Epidemiology & prevention of cardio-metabolic disease in the era of multimorbidity: a global perspective

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Schulich MEDICINE & DENTISTRY

Family Medicine Rounds
November 6, 2019

Western

Faculty/Presenter Disclosure

Faculty: Dr. Saverio Stranges, MD, PhD, FHHA

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Consulting Fees: N/A
Other: N/A

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Disclosure of Commercial Support

- **This program has received no in-kind support.**
- **This program has no financial support.**

<u>Potential for conflict(s) of interest</u>:

No member of the planning committee has disclosed a potential conflict of interest.

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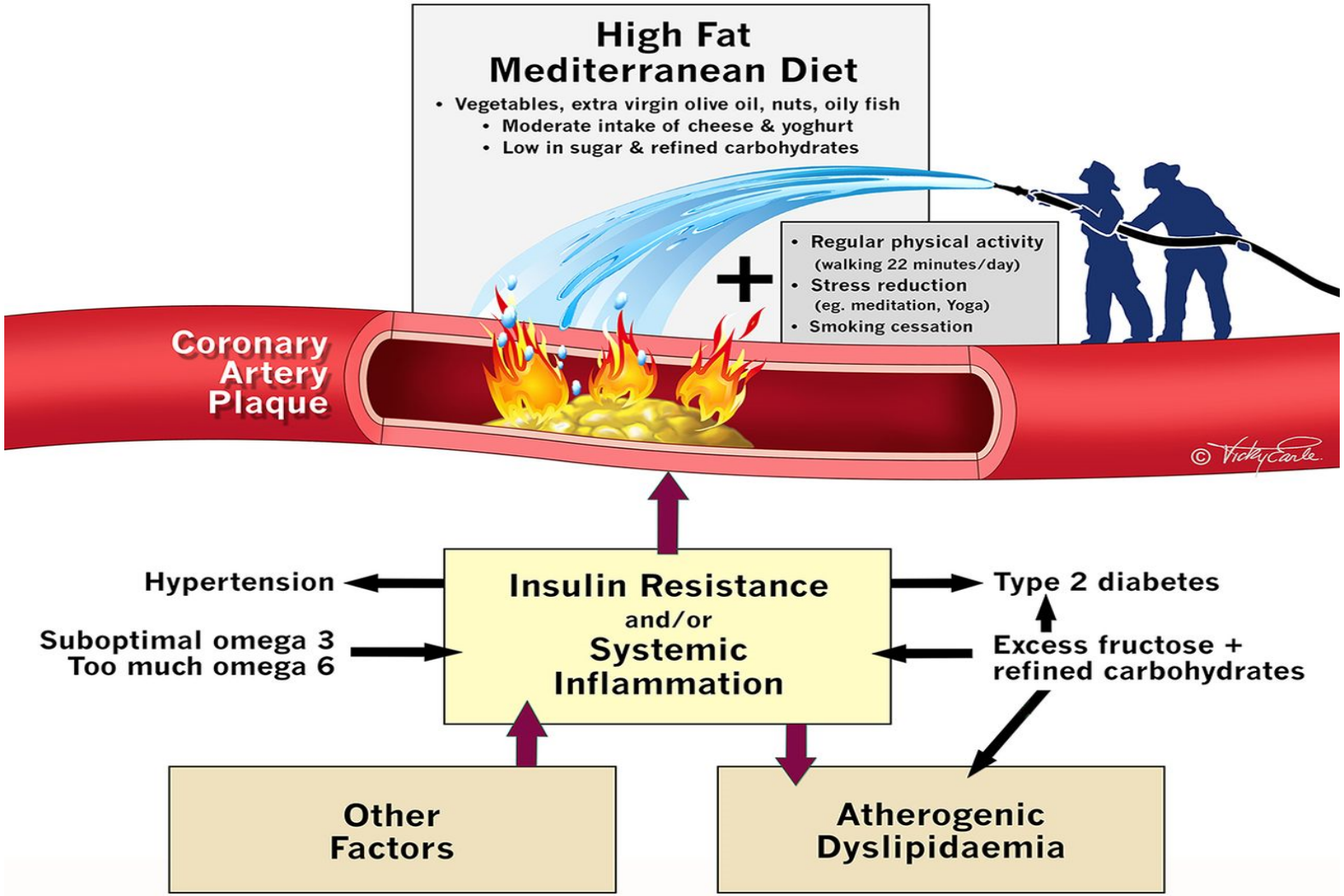
Outline

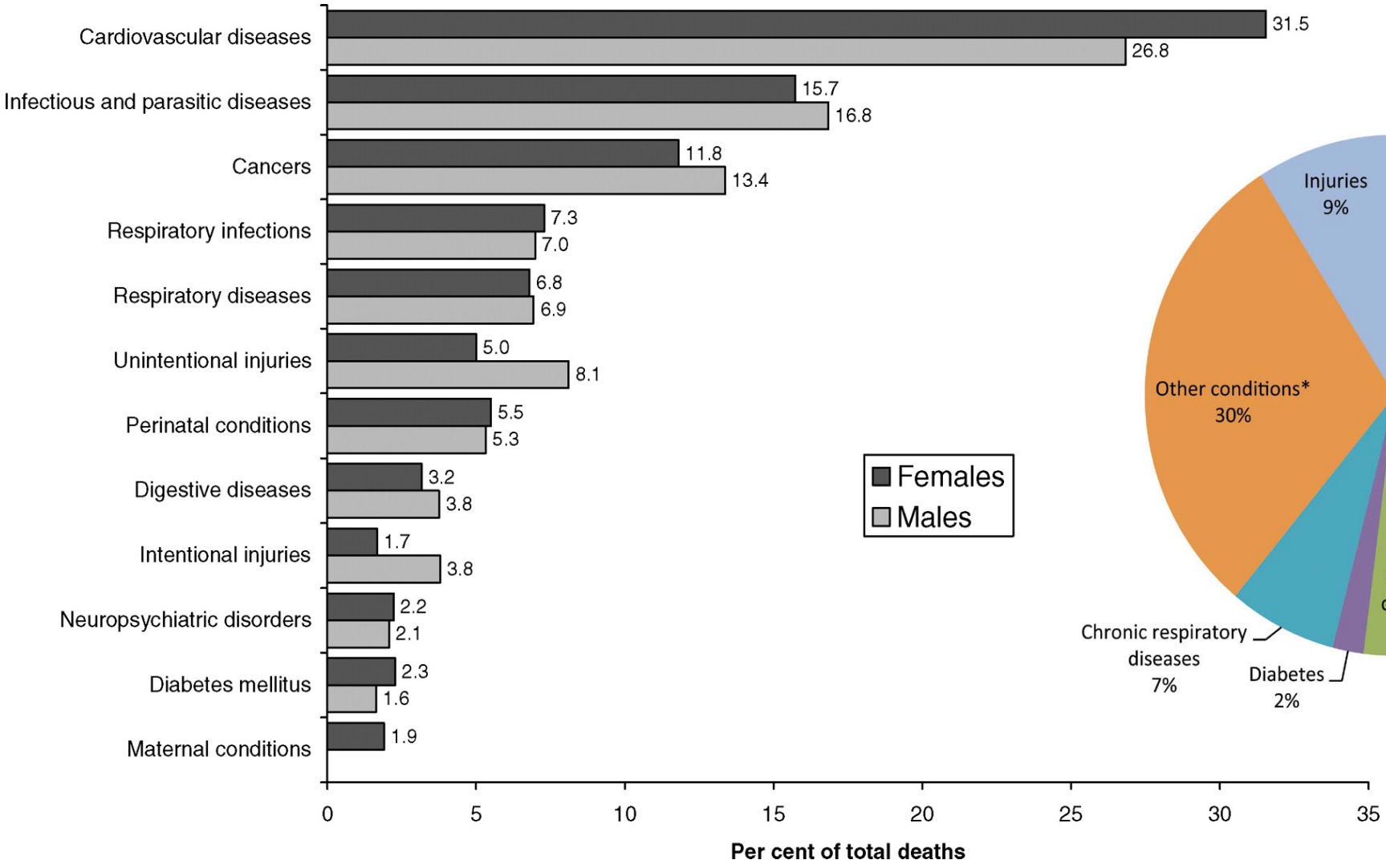
- ✓ Global epidemiological data/trends (“Paradigm Shift”)
- ✓ CVD in the context of aging and multimorbidity
- ✓ Traditional risk factors (Dietary Patterns/Micronutrients)
- ✓ Emerging risk factors/risk markers (Sleep Problems)
- ✓ Role of social determinants of health
- ✓ Lessons learned & way forward

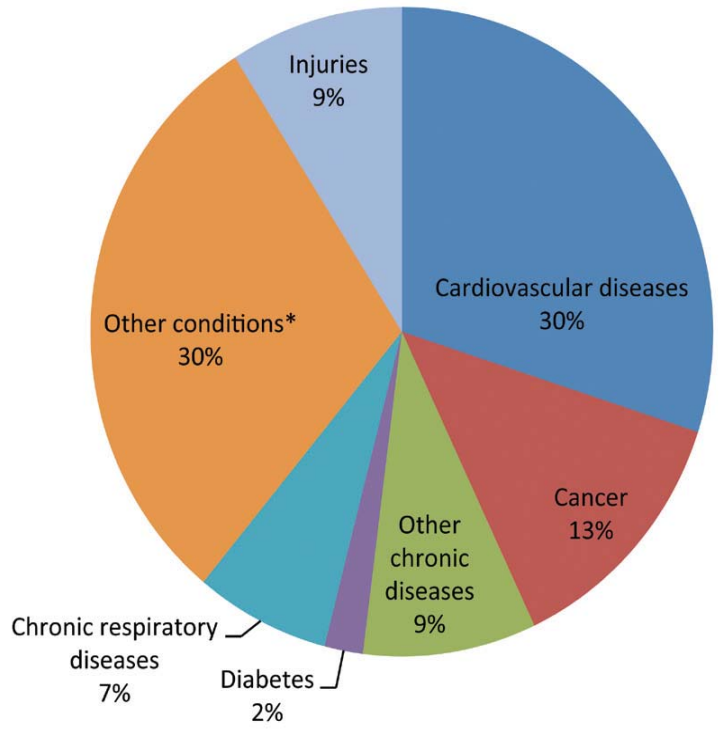
Current views on coronary heart disease pathogenesis…Beyond the 'plumbing approach'



Aseem Malhotra et al. Br J Sports Med 2017;51:1111-1112

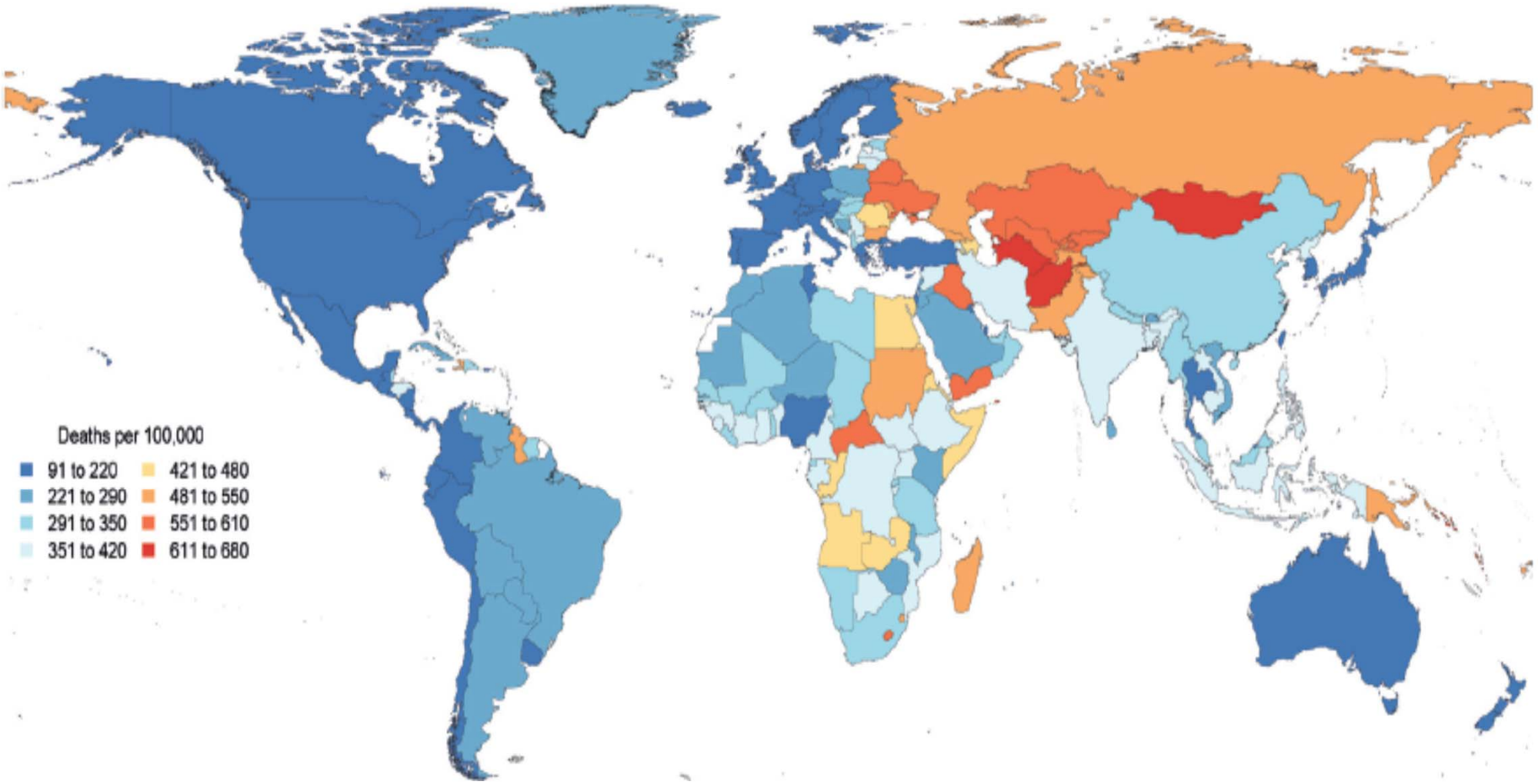
CVD: leading cause of death worldwide





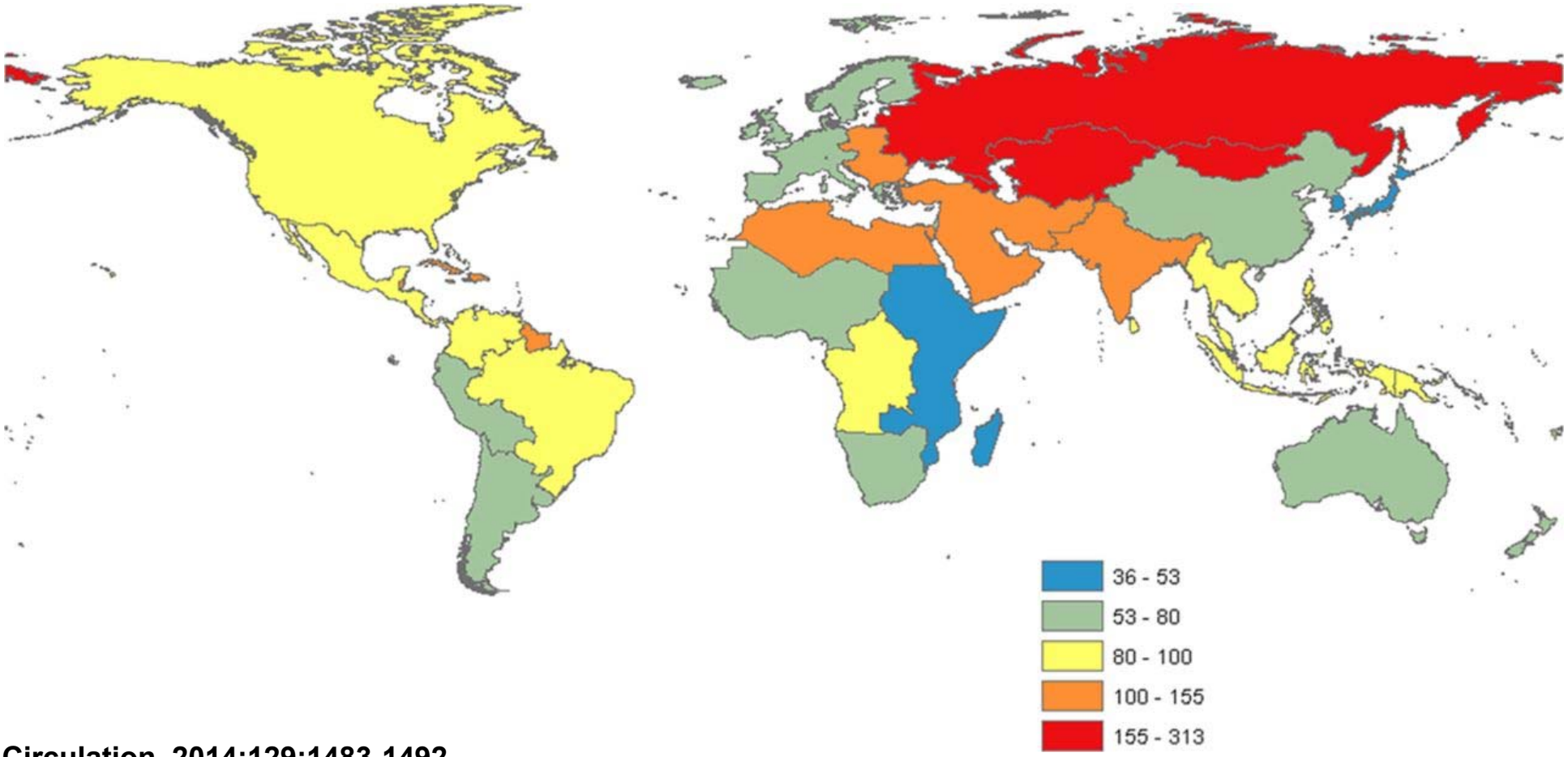
Br Med Bull. 2009 – WHO 2011 – The LANCET 2012

CENTRAL ILLUSTRATION Global Map, Age-Standardized Death Rate of CVD in 2015



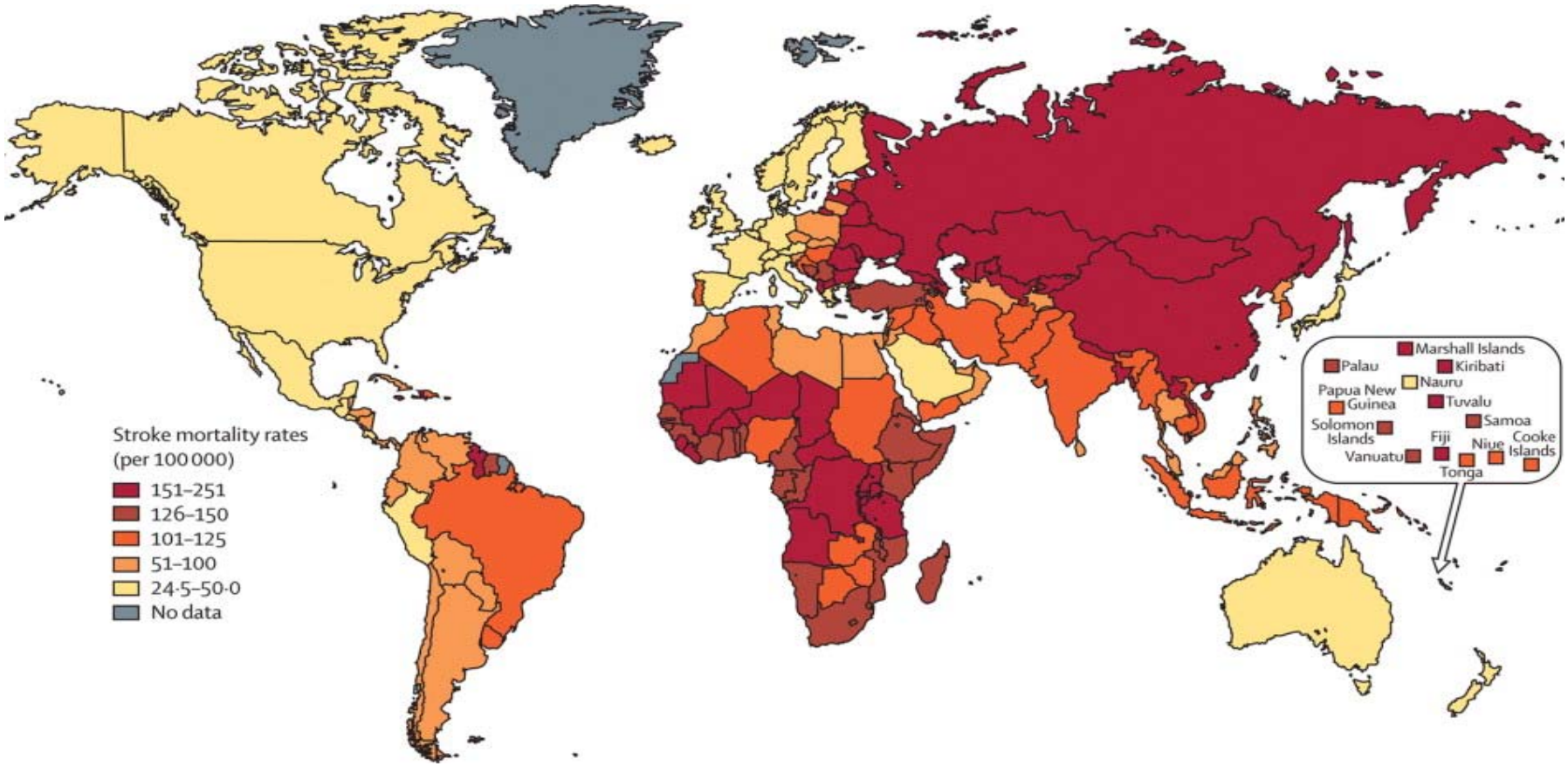
Roth GA, …Stranges S, et al. J Am Coll Cardiol. 2017;70(1):1-25

