

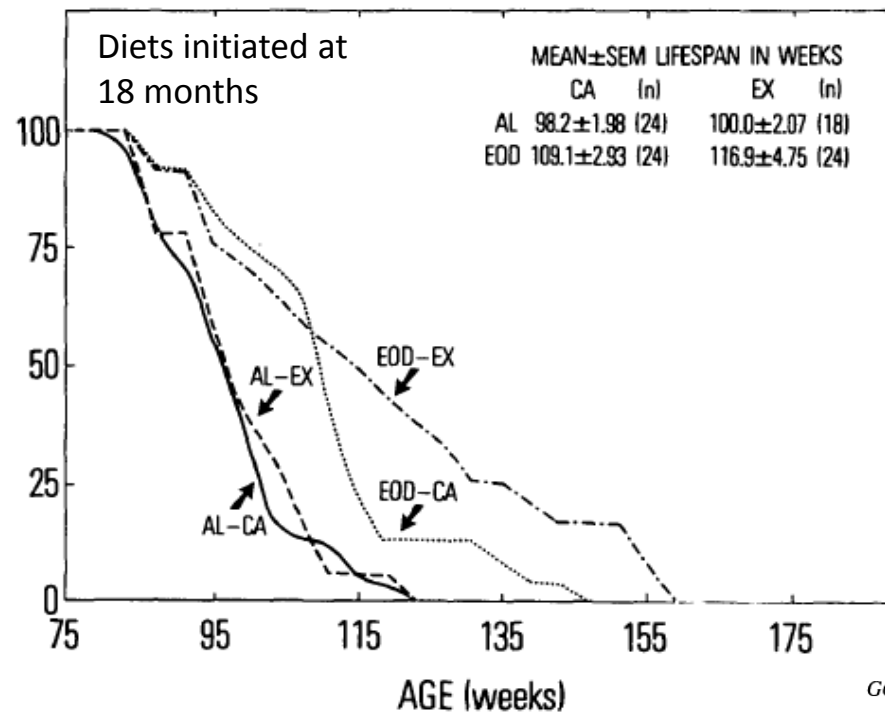
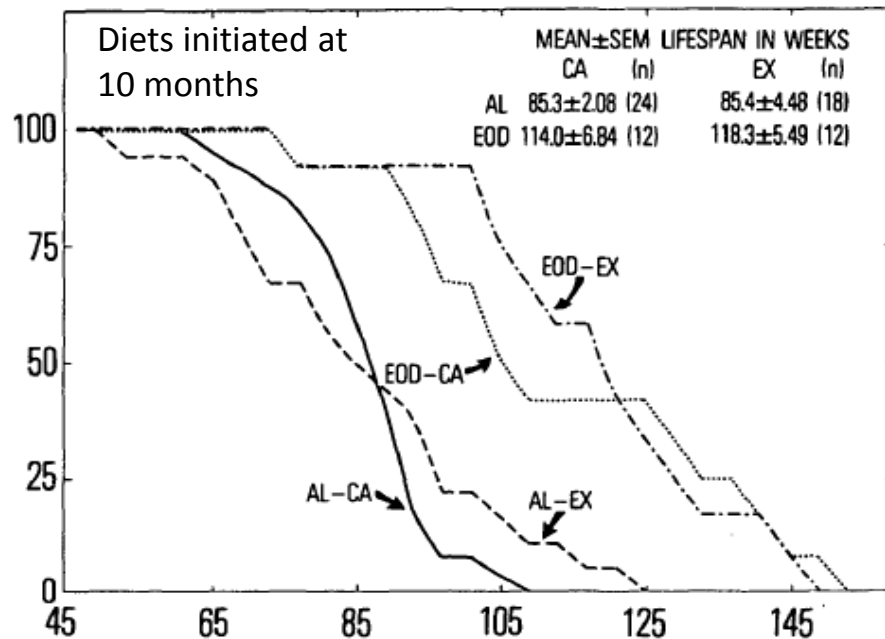
Implementation of Intermittent Fasting Prescriptions: Breaking Through the Barriers

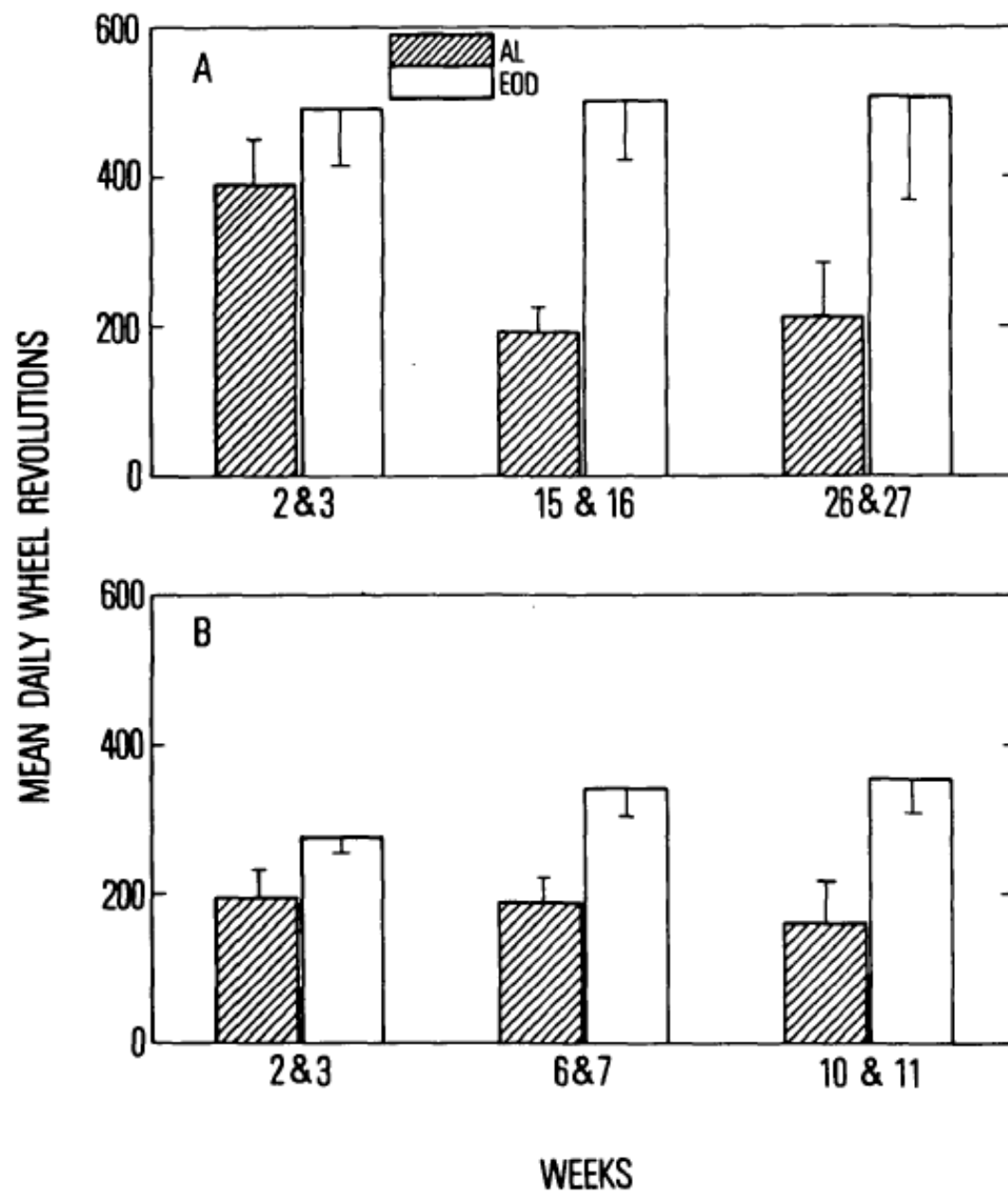


‘The Fountain of Youth’ Maestro della Manta, circa 1411.

