

Cancer and NCD prevention from a global perspective

ICCC5 Lima, Peru

Graham A Colditz, MD DrPH
Niess-Gain Professor

Department of Surgery
Division of Public Health Sciences

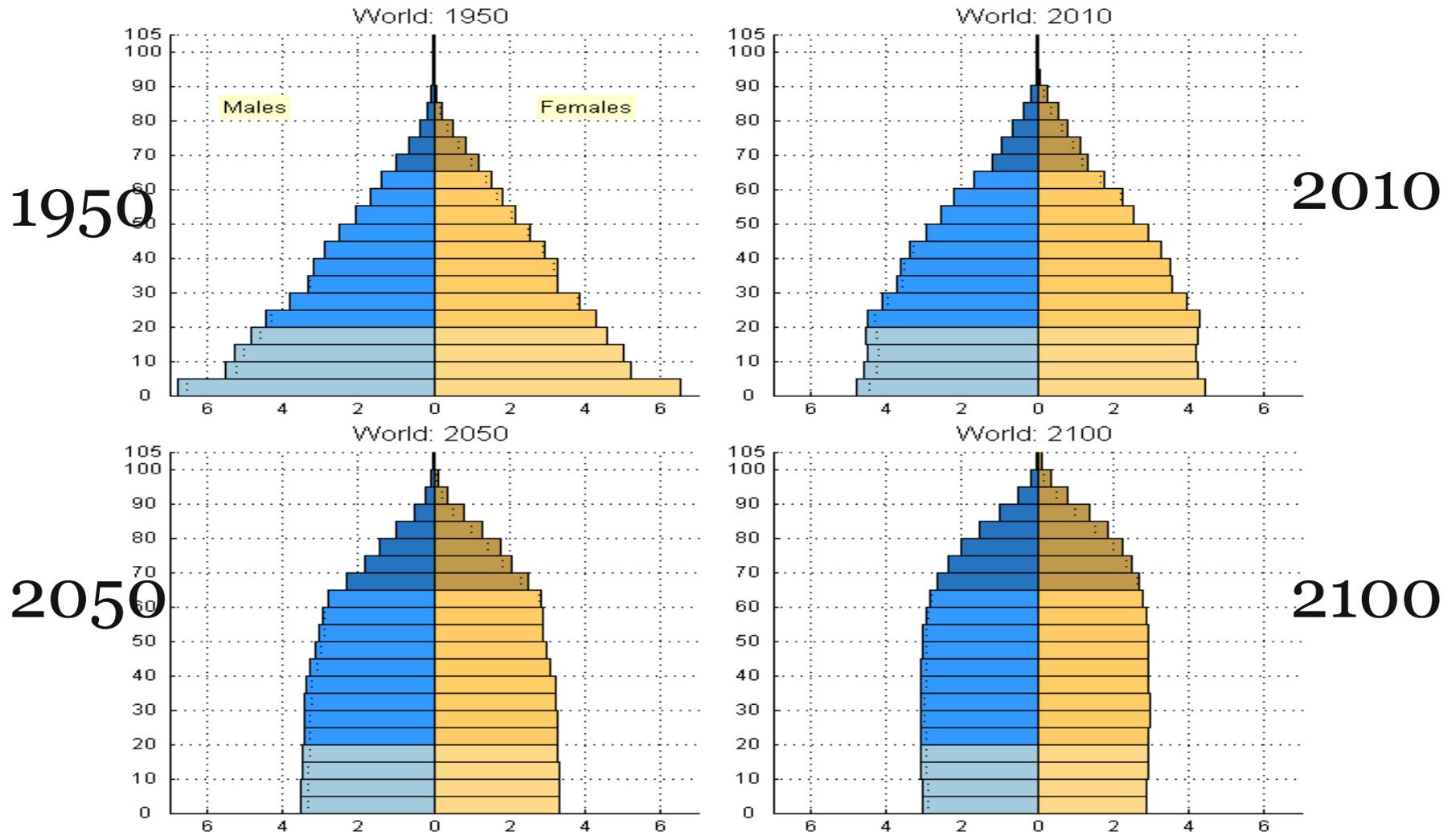


Washington University in St. Louis

SCHOOL OF MEDICINE

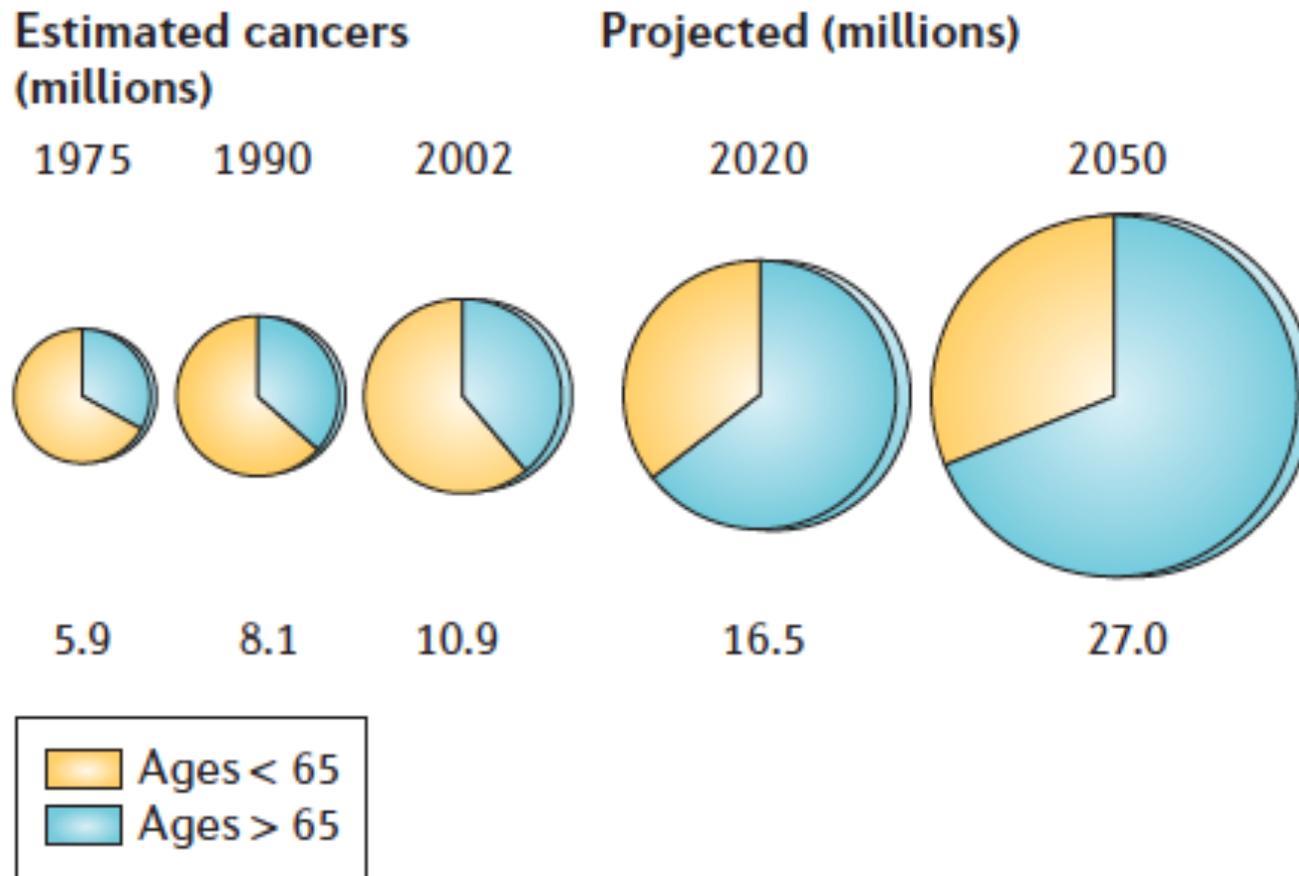
World: Population Pyramids 1950-2100

Population by age groups and sex (percentage of total population)



