations across four continents, including institutions like Columbia University, University of London, and others.

## The "Double Burden"



**1 billion hungry** vs **2 billion overweight**

**ONE GLOBAL ISSUE!**

Gustafson, 30 project

### The Bill, Please

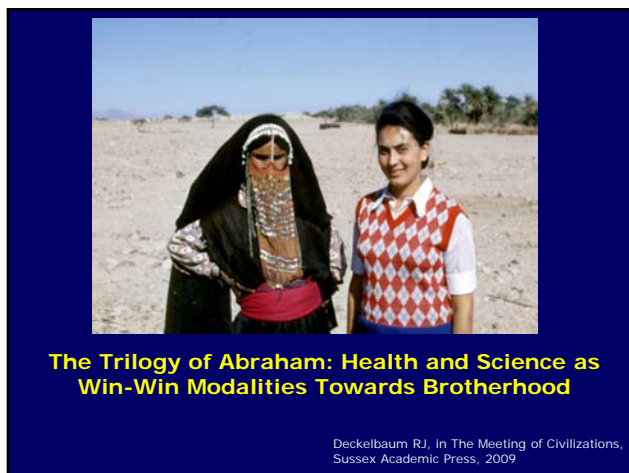
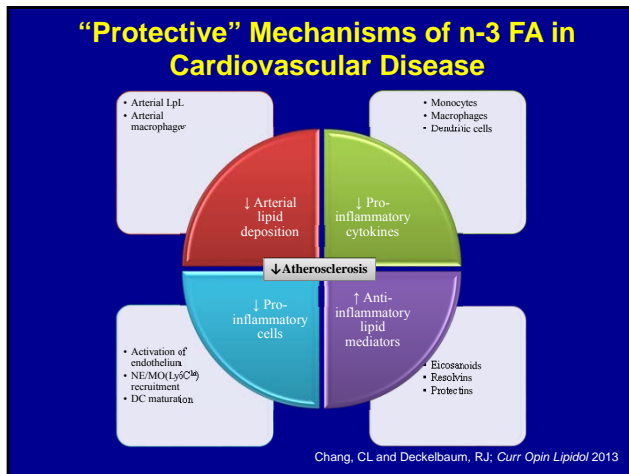
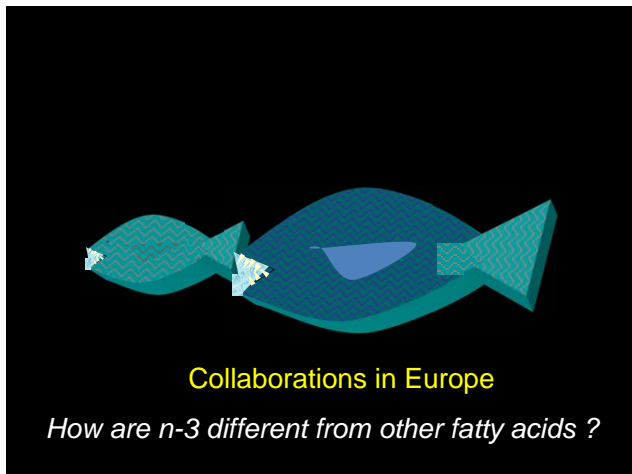
(for 5 chronic diseases for 20 years)  
 N.B. These numbers are TRILLIONS

Table 14: The anticipated economic toll of NCDs is staggering  
 Economic burden of NCDs, 2011-2030 (trillions of US\$ 2010), based on EPIC model 1<sup>2</sup>

Country income group	Diabetes	Cardiovascular diseases	Chronic Respiratory diseases	Cancer	Mental illness*	Total
High	0.9	8.5	1.8	5.4	9.0	25.5
Upper-middle	0.6	4.8	2.2	2.3	5.1	14.9
Lower-middle	0.2	2.0	0.9	0.5	1.9	5.5
Low	0.0	0.3	0.1	0.1	0.3	0.8
<b>LMIC</b>	<b>0.8</b>	<b>7.1</b>	<b>3.2</b>	<b>2.9</b>	<b>7.3</b>	<b>21.3</b>
<b>World</b>	<b>1.7</b>	<b>15.6</b>	<b>4.8</b>	<b>8.3</b>	<b>16.3</b>	<b>46.7</b>

\*The numbers for mental illness were obtained by relating the economic burden of all other diseases to their associated number of DALYs. Then the burden for mental illness was projected using the relative size of the corresponding DALY numbers to all the other conditions.