Ischemic heart disease mortality rates per 100,000
Global Burden of Disease 2010



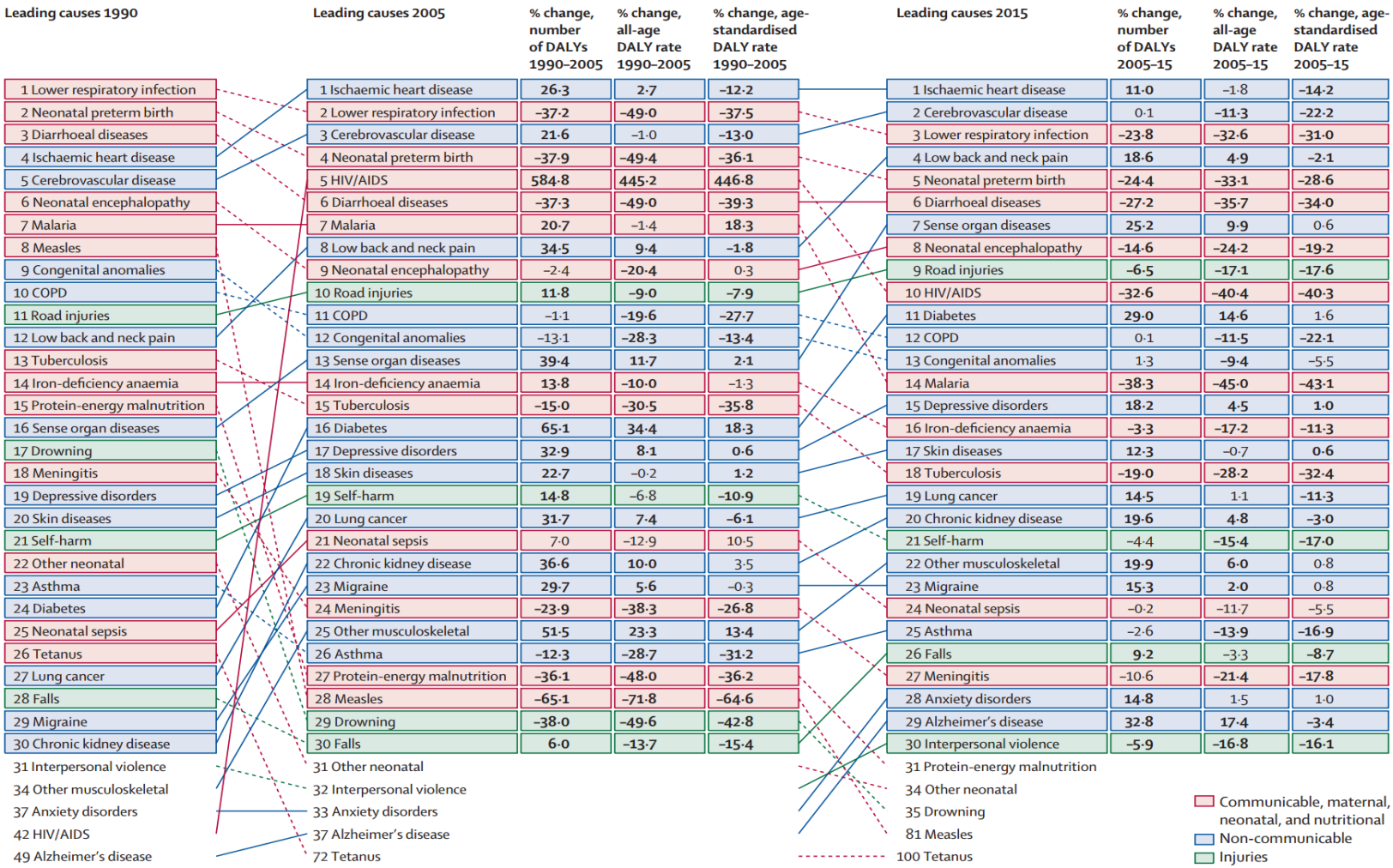
Circulation. 2014;129:1483-1492

Global variation in stroke mortality rates

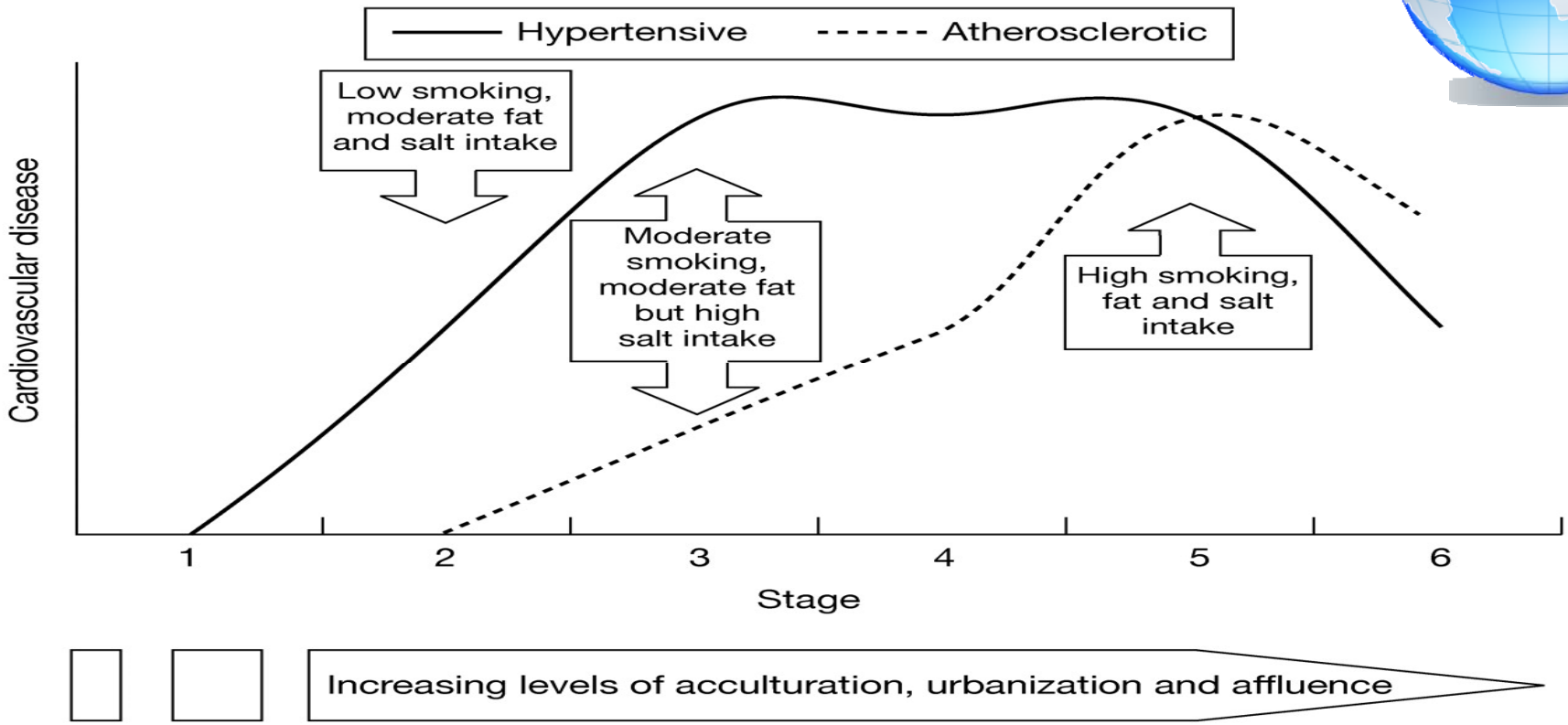


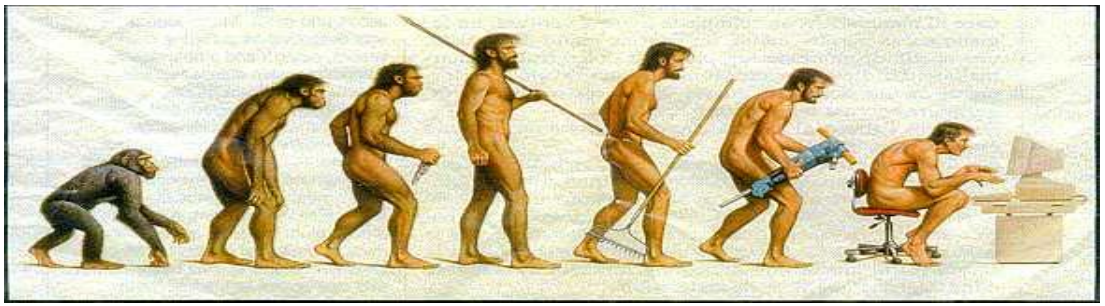
The LANCET Neurology. 2009;8:345-54

Leading 30 causes of global DALYs for both sexes combined, 1990, 2005, 2015, Global Burden of Disease, GBD



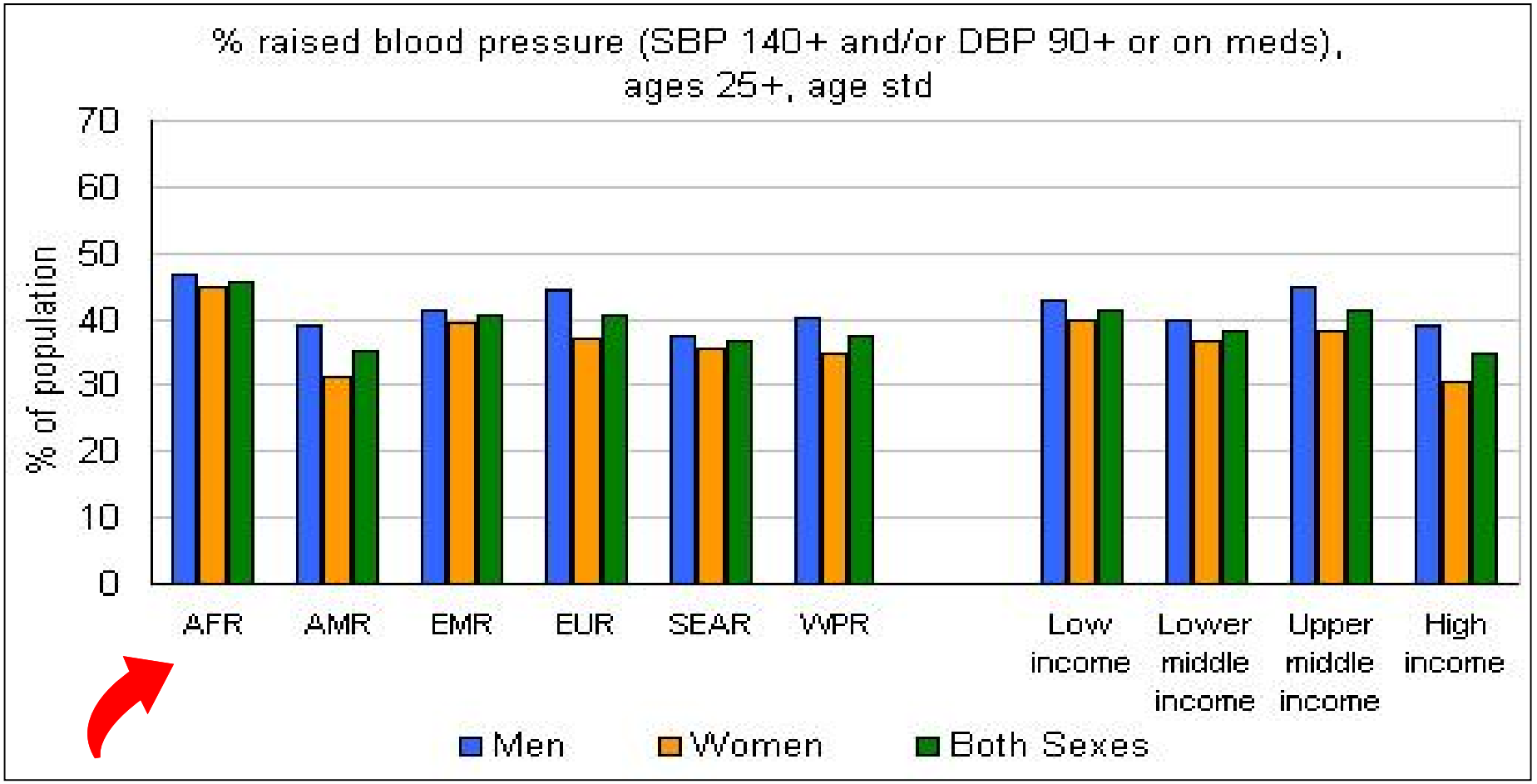
Epidemiological & Nutritional Transition: Impact on CVD in low-resource settings…





Int J Epidemiol. 2004

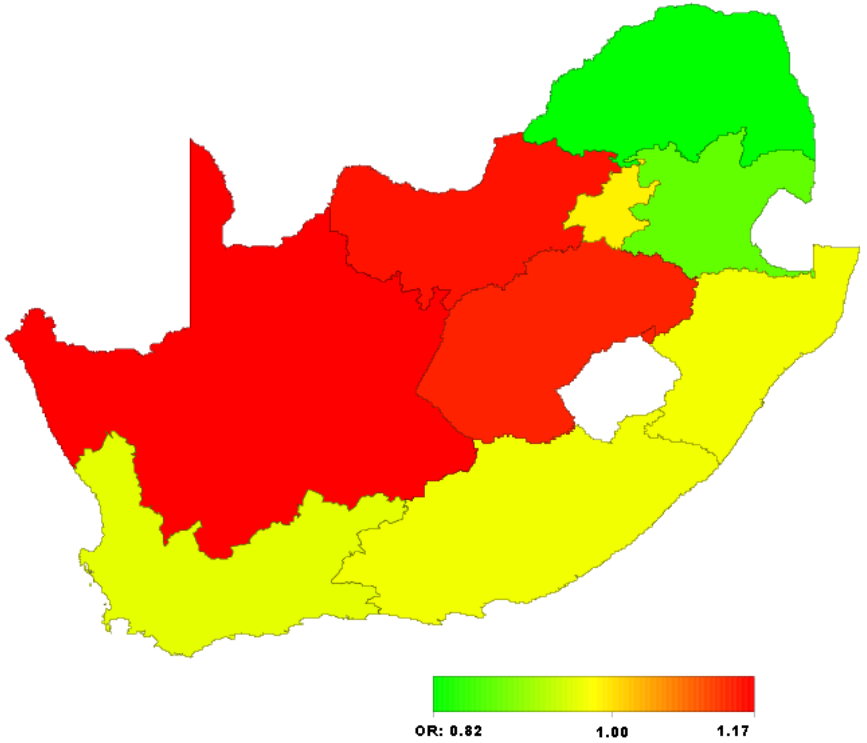
Prevalence of Hypertension in WHO regions



WHO 2013

Geographic variation of hypertension in South Africa

Demographic & Health Survey, N=13,596

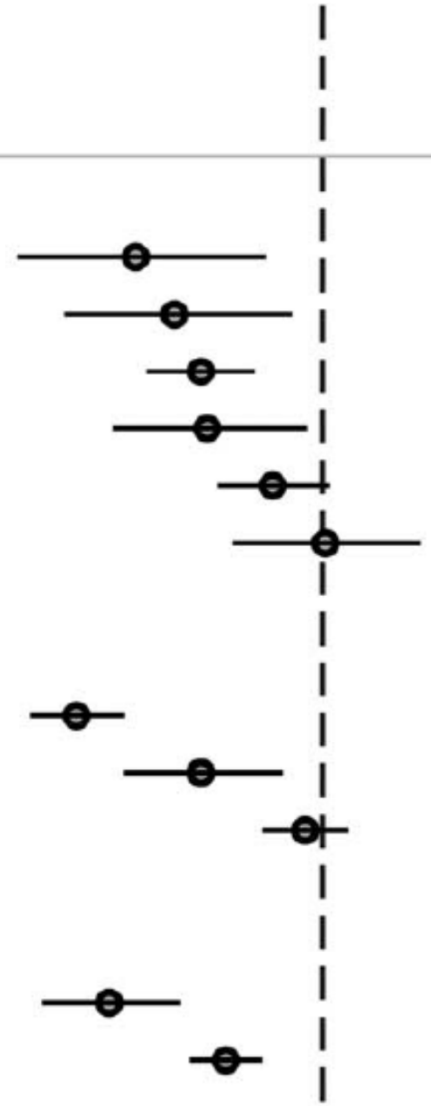


Prevalence of hypertension = 30.4%

Red coloured – high risk
Green coloured – low risk

Kandala N-B, Tigbe W, Manda SOM, Stranges S. Am J Hypertens. 2013;26:382-91

Prevalence of Hypertension in LMICs

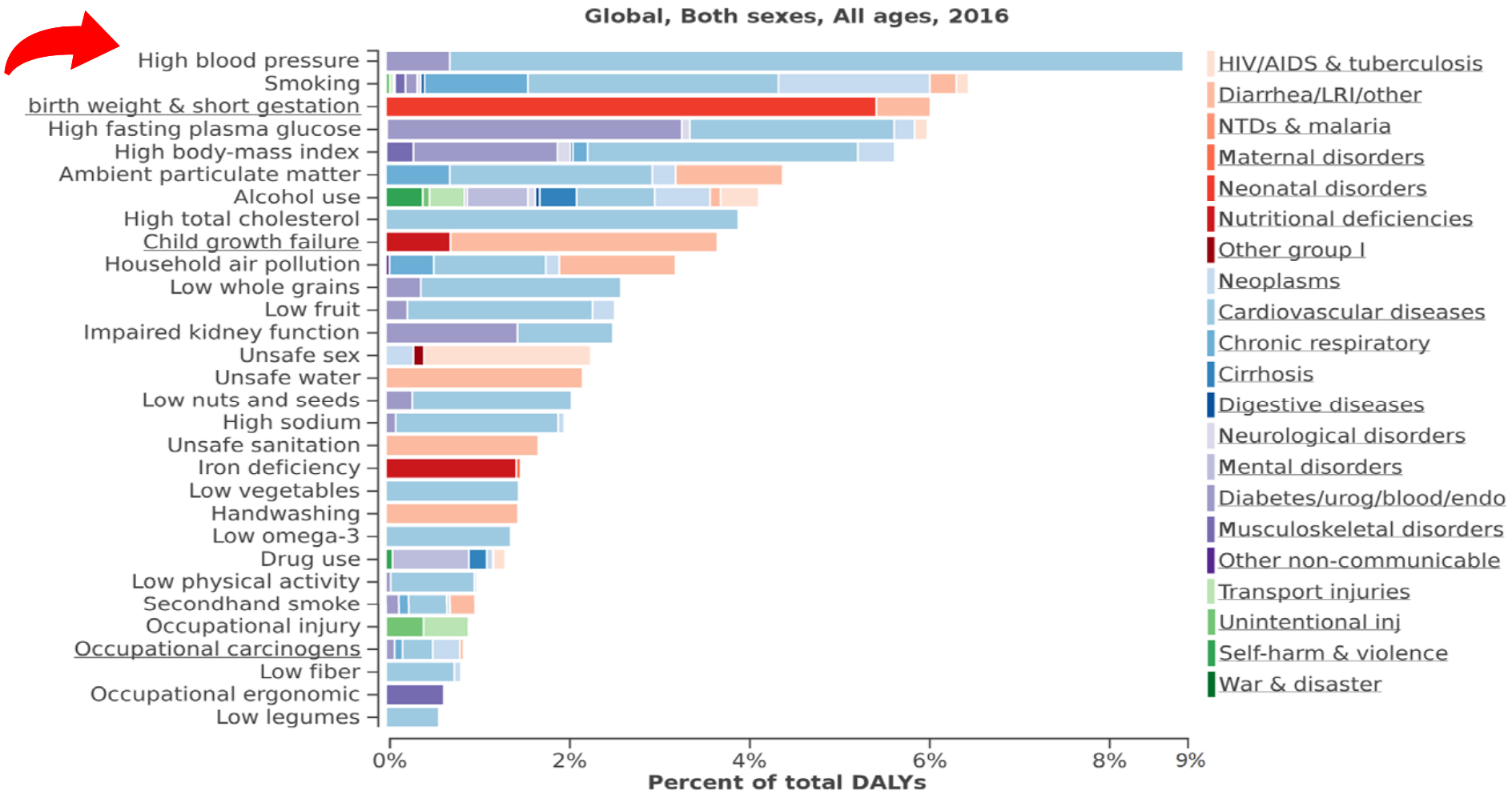


Subgroup	Prevalence % (95% CI)	Number of studies	Heterogeneity % (95% CI)	Tau-squared
Region				
Middle East and North Africa	26.9 (19.3 to 35.3)	12	99.9 (99.9 to 99.9)	0.102
South Asia	29.4 (22.3 to 37.0)	70	100.0 (100.0 to 100.0)	0.474
Sub-Saharan Africa	31.1 (27.6 to 34.6)	74	99.6 (99.5 to 99.6)	0.108
Europe and Central Asia	31.5 (25.4 to 37.9)	12	99.7 (99.6 to 99.7)	0.056
East Asia and Pacific	35.7 (32.2 to 39.4)	33	99.8 (99.8 to 99.8)	0.049
Latin America and Caribbean	39.1 (33.1 to 45.2)	41	99.7 (99.7 to 99.7)	0.162
.				
Income				
Low-income	23.1 (20.1 to 26.2)	33	99.0 (98.9 to 99.1)	0.044
Lower middle-income	31.1 (26.1 to 36.4)	118	100.0 (100.0 to 100.0)	0.379
Upper Middle-income	37.8 (35.0 to 40.6)	90	99.8 (99.8 to 99.8)	0.077
.				
Residence				
Rural	25.2 (20.9 to 29.8)	50	99.7 (99.7 to 99.7)	0.124
Urban	32.7 (30.4 to 35.0)	80	99.5 (99.5 to 99.5)	0.049

Overall prevalence = 32.3%

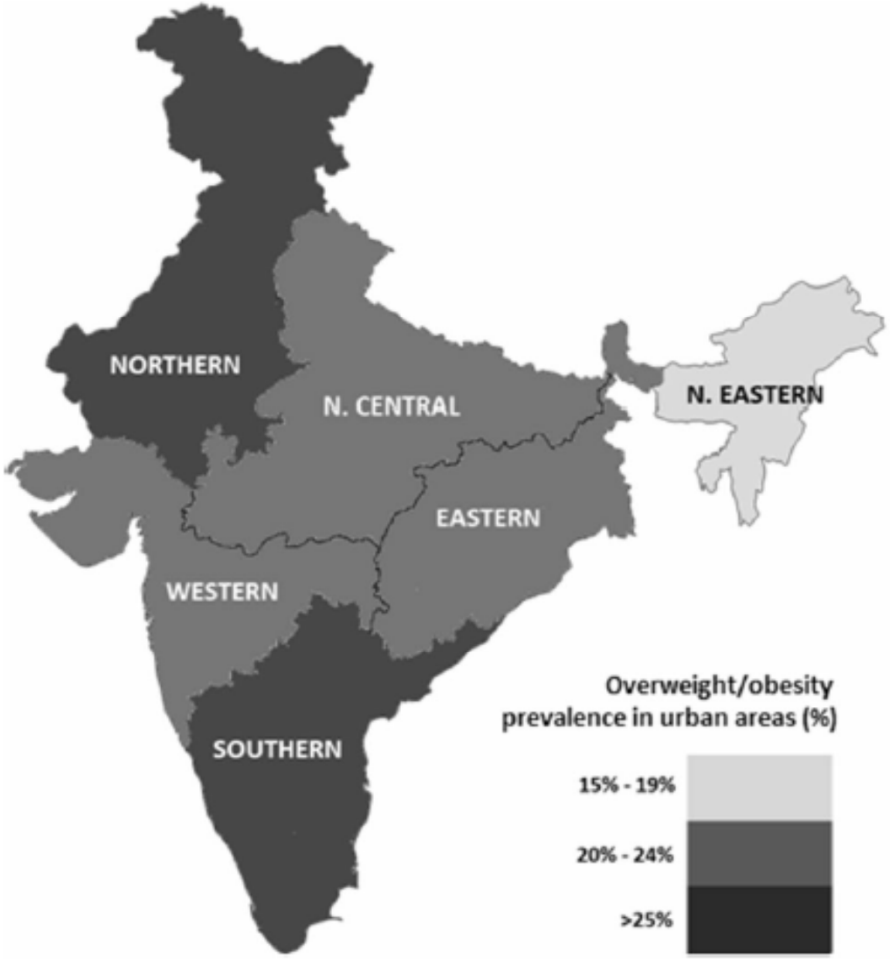
Sarki AM, Stranges S, et al. Medicine 2015;94:e1959

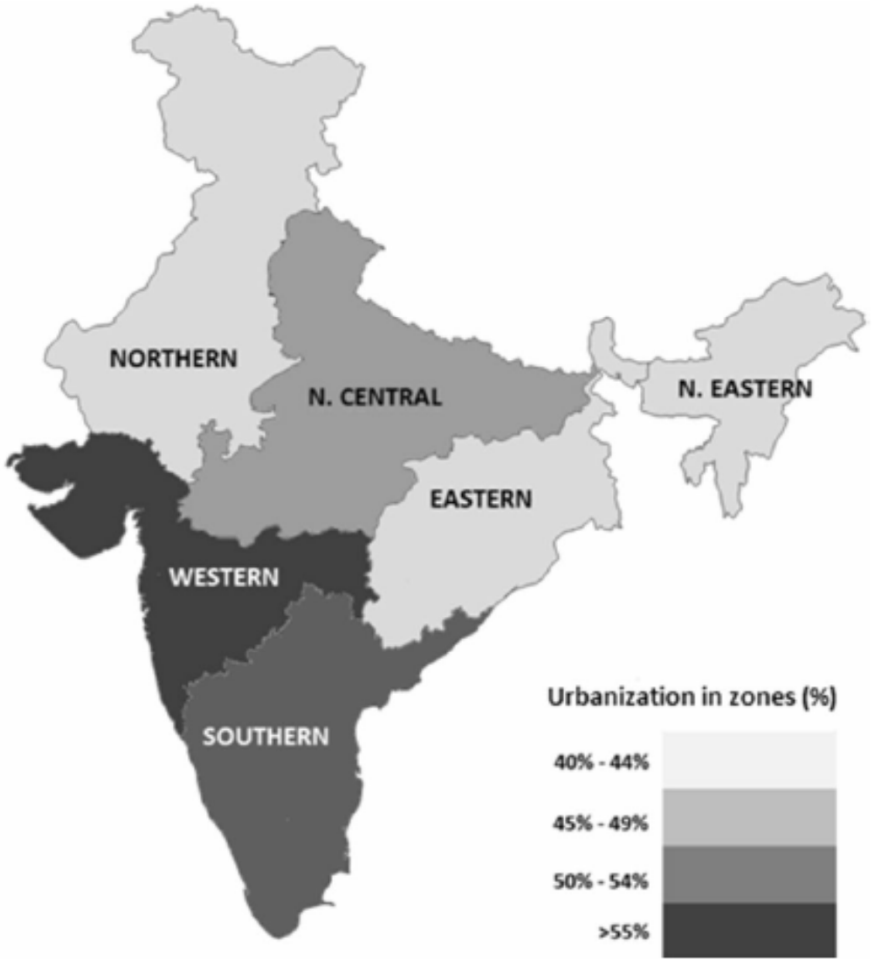
DALYs (%) attributable to leading global risk factors 2016, both sexes, Global Burden of Disease (GBD) Study



Urbanization & Geographic Variation of Overweight/Obesity in India

2005-2006 Demographic & Health Survey (DHS)





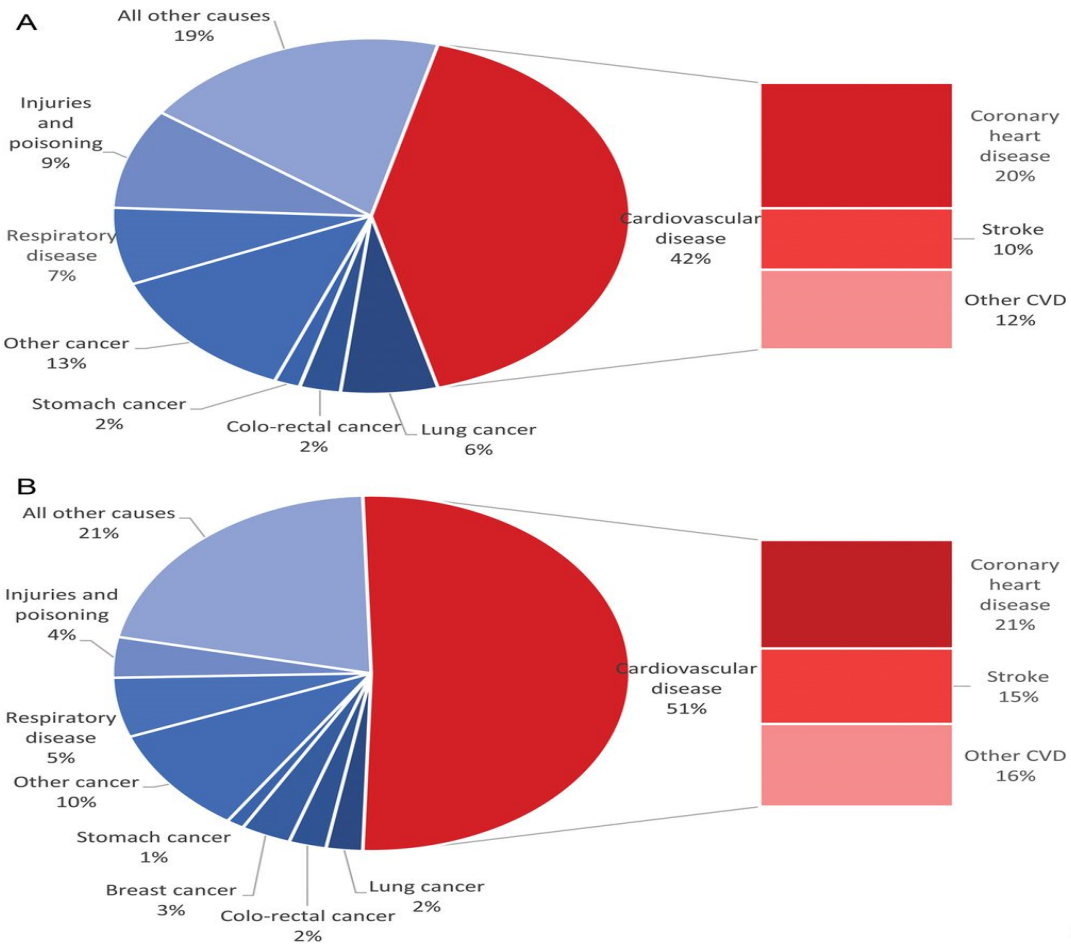
Urban areas were consistently associated with a higher risk of overweight/obesity across all zones