Wistar Rats

PERCENT SURVIVING





The Fasting Cure

by

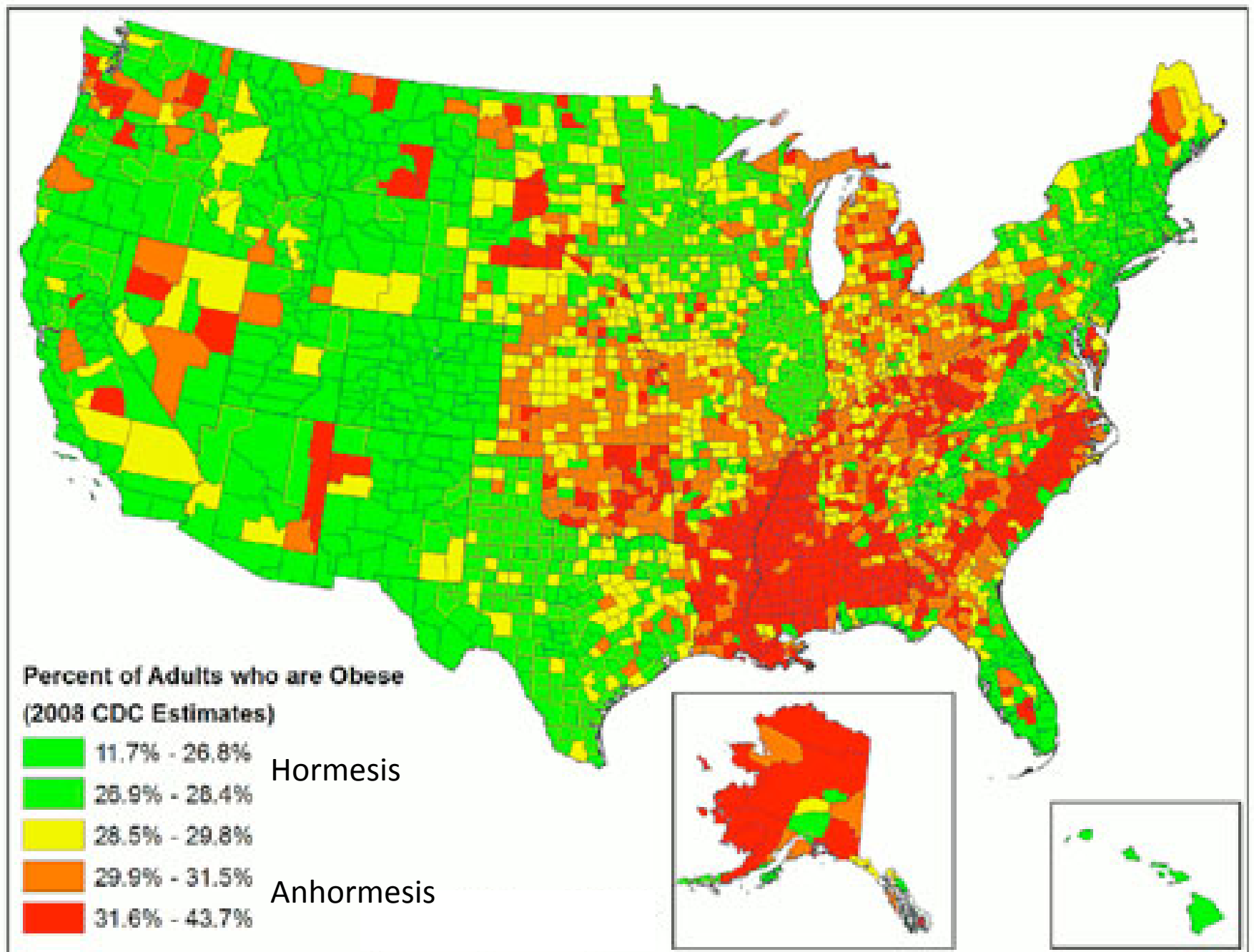
UPTON SINCLAIR

COPYRIGHT, 1911, BY

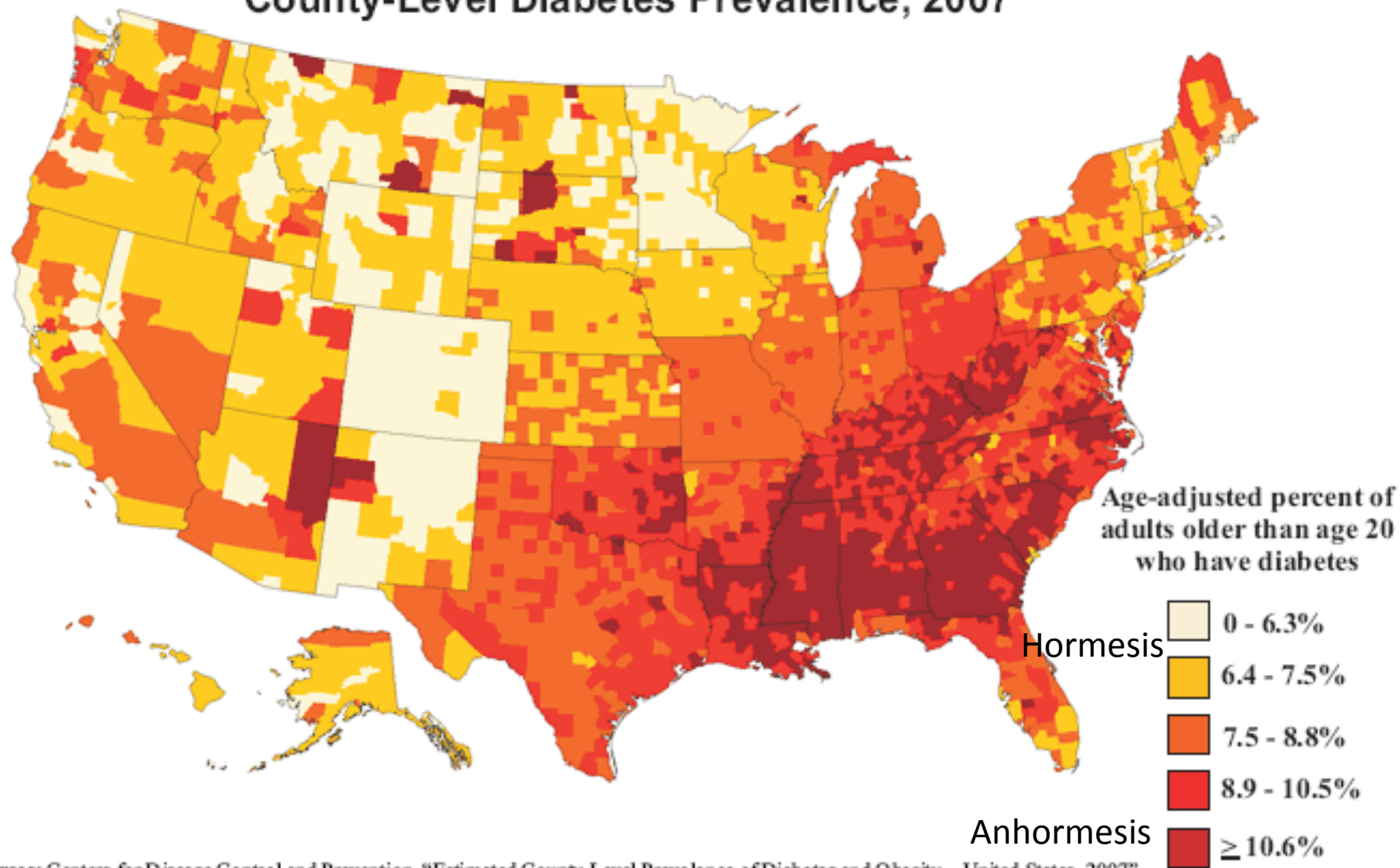
MITCHELL KENNERLEY

ters which are genuine and beyond dispute. The cures which they record are altogether without precedent, I think.

The reader will find in the course of the book (page 63) a tabulation of the results of 277 cases of fasting. In this number of desperate cases, there were only about half a dozen definite and unexplained failures reported. Surely it cannot be that medical men and scientists will continue for much longer to close their eyes to facts of such vital significance as this.