[The Global Economic Burden of NCDs, WHO/MSP/11.0](#)



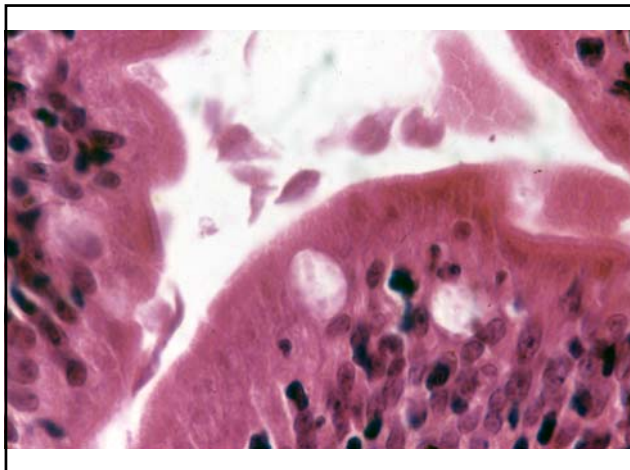
*" 'An hour's study of nature is better than a year's prayer,' declared the Prophet. He directed his followers to 'listen to the words of the scientist and instill unto others the lessons of science.' "*

*From a Commentary by Ziauddin Sardar  
Nature, Vol 448/12 July 2007*

### Barriers to Scientific and Medical Advancement for the Children of Abraham

- ◆ Religious restrictions
- ◆ Inequalities in infrastructure, trained personnel, scientific research support, access to health services, health budgets
- ◆ Political restrictions
- ◆ Security/safety concerns
- ◆ Mistrust
- ◆ .....

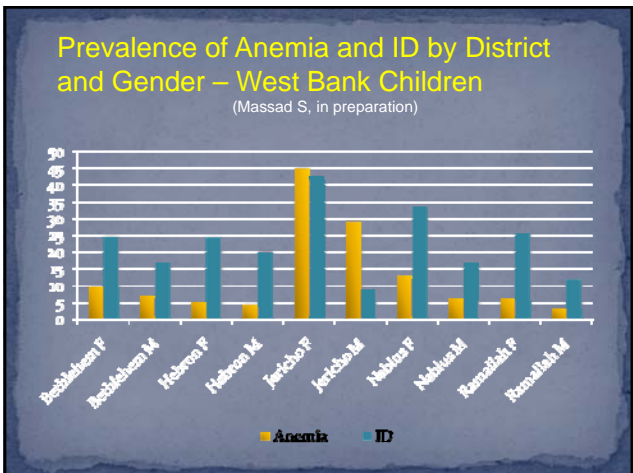




### Age-Specific Prevalence of Anemia (Percent with hemoglobin <11g/dl)

	Age (Months)		
	6-12	12-24	24-36
Syria	77	80	67
Jordan	66	63	45
W. Bank	71	66	35
Gaza	82	75	55
Lebanon	76	77	59

- ### Flour fortification in the West Bank
- Folate
  - Fe
  - B12,
  - B1, B2, B6
  - Niacin
  - Zn
  - Vit A and D



### Serum Folate – West Bank Children

(Massad S, in preparation)

- Median folate: 16.1 ng/ml
- 0.1% : <3.1 µg/L (Very low)
- 2.3% : <7.0 µg/L (NTD risk)
- 72.3%: 7-20 µg/L (Normal)
- 25.1% : >20 µg/L (High)
- 8.5% : >30 µg/L (High)

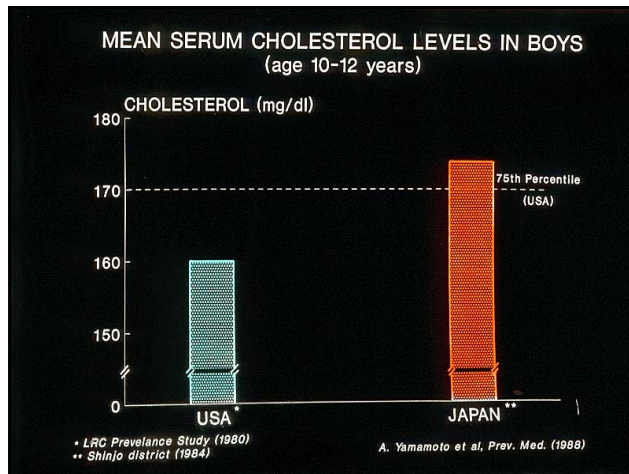
*>33% of West Bank school children have "high" serum folate levels*



**The Medical School for International Health**

*A collaboration between BGU and Columbia U.*

### How and Why MSIH Started? The Need for New Paradigms in Medical Education



### Predictions from the Hegsted Equation

$\Delta$  Cholesterol (mg/dl) = 2.16  $\Delta$ S - 1.65  $\Delta$ P + .068  $\Delta$ C mg/day