Siddiqui ST, Kandala N-B & Stranges S. Int J Public Health. 2015;60:717-26

CVD: leading cause of death in Europe

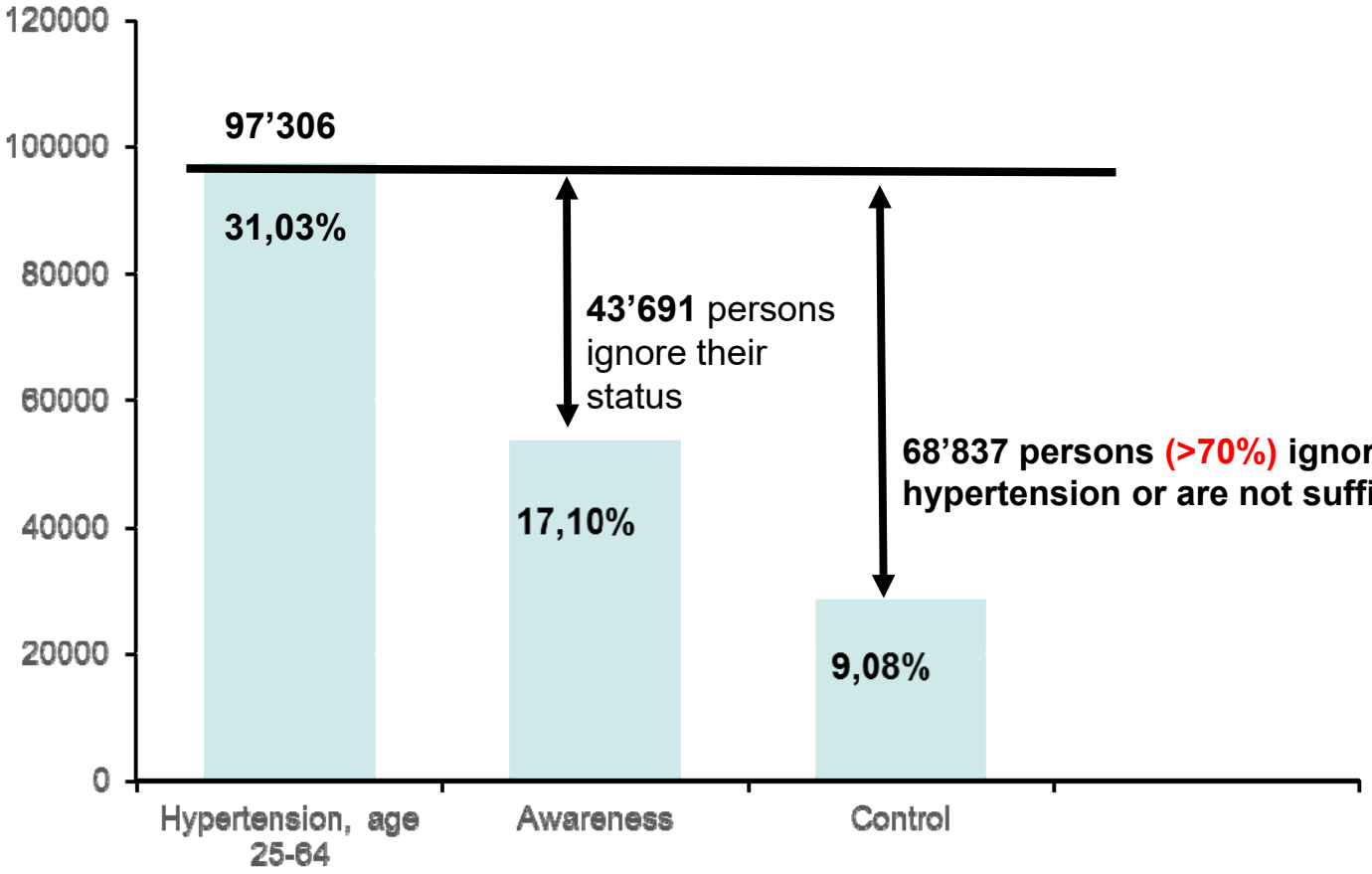
MEN

WOMEN



Eur Heart J. 2014;35:2950-2959

Hypertension Burden in Luxembourg
European Health Examination Survey (2013-15, age 25-64)



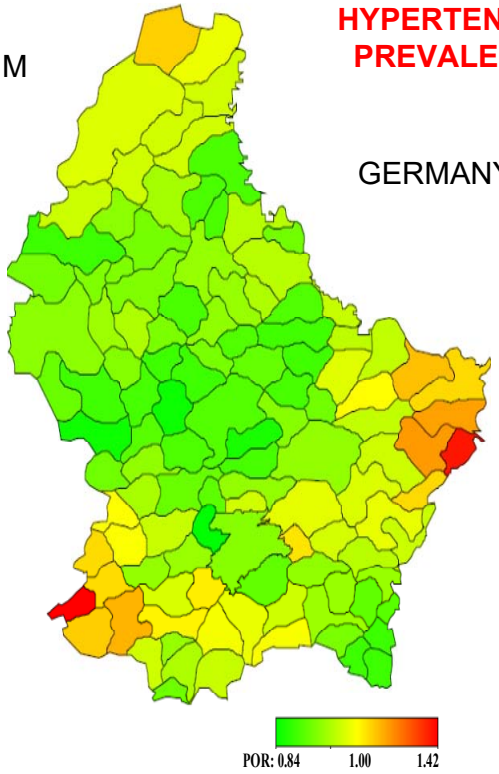
Maria Ruiz-Castell, Stranges S et al. *Medicine*. 2016;95(36):e4758

Geographic Variations in Hypertension Burden
Luxembourg Health Examination Survey (2013-15, age 25-64)

BELGIUM

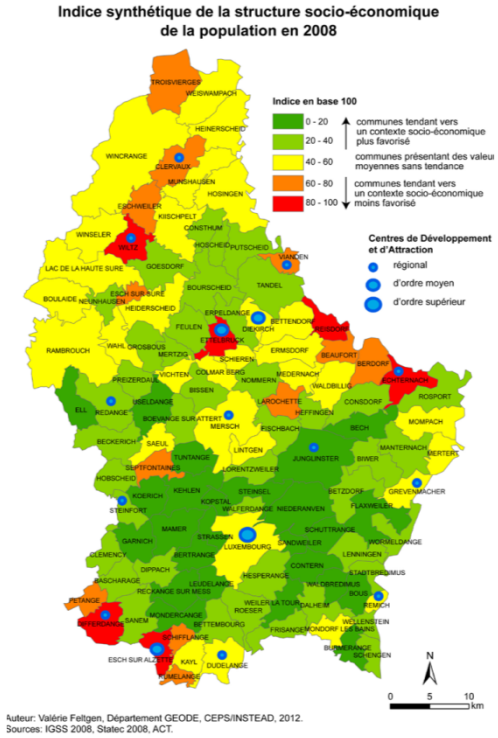
HYPERTENSION PREVALENCE

GERMANY



FRANCE

SOCIOECONOMIC STRUCTURE



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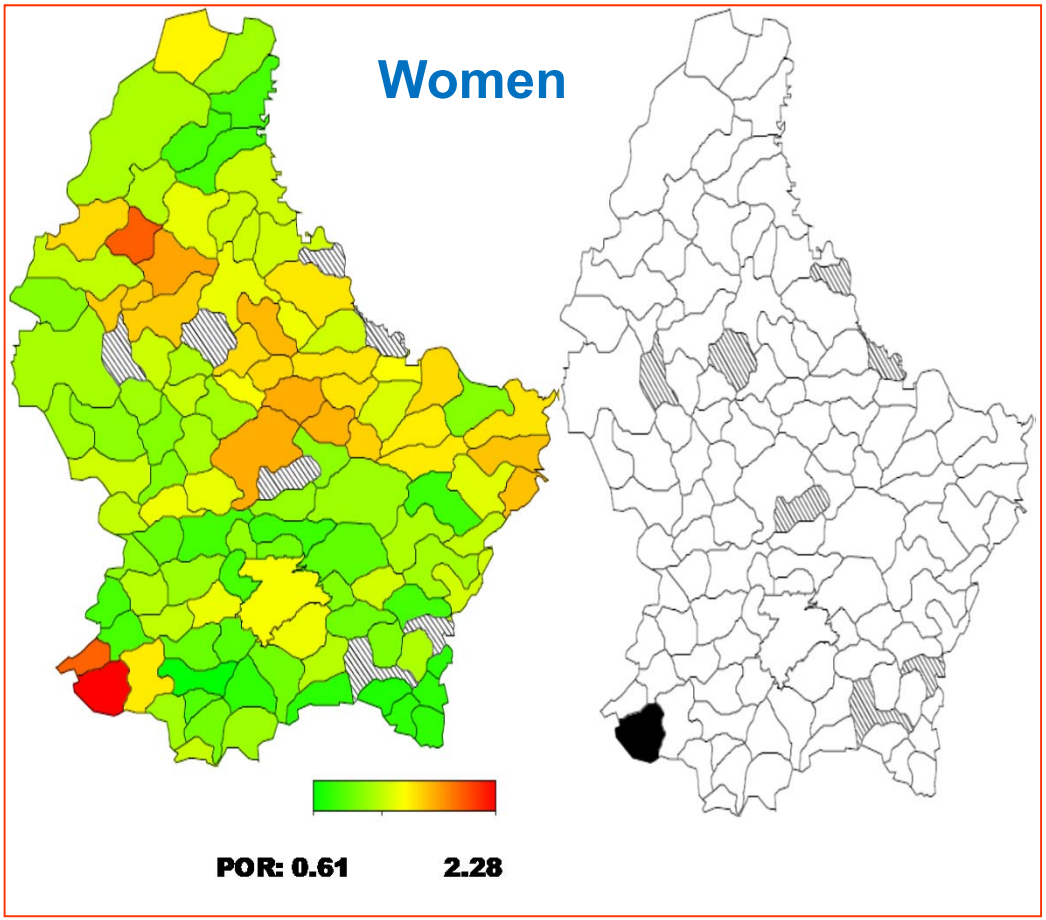
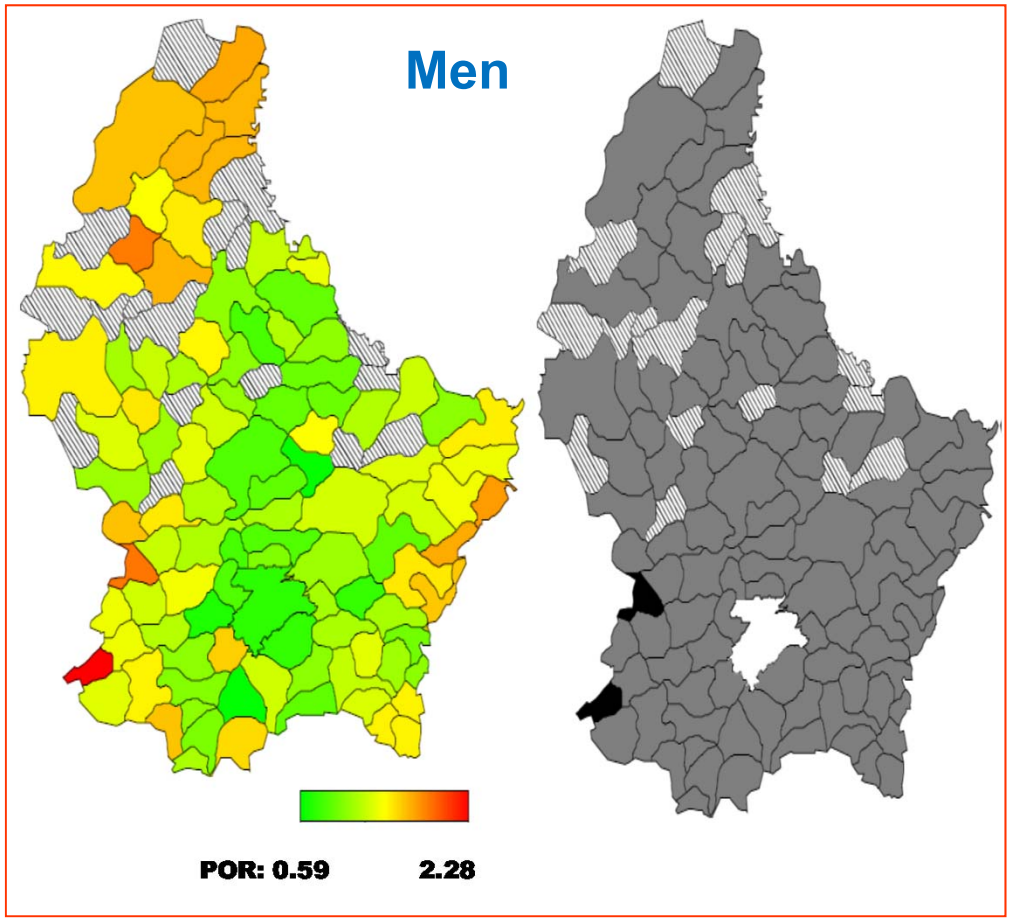
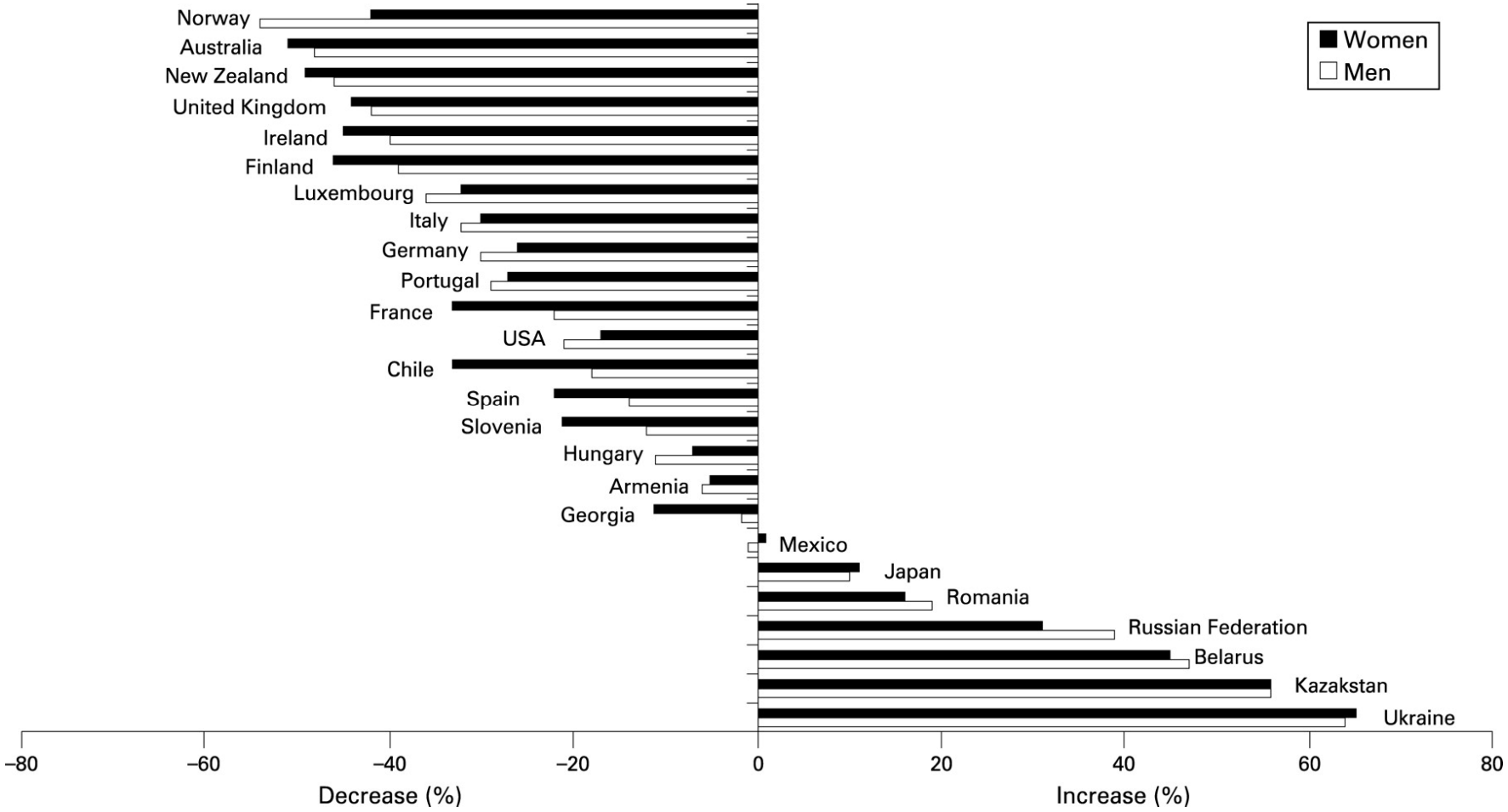
Geographic Variations in Obesity Burden
Luxembourg Health Examination Survey (2013-15, age 25-64)





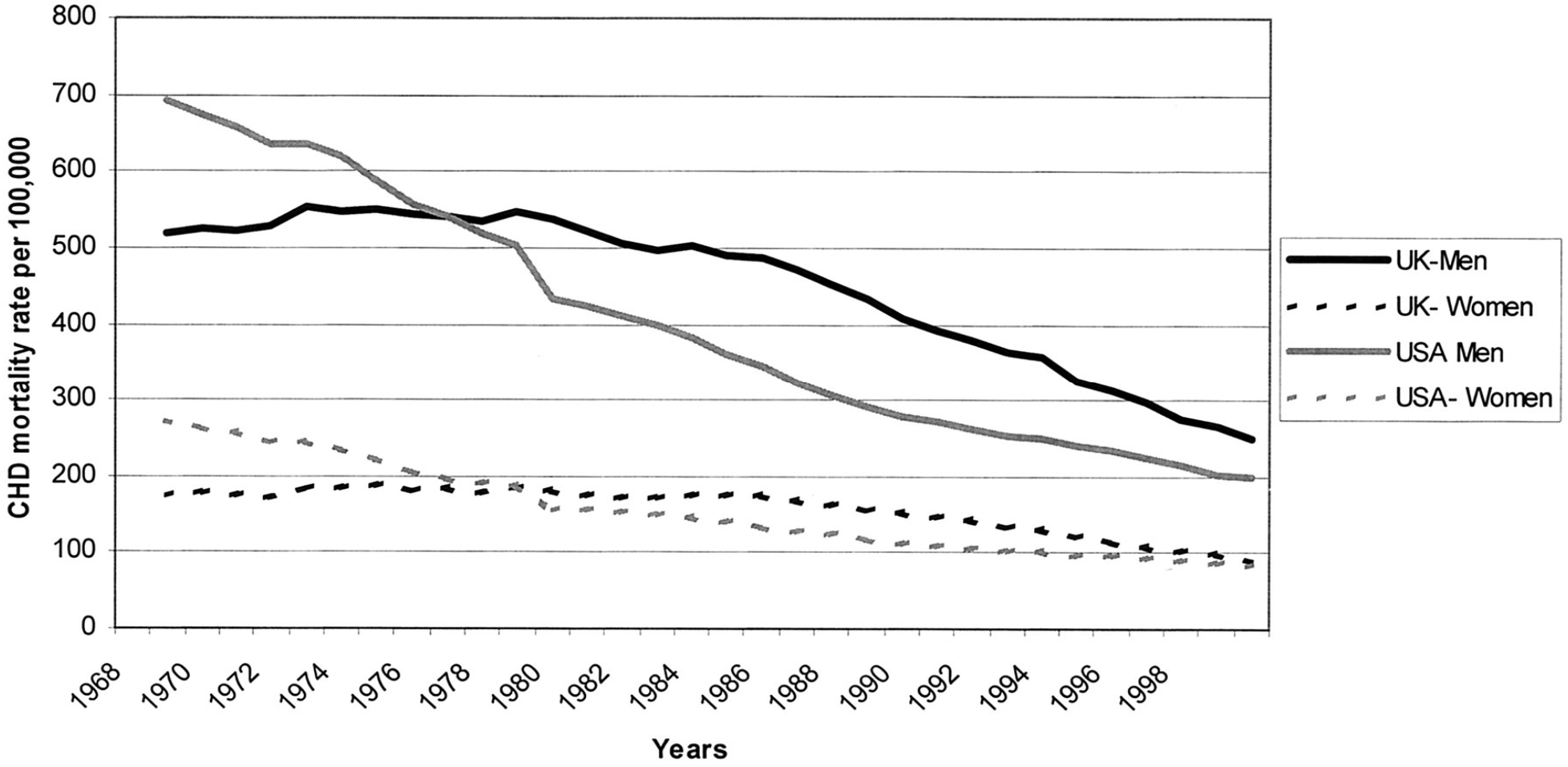
Samouda H, Stranges S et al. *PLoS One*. 2018;13(6):e0197021

Changes in coronary heart disease mortality, in men and women aged 35–74, between 1990 and 2000



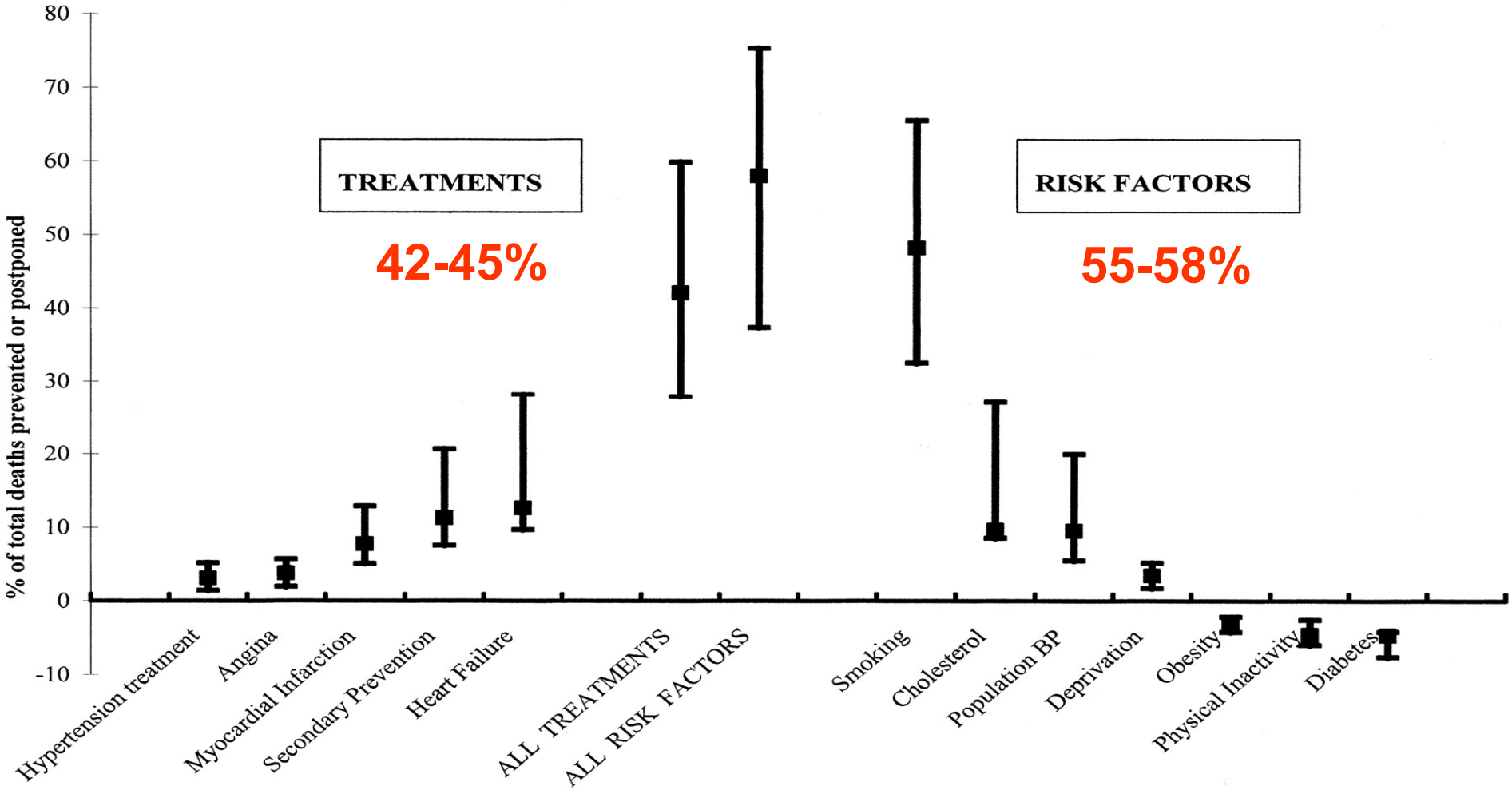
Capewell S, O'Flaherty M. Heart 2008;94:1105-1108

Coronary heart disease (CHD) mortality trends in the UK and US



Circulation 2004;109:1101-7

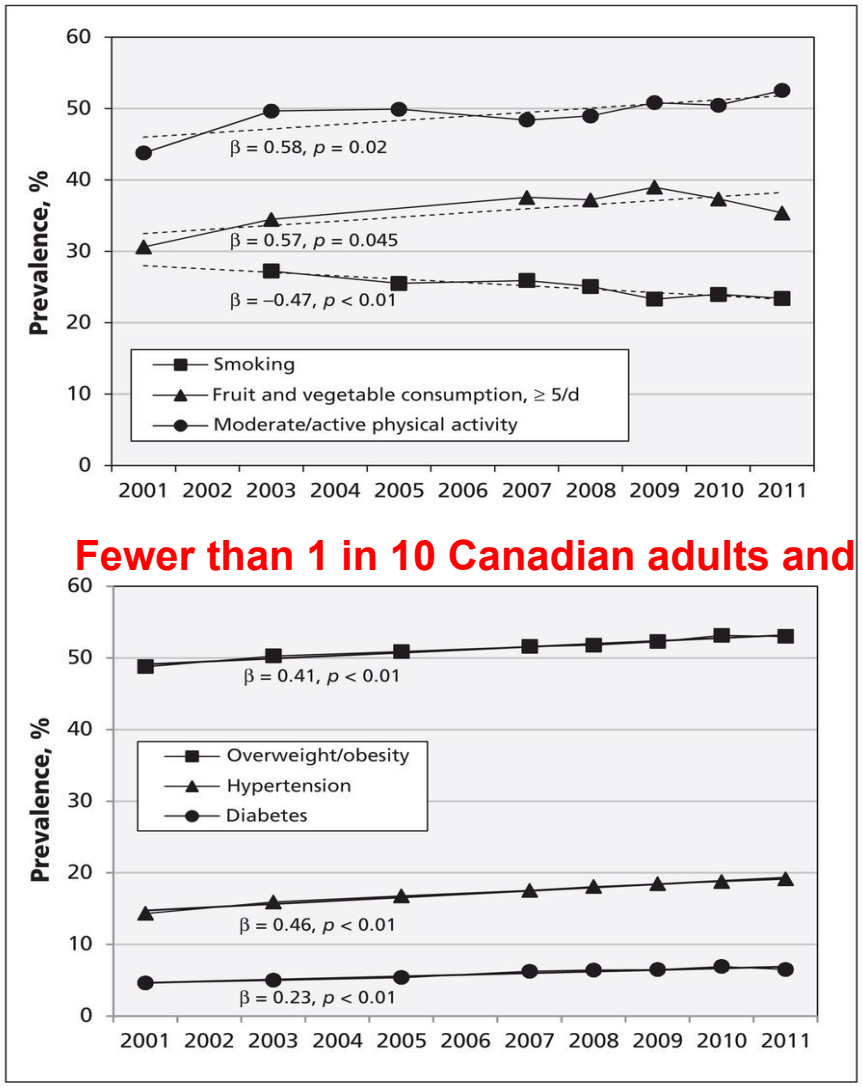
Explaining declining trends in CHD mortality in Western Countries