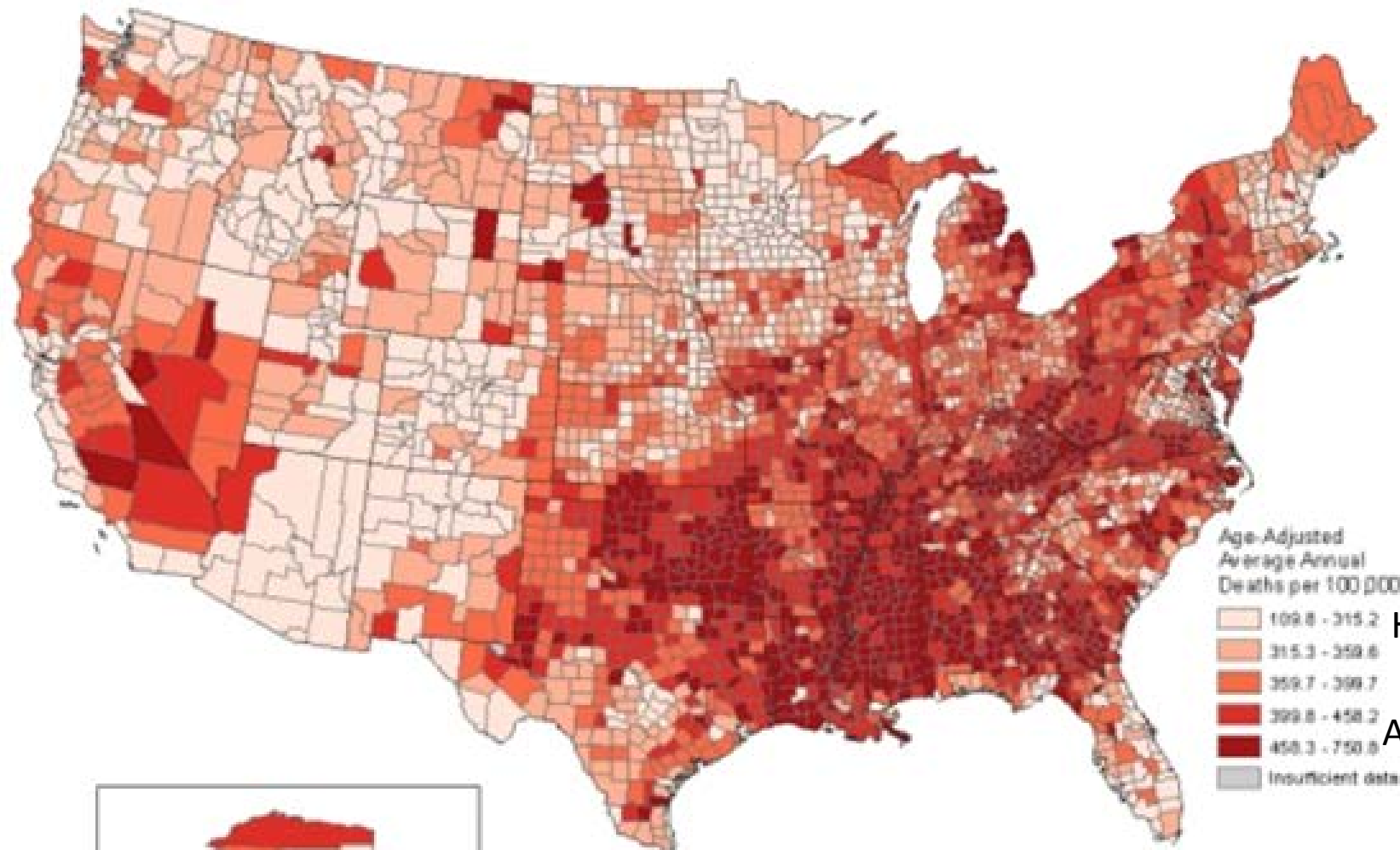


County-Level Diabetes Prevalence, 2007



Sources: Centers for Disease Control and Prevention, "Estimated County Level Prevalence of Diabetes and Obesity—United States, 2007" *Morbidity and Mortality Weekly Report* 58 No. 45 (Nov. 20, 2009):1259-1263.