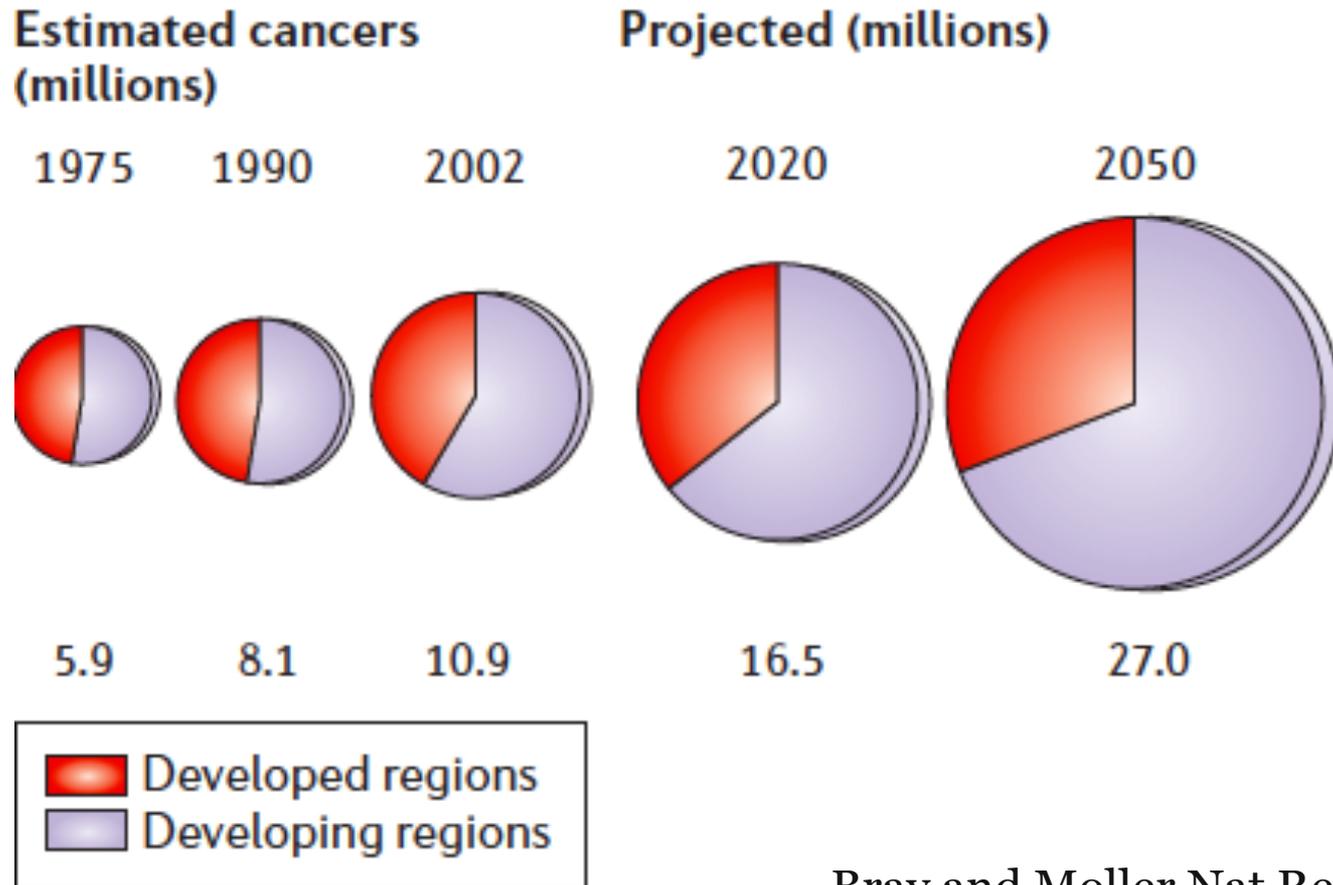
United Nations, Department of Economic and Social Affairs, Population Division (2011)

Estimated new cancer cases, World, 1975 to 2050: Age



Bray and Moller Nat Rev Cancer 2006

Estimated new cancer cases, World, 1975 to 2050: Region

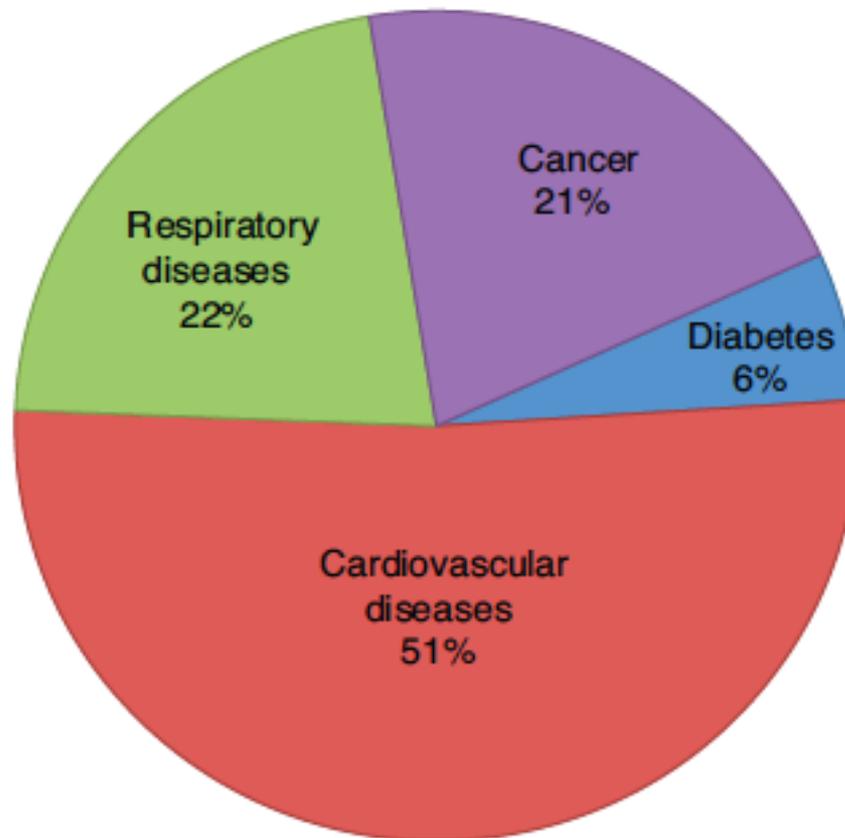


Bray and Moller Nat Rev Cancer 2006

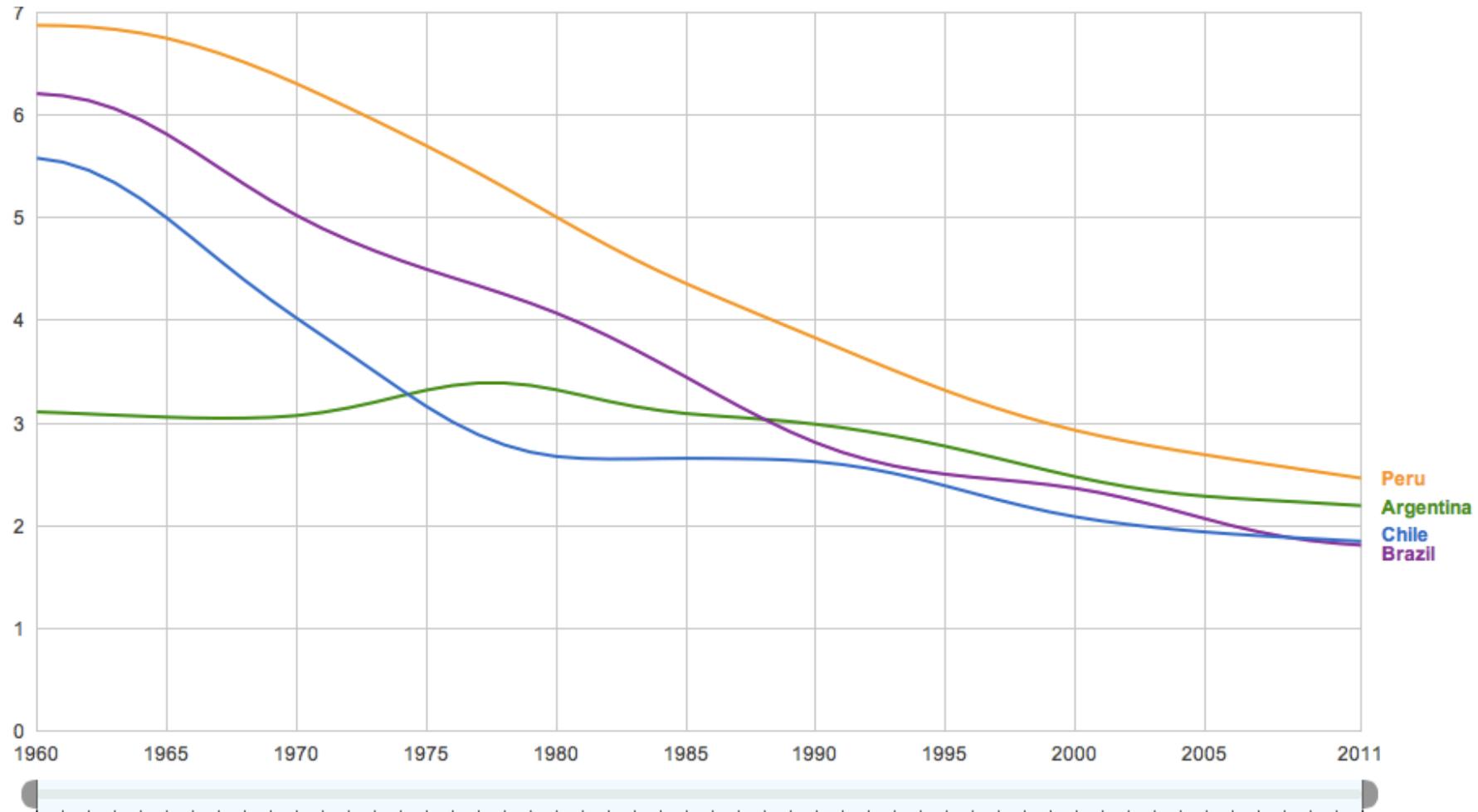
the world, 1975–2050. Changes in the age distribution and