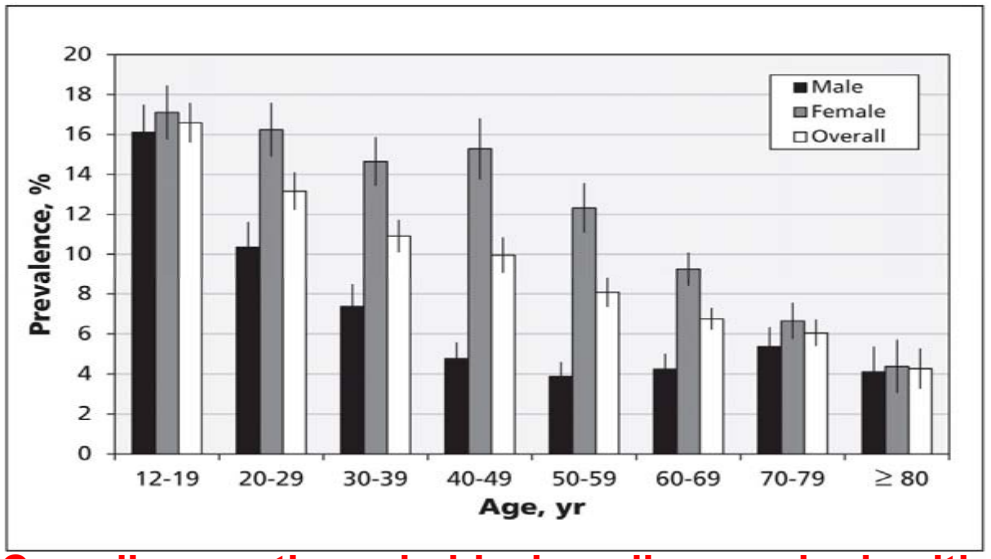


Circulation 2004;109:1101-7 & Heart 2013;99:159-62 & BMJ. 2014;348:g1088 (Scotland)

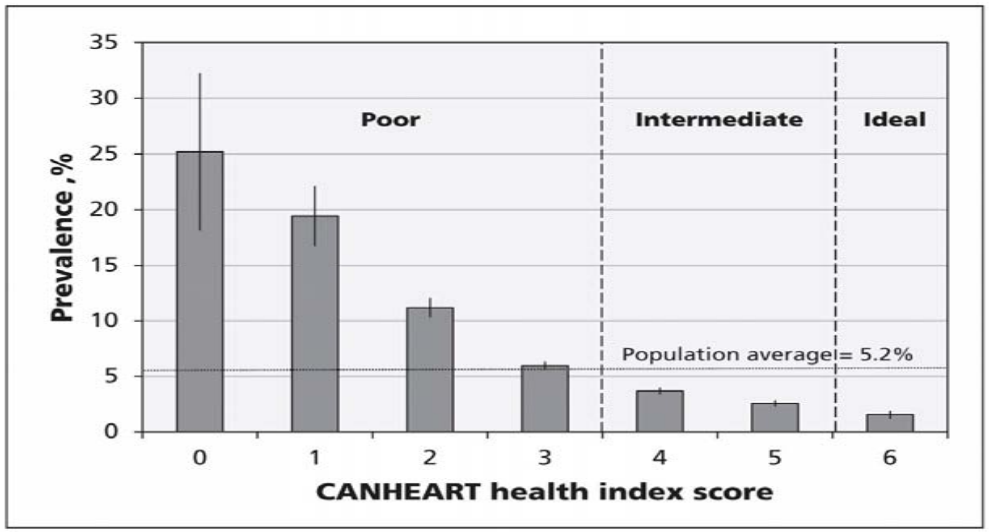
Cardiovascular Health of the Canadian Population

Canadian Community Health Survey 2003–2011





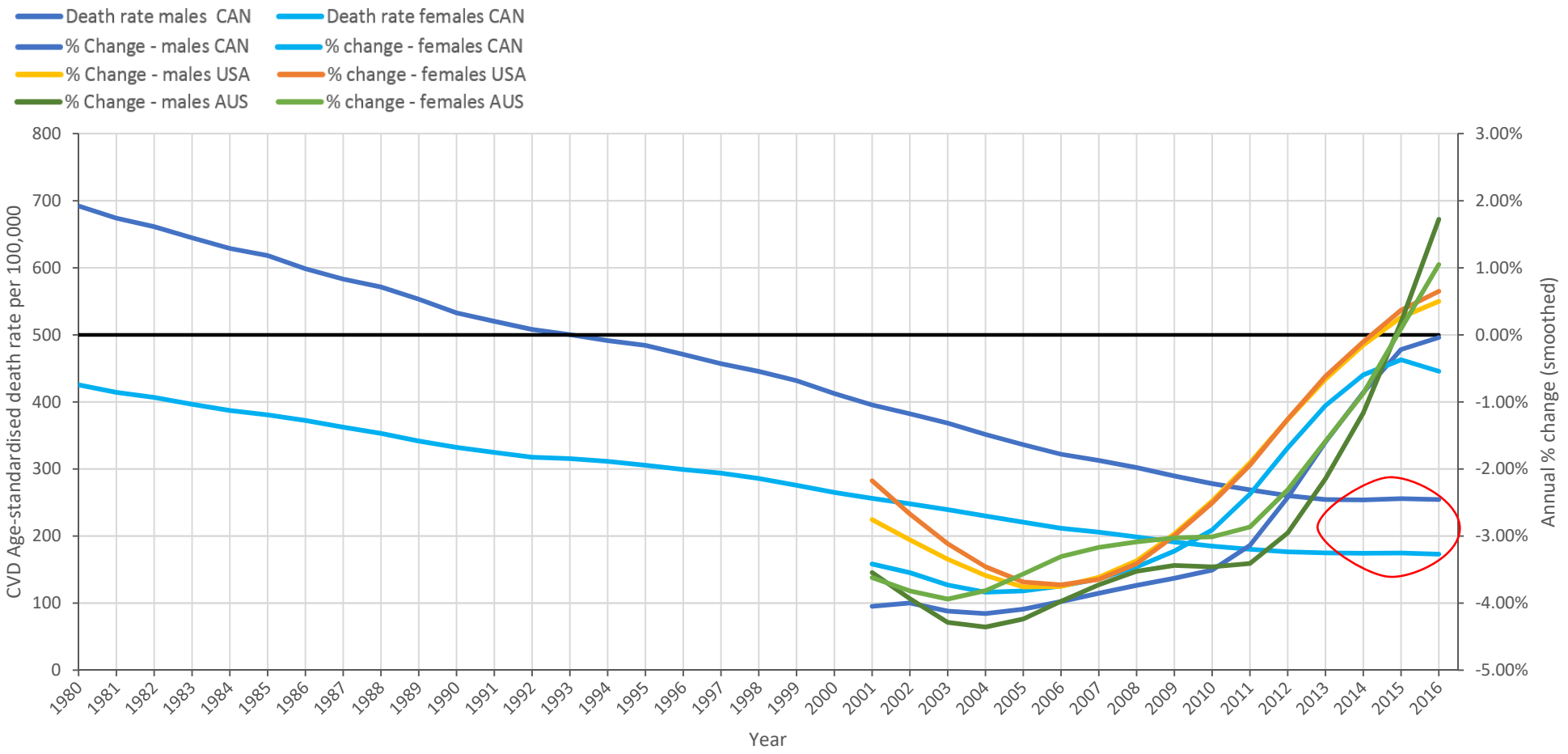
Fewer than 1 in 10 Canadian adults and 1 in 5 Canadian youth are in ideal cardiovascular health



Maclagan LC et al. CMAJ 2014;186:180-7

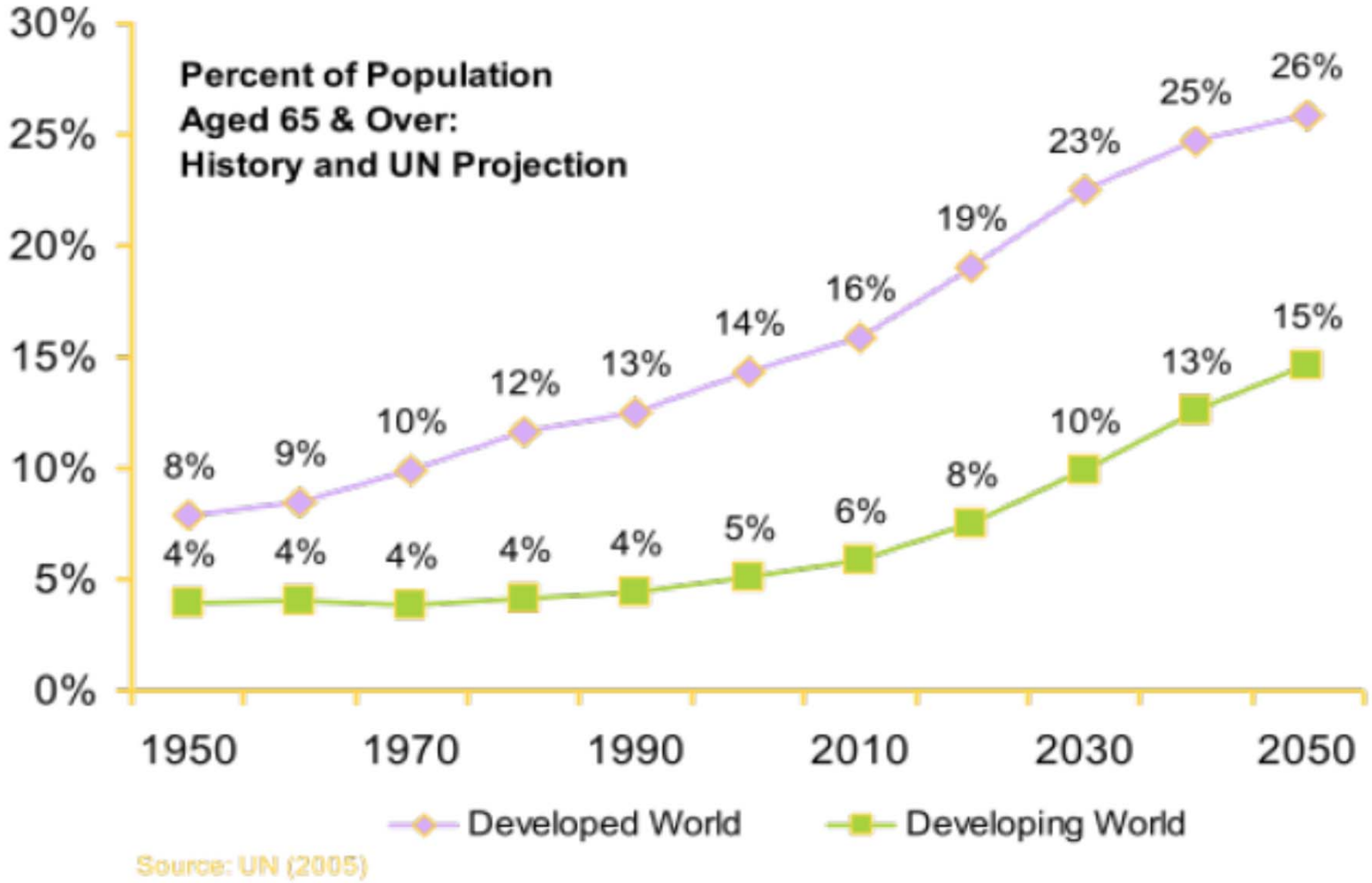
End of the long-term decline in CVD mortality?

Cardiovascular disease death rates, Canada, 1980-2016



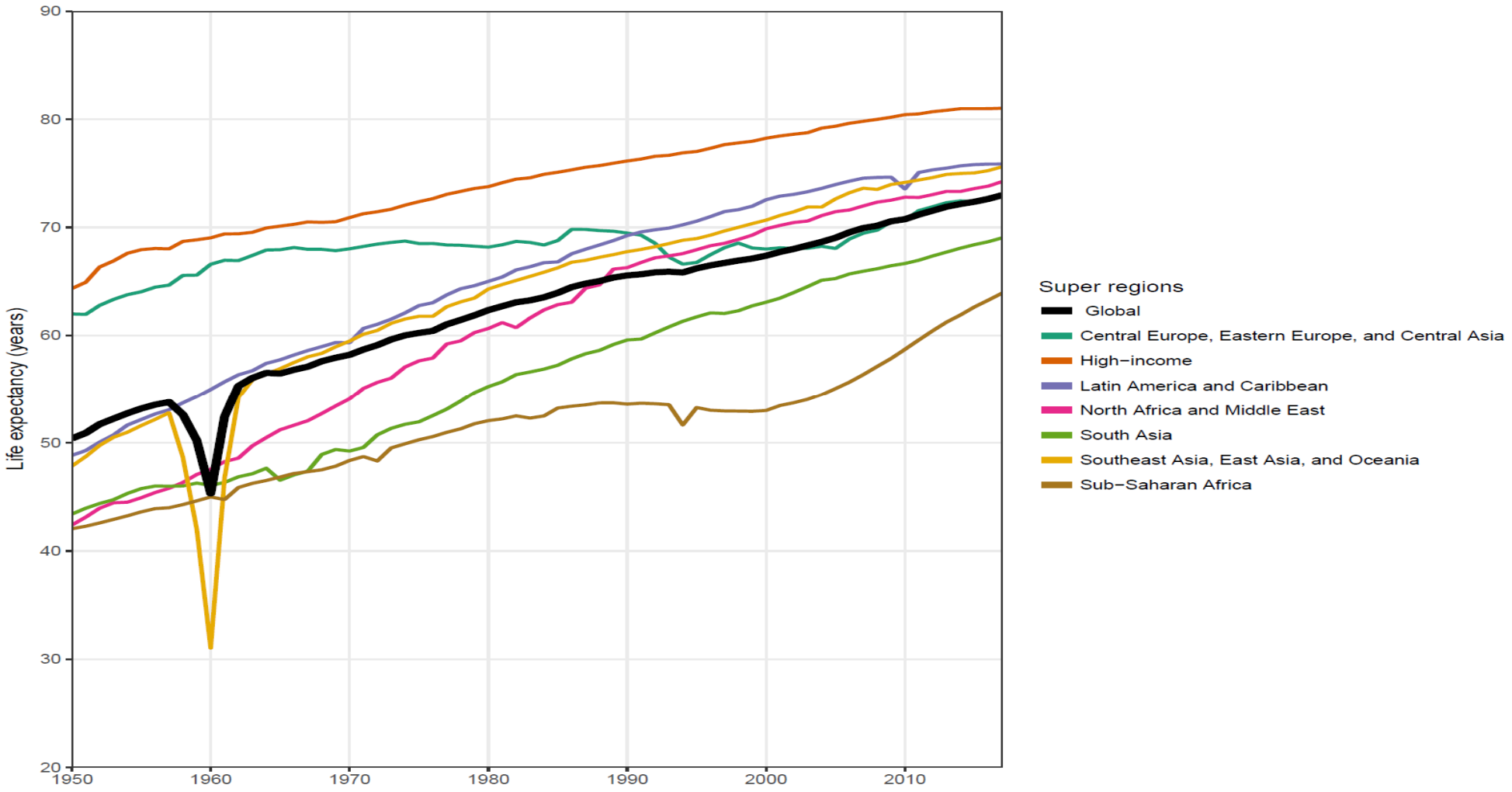
Global Burden of Disease Study, 2017-18

Trends in Global Aging



Source: UN (2005)

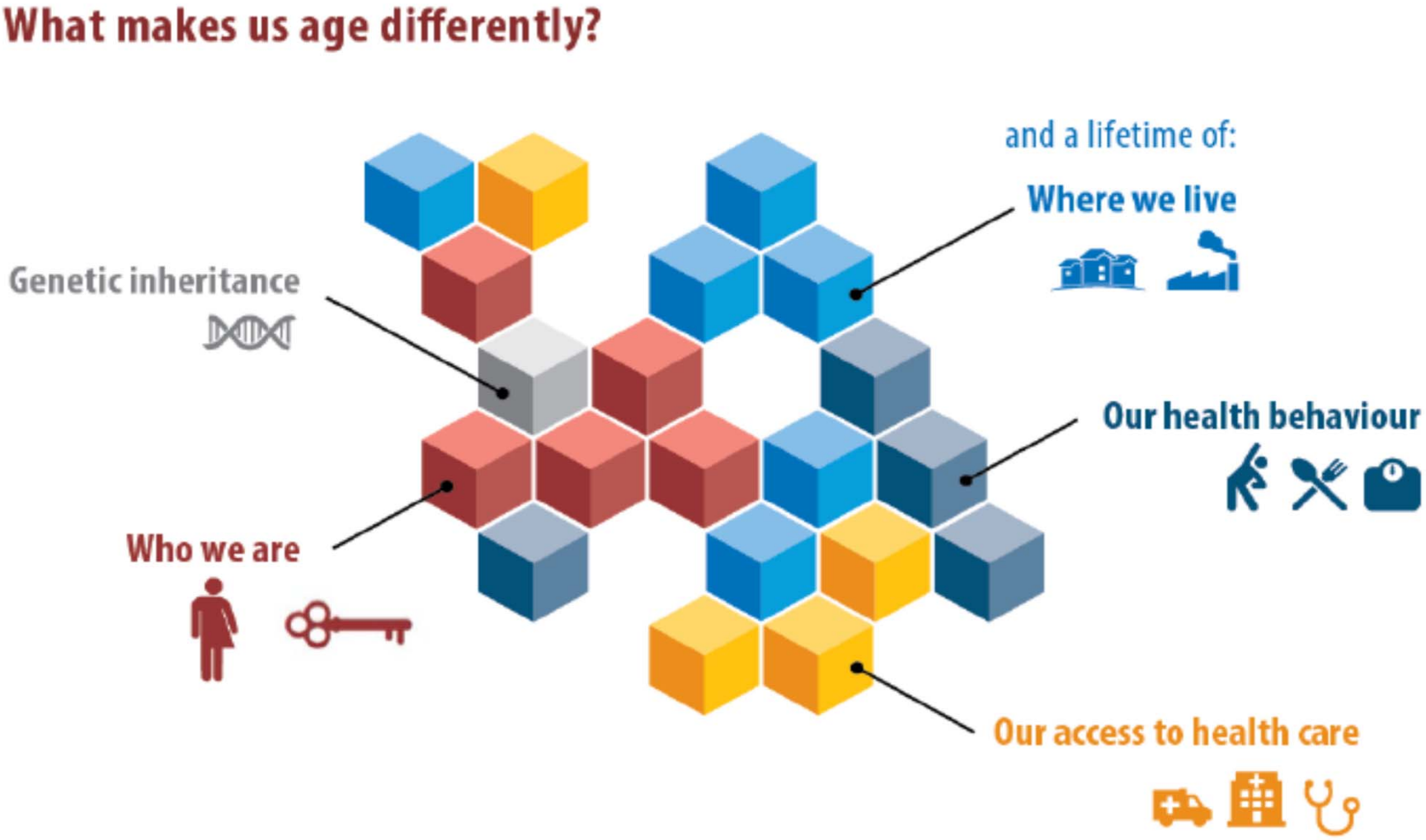
Life expectancy at birth, both sexes, 1950-2017



Global Burden of Disease. Lancet 2018;392:1684-1735

There is no “typical” older person

Health and Functional Abilities in older age are not random

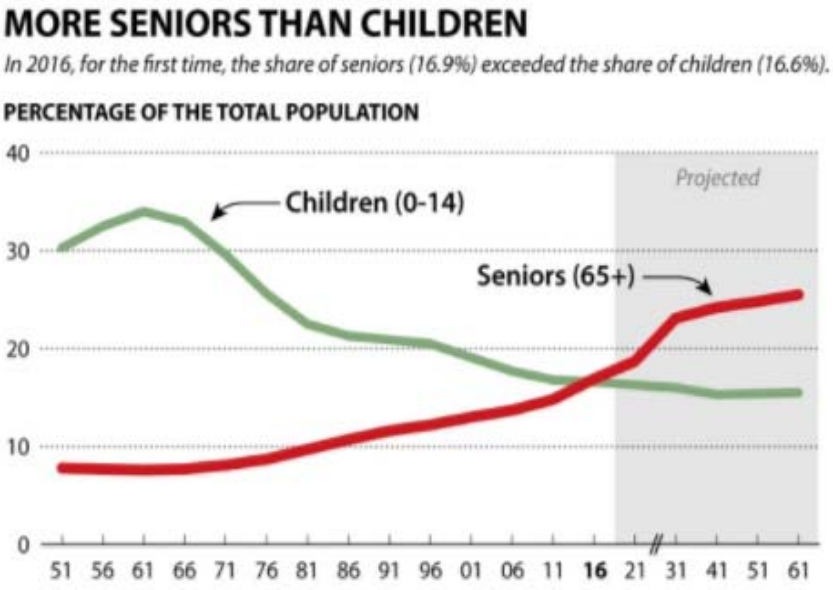


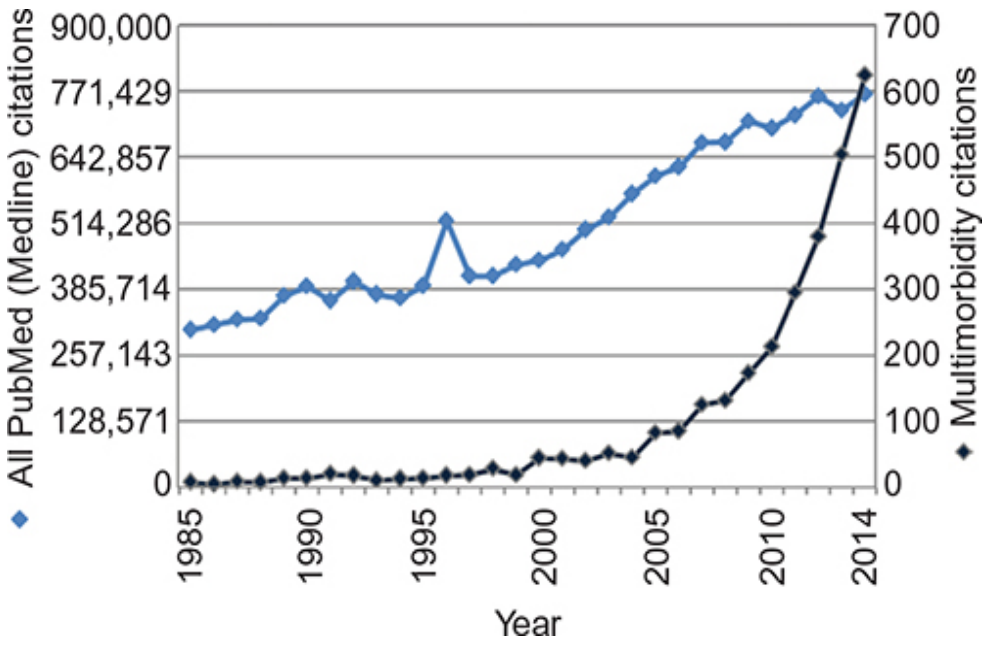
The Importance of Multimorbidity and Aging

Canadian seniors now outnumber children for 1st time, 2016 census shows

Share of seniors in Canada's population sees biggest increase since Confederation

By Éric Grenier, CBC News Posted: May 03, 2017 8:47 AM ET | Last Updated: May 07, 2017 2:27 PM ET

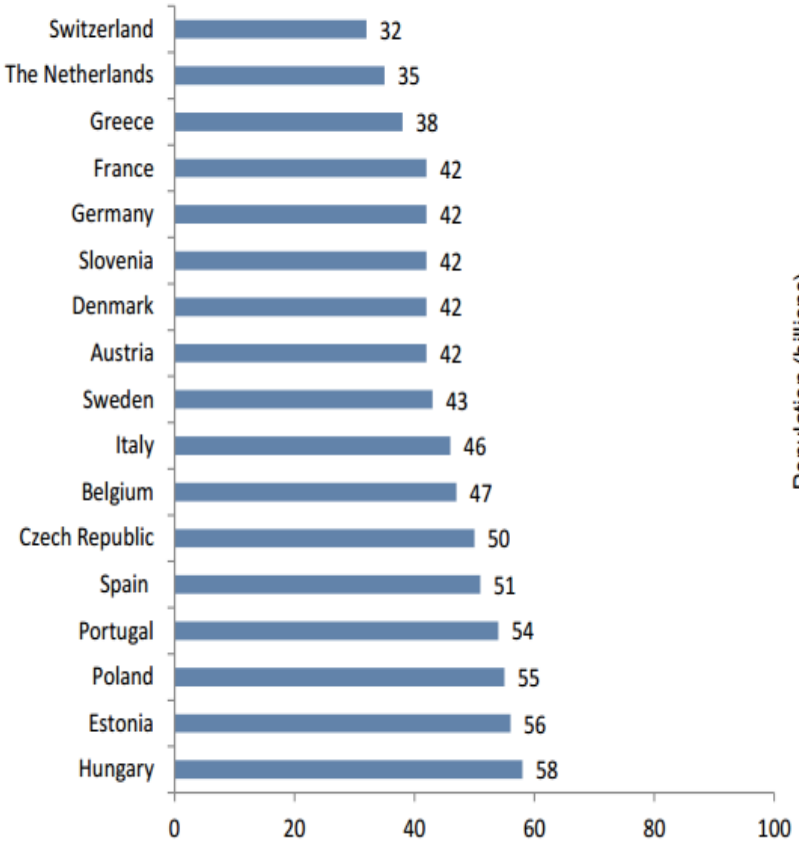




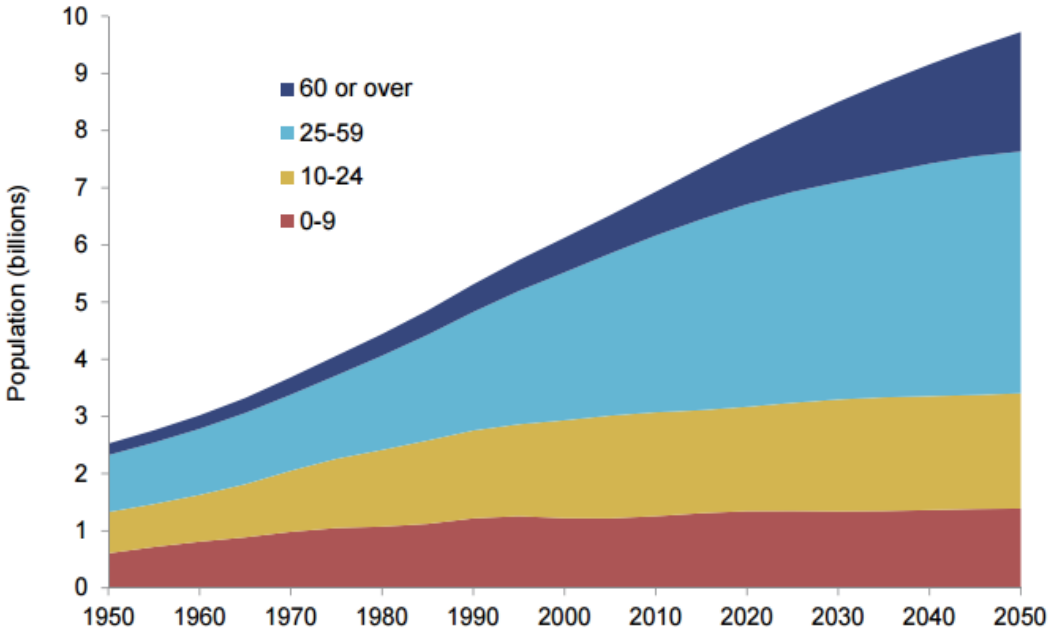
Source: McPhail, 2016; Statistics Canada 2017