Heart Disease Death Rates, 2007-2009 Adults Ages 35+, by County



Age-Adjusted
Average Annual
Deaths per 100,000

109.8 - 315.2

315.3 - 359.6

359.7 - 399.7

399.8 - 458.2

458.3 - 750.8

Insufficient data

Hormesis

Anhormesis



Alaska



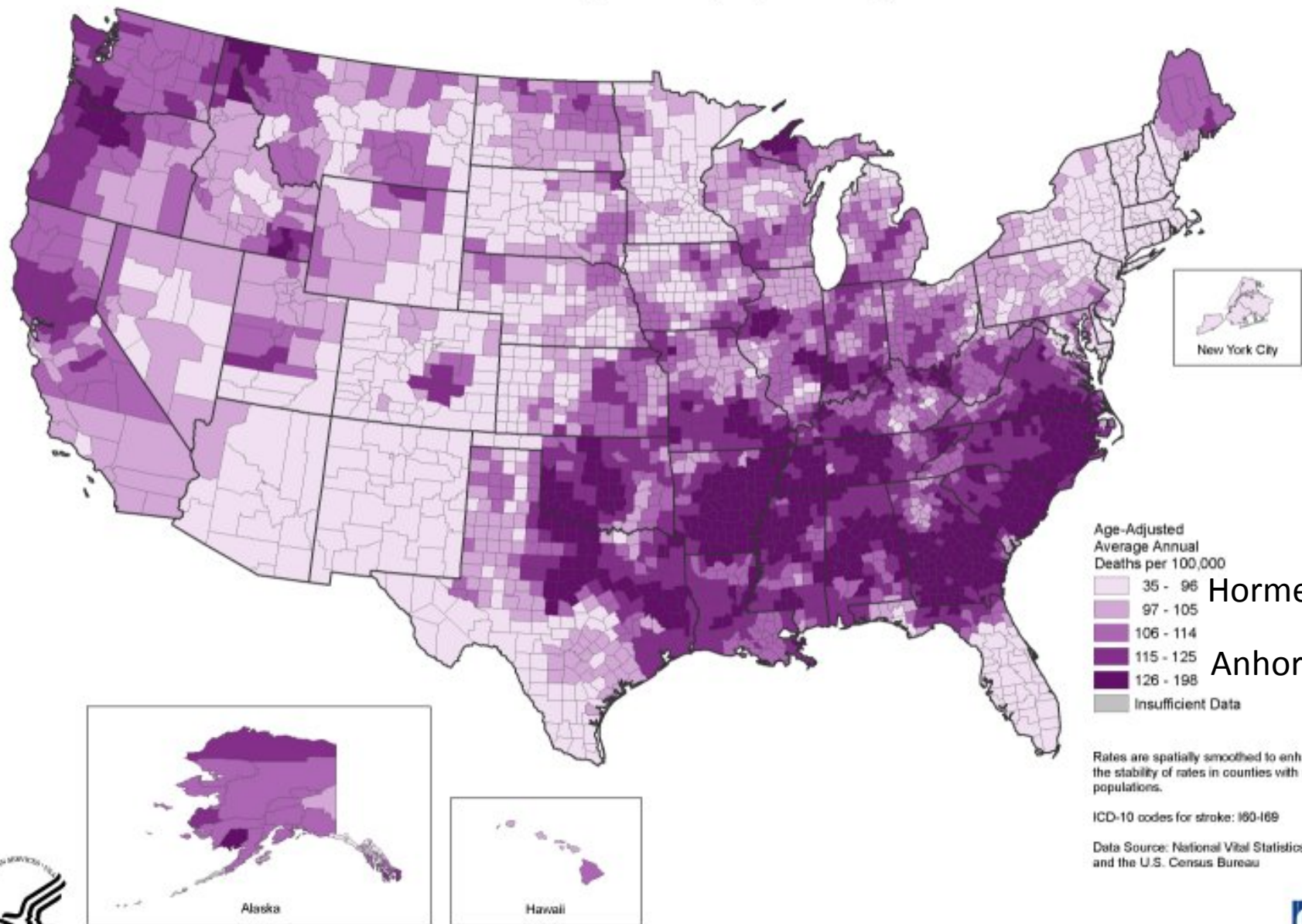
Hawaii

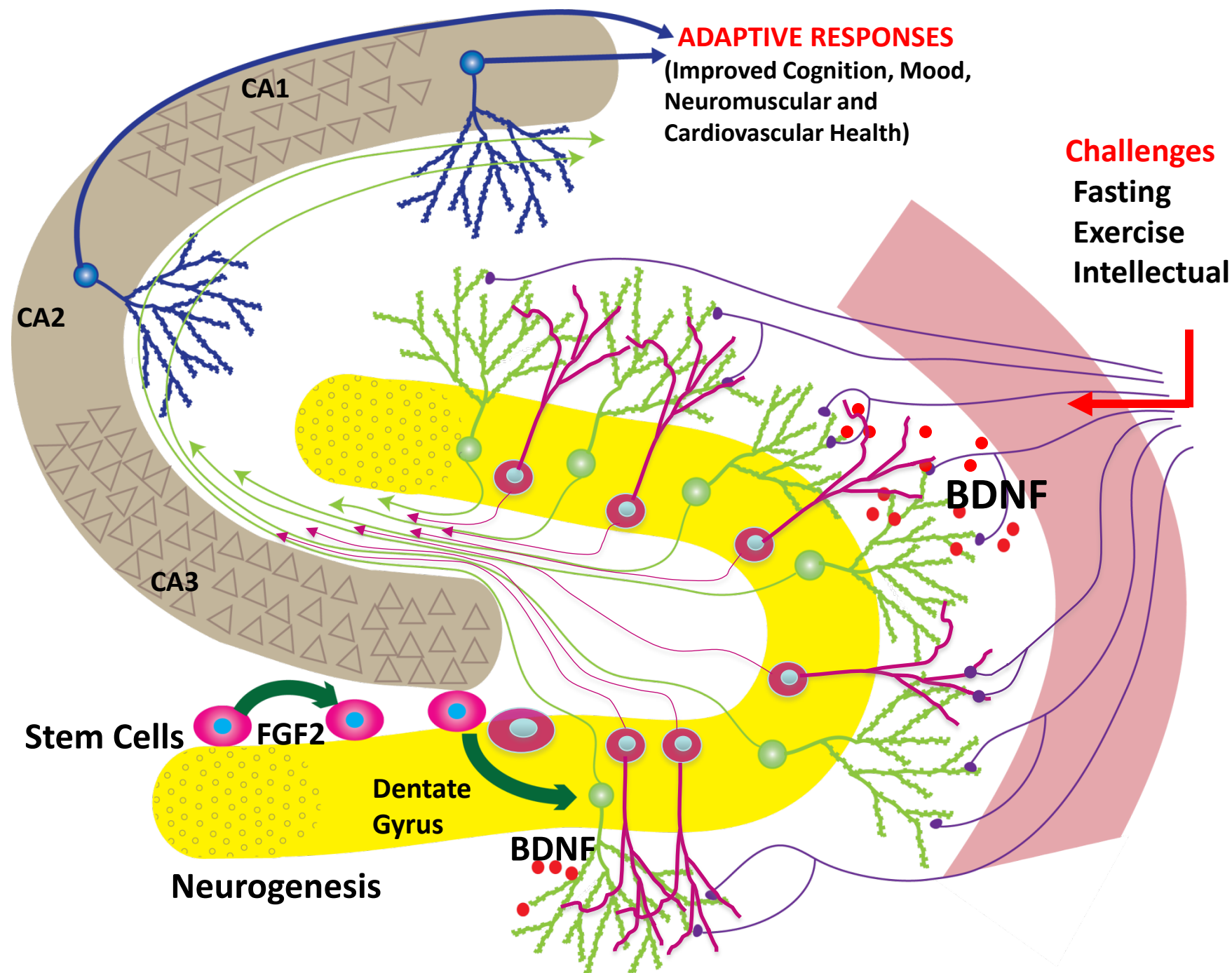
Rates are spatially smoothed to enhance the stability of rates in counties with small populations.

ICD-10 codes for heart disease: I00-I09, I11, I13, I20-I51

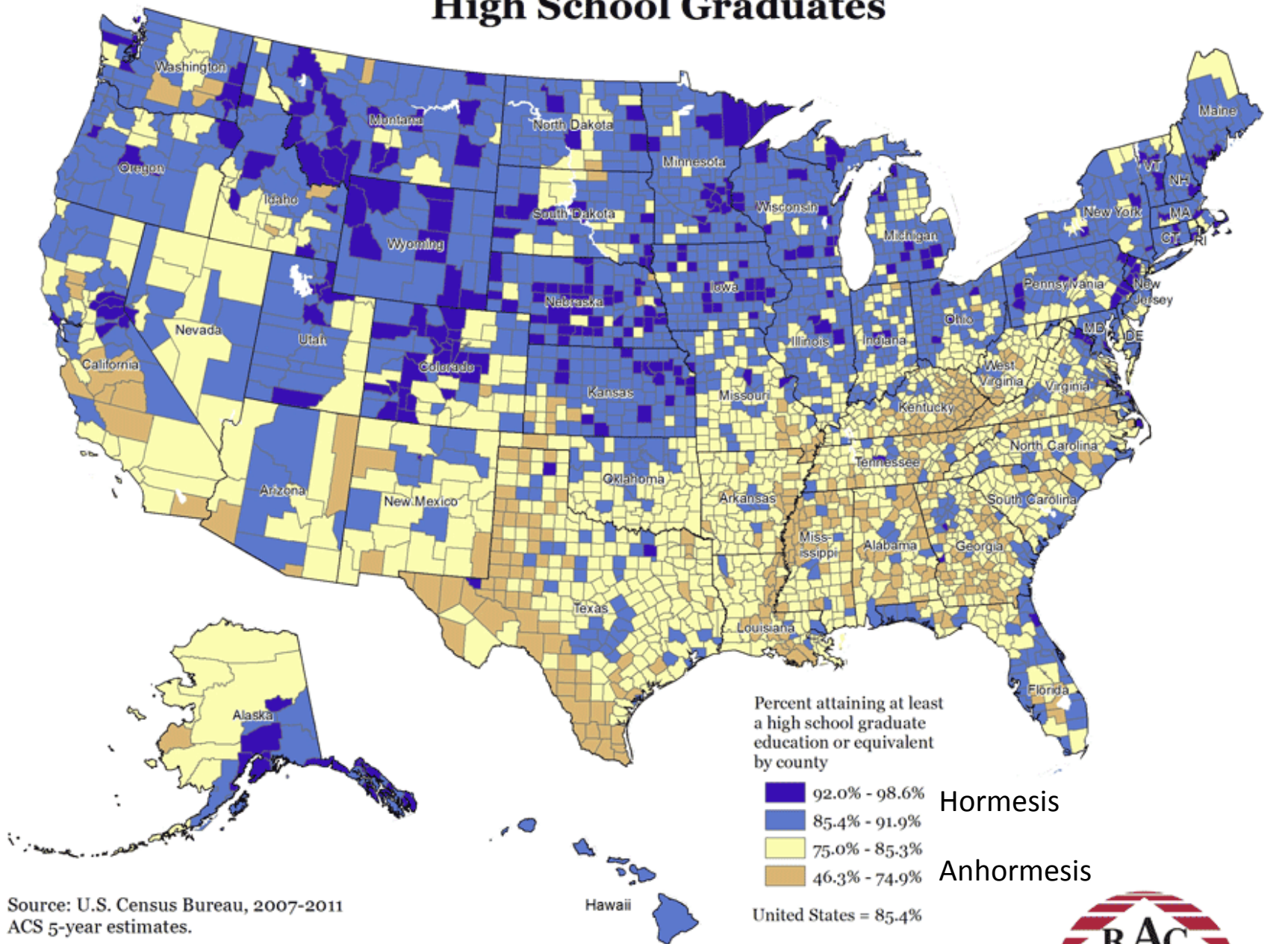
Data Source: National Vital Statistics System and the U.S. Census Bureau

Stroke Death Rates, 2000-2006 Adults Ages 35+, by County





High School Graduates



Source: U.S. Census Bureau, 2007-2011
ACS 5-year estimates.

Note: Alaska and Hawaii not shown to scale

Alternate day fasting: eating no food or <600 calories every other day.