Breakdown NCD costs for LMIC

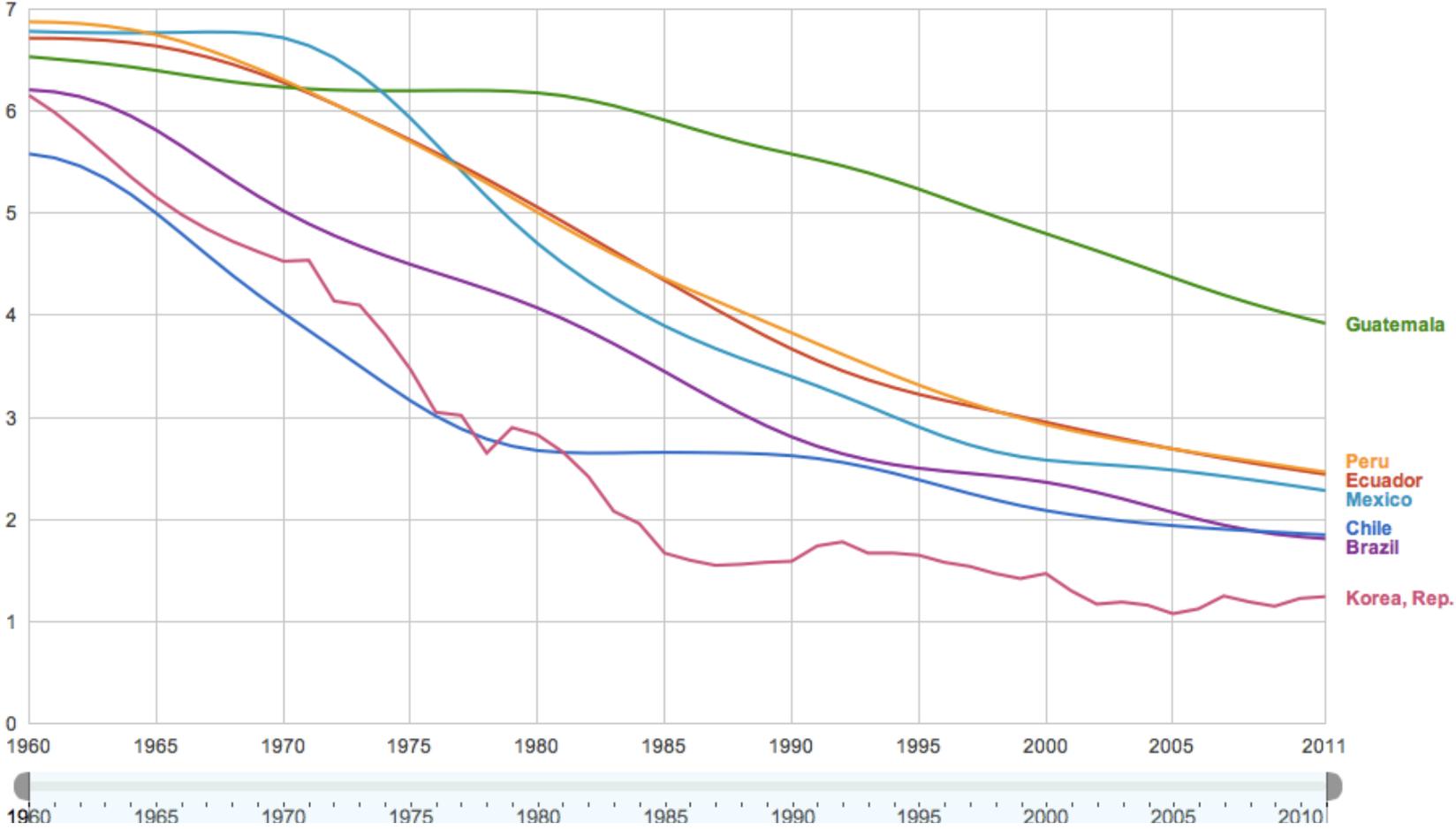
Lost output 2011-2025, by disease type



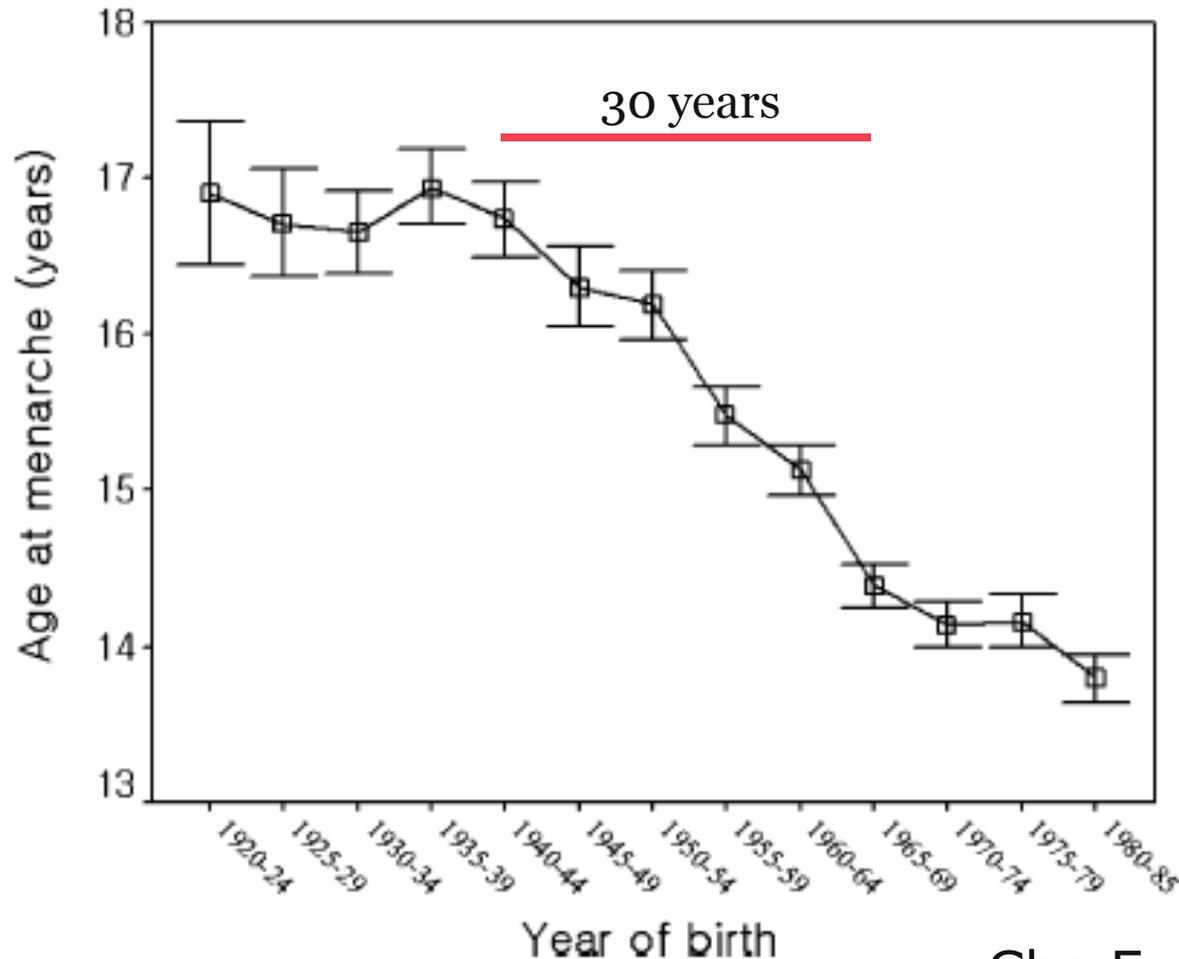
S. America declining fertility



Global context

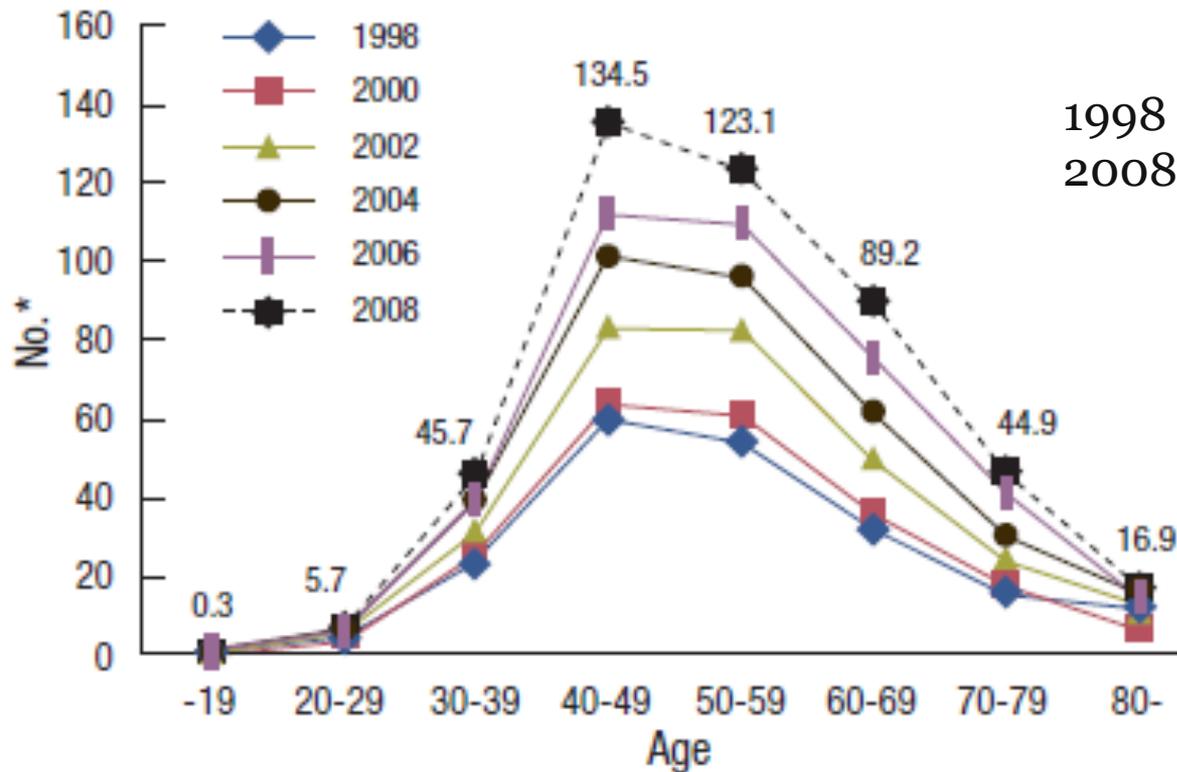


Change in menarche, Korea



Cho Eur J Pediatr 2009

Breast Cancer Incidence, Korea



Jung et al, J Breast Ca, 2011

Why are we not preventing cancer now?

Multiple barriers:

- Skepticism that cancer can be prevented
- Short term focus of cancer research
- Interventions deployed too late in life
- Research focused on treatment not prevention
- Debates among scientists
- Societal factors ignored
- Lack of transdisciplinary training
- Complexity of implementation

Colditz et al Sci Transl Med 2012: March 28

Overcoming obstacles of skepticism and time frame

- Must counter skepticism that cancer can be prevented
 - Goals of prevention: risk marker, premalignant lesion, invasive disease, death
 - Avoid exposure vs. remove later in life
 - Can we intervene if we don't have the pathway defined?
- Take into account time frame of cancer development

Complexity of prevention

- Success requires more than a “finite medical intervention” to achieve prevention in the broader community and improve population health
- Interplay of individual behavior, social circumstances, behavior, genetics, and health care system

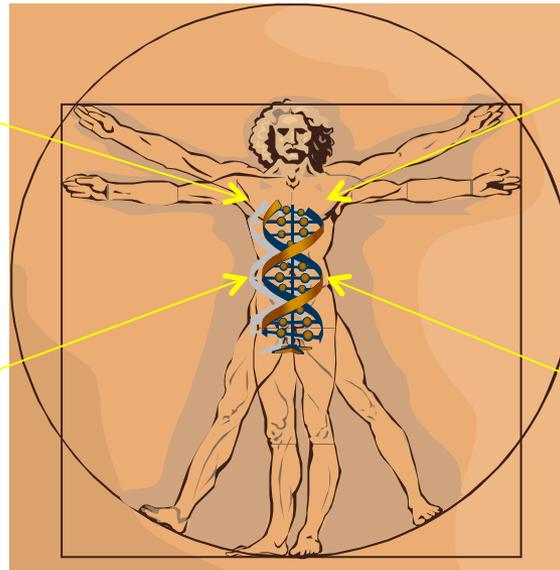