Multi-Morbidity & Aging

Rising Prevalence of Multi-Morbidity



Rising Prevalence of Aging

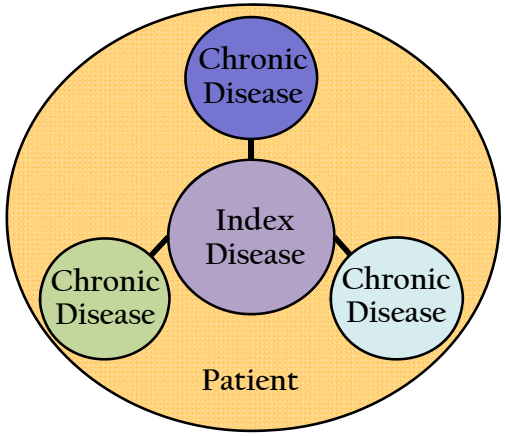


Source: ICARE4U, 2015; United Nations, 2015

Multimorbidity vs. Comorbidity

- Co-Morbidity = Index disease holds priority over any other co-occurring chronic diseases within an individual
  - Focus on a central disease that is of primary interest
  - Facilitates specialist and disease-centered approach

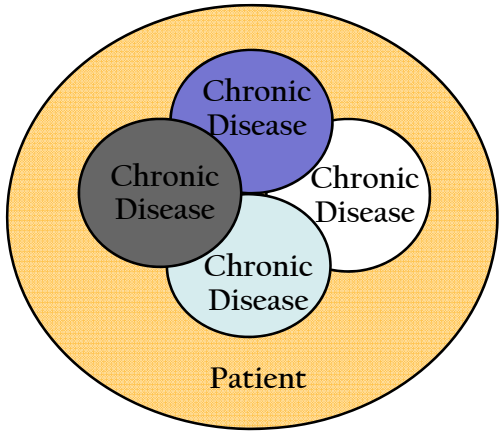
- Multi-Morbidity = Coexistence of multiple diseases within the same individual (typically defined as 2+ or 3+ chronic diseases)
  - One disease is not necessarily more central than the others
  - Facilitates more holistic and patient-centered approach



Co-Morbidity

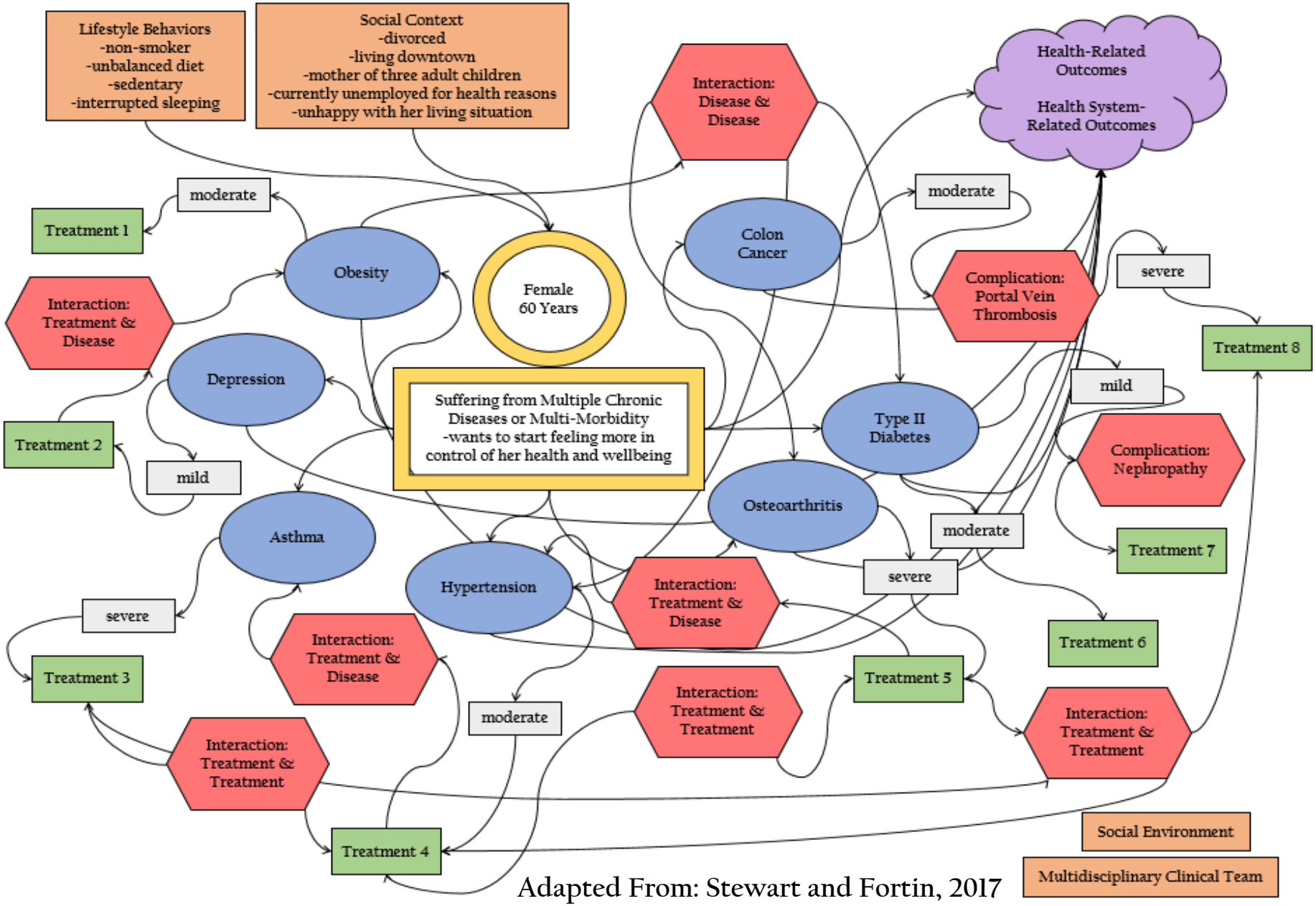
vs.

Multi-Morbidity



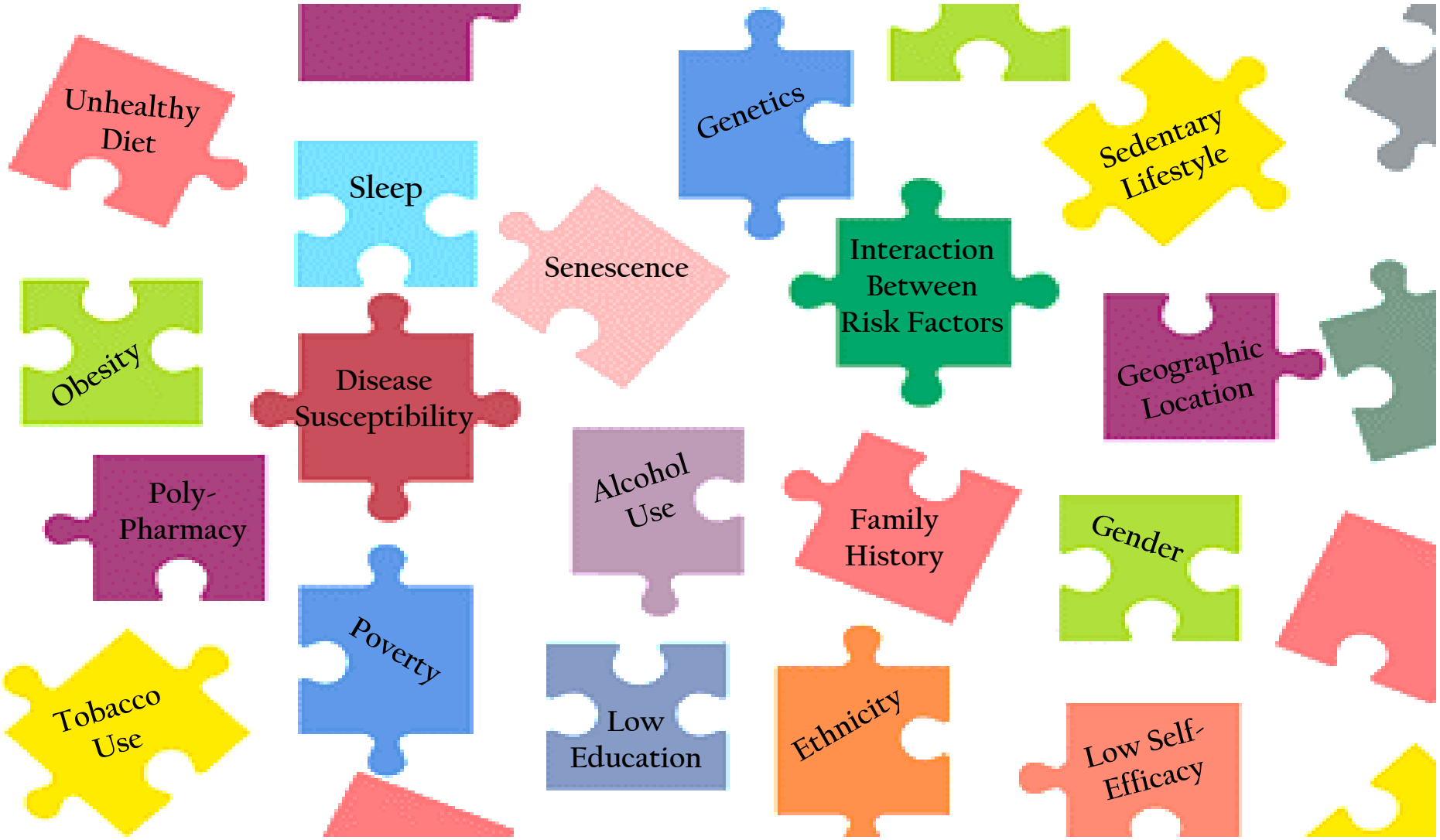
Source: Boyd and Fortin, 2010

Nicholson K, Stranges S, et al. J Clin Epidemiol. 2019;105:142-146



Adapted From: Stewart and Fortin, 2017

Understanding Diverse Drivers of Multimorbidity



Ageing Research Reviews 53 (2019) 100903

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Ageing Research Reviews

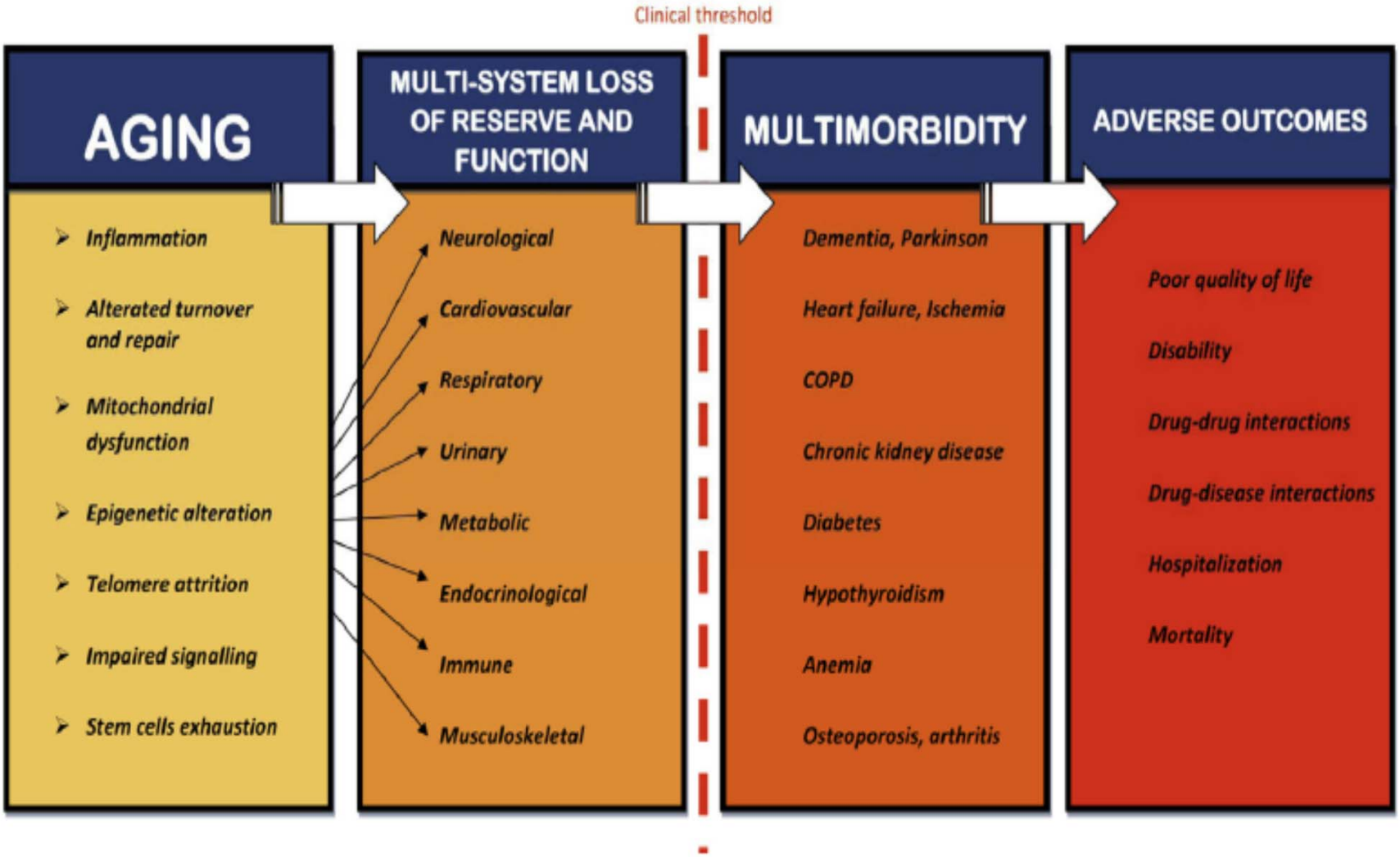
journal homepage: www.elsevier.com/locate/arr

Review

Multimorbidity and quality of life: Systematic literature review and meta-analysis

Tatjana T. Makovski[a,b,c,*], Susanne Schmitz[a], Maurice P. Zeegers[c], Saverio Stranges[a,d,e], Marjan van den Akker[b,f,g]

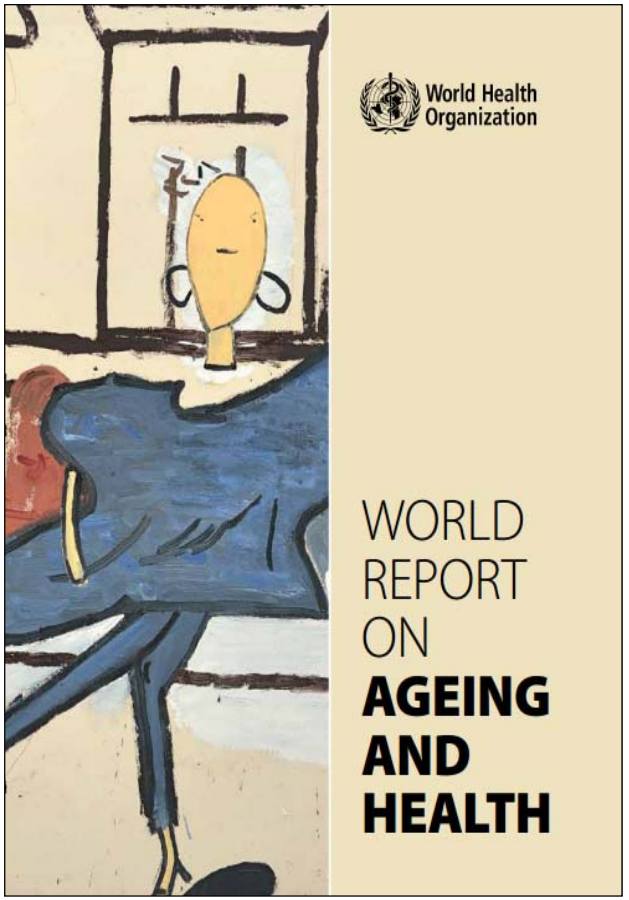
From the era of "single chronic disease medicine" to the era of "multimorbidity medicine"



Source: Fabbri E, et al. J Am Med Dir Assoc. 2015;16:640-7

The Importance of Multimorbidity and Aging

International Reports on Multimorbidity and Ageing



Source: OECD, 2011; WHO, 2015; Academy of Medical Sciences, 2018

What is the Canadian Longitudinal Study on Aging (CLSA)?

"The Canadian Longitudinal Study on Aging is the largest most comprehensive research platform and infrastructure available for aging research with longitudinal data that will span 20 years from over 50,000 Canadians over the age of 45"

A research platform – infrastructure to enable state-of-the-art, interdisciplinary population-based *research* and *evidenced-based* decision-making that will lead to better health and quality of life for Canadians

Challenge: Integration of Primary Care and Public Health

Why A Challenge?

– Lack of consistent collaboration and integration between primary care and public health creates a substantial breach in delivering the most effective management and prevention of multimorbidity

– In fact, multimorbidity represents a complex example of why this integration between primary care and public health is essential

International Journal of Public Health
https://doi.org/10.1007/s00038-019-01278-1

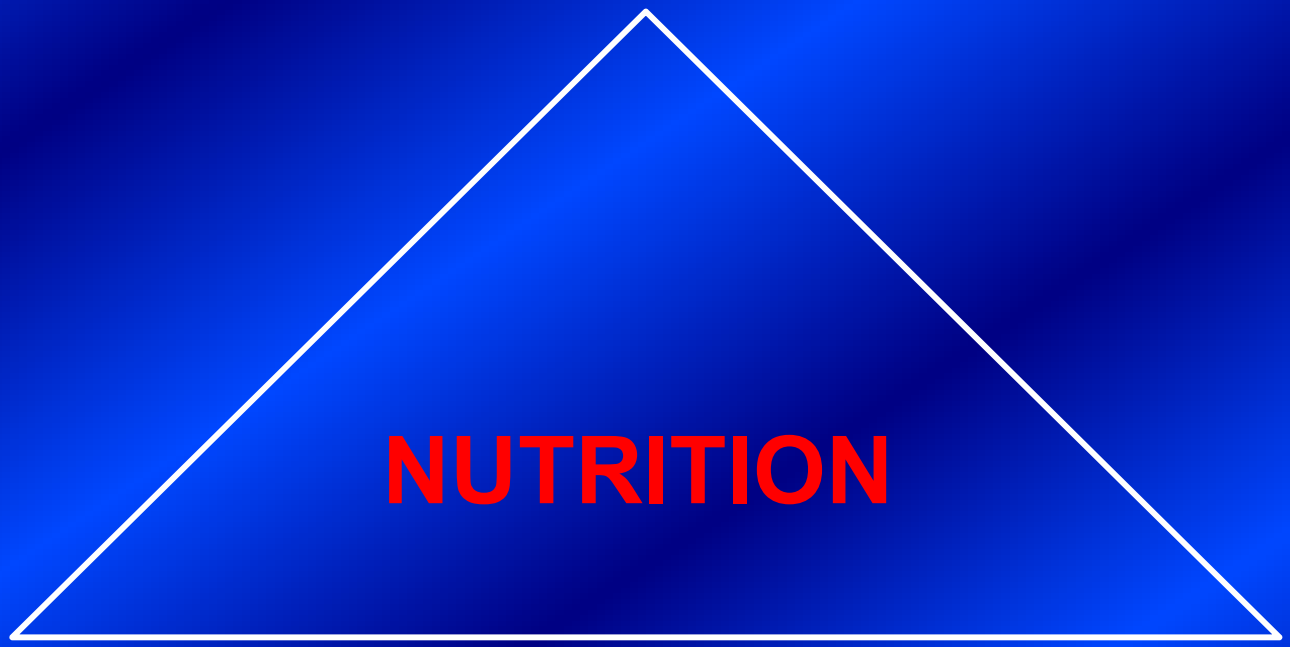
COMMENTARY

The integration of primary care and public health to improve population health: tackling the complex issue of multimorbidity

Kathryn Nicholson[1] · Tatjana T. Makovski[2,3,4] · Saverio Stranges[1,2,5]

Chronic Outcomes

(CVD, diabetes, cancer, mortality, aging, longevity)



Dietary Patterns

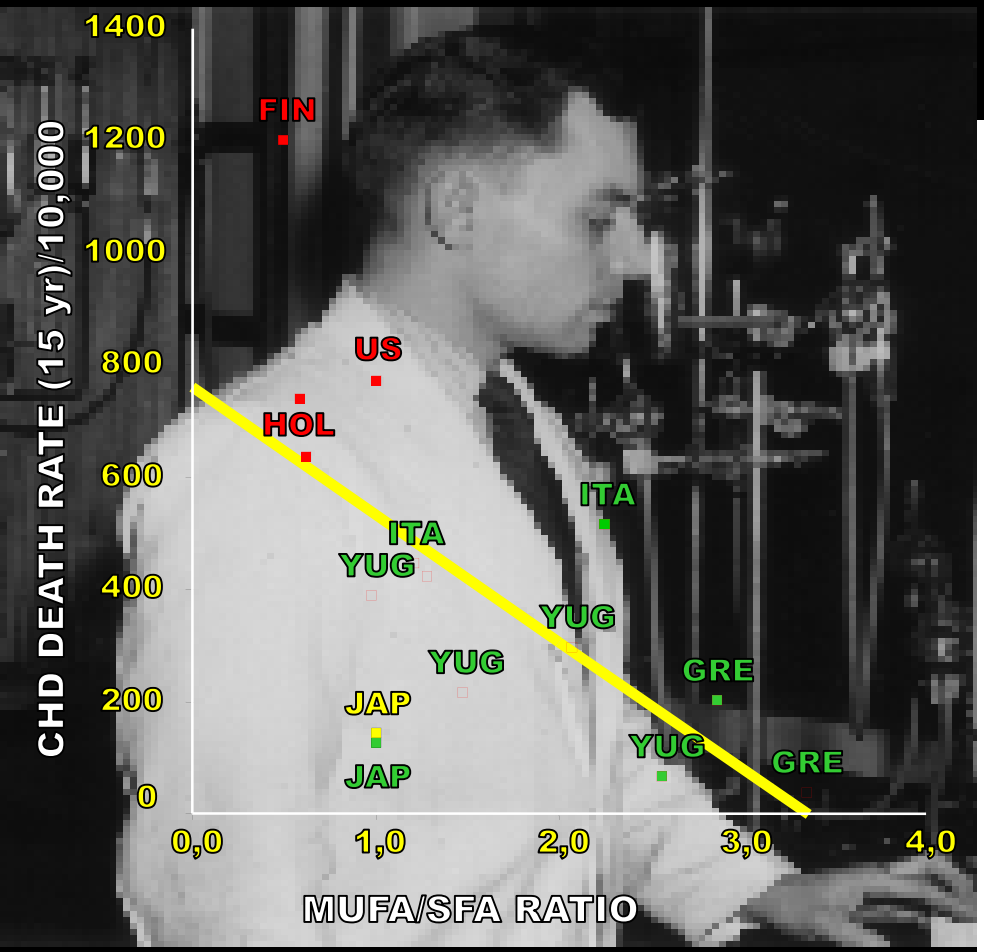
(Mediterranean diet, vegetarianism, DASH, etc.)