	<u><math>\Delta</math> Cholesterol (mg/dl)</u>
	<u>Predicted</u> <u>Actual</u>
<b>Spain vs U.S.</b>	+8 to +20      +9 to +15
<b>Japan vs U.S.</b>	<b>-8 to -28</b> +5 to +11

Adapted from Couch S... Deckelbaum R; AJCN, 2000

### International Comparison of Risk Factors in Childhood for Lifestyle Related Diseases:

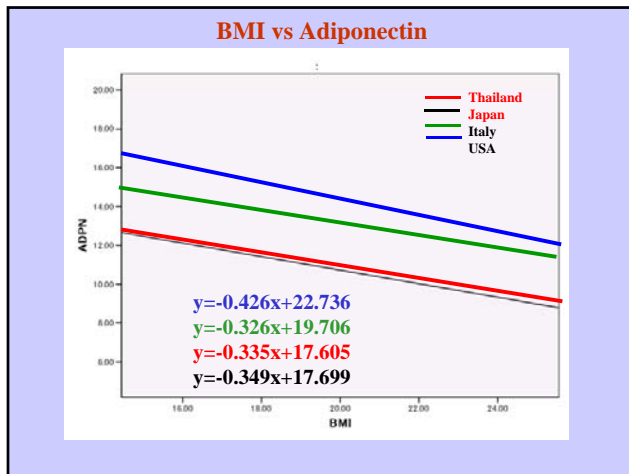
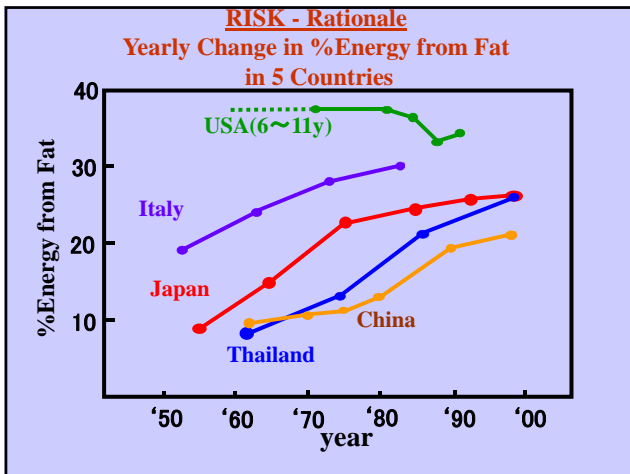
#### The Danone RISK Study

(Takemoto K, Deckelbaum RJ...2015)

Richard J. Deckelbaum MD  
Kaichi Kida MD  
Koji Takemoto MD  
Steven Shea MD  
Leonardo Pinelli MD  
Supawadee Likitmaskul MD

Supported by The Danone Institute of Japan

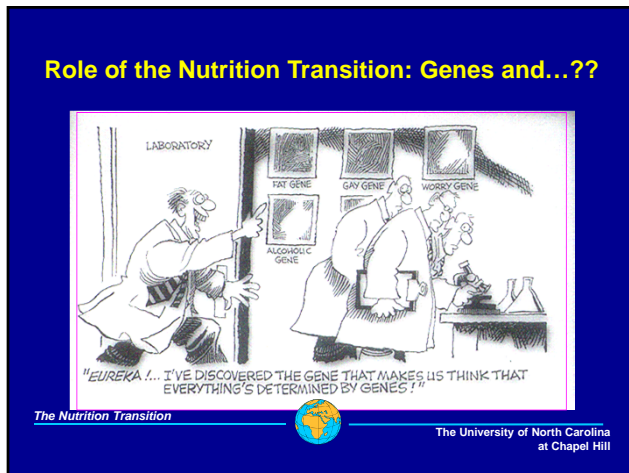
Goal: To compare lifestyle factors and phenotypic markers for chronic diseases in children in 5 countries



### Danone RISK Project

#### Significance

- *Differential relationships of lifestyle and phenotypic factors* related to risks for chronic diseases between countries
- Data will help *understand mechanistic differences* in lifestyle responses between populations
- **Need for population specific guidelines and interventions**



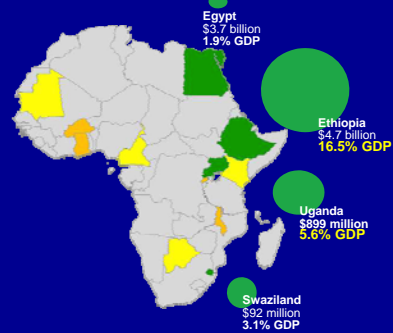
## Thrifty Genes!!