What Potentially Influences Cancer?

Genetic factors

telomere length
Inherited mutations
sporadic mutations

Macro-level factors

crime
poverty
availability of services



Individual-level factors

diet
health behaviors

Demographic factors

age
gender
ancestry

What is preventable?

- More than 50% of all cancer, heart disease, stroke, diabetes, can be prevented with what we know now
- How big is the reduction due to lifestyle?
- How long will we wait?

Lifestyle: high income countries

Cause	% cancer caused	Magnitude possible reduction	Time (yrs)
Smoking	33		
Overweight/obesity	20		
Diet	5		
Lack of exercise	5		
Occupation	5		
Viruses	5-7		
Family history	5		
Alcohol	3		
UV/ionizing radiation	2		
Reproductive	3		
Pollution	2		

Lifestyle: high income countries

Cause	% cancer caused	Magnitude possible reduction	Time (yrs)
Smoking	33	75%	
Overweight/obesity	20	50%	
Diet	5	50%	
Lack of exercise	5	85%	
Occupation	5	50%	
Viruses	5-7	100%	
Family history	5	50%	
Alcohol	3	50%	
UV/ionizing radiation	2	50%	
Reproductive	3	0	
Pollution	2	0	

Tobacco control: population wide strategies

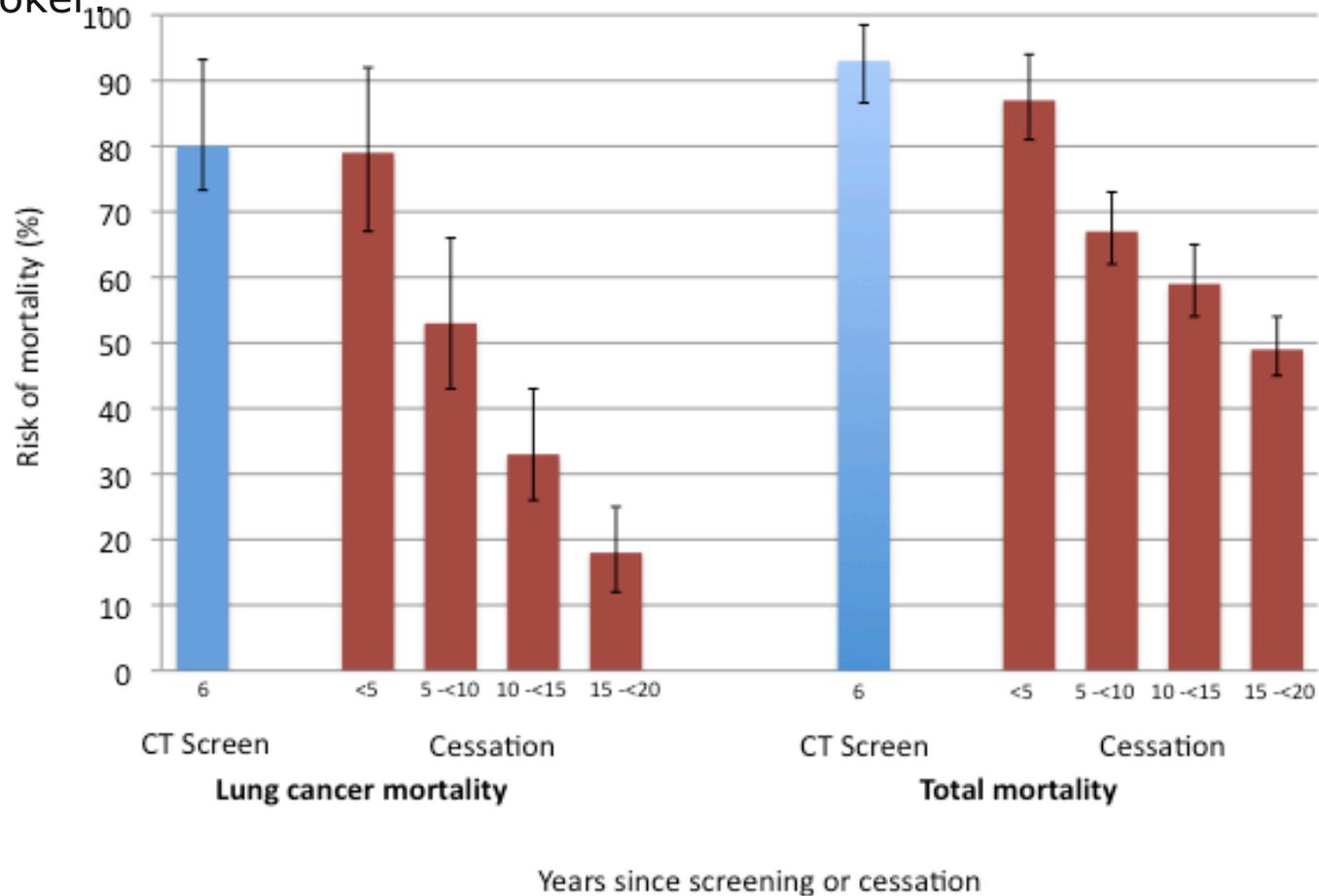
MPOWER

- **M**onitor tobacco use and prevention policies
- **P**rotect people from tobacco smoke
- **O**ffer help to quit tobacco use
- **W**arn about the dangers of tobacco
- **E**nforce bans on tobacco advertising, promotion, and sponsorship
- **R**aise taxes on tobacco