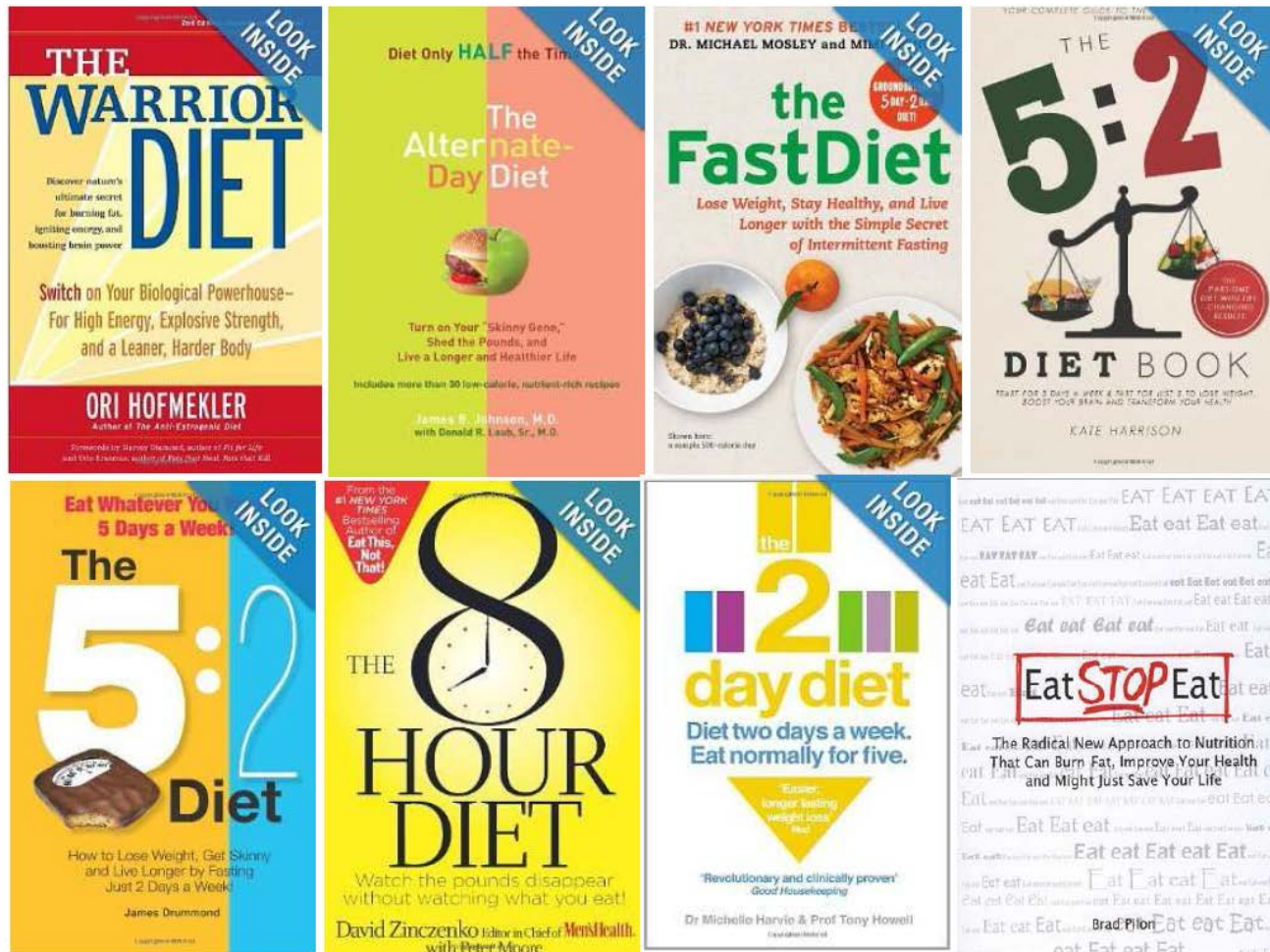
Anson RM et al. (2003) PNAS 100:6216-20. Johnson J et al. (2007) Free Radic Biol Med. 42:665-74.

5:2 diet: eating normally 5 days each week and eating <500 calories the other 2 days.

Harvie M et al. (2011) Int J Obes. 35:714-27; Harvie et al. (2013) Br J Nutr. 110:1534-47.

Daily time-restricted eating: food is consumed only during a 4-8 hour period each day.

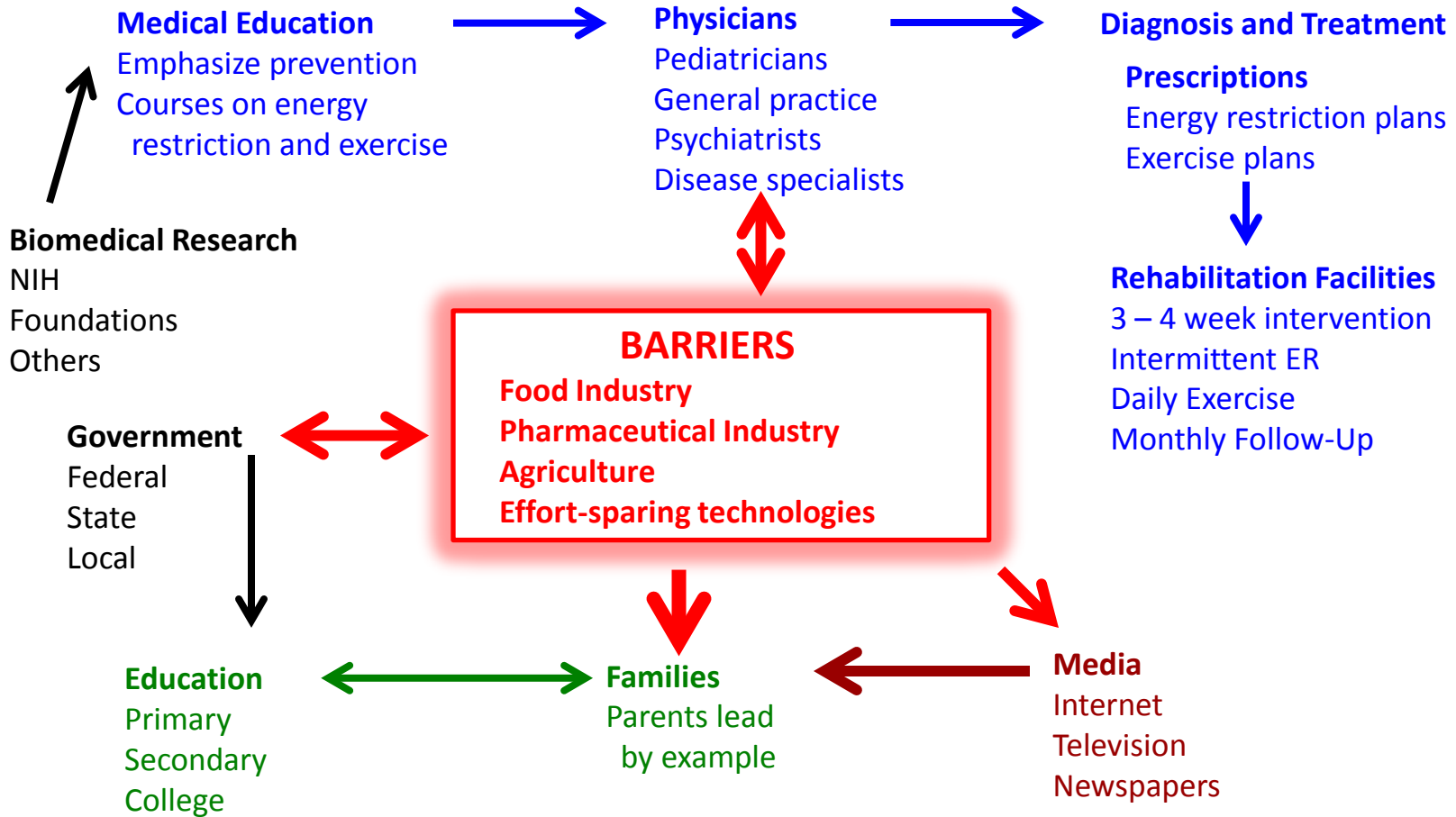
Anson RM et al. (2003) PNAS 100:6216-20; Hatori M et al. (2012) Cell Metab. 15:848-60.