Micronutrients

(dietary supplements, multivitamins, multiminerals)

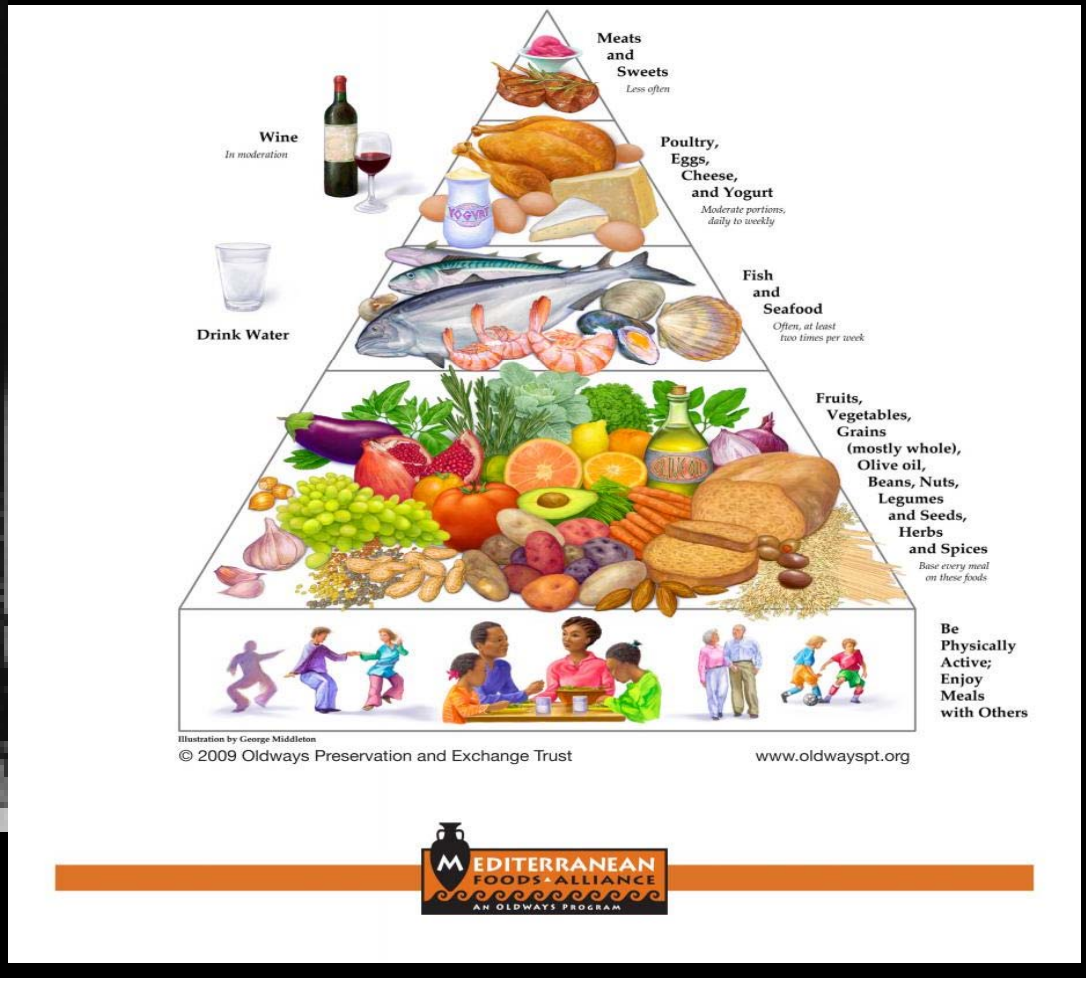
Role of Dietary Patterns

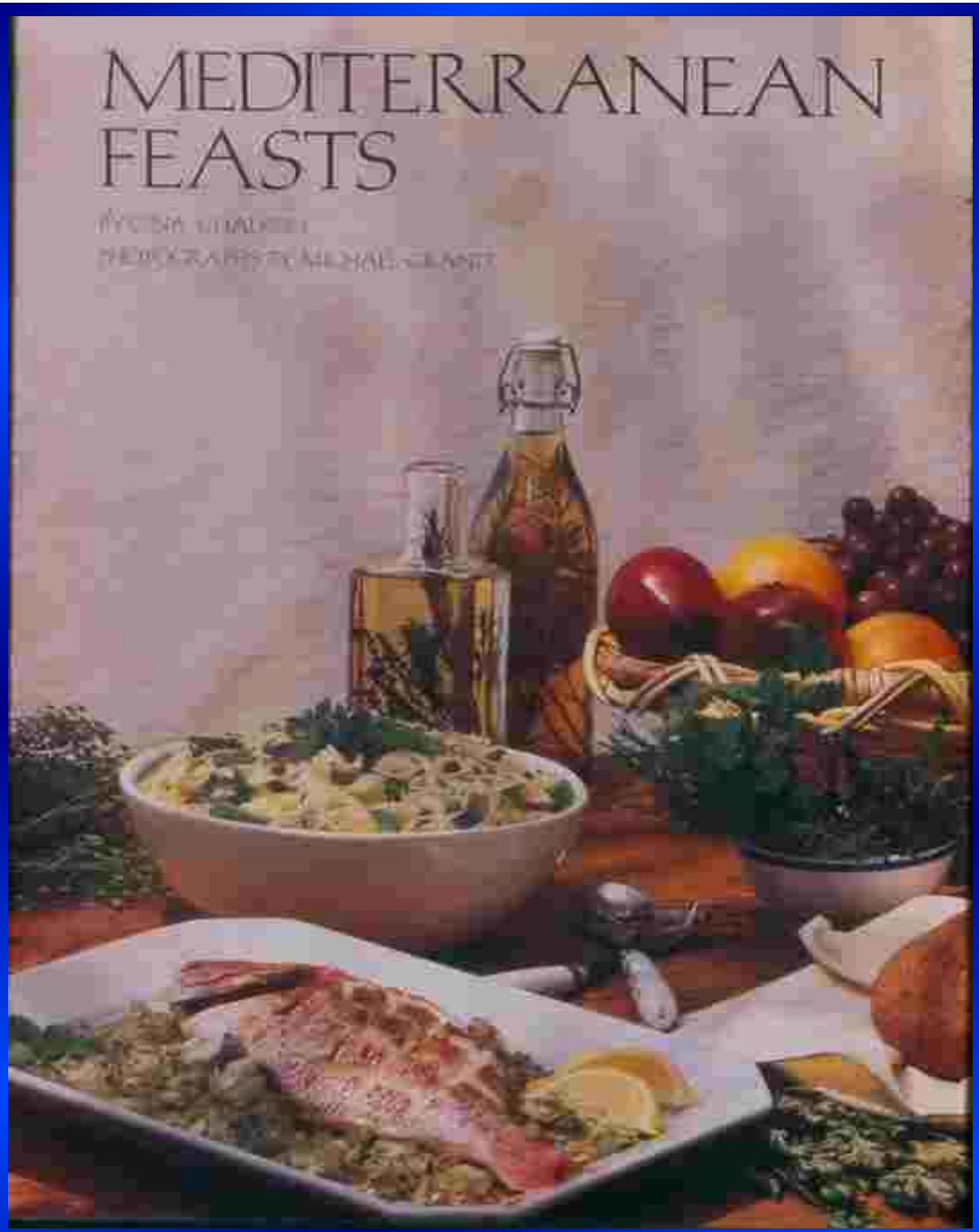
Seven Countries Study



A. Keys

Mediterranean Diet Pyramid





The Mediterranean Diet

- Olive Oil
- Wine
- Garlic
- Fish
- Vegetables
- Legumes
- Fruit as dessert
- *A philosophy of life…*

Healthy Traditional Mediterranean Diet: An Expression of Culture, History, and Lifestyle

Antonia Trichopoulou, M.D., and Pagona Lagiou, M.D.

Mediterranean diet pyramid: a cultural model for healthy eating[1,2]

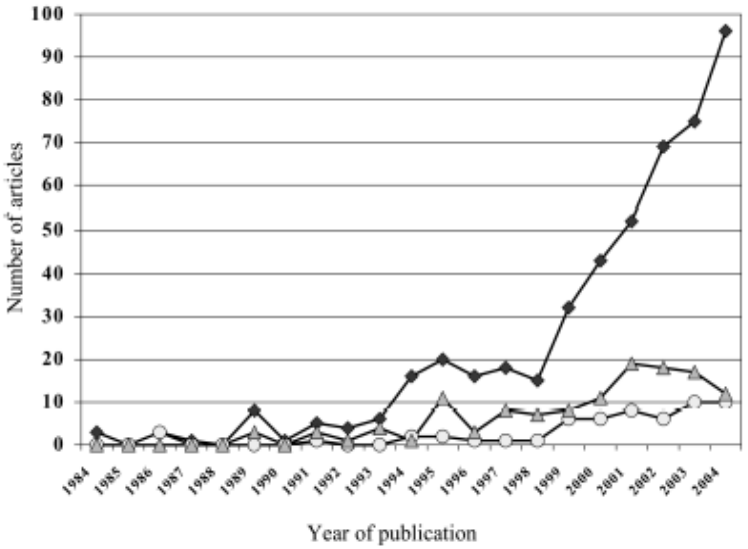
Walter C Willett, Frank Sacks, Antonia Trichopoulou, Greg Drescher, Anna Ferro-Luzzi, Elisabet Helsing, and Dimitrios Trichopoulos

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JUNE 26, 2003 VOL. 348 NO. 26

Adherence to a Mediterranean Diet and Survival in a Greek Population

◆, Publications; △, reviews; ○, clinical trials.



BMJ

RESEARCH

Adherence to Mediterranean diet and health status: meta-analysis

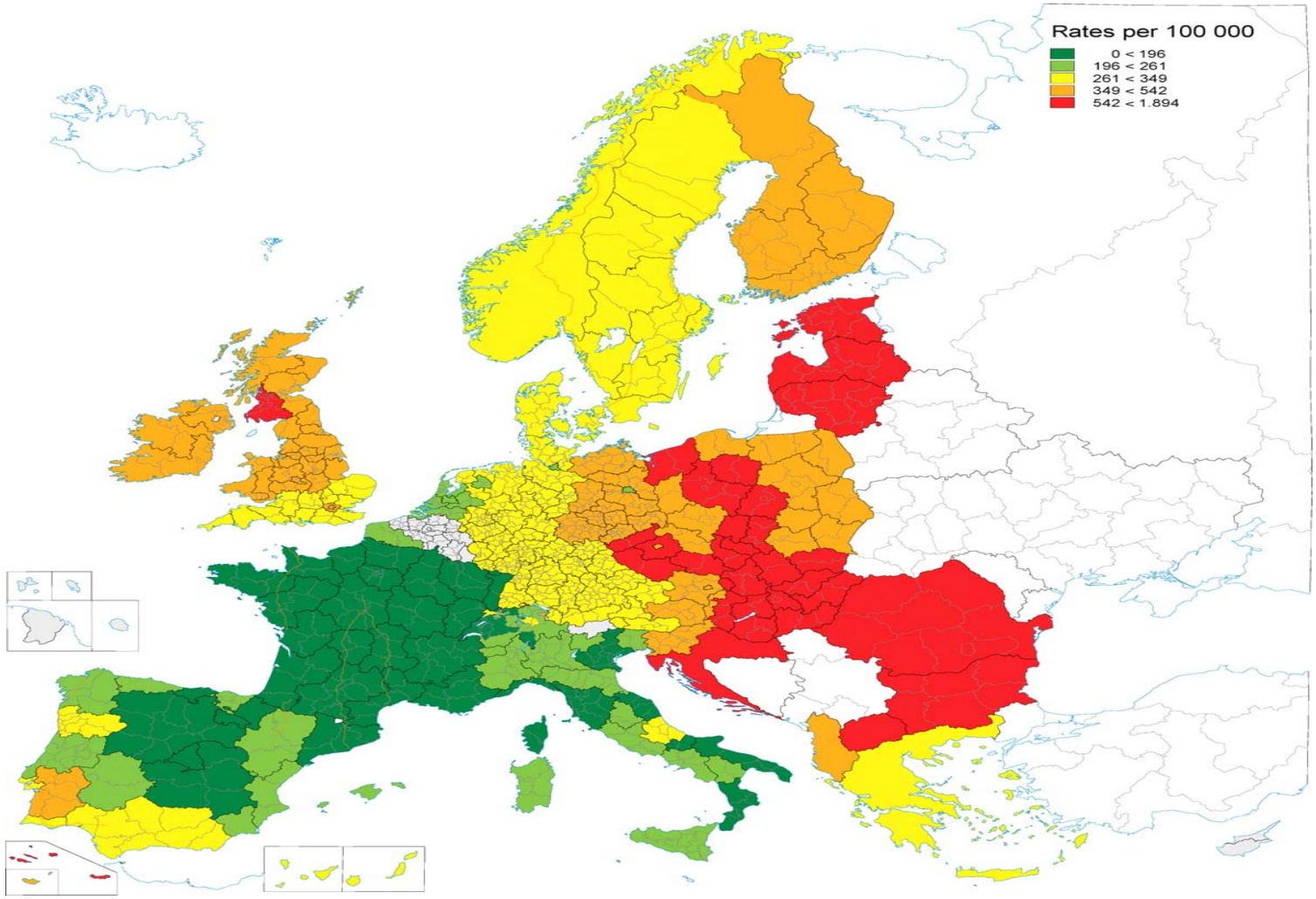
American Journal of Epidemiology

Vol. 170, No. 12
DOI: 10.1093/aje/kwp282
Advance Access publication: November 10, 2009

Original Contribution

Adherence to the Mediterranean Diet and Risk of Coronary Heart Disease in the Spanish EPIC Cohort Study

Dietary patterns may still contribute to differences in CVD incidence/mortality across countries



Müller-Nordhorn J et al. Eur Heart J 2008

'Mediterranean' dietary pattern for the primary prevention of cardiovascular disease (Review)

Rees K, Hartley L, Flowers N, Clarke A, Hooper L, Thorogood M, Stranges S

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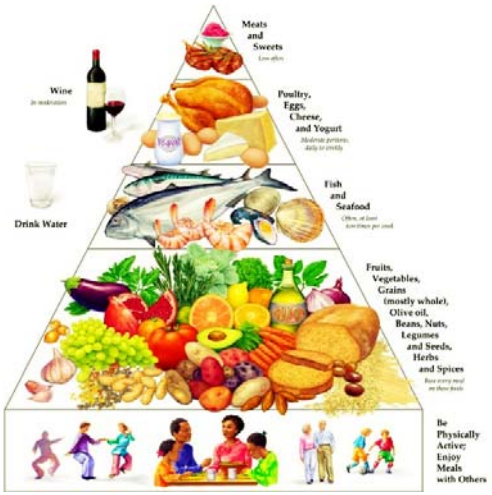
Cochrane Database Syst Rev. 2013;8:CD009825



Cochrane Library

Cochrane Database of Systematic Reviews

Mediterranean-style diet for the primary and secondary prevention of cardiovascular disease (Review)

Rees K, Takeda A, Martin N, Ellis L, Wijesekara D, Vepa A, Das A, Hartley L, Stranges S

Cochrane Database Syst Rev. 2019;3:CD009825

Cochrane Library

Cochrane Database of Systematic Reviews

Increased consumption of fruit and vegetables for the primary prevention of cardiovascular diseases (Review)

Hartley L, Igbinedion E, Holmes J, Flowers N, Thorogood M, Clarke A, Stranges S, Hooper L, Rees K

Cochrane Database Syst Rev. 2013;(6):CD009874

Canada's food guide

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Health Canada Santé Canada

Canada

Canada's food guide

Eat well. Live well.

Healthy eating is more than the foods you eat

Be mindful of your eating habits

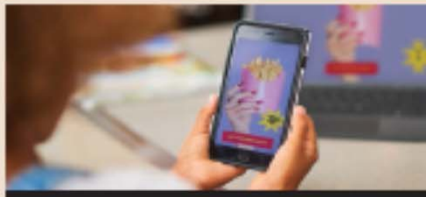
Cook more often

Enjoy your food

Eat meals with others

Use food labels

Limit foods high in sodium, sugars or saturated fat



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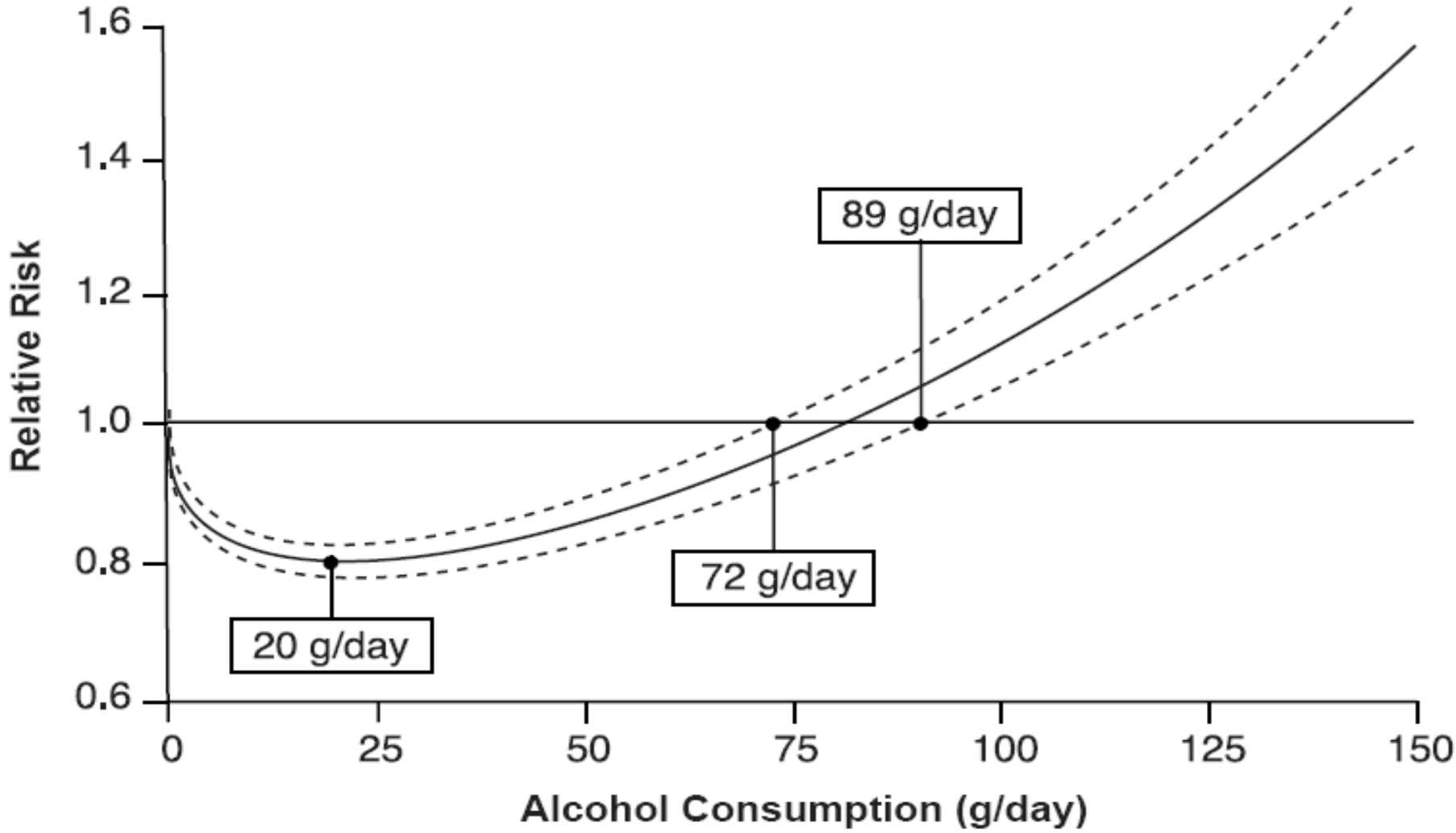
Mediterranean Diet: Alcohol Consumption and CVD



Addiction. 2000;95(10):1505-23

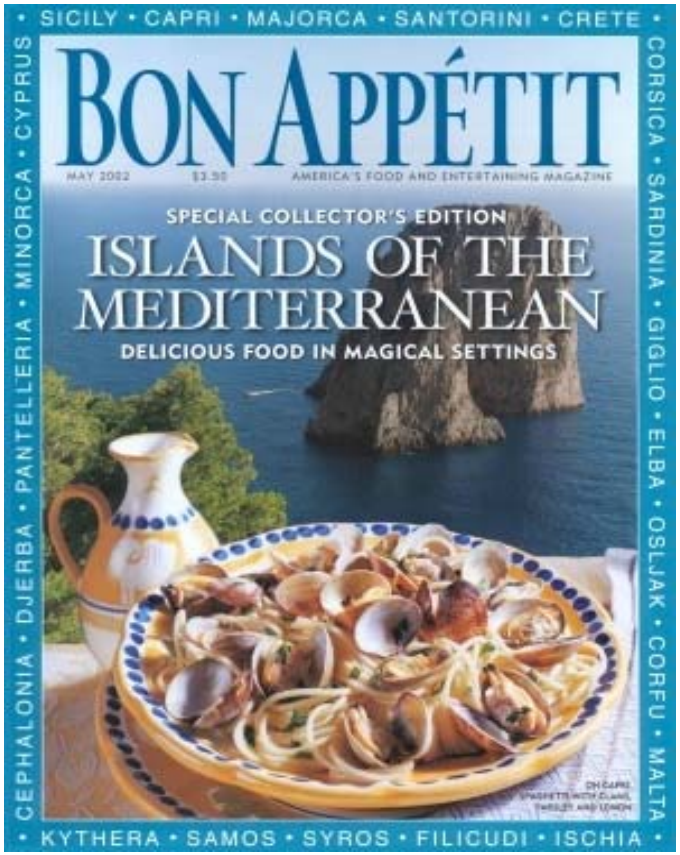
Alcohol Drinking Patterns & Hypertension Risk

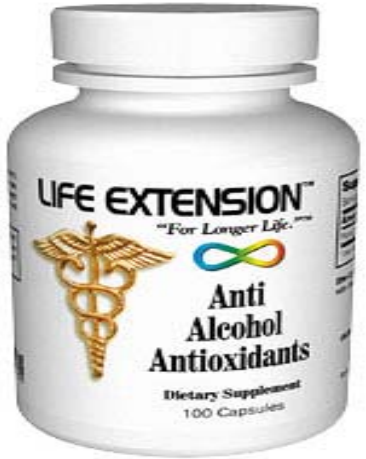
Western New York Health Study

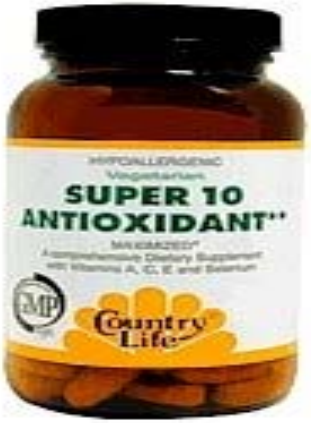
	Odds Ratio (OR) Hypertension
All Drinkers	
Average volume (≥ 2 drinks/day)	2.31 (1.47-3.62)
Drinking outside meals	1.41 (1.04-1.91)
"Light Drinkers" (< 2 drinks/day)	
Drinking outside meals	1.45 (1.04-2.02)

Stranges et al. Hypertension. 2004;44:813-9

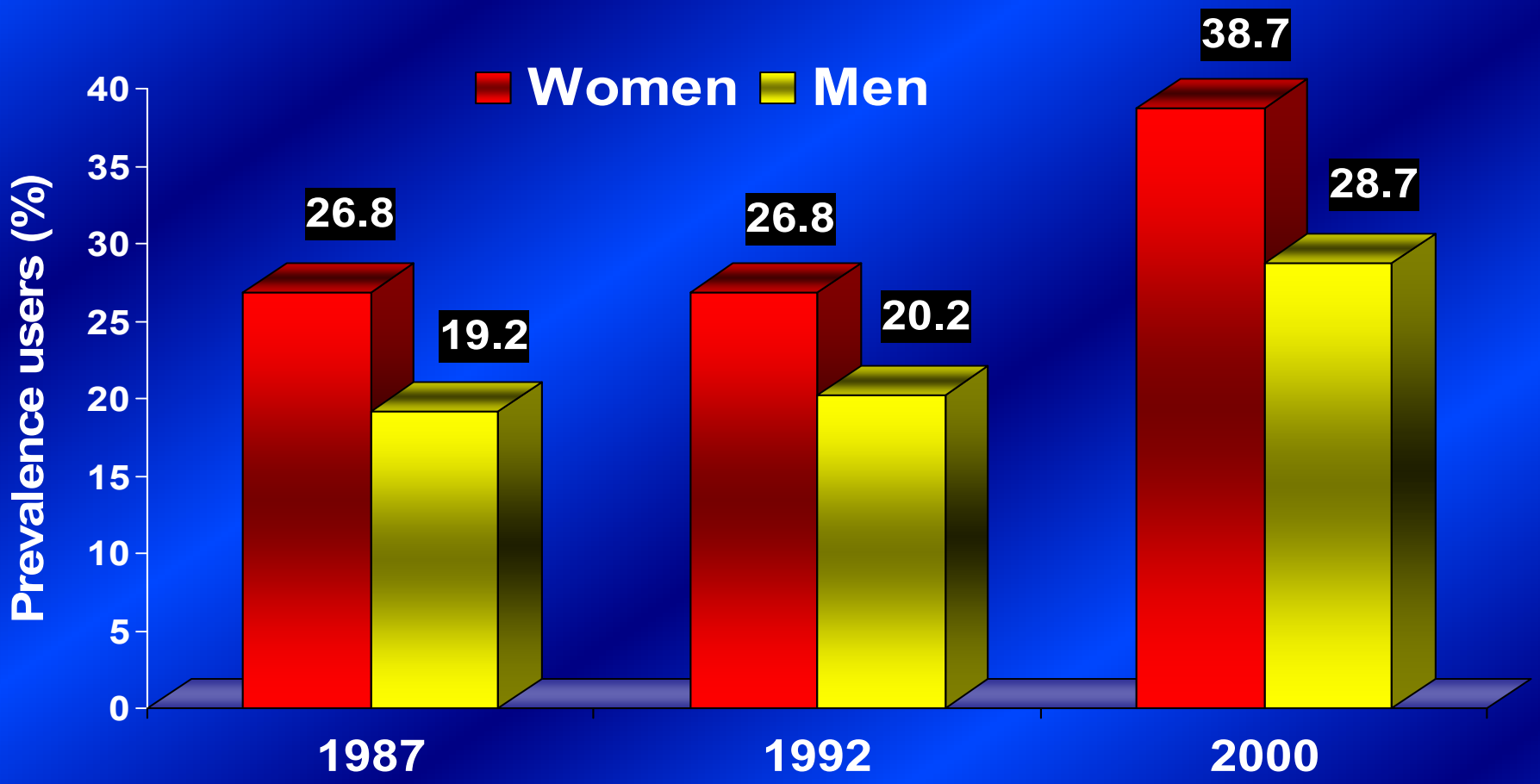
From Dietary Patterns to Nutritional Supplements: A potential shortcut to chronic disease prevention…?