Implement Framework Convention on Tobacco Control

Time course: lung & total mortality

Current smoker:
continuing



Sources: Kenfield et al, 2008; Aberle et al, 2011

Infections

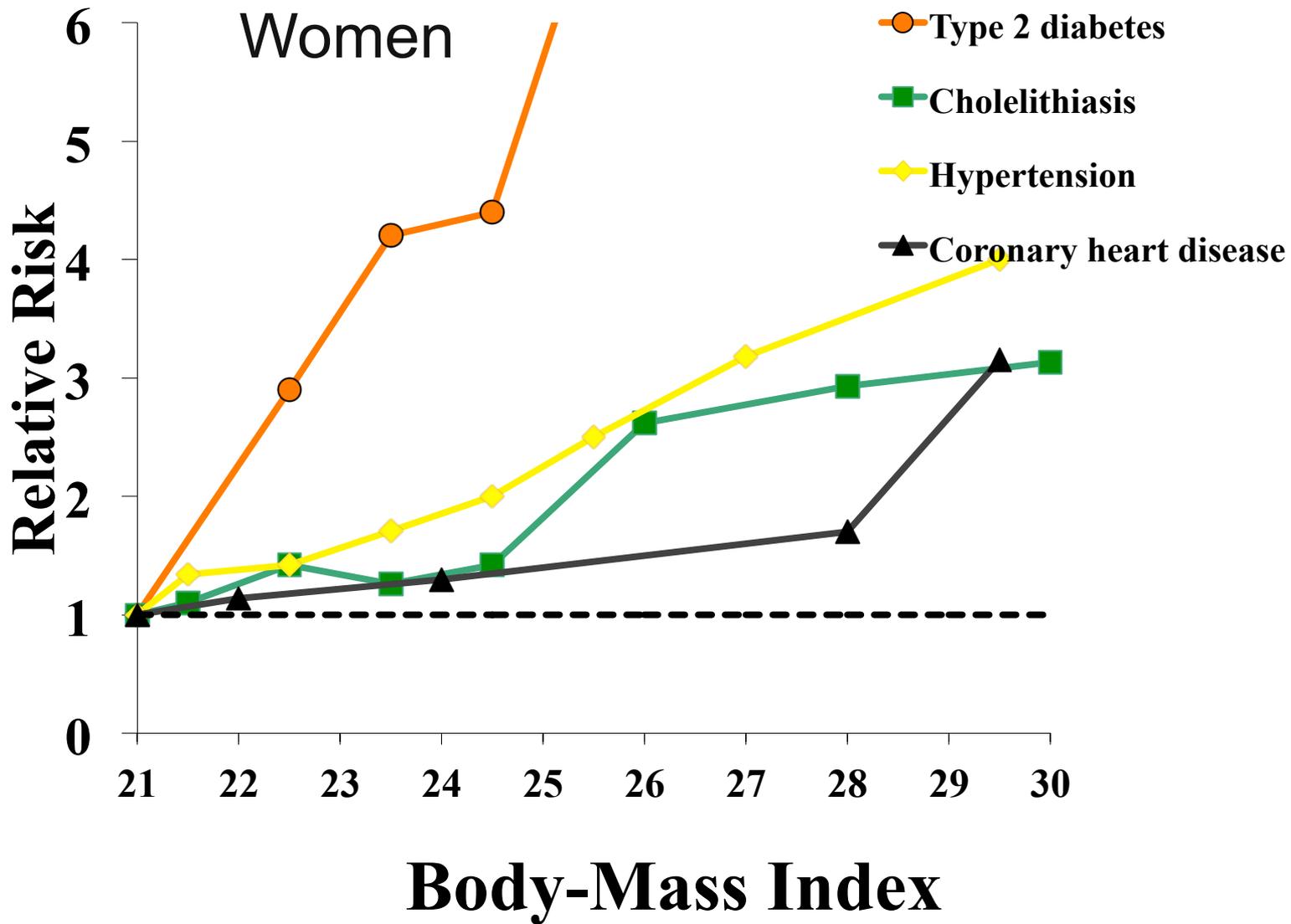
- Helicobacter pylori
- HPV
- Hepatitis B
- Hepatitis C
- Epstein-Barr virus
- HTLV
- Human herpes virus 8
- *Schistosoma haematobium*
- *Opisthorchis viverrini*
- High income countries 7.4%
- Low and middle income countries 23% of cancer
- 2 million cases/yr (16%)
 - de Martel et al, Lancet Oncology, 2012

Lifestyle: high income countries

Cause	% cancer caused	Magnitude possible reduction	Time (yrs)
Smoking	33	75%	10-20
Overweight/obesity	20	50%	2-20
Diet	5	50%	5-20
Lack of exercise	5	85%	5-20
Occupation	5	50%	20-40
Viruses	5-7	100%	20-40
Family history	5	50%	2-10
Alcohol	3	50%	5-20
UV/ionizing radiation	2	50%	2-10
Reproductive	3	0	N/A
Pollution	2	0	N/A

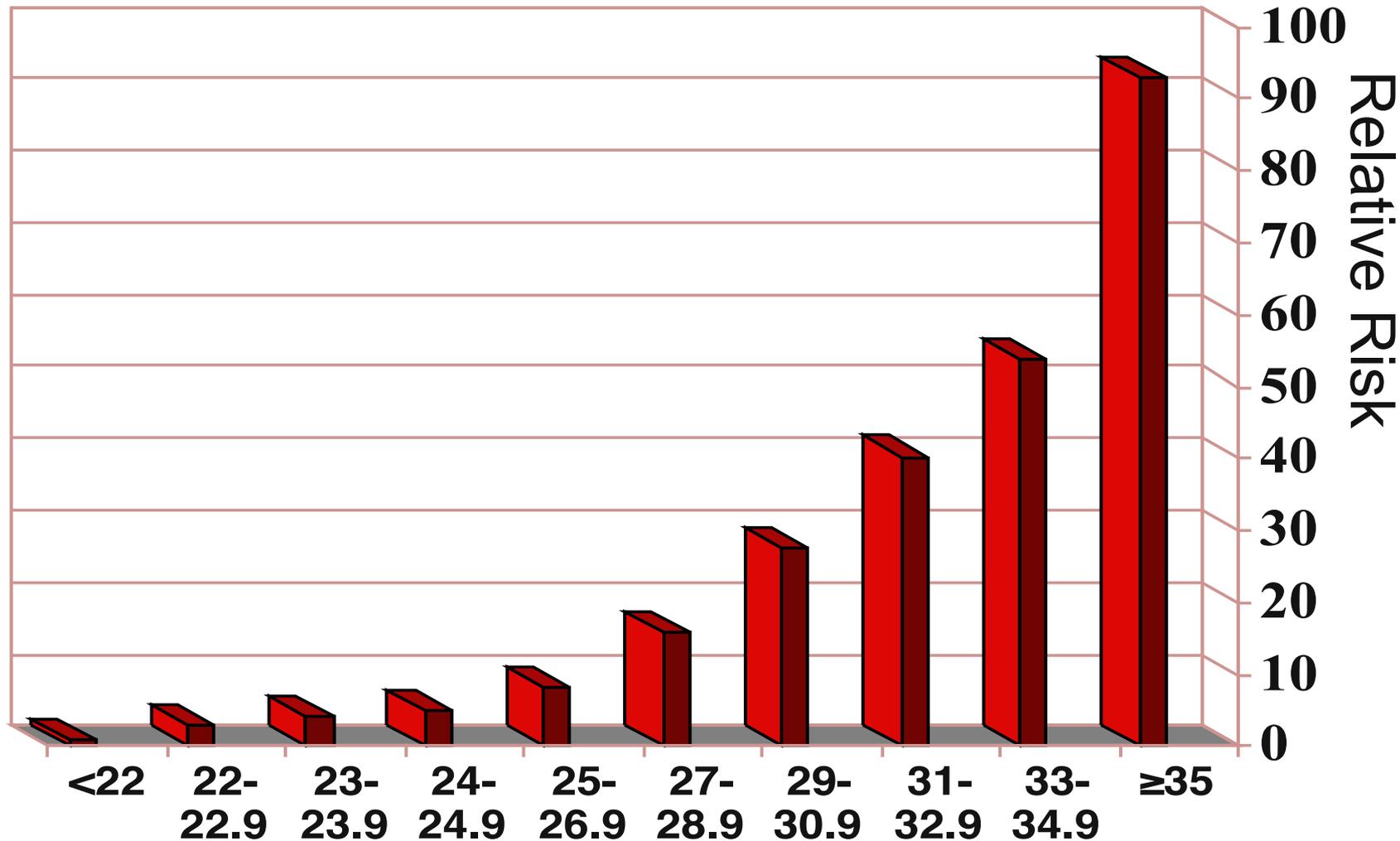
Diabetes and heart disease prevention priority