Longo VD and Mattson MP (2014) **Fasting: Molecular Mechanisms and Clinical Applications.**

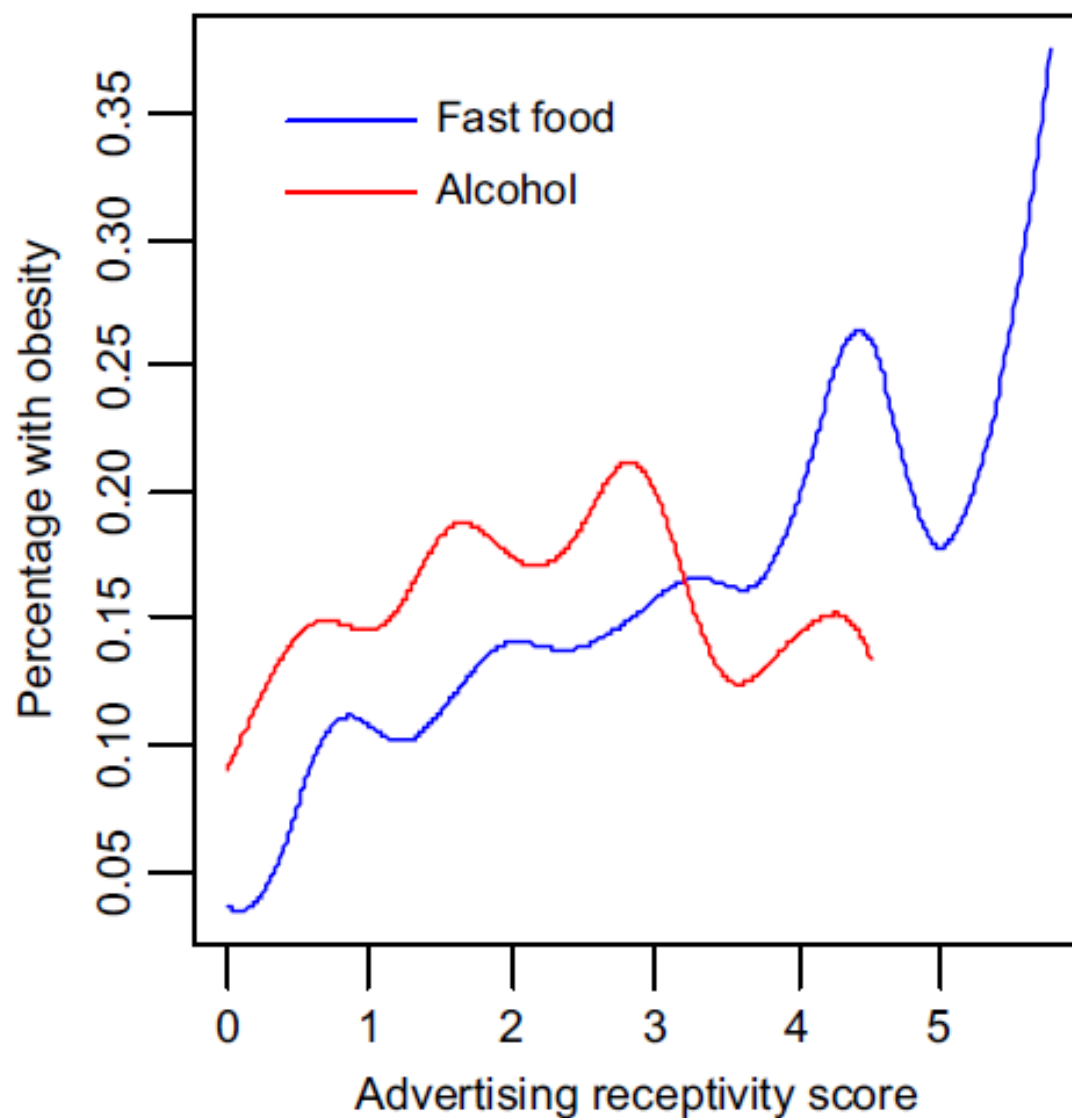
Cell Metabolism 19: 181-192.

Fasting and Society: Circumventing and Removing the Barriers



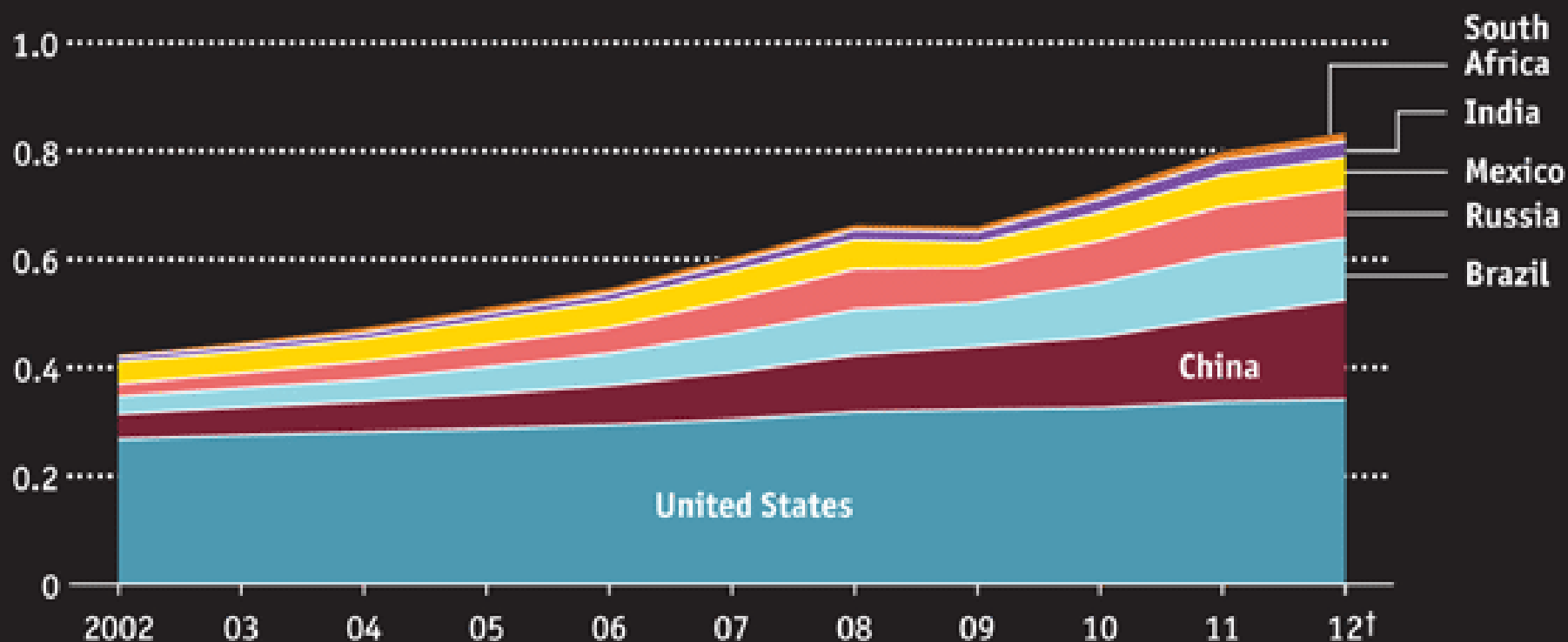


Time magazine (2009)



Growth area

Packaged-food sales*, \$trn



Source: Euromonitor International

*Trade value at current prices and current exchange rates †Estimate

	Revenue (\$ millions)	Profits (\$ millions)	Profits % of Revenue
Walmart	408,214	14,335	3.51
Exxon	284,650	19,280	6.77
J &J	61,897	12,266	19.8
Pfizer	50,009	8,635	17.6
Merck	27,328	12,901	47.2
Abbott	30,052	5,745	19.1
Apple	36,537	5,704	15.6
Eli Lilly	21,836	4,328	19.8
Bristol-Meyer	21,634	10,612	49.05



Source: Fortune 500 (2010)

“Man has an inborn craving for medicine. Heroic dosing for several generations has given his tissues a thirst for drugs....It is really one of the most serious difficulties with which we have to contend. Even in minor ailments, which would yield to dieting or to simple home remedies, the doctor’s visit is not thought to be complete without the prescription. “

William Osler (1932), the father of modern medicine.