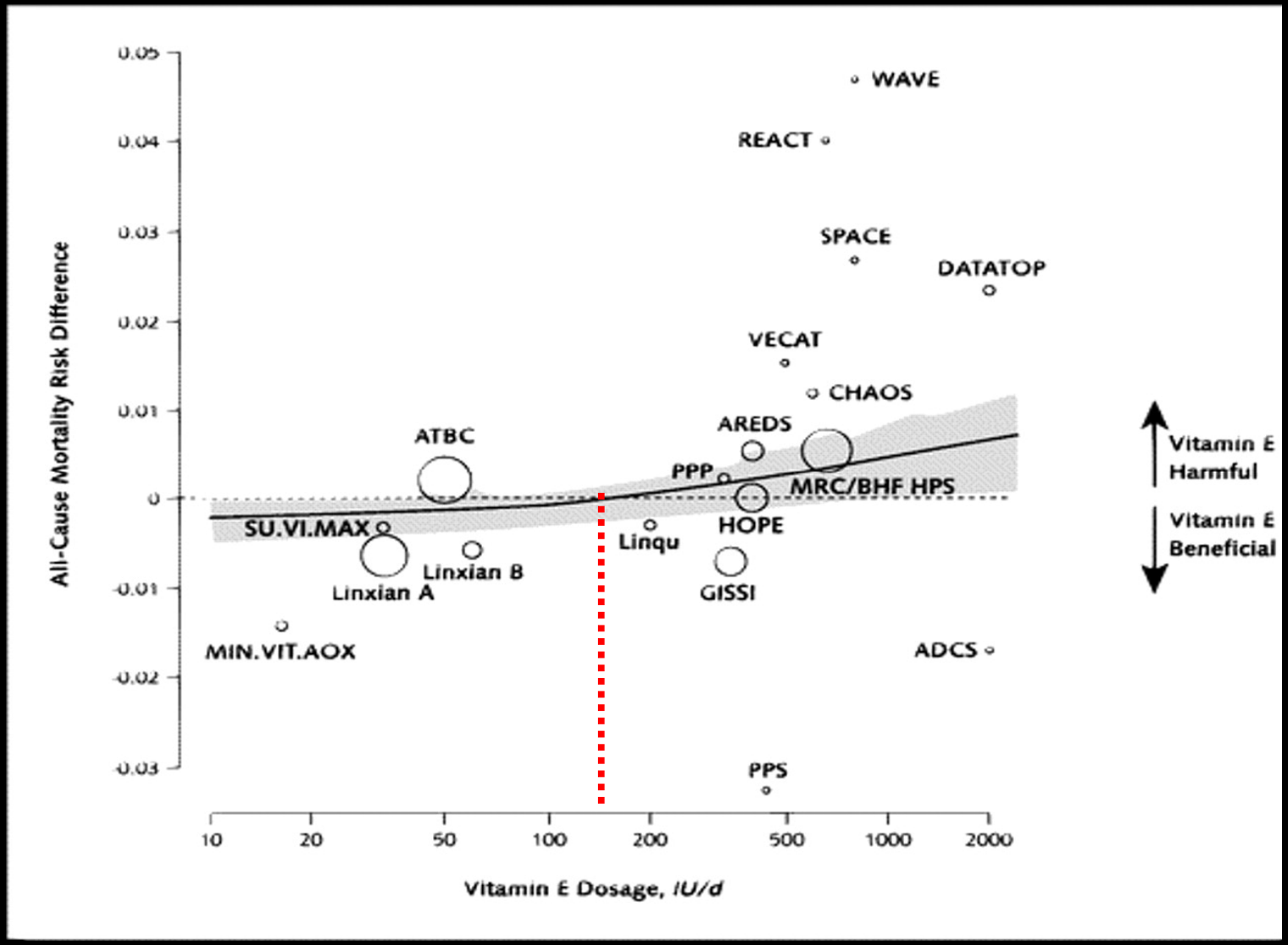


Trends in Daily Use of Vitamin/Mineral Supplements - US Adults (≥ 18 y)



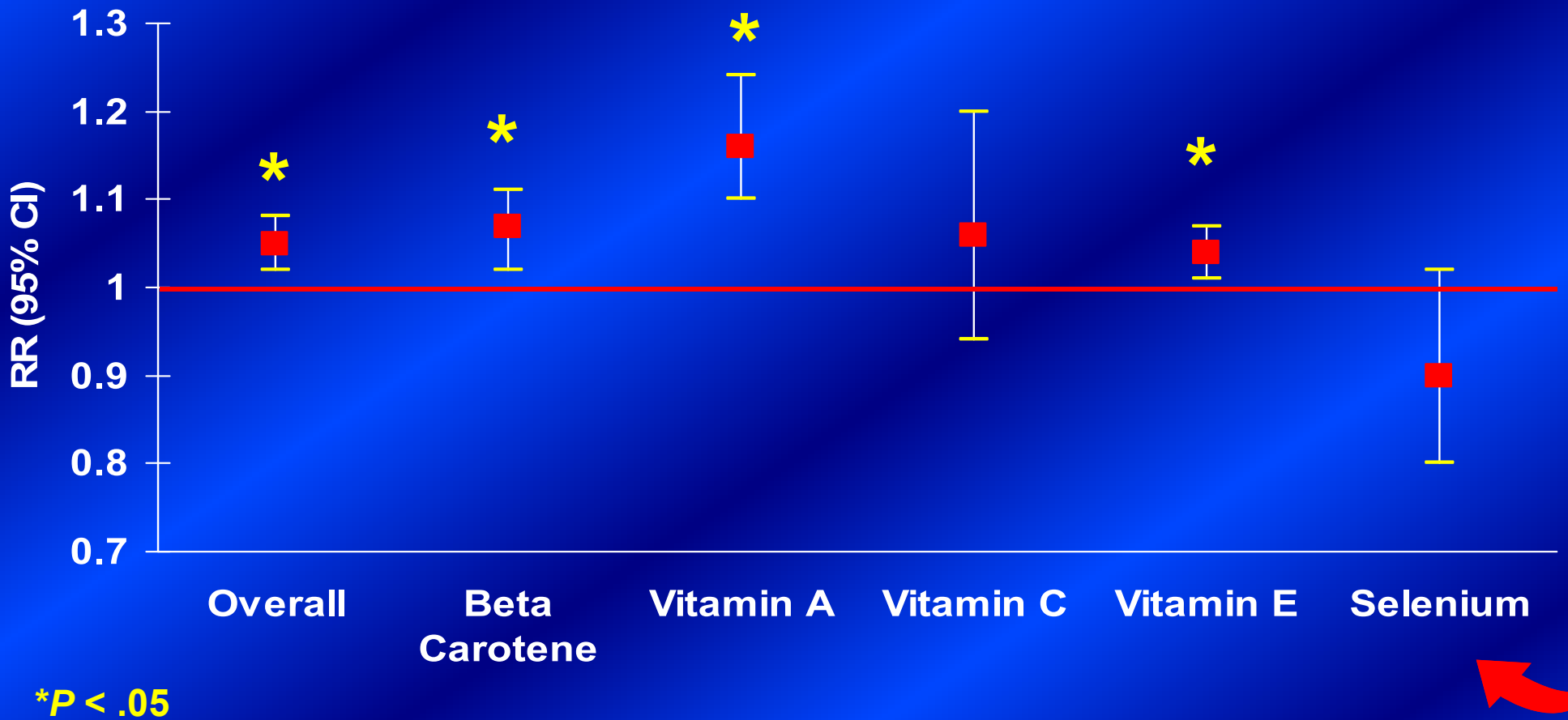
National Health Interview Survey. J Am Diet Assoc. 2004; 104:942-950

Vitamin E Supplementation and Mortality



Miller ER et al. Ann Intern Med 2005;142:37-46

Mortality in Randomized Trials of Antioxidant Supplements



*P < .05

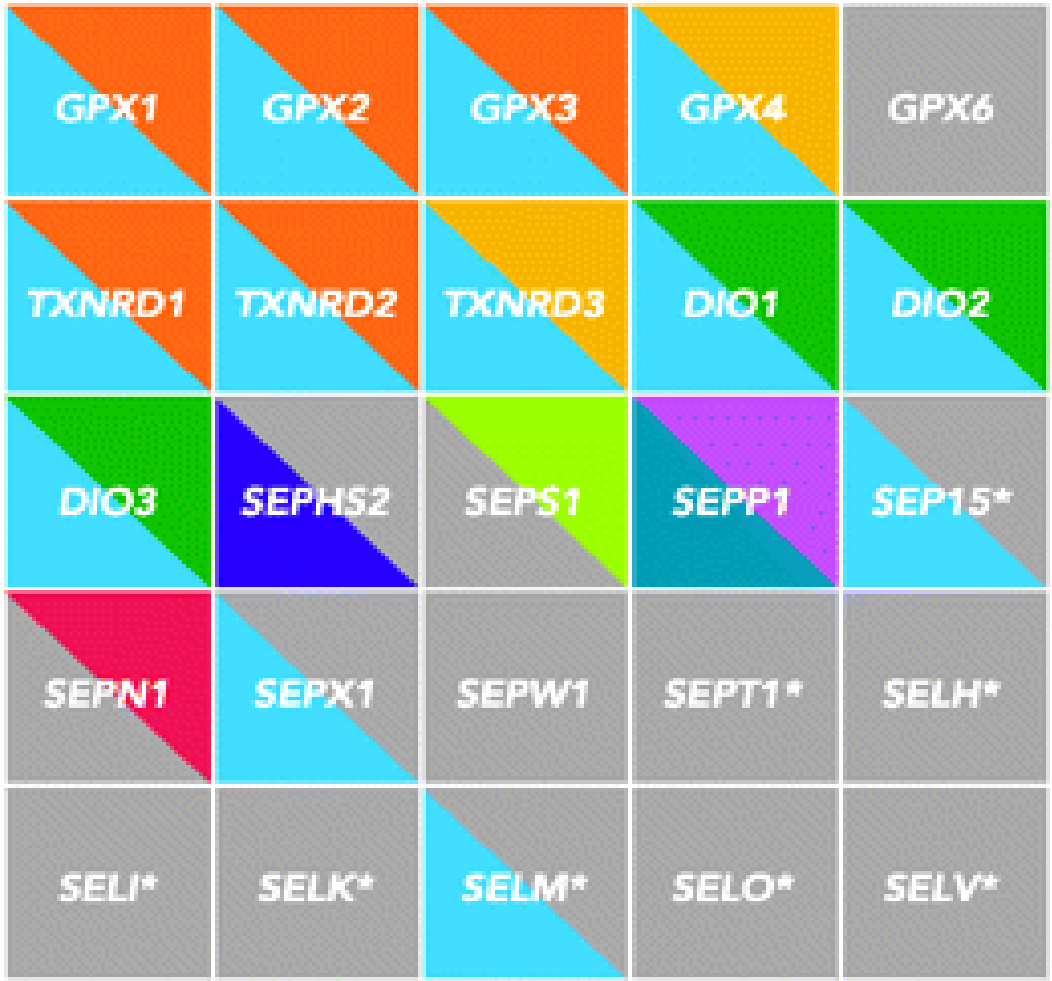
Bielakovic G. JAMA. 2007;297:842-857 & Cochrane Database Syst Rev. 2012;3:CD007176

Selenium Supplementation & Chronic Disease Prevention

Nutritional Prevention of Cancer (NPC) Trial

JAMA 1996;276:1957-63

Physiological roles of selenoproteins



Biochemical activities
- Oxidoreduction
- Selenocysteine synthesis
- Selenium transport
- Unknown

Major physiological roles
- Cancer prevention or development
- Male fertility
- Thyroid metabolism
- Immune function
- CNS function
- Muscle function
- Unknown

Moghadaszadeh B, Beggs AH. Physiology 2006;21:307-15

Selenium Supplementation vs. CVD

NPC Trial (1983-1996)

Participants without prevalent CVD at randomization (n = 1,004)

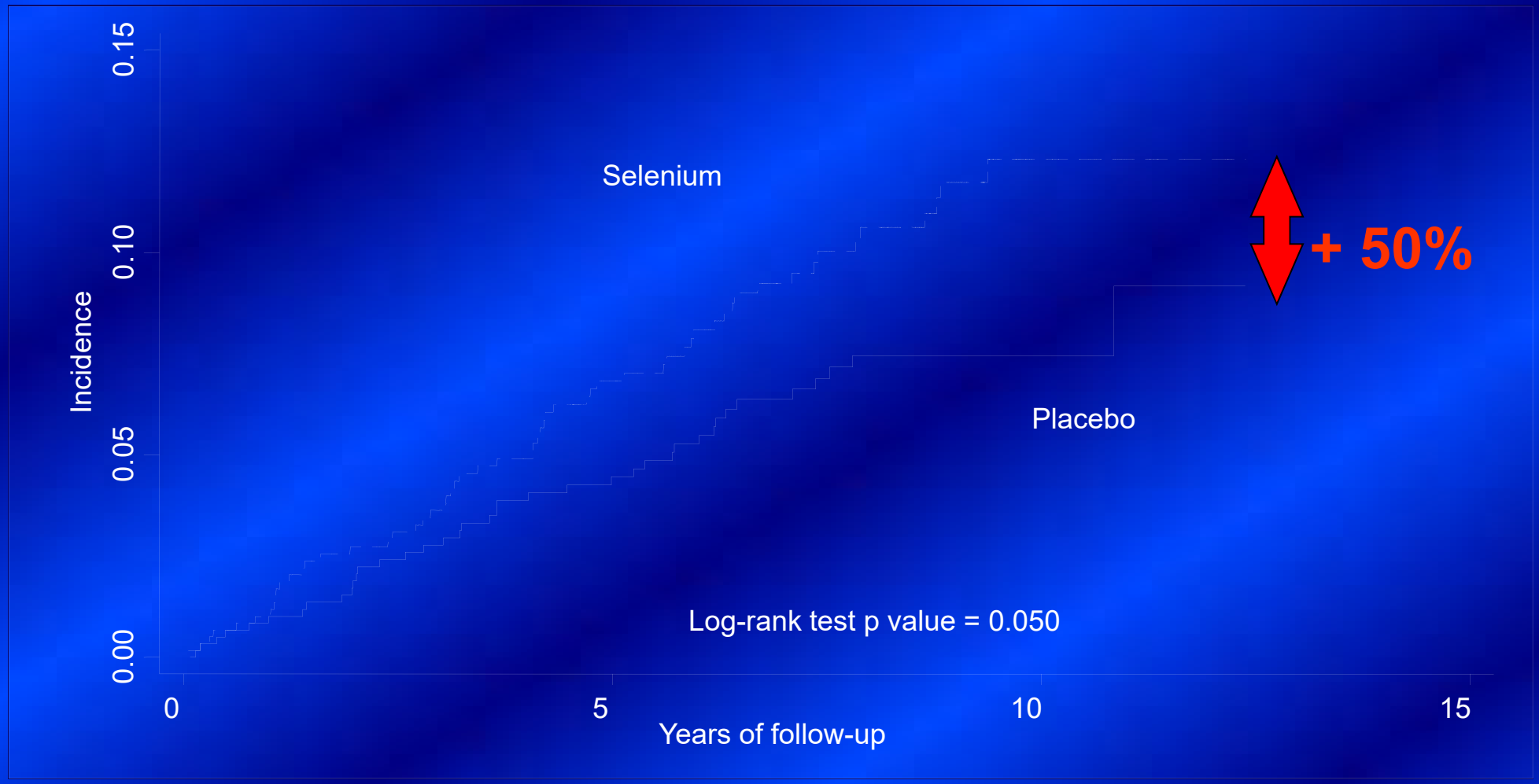
Mean follow-up: 7.6 years

CVD	Cases		Adjusted hazard ratios*		
	Se	Placebo	HR	95% CI	*P*
All CVD	103	96	1.03	0.78-1.37	0.81
All CHD	63	59	1.04	0.73-1.49	0.81
ALL CVA	40	37	1.02	0.65-1.59	0.94
CVD Mortality	40	31	1.22	0.76-1.95	0.41
All-cause Mortality	110	111	0.95	0.73-1.24	0.71

Stranges S et al. Am J Epidemiol. 2006;163:694-9

Selenium Supplementation vs. Diabetes

NPC Trial



Stranges S et al. Ann Intern Med. 2007;147:217-23

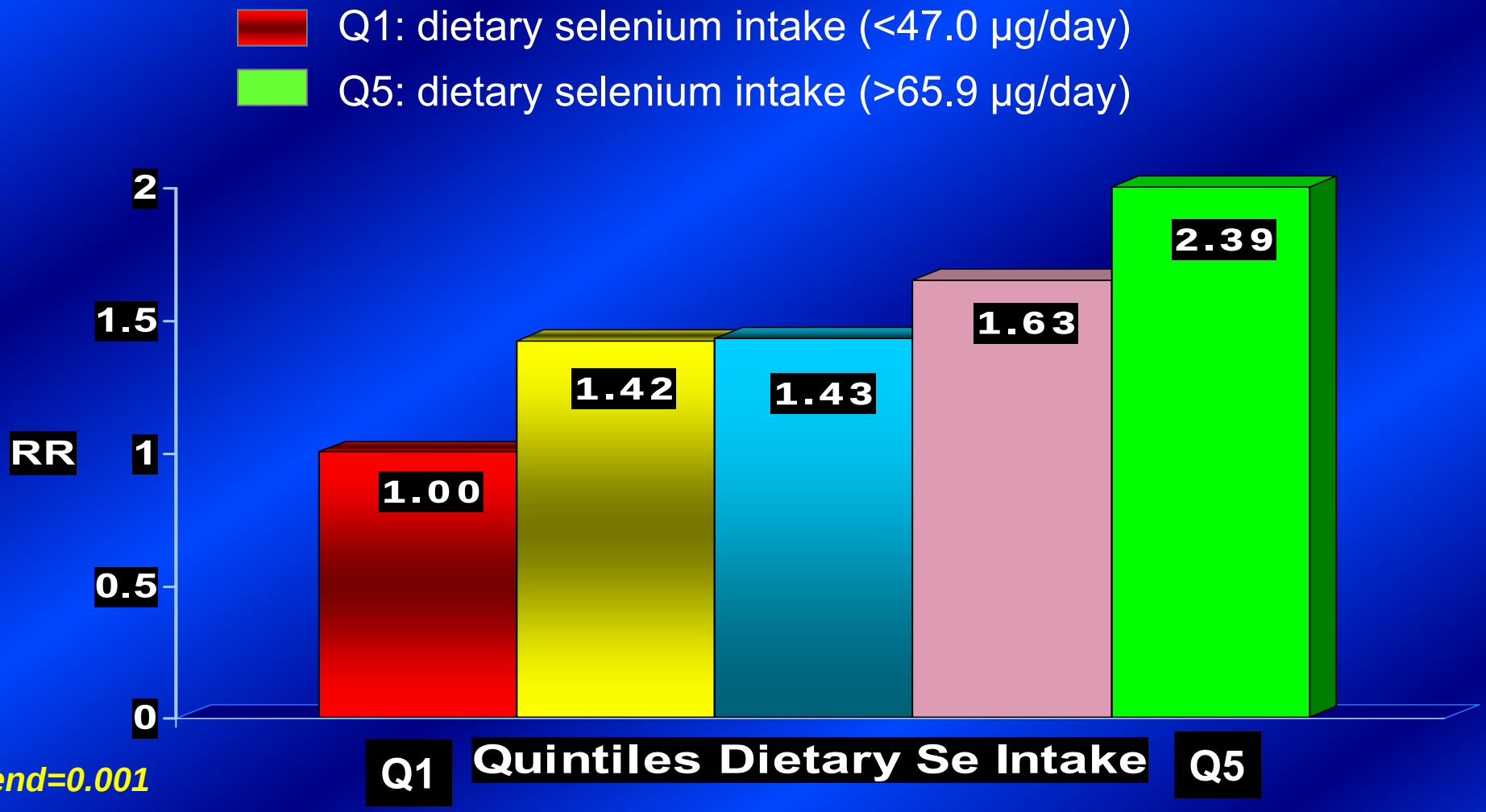
Risk of Diabetes by Baseline Plasma Selenium (ng/ml) NPC Trial

	Adjusted hazard ratios*			
	HR	95% CI	*P*	*P*, int
Overall	1.55	1.03-2.33	0.03	
By median				0.028
≤ 113.4	1.04	0.60-1.80	0.89	
> 113.4	2.50	1.32-4.77	0.005	
By tertiles				0.038
≤ 105.2	1.13	0.58-2.18	0.72	
105.3-121.6	1.36	0.60-3.09	0.63	
> 121.6	2.70	1.30-5.61	0.008	

Stranges S et al. Ann Intern Med. 2007;147:217-23

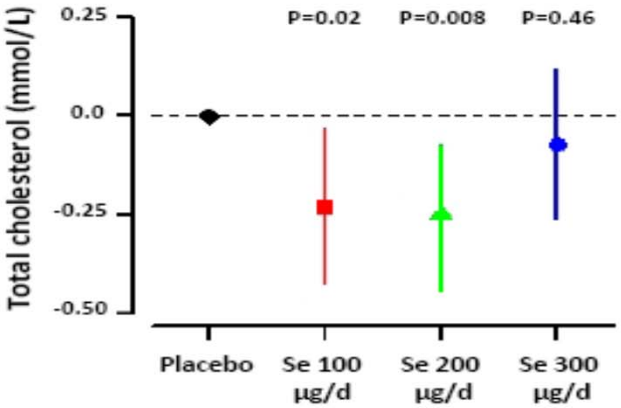
Dietary Selenium Intake and Incident Diabetes

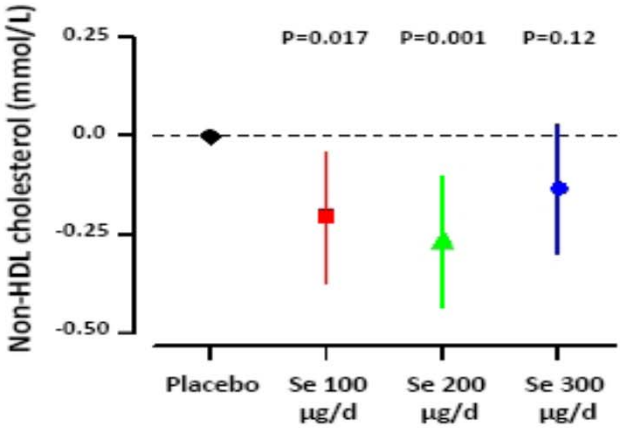
ORDET/EPIC Study, n=7,182 women

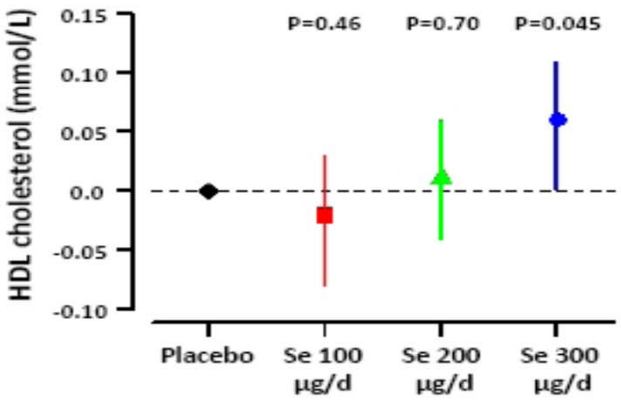


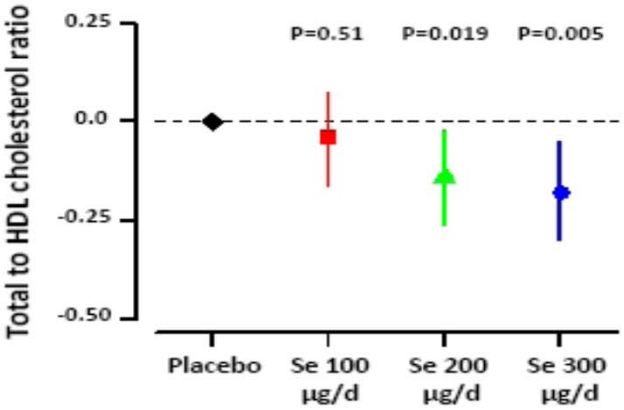
Stranges S, Vinceti M et al. BMC Public Health. 2010;10(1):564

Effect of Selenium Supplementation (6 months) on Blood Lipids – UK PRECISE Trial





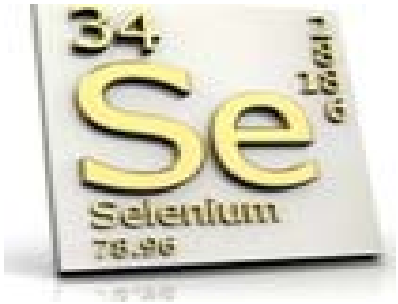




Rayman MP, Stranges S, et al. Ann Int Med. 2011;154:656-65

Selenium supplementation for the primary prevention of cardiovascular disease (Review)

Rees K, Hartley L, Day C, Flowers N, Clarke A, Stranges S



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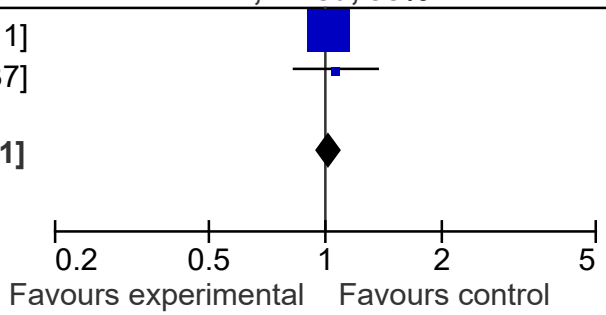
Cochrane Database Syst Rev. 2013;1:CD009671

Selenium Supplementation & CVD Prevention: Cochrane Systematic Review

All CVD events (fatal and non-fatal)

Study or Subgroup	Selenium supplementation Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Lippman 2009	1080	8752	1050	8696	91.6%	1.02 [0.94, 1.11]
Stranges 2006	103	504	96	500	8.4%	1.06 [0.83, 1.37]
Total (95% CI)		**9256**		**9196**	**100.0%**	**1.03 [0.95, 1.11]**
Total events	1183		1146			

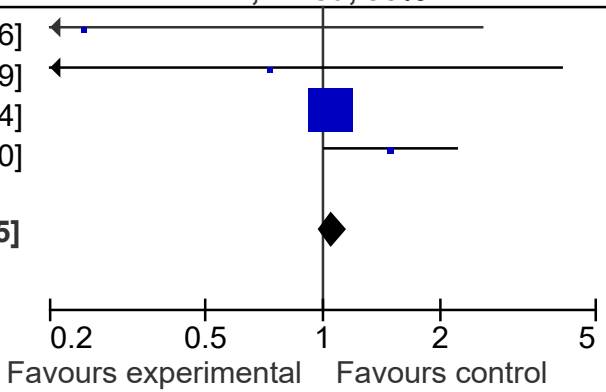
Heterogeneity: Chi² = 0.09, df = 1 (P = 0.76); I² = 0%
Test for overall effect: Z = 0.65 (P = 0.51)