- Obesity, lack of physical activity, smoking, and poor diet account for majority of heart disease and diabetes
- Not smoking, being physically active, remaining normal weight and a diet high in fiber, grains, and no trans fat, will avoid NCDs
- 64% CHD (Stampfer et al NEJM 2000)
- 80+% DB (Hu et al NEJM 2001)



Willett Dietz Colditz, NEJM 1999

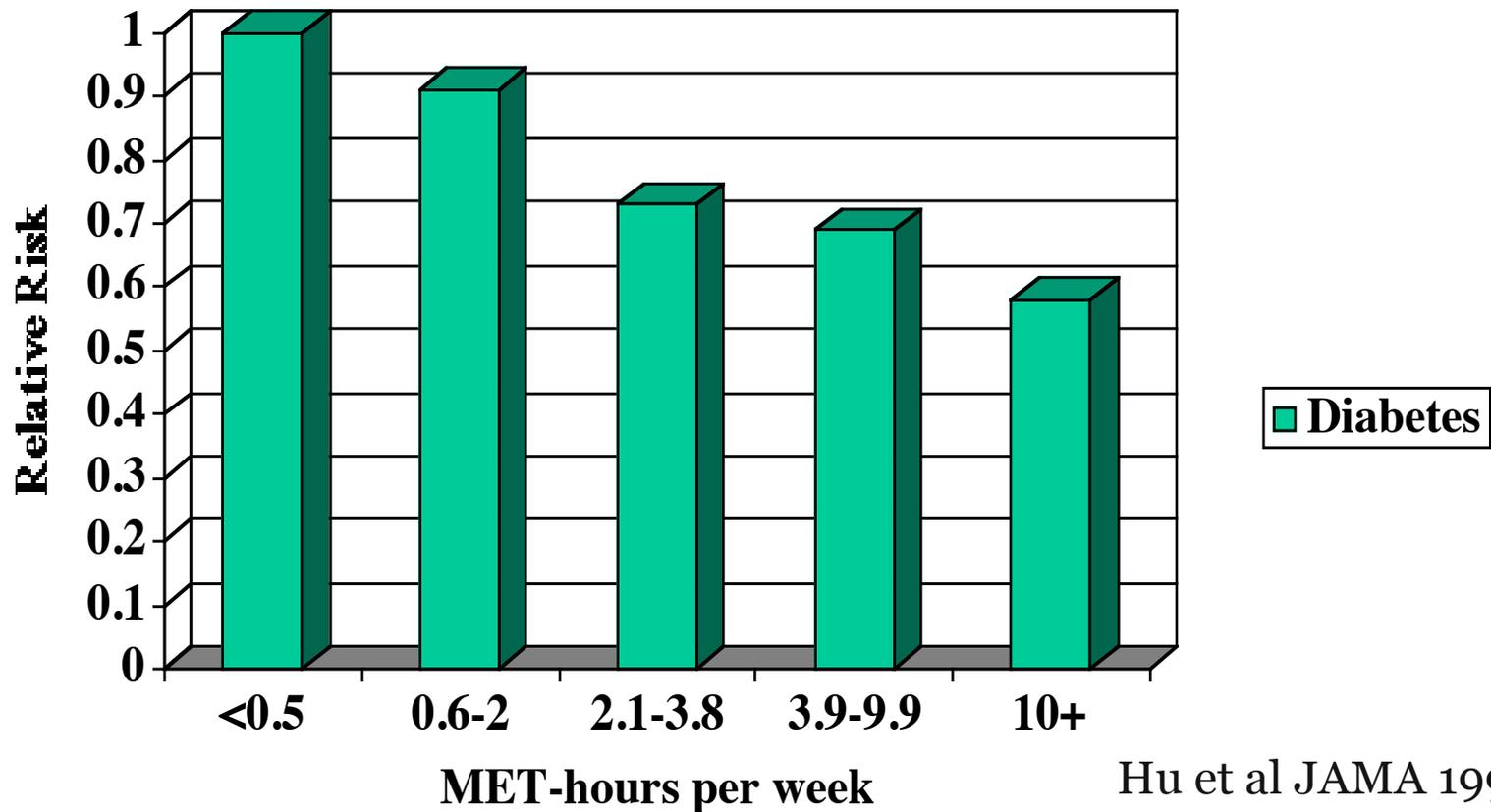
BMI and risk of Diabetes in Women



Body mass index

Colditz Ann Intern Med 1995

Walking and diabetes



ROADMAP FOR WINNING TOGETHER: TCCC & OUR BOTTLING PARTNERS



Our Mission
To refresh the world...
Inspire moments of optimism and happiness...
Create value and make a difference.



Our Vision	Our Goals	Our System Priorities – Consumer / Customer and Commercial / Franchise	Our Metrics
PROFIT	More than double system revenue while increasing system margins.	Maximize Company and bottler long-term cash flow: <ul style="list-style-type: none"> Boost system investment in sales and market execution. Operate the lowest cost manufacturing and logistics in every market, while maintaining our quality standards Use our size and expertise to create economies of scale. 	<ul style="list-style-type: none"> Total shareowner return Economic profit growth System cash flow
PEOPLE	Be a great place to work.	Attract, engage and retain the best talent: <ul style="list-style-type: none"> Increase people's system knowledge and cross-system movement. Inspire our people to be passionate ambassadors for our brands. Recruit, develop and advance women and achieve true diversity. 	<ul style="list-style-type: none"> Engagement Employer of choice Workplace rights Diversity Retention
PORTFOLIO	More than double our servings to over 3 billion a day. Be #1 in NARTD business in every market and every category that's of value to us.	Develop and deploy the world's most innovative and effective marketing. Win with Coca-Cola: <ul style="list-style-type: none"> Accelerate growth of Trademark Coca-Cola, the epicenter of our business. Act now to ensure the next generation of youth falls in love with Coca-Cola. Aggressively increase the value of our portfolio: <ul style="list-style-type: none"> Acquire or develop scalable, innovative premium brands. Bring innovations to the market faster. Satisfy the needs of older consumers with the right brands and marketing. Together with our bottlers, use new technologies to reinvent our fountain business. Ensure that our products are always the 'gold standard' for quality. 	<ul style="list-style-type: none"> Volume & value share Servings growth Brand health Category ranking # of new billion dollar brands Commercialization: <ul style="list-style-type: none"> Percentage Speed Longevity Quality index
PARTNERS	Be the most preferred and trusted beverage partner.	Think and act like an integrated global enterprise while intensifying our local focus. Become a critical part of our customer's growth strategies: <ul style="list-style-type: none"> Align our franchise structure to create unsurpassed value for our customers. Focus on selling and merchandising; be flexible on delivery method. Win at the point of sale: <ul style="list-style-type: none"> Anticipate and serve local tastes, traditions and needs, providing outlets with products and communications tailored to their specific shoppers. Expand immediate consumption investment. 	<ul style="list-style-type: none"> Customer relationship health Retail sales growth Shopping trips with a Company product Immediate consumption growth
PLANET	Global leadership in sustainable water use. Industry leadership in packaging, energy and climate protection	Create competitive advantage by fulfilling our Live Positively commitments: <ul style="list-style-type: none"> Community Marketplace (beverage benefits and active, healthy living) Workplace Environment (climate packaging and water) 	<ul style="list-style-type: none"> Reputation tracking Environmental performance Safety record
PRODUCTIVITY	Manage people, time and money for greatest effectiveness.	Design and Implement the most effective and efficient business system: <ul style="list-style-type: none"> Redirect resources to drive profitable growth. Standardize and simplify our business processes, data and IT systems. Create a competitive cost advantage across the entire supply chain. Build a continuous improvement and cost management culture. Minimize our energy use. 	<ul style="list-style-type: none"> Market-driven spending levels Supply chain costs Overhead per unit Total energy use