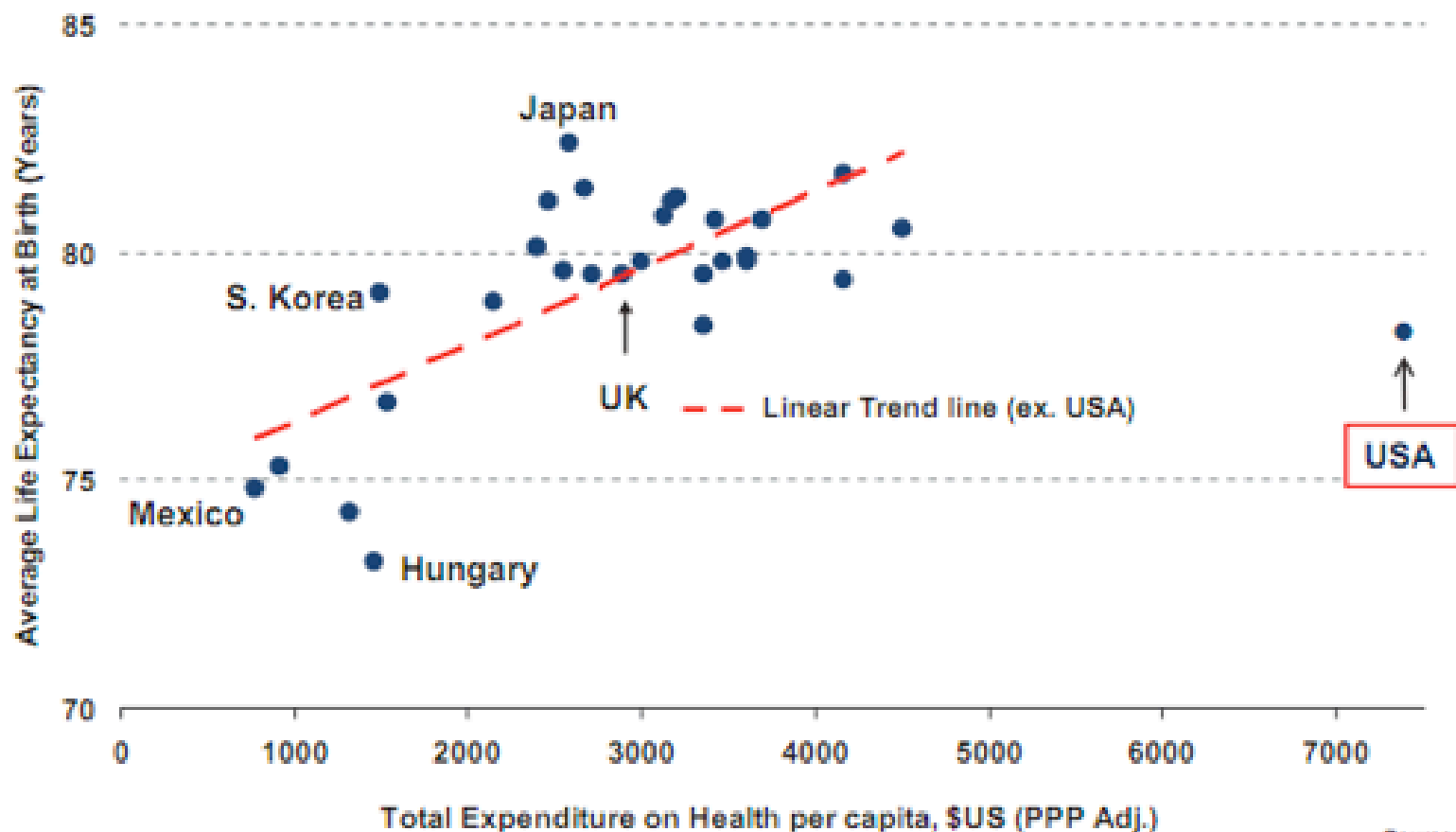
In some places, with some psychiatrists, patients are seen for 10 minutes or so and treated like checkbooks: the more patients seen, the more profit made. Add the fact that usually such practice involves giving drugs for symptoms—that medications are the main activity in such assembly-line psychiatry— and we see the problem. The direct damage done by us, by practicing doctors, who see patients mainly for profit is likely on a scale that easily out-Herods any of the harm produced by the pharmaceutical industry.

S. Nassir Ghaemi (2013) Perspectives in Biology and Medicine. 56: 223-235.

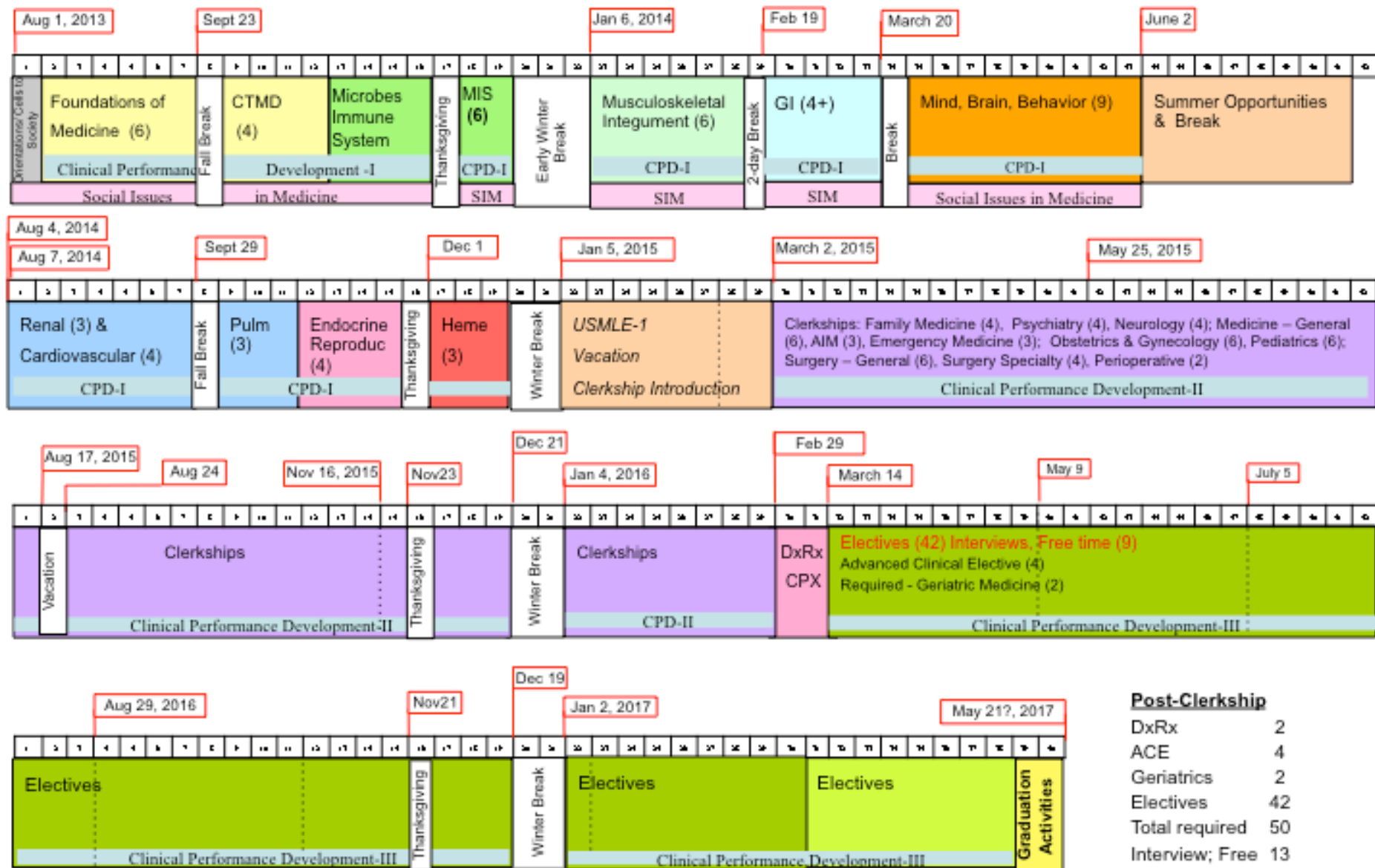
Restructure Medicare & Medicaid: Most Businesses are Performance-Based, Many Components of Healthcare System are Not

USA Healthcare Outcome (based on Life Expectancy) Have Room For Improvement Relative to Other Countries

Healthcare Spending per capita vs. Average Life Expectancy Among OECD Countries, 2007