Interactions between genes, lifestyle, and.... epigenetics



## Social and Economic Impact of Child Undernutrition

(Annual Losses)




COHA Study, WFP, 2014

**Deaths from CVD/100,000  
35-64yrs (2000)**

	Males	Females
• Brazil:	71	49
• India:	81	56
• S Africa:	97	68
• USA:	56	28

Adapted from Leeder S et al, Race Against Time, 2004

**Sauri Sublocation  
10 villages**

5200 people, 950 households

Hunger periods 3- 7 months  
64% below poverty line

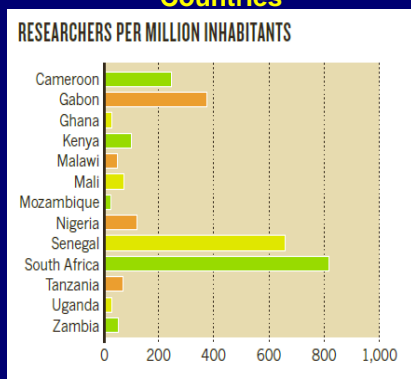
25-30% HIV-AIDS  
Malaria parasitemia (43%)  
Anemia <5yrs (85%)  
Anemia +malaria <5yrs (46%)  
No health clinic, no electricity

**MVP - Concomitant Intersectoral Community Participation**

<p>Training – empowerment, management, governance, technical aspects</p>	<p>Water Agriculture Health Electricity/Energy School Environment Business</p>
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## Fewer Researchers in Sub-Saharan African Countries



## African Nutritional Sciences Research Consortium (ANSRC) Strengthening Capacity for Science and Innovation in Africa



- Build local capacity for science – linking health with nutrition, agriculture, and “biotechnology”
- Use graduates for TOT –trainers of trainers,...and students
- Economic development with scientific development
- Diminish “brain drain”
- Bring African universities into the respected group of top science training institutions

## Seasonal hunger .....; intersectoral solutions needed



Deckelbaum R.J, Lancet Global Health, 2016

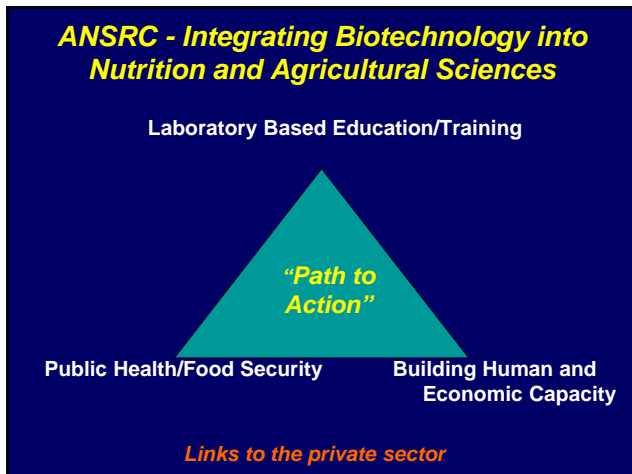
## Health, Agriculture, and Biologic Areas of Relevance Link to Local Public Health and Agricultural Problems Examples for future PhD research projects

### Under- and Over-nutrition

- Molecular actions of nutrients in soil, plants, animals, humans
- NCDs: metabolic syndrome, Type 2 diabetes, CVD, cancer
- Reproductive health, stunting

### Nutrition and Emerging Health Problems

- Seasonal starvation and epigenetics
- Resilient crop selection and genetics
- Food safety (aflatoxins, microbes, water)
- Provision of quality nutrients/foods
- Integrating with One Health



**ANSRC – Higher Education for Africa**

ANSRC Workshop, Nairobi 2013

Partnerships:


- African Development Bank
- Pan African University
- BECA/ILRI CoE in Health Sciences and Bioengineering
- New Einstein Initiative
- AERC, CARTA (APHRC),
- African Academies of Science
- Columbia University, UW (Madison),
- **14 African universities**

*Political buy-ins established*

*Ready to operationalize in 3-4 mos*

- Lessons Learned**
- Build local capacity
  - Do the lab work locally
  - Listen first – talk later
  - Include other sectors and disciplines
  - Encourage “south-south” collaborations
  - Be “apolitical”
  - ....., ....., .....

**Concluding messages....**



**What are the costs of doing nothing????**



*Make a Difference - Plan and Build Nutrition Partnerships Together!*



Thanks to our partners! Thank you!