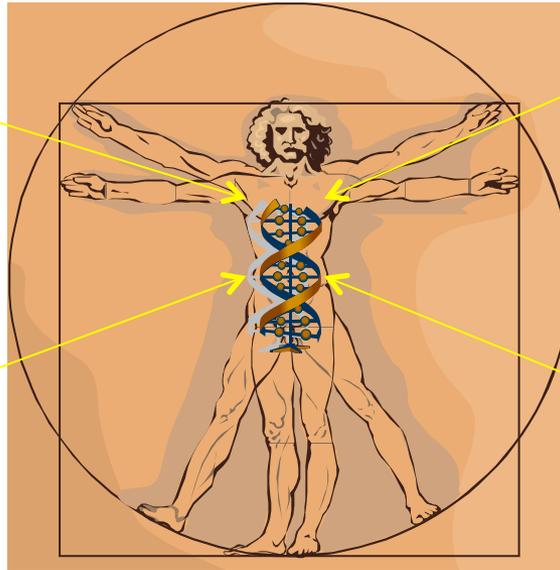
What Potentially Influences Cancer?

Genetic factors

telomere length
Inherited mutations
sporadic mutations

Macro-level factors

crime
poverty
availability of services

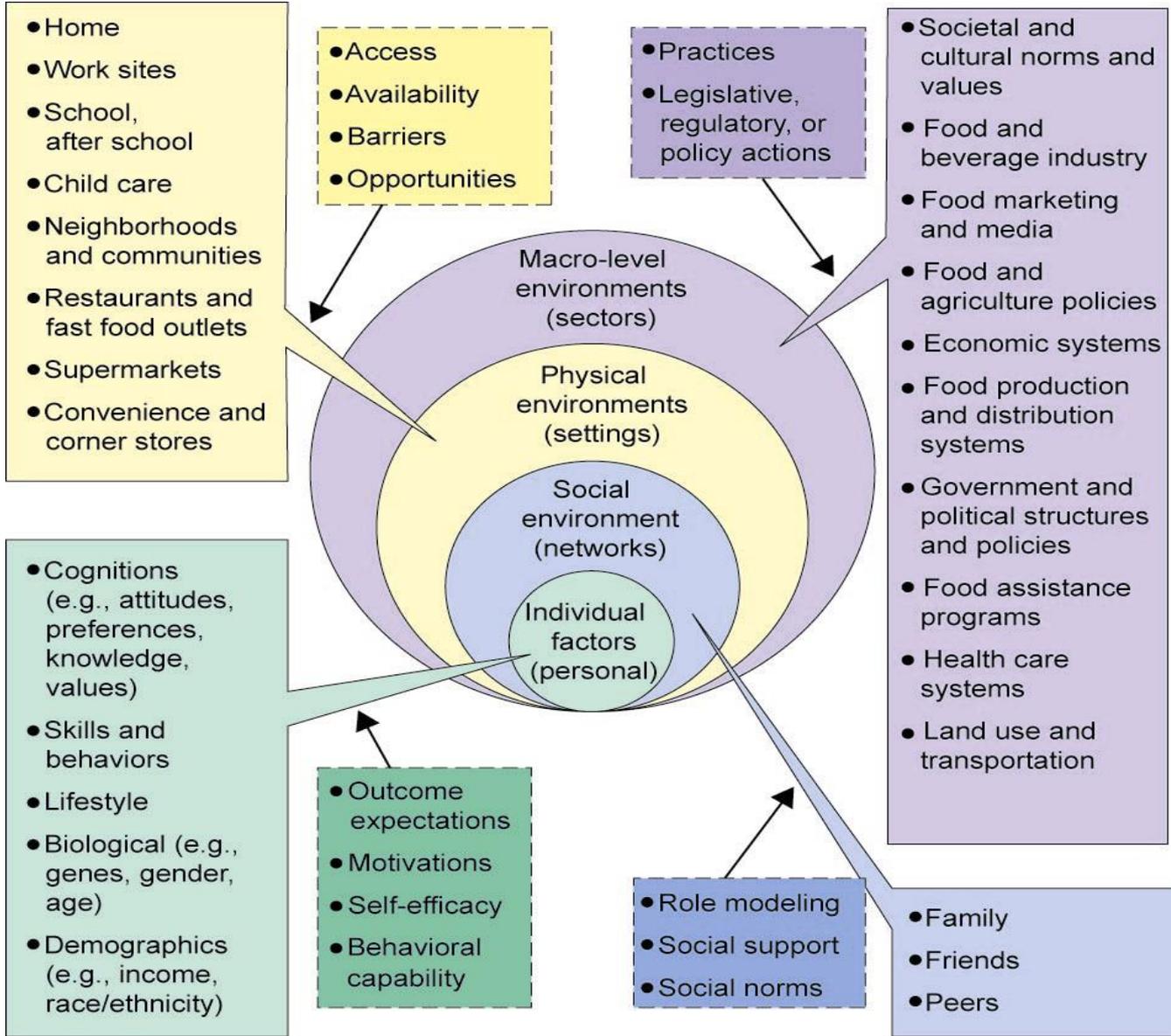


Individual-level factors

diet
health behaviors

Demographic factors

age
gender
ancestry

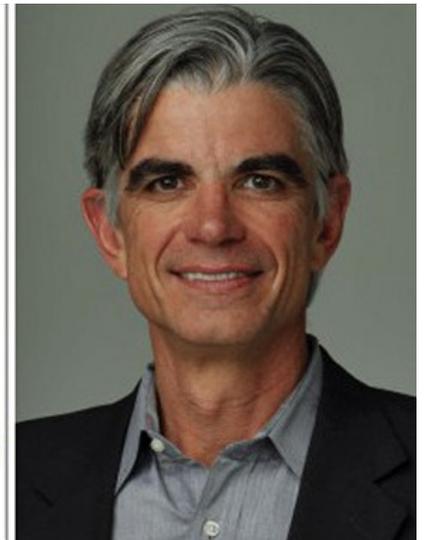
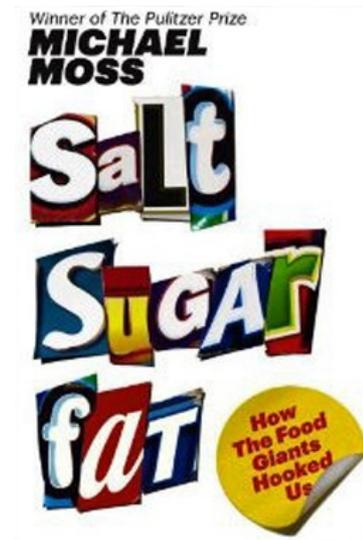


AR Story M, et al. 2008. Annu. Rev. Public Health. 29:253-72

Annual Reviews

Salt, Sugar, Fat

- Farm policy and market incentives
- Dairy as major example, as is beef
 - Two major sources of saturated fat
 - Marketing of cheese to deal with the surplus of dairy fat



Sugar, Salt, Fat



- Fat, → cheese in school lunches, → pizza crust, → Guatemala school food sources!
- Salt, from winter roads, to processing for faster impact on taste buds and increased consumption of processed foods
- Sugar, beverages, increasing consumption

WHO priorities: population-wide interventions

- Reducing tobacco use (a best buy)
- Promoting physical activity
- Reducing harmful alcohol use
- Promoting healthy diets
- Cancer specific strategies
 - Hepatitis B vaccine (a best buy)
 - HPV vaccine
 - Cervical cancer screening

 - Not currently recommended in low income countries – CRC screening

WHO: Global status report on noncommunicable diseases, 2010



Scientific Knowledge

Political Will

Health

Social strategy

Provider
Regulations
Community

Atwood, Colditz, Kawachi, AJPH 1997; 87: 1603-1606.