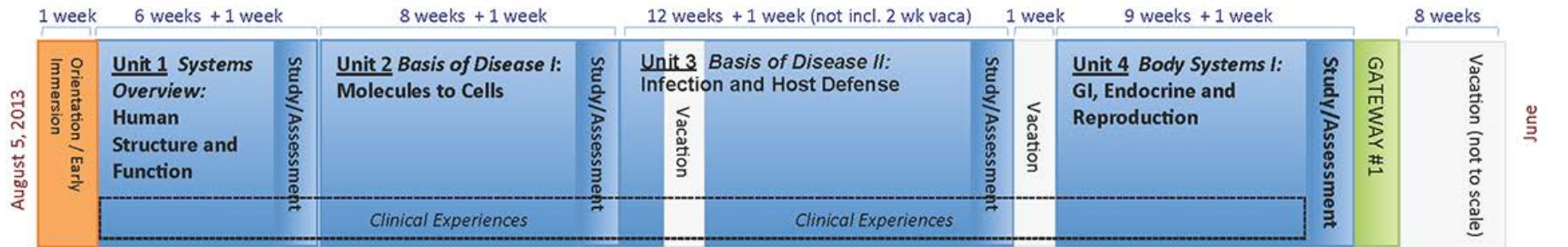
“Next Generation” Cells to Society Curriculum



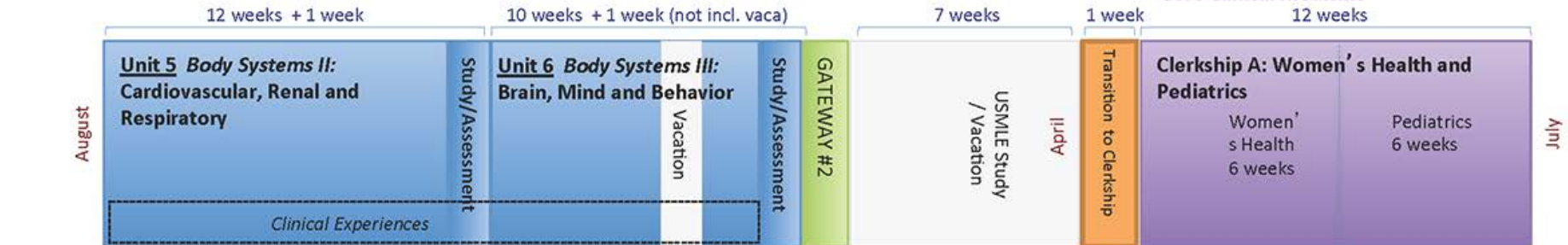
4 Year Curricular Map (April 2012)

SUNY Downstate

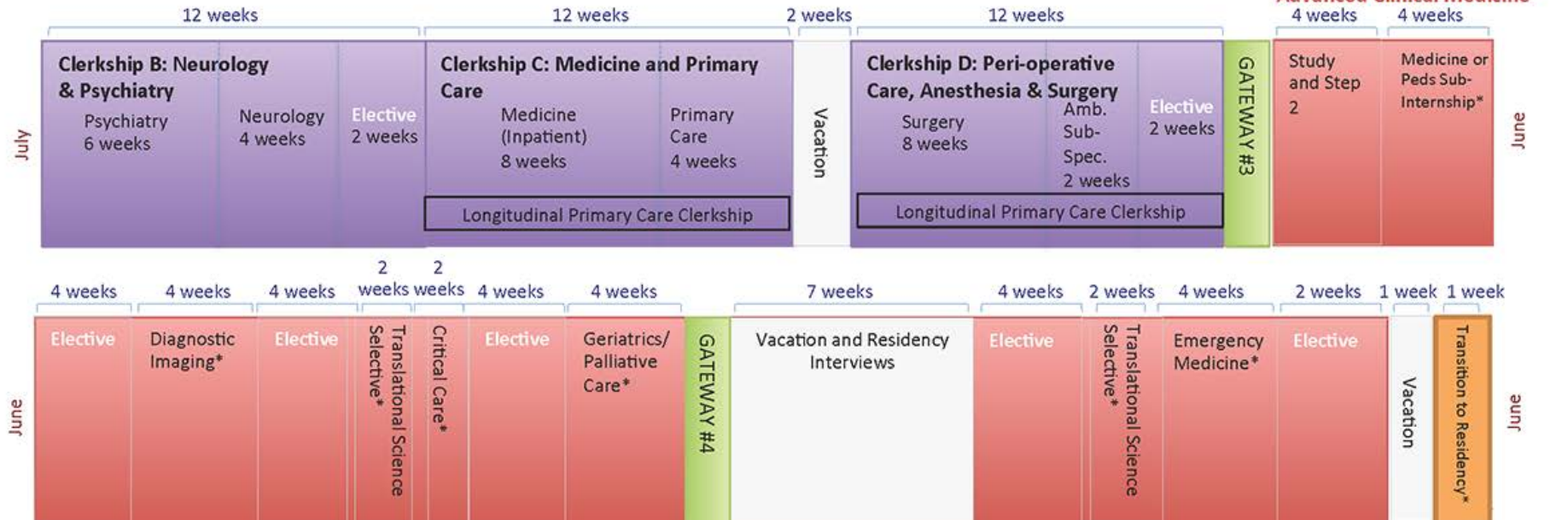
Foundations of Medicine



Core Clinical Medicine



Advanced Clinical Medicine



Threads are included in all four years : Geriatrics, Patient Safety, Nutrition. * Required elements in Advanced Clinical Medicine Years / Items not to scale

	Summer	Fall	Winter	Spring		
Y e a r 1	Optional prematriculation course	Human Health and Disease				
		Foundations of Human Bio. Cardiovascular I Pulmonary I Gastrointestinal I	Renal I Musculoskeletal I Mind, Brain, & Behavior I	Endocrinology, Reproduction & Metabolism I Immunology and Hematology Microbiology		
		Clinical Foundations (Including clinical skills and professional development curriculum, longitudinal ambulatory externship, case-based learning modules)				
		Human Health and Disease				Clinical Transitions (1 week)
Y e a r 2	Optional exploratory pursuits (e.g., research, clinical outreach)	Principles of Clinical Oncology Epidemiology, Biostatistics & Medical Informatics Musculoskeletal II Gastrointestinal II Endocrinology, Reproduction & Metabolism II Cardiovascular II	Mind, Brain, & Behavior II Pulmonary II Renal II	Multi-Organ System Disorders and Integrative Cases Review (2 weeks)	Comprehensive Review and Study for USMLE Step 1 (6weeks)	
		Clinical Foundations (Including clinical skills and professional development curriculum, longitudinal ambulatory externship, case-based learning modules)				
Y e a r 3	Core Clinical Clerkships Medicine (12 weeks); Surgery (8 weeks); Pediatrics (8 weeks); Reproductive Medicine (6 weeks); Psychiatry (6 weeks); Neurology (4 weeks); Primary Care (1 afternoon/week throughout year, except during Surgery)					
	Clinical Selectives (2 two-week selectives. One must be in surgery or a surgery-related field)					
Y e a r 4	Requirements of 4 th year: 10 months of enrollment: 12 weeks of direct patient care clerkships (1 each of inpatient, outpatient, and primary care) at least 16 weeks of other clinical elective; completion of Independent Study Project.			Principles to Practice (4 weeks)		

Clinical Transitions
(1 week)

**EFFECTS OF INTERMITTENT
FASTING ON THE BODY AND BRAIN
THAT MAY THWART OBESITY AND
CHRONIC DISEASES**

BLOOD

Decreased insulin, IGF-1
and leptin. Increased ketones,
adiponectin and ghrelin.

LIVER

Increased insulin sensitivity
Ketone body production
Decreased IGF-1 levels

INTESTINES

Reduced energy uptake
Reduced inflammation
Reduces cell proliferation

BRAIN

Improved cognitive function
Increased neurotrophic factors
Increased stress resistance
Reduced inflammation

HEART

Reduced resting heart rate
Reduced blood pressure
Increased stress resistance

FAT CELLS

Lipolysis
Reduced leptin
Increased adiponectin
Reduced inflammation

MUSCLE

Increased insulin sensitivity
Increased efficiency
Reduced inflammation

**IF Promotes Fat 'Burning' and
the Production of Beneficial Ketones**

Fasting and Society: Circumventing and Removing the Barriers