Department of Surgery
Division of Public Health Sciences

Best buys

Interventions that are not only highly cost-effective but also feasible and appropriate to implement within the constraints of the local LMIC health system

Sustained social change / collective impact requires:

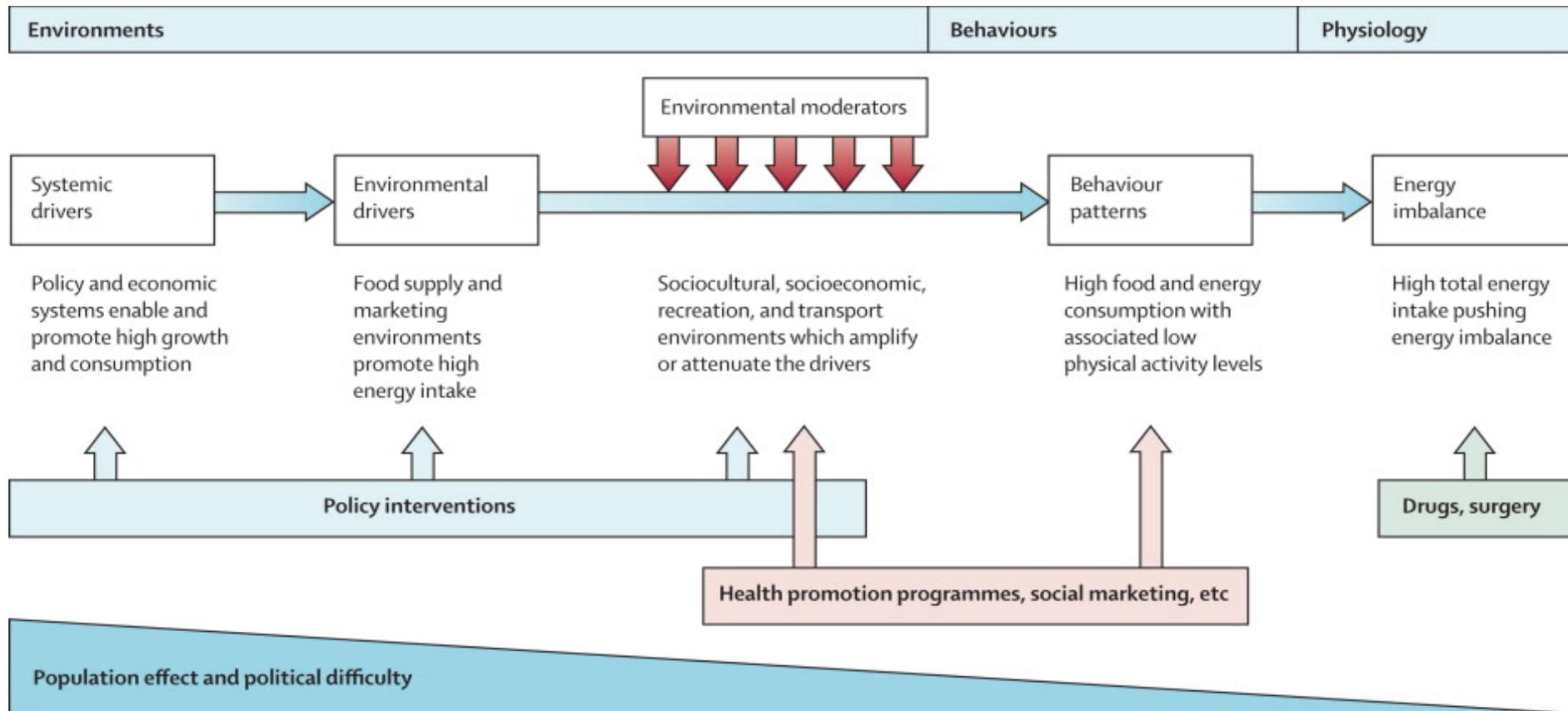
Shared common agenda

Shared measurement system

Mutually reinforcing activities

Continuous communication and backbone support organization

A framework to categorize obesity determinants and solutions



The global obesity pandemic: shaped by global drivers and local environments. Swinburn BA et al.

The Lancet Volume 378, Issue 9793 2011 804 – 814 [http://dx.doi.org/10.1016/S0140-6736\(11\)60813-1](http://dx.doi.org/10.1016/S0140-6736(11)60813-1)

Commission on social determinants of health, 2008

Improve the conditions of daily life – the circumstances in which people are born, grow, live, work, and age.

Tackle the inequitable distribution of power, money, and resources – the structural drivers of those conditions of daily life – globally, nationally, and locally.

Measure the problem, evaluate action, expand the knowledge base, develop a workforce that is trained in the social determinants of health, and raise public awareness about the social determinants of health.

“In the beginning of every enterprise we should know, as distinctly as possible, what we propose to do, and the means of doing it... We desire to lay the foundation and to mature some parts of the plan. Those who come after us must finish the work.”

William Greenleaf Eliot, co-founder

Washington University in St Louis

1854

my results **zoom** health tracker

Results can be sent to your doctor, family, friends, or even to yourself to print.

Michelle

my risks Tap each to learn more

high
above average
average
below average
low

- stroke & heart disease
- lung cancer
- diabetes
- breast cancer
- colon cancer

my profile

Female
59 years old
5 feet, 7 inches tall
27 pounds

my healthy habits
daily aspirin
little TV or screen time
regular cancer screenings
eat a lot of nuts, fruits & vegetables and whole grains

my challenge
weight: too heavy
smoking
diet: not enough fish and healthy fats
diet: too much full-fat dairy

my modified risk
my original risk

Washington University School of Medicine in St. Louis

Available on the App Store

SITEMAN CANCER CENTER
BARNES-JEWISH HOSPITAL • WASHINGTON UNIVERSITY SCHOOL OF MEDICINE
A National Cancer Institute Comprehensive Cancer Center

ABOUT US | NEWS & EVENTS | MAPS | CONTACT US | SITEMAP

Patient & Visitor Information | Treatment Programs | Prevention & Screening | Research Programs | How to Help | For Health Professionals

Your Disease Risk
THE SOURCE ON PREVENTION

my results: **No Results Yet**

Subscribe e-mail updates

What is...?
Prevention Risk
A Screening Test

How to...
Estimate Risk

Community Action

Disclaimer
Privacy Policy
Feedback on this Site

What is your risk?

Cancer: There's much more to it than just smoking and lung cancer.	What's your cancer risk?
Diabetes: Over 18 million in the U.S. suffer from it. Take steps now to lower your risk.	What's your diabetes risk?
Heart disease: The #1 killer in the U.S. is also one of the most preventable.	What's your heart disease risk?
Osteoporosis: Calcium isn't the only way (or even the best way) to protect yourself.	What's your osteoporosis risk?
Stroke: Most cases of this feared disease can be avoided by lifestyle changes.	What's your stroke risk?

Cancer News in Context
From the Prevention Team at the Siteman Cancer Center

Home | About CNIC | Prevention Snapshot | Extras | Cancer Screening | Glossary | Zero Conflicts

THURSDAY, OCTOBER 6, 2011

6 Ways to Prevent Breast Cancer

Ask women what they think is the biggest threat to their health, and most will answer "breast cancer." And even though lung cancer and heart disease kill more women each year,



facebook

Your Disease Risk
THE SOURCE ON PREVENTION
www.yourdiseaserisk.wustl.edu

Wait | Info | Links | Discussions | Notes

Your Disease Risk + Fans | Your Disease Risk | Just Fans

a Risk Your Disease Risk News "Cancer News in Context" post.
Cancer News in Context: Adolescent & Young Adult Drinking, Better Breast Disease, and Cancer Risk
www.cancernewsincontext.org
New results indicate regular fruit and vegetable intake may lower the risk of breast cancer. A new study has found strong links between the drinking behavior of young women and adolescent girls and their later risk of developing benign breast disease, a marker...

a Risk Your Disease Risk News research from YOR's Dr. Graham Colditz, showing that early life can have an important impact on later cancer risk.
Adolescent drinking adds to risk of breast disease, breast cancer | Newsroom | Washington University
www.wustl.edu
Girls and young women who drink alcohol increase their risk of benign (noncancerous) breast disease, since a study by researchers at Washington University School of Medicine in St. Louis and Harvard University. Being breast disease increases the risk for developing breast cancer.

a Risk Your Disease Risk Cancer News in Context: Despite New Results - Keep Eating Your Fruits and Vegetables
www.cancernewsincontext.org
The headlines this week about fruits and vegetables doing little, if anything, to lower cancer risk may entice you to reach for a candy bar rather than a carrotstick, but there's still plenty of good...

a Risk Your Disease Risk Cancer News in Context: Health care reform and prevention of cancer
www.cancernewsincontext.org
In Sunday's New York Times (Story), Robert Pear writes about the many disease prevention initiatives contained in the new health care law recently passed by congress and approved by the president. It's important to stress and consider the full implications of this...



Your Disease Risk
@YourDiseaseRisk

Healthy tweets from the team at the award winning website site at Washington University School of Medicine. Know your risk. Change your future.
St. Louis, MO · <http://yourdiseaserisk.org>

653 TWEETS | 43 FOLLOWING | 652 FOLLOWERS

Follow [Go to full profile →](#)

Your Disease Risk @YourDiseaseRisk 25 Sep
Wonder about your ovarian cancer risk and what you can do to lower it? Visit "Your Disease Risk": yourdiseaserisk.wustl.edu/hccpqulz.pl?la... (#ovariancancer) Details

Your Disease Risk @YourDiseaseRisk 24 Sep
Follow up is important but cost an issue for both