Type 2 Diabetes

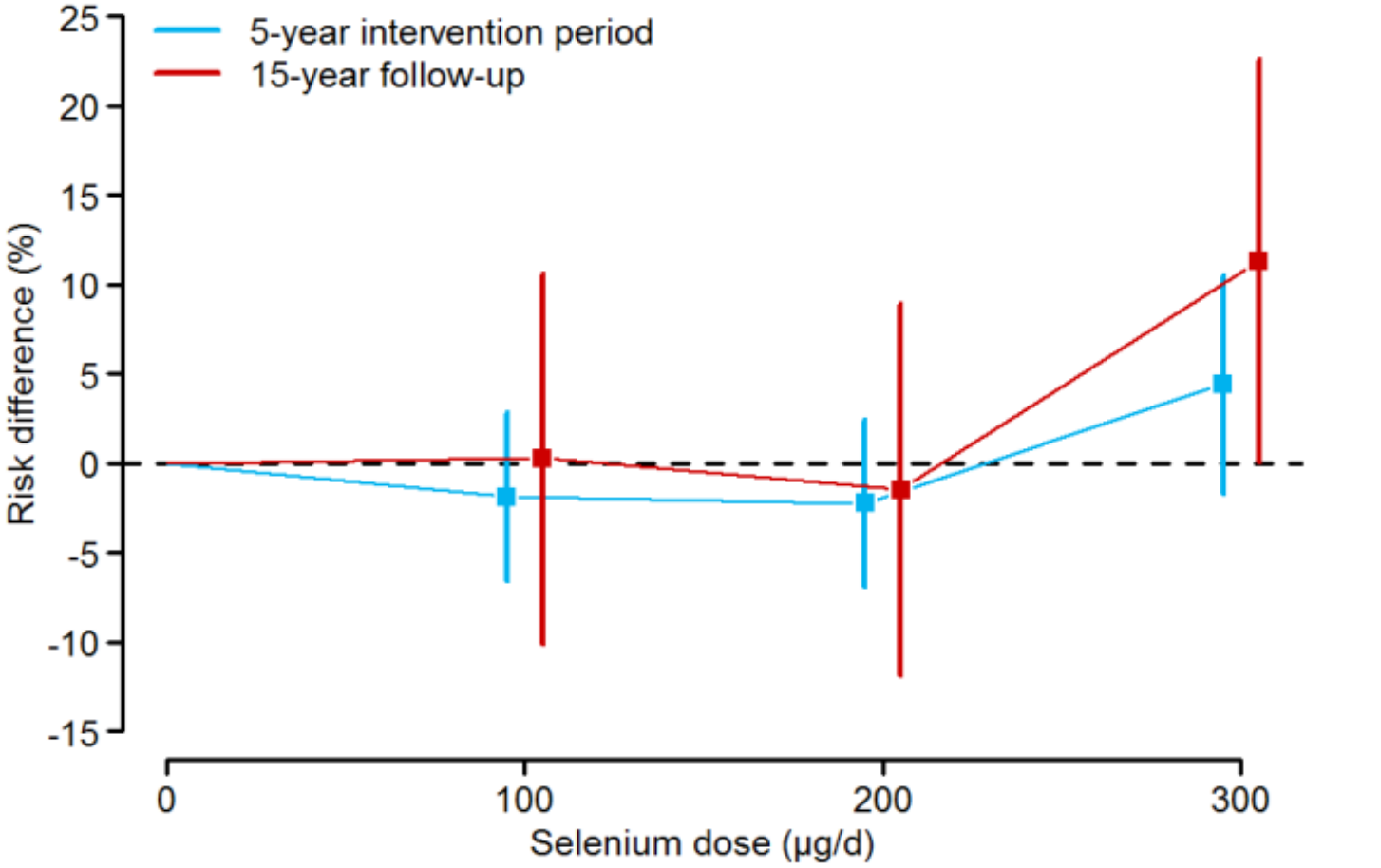
Study or Subgroup	Selenium supplementation Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Algotar 200µg 2010	1	47	2	23	0.3%	0.24 [0.02, 2.56]
Algotar 800µg 2010	3	47	2	23	0.3%	0.73 [0.13, 4.09]
Klein 2011	913	8752	869	8696	95.2%	1.04 [0.96, 1.14]
Stranges 2007	58	600	39	602	4.3%	1.49 [1.01, 2.20]
Total (95% CI)		**9446**		**9344**	**100.0%**	**1.06 [0.97, 1.15]**
Total events	975		912			

Heterogeneity: Chi² = 4.75, df = 3 (P = 0.19); I² = 37%
Test for overall effect: Z = 1.33 (P = 0.18)



Rees K, Stranges S. Cochrane Database Systematic Reviews 2013;1:CD009671

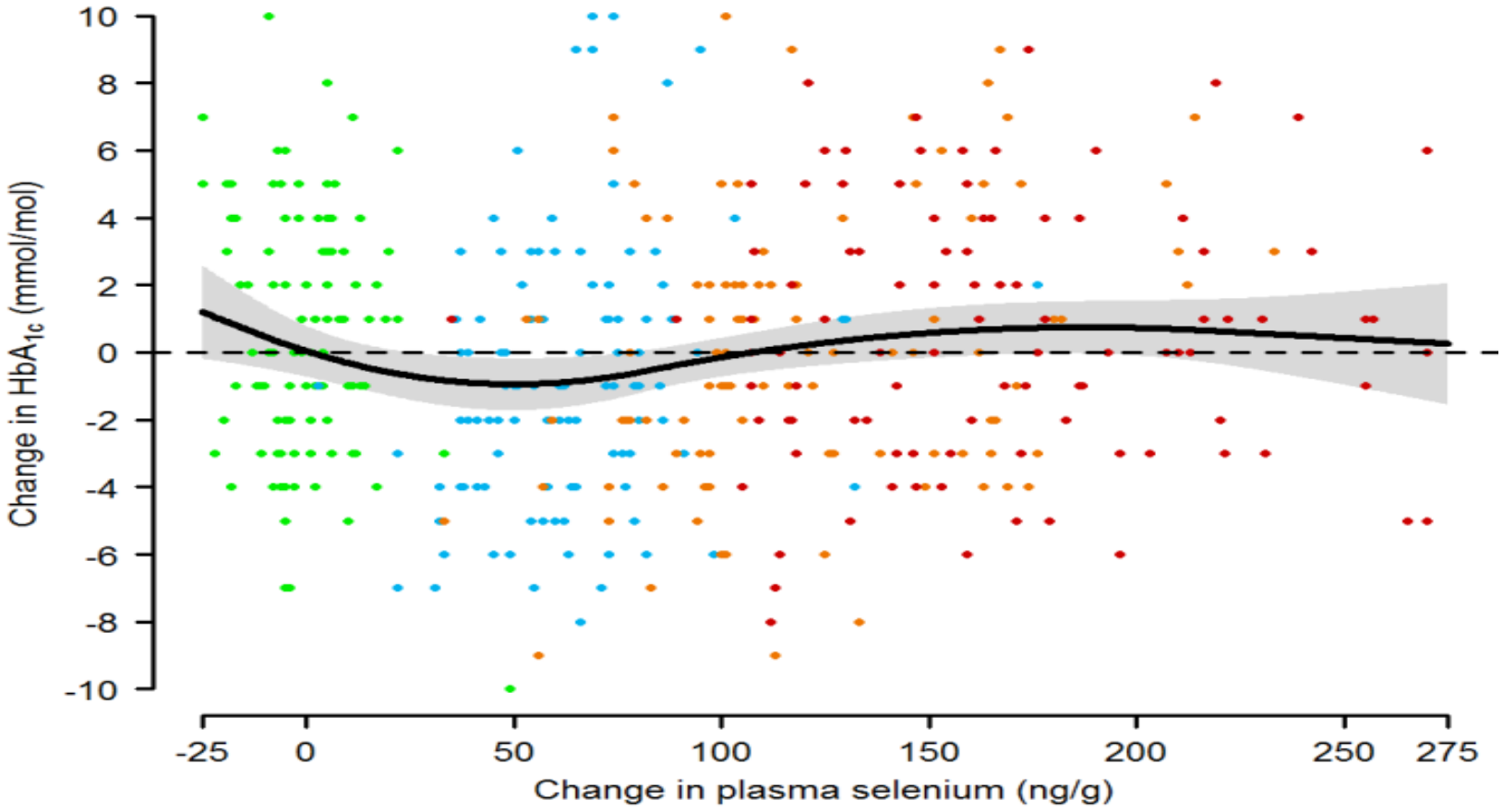
Effect of Selenium Supplementation (5 years) on All-cause Mortality – DK PRECISE Trial



5 years	-1.9 (-6.6 to 2.9)	-2.2 (-6.9 to 2.5)	4.5 (-1.7 to 10.6)
15 years	0.3 (-10.1 to 10.6)	-1.5 (-11.9 to 8.9)	11.3 (0.0 to 22.6)

Rayman MP, Stranges S, et al. Free Radic Biol Med. 2018;127:46-54

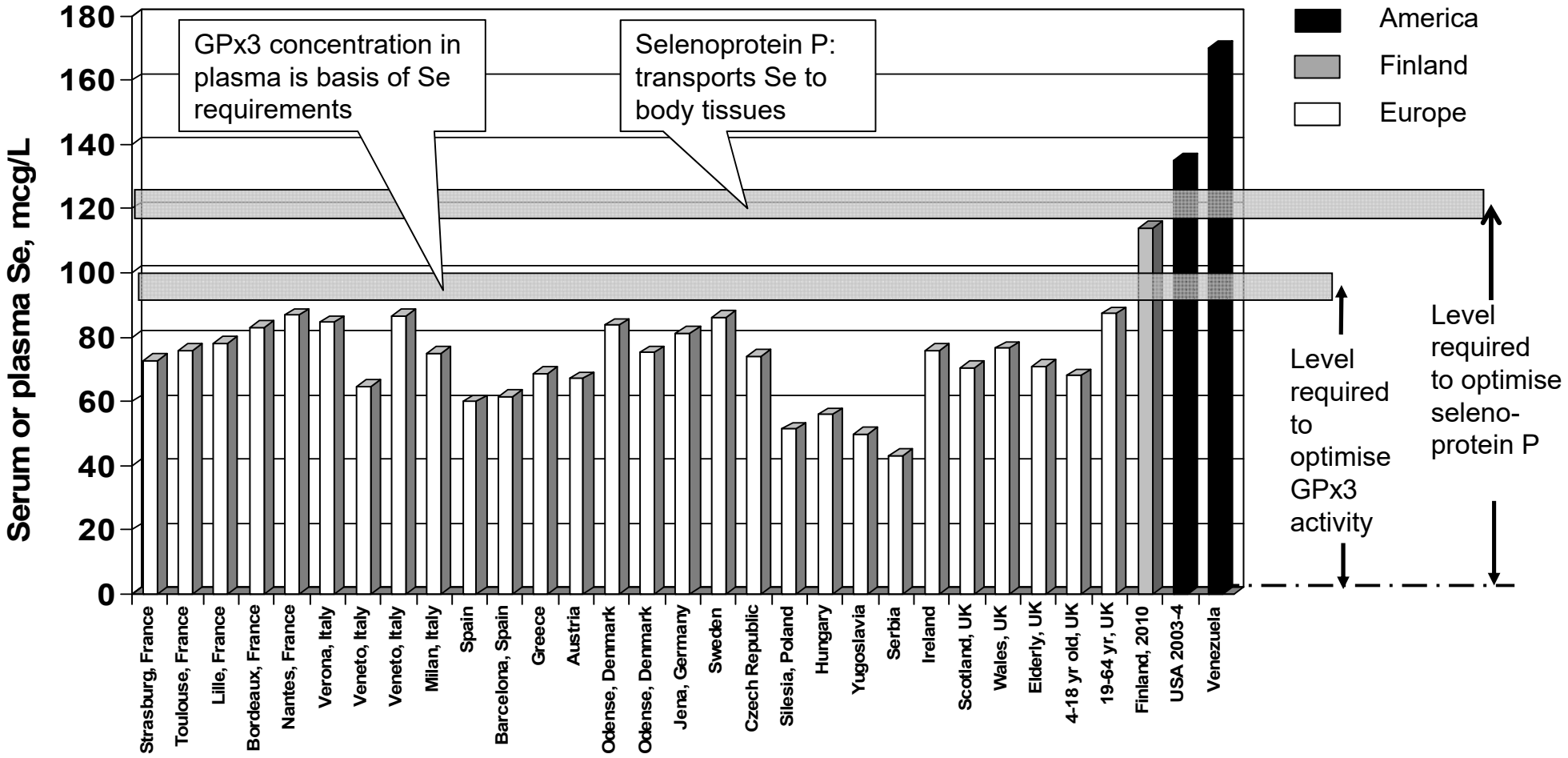
Changes in HbA_{1c} after 6 months by changes in plasma selenium concentrations - DK PRECISE Trial



U-shaped association between changes in plasma Se and HbA1c levels

Stranges S et al. Diabetes Obes Metab. 2019; 21:541-549

Geographic variations in Selenium status might explain inconsistent results across populations (biological plausibility)



Rayman MP, Stranges S. Free Radic Biol Med. 2013;65:1557-64

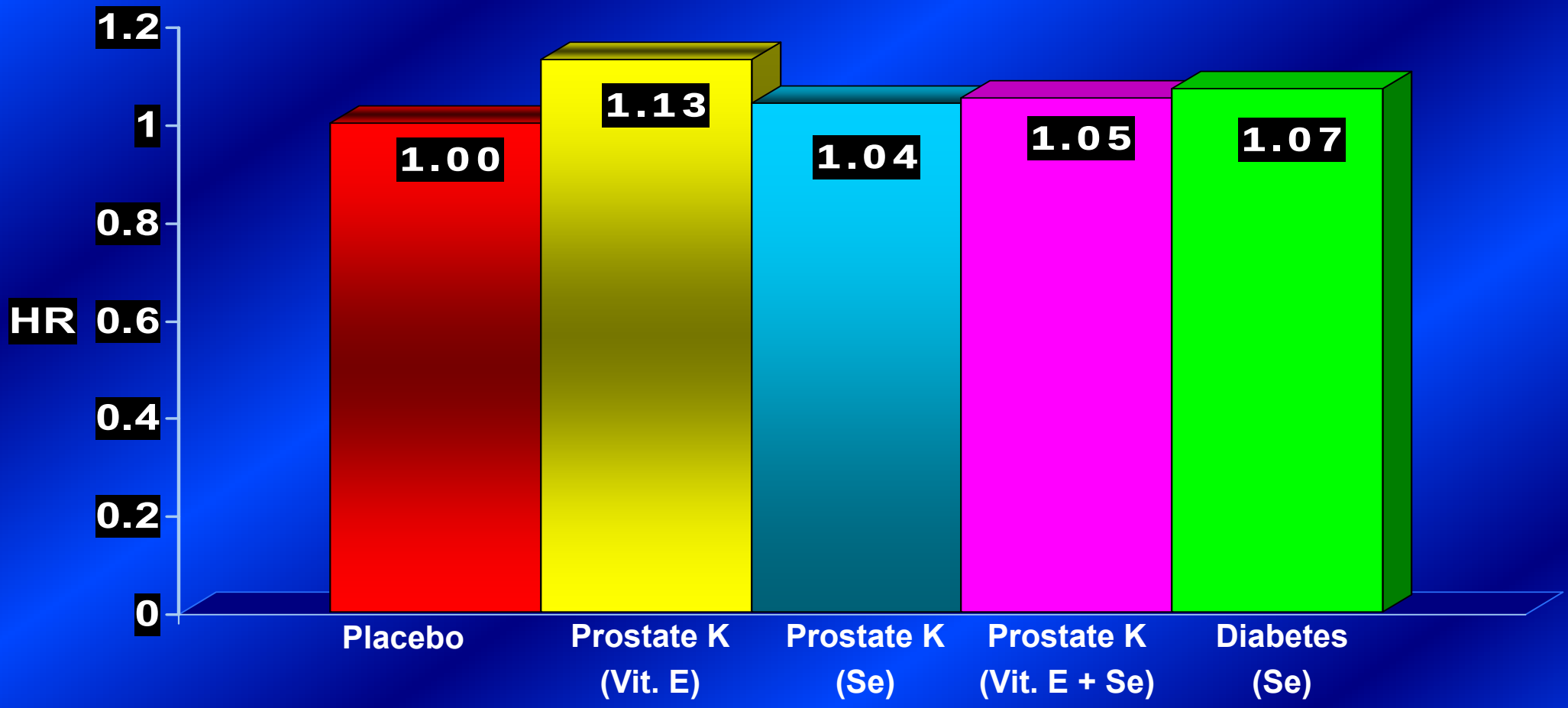
Selenium and Vitamin **E** **C**ancer Prevention **T**rial **(SELECT)**

	Vitamin E (400 IU/day)		
Selenium (200 µg/day)	+	-	T
+	8,100	8,100	16,200
-	8,100	8,100	16,200
T	16,200	16,200	32,400

- Cost: $175,000,000 (NCI, NIH, etc.)

SELECT: Findings…Stopped after 5.5 y

n=35,533 US male adults



JAMA. 2009; 301:39-51

EDITORIAL | Annals of Internal Medicine

Enough Is Enough: Stop Wasting Money on Vitamin and Mineral Supplements

Ann Intern Med. 2013;159:850-851.

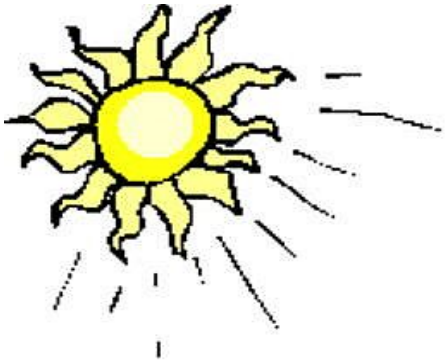
Eliseo Guallar, MD, DrPH
Johns Hopkins Bloomberg School of Public Health
Baltimore, Maryland

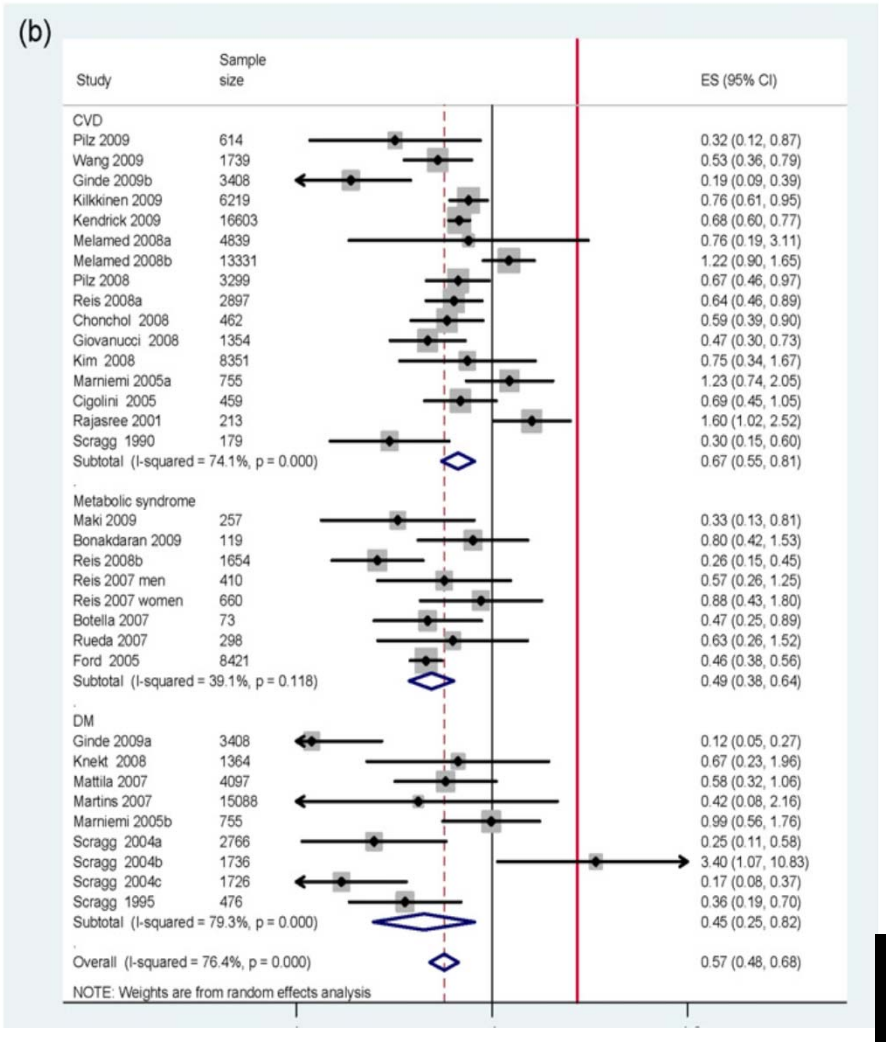
Saverio Stranges, MD, PhD
Warwick Medical School, University of Warwick
Coventry, United Kingdom

Cynthia Mulrow, MD, MSc
Annals of Internal Medicine, American College of Physicians
Philadelphia, Pennsylvania

Lawrence J. Appel, MD, MPH
Edgar R. Miller III, MD, PhD
Johns Hopkins School of Medicine
Baltimore, Maryland

Potential Role of Vitamin D in Cardio-metabolic Disease Prevention?





-43%

Parker J, Mavrodaris A, Stranges S, et al. Maturitas. 2010;65:225-36

Nutrients **2015**, *7*, 6780-6796; doi:10.3390/nu7085308

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Article

Prevalence and Correlates of Vitamin D Deficiency and Insufficiency in Luxembourg Adults: Evidence from the Observation of Cardiovascular Risk Factors (ORISCAV-LUX) Study

Ala'a Alkerwi [1,*], Nicolas Sauvageot [1], Georges Gilson [2] and Saverio Stranges [1]

[1] Luxembourg Institute of Health (LIH) (formerly the Centre de Recherche Public Santé), Centre d'Etudes en Santé, Grand-Duchy of Luxembourg, L-1445 Strassen, Luxembourg;

British Journal of Nutrition, page 1 of 8

doi:10.1017/S0007114516000702

Daily chocolate consumption is inversely associated with insulin resistance and liver enzymes in the Observation of Cardiovascular Risk Factors in Luxembourg study

Ala'a Alkerwi[1]*, Nicolas Sauvageot[1], Georgina E. Crichton[1,2], Merrill F. Elias[3,4] and Saverio Stranges[1,5]

[1]*Luxembourg Institute of Health (LIH) (formerly CRP-Santé), Epidemiology and Public Health Research Unit, Strassen, L-1445, Grand-Duchy of Luxembourg*

[2]*Nutritional Physiology Research Centre, University of South Australia, Adelaide 5001, Australia*

[3]*Department of Psychology, University of Maine, Orono, ME 04469, USA*

[4]*Graduate School of Biomedical Science and Engineering, University of Maine, Orono, ME 04469, USA*

[5]*Division of Health Sciences, University of Warwick Medical School, Coventry CV4 7AL, UK*

Emerging Risk Factors:
Sleep Problems & Cardiometabolic Disease

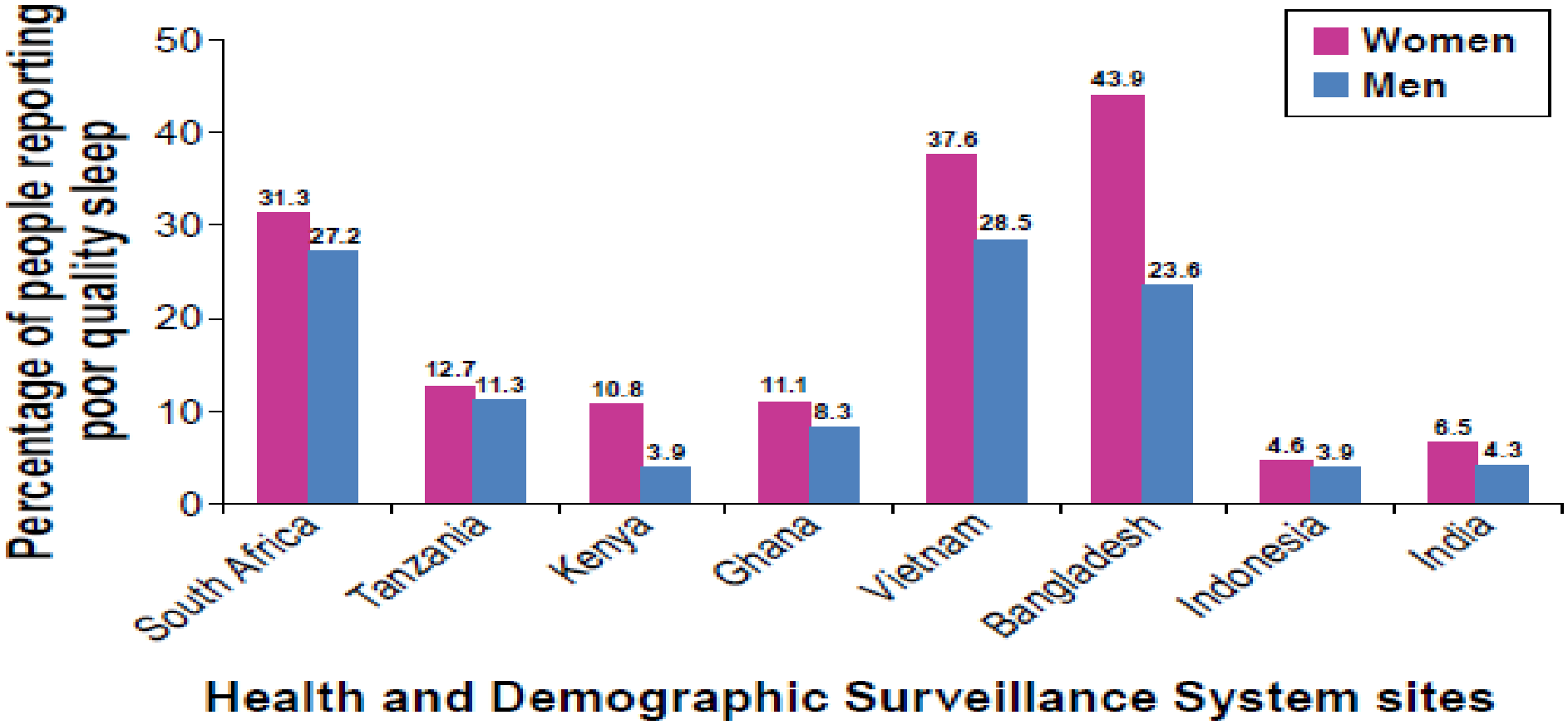
http://dx.doi.org/10.5665/sleep.2012

Sleep Problems: An Emerging Global Epidemic? Findings From the INDEPTH WHO-SAGE Study Among More Than 40,000 Older Adults From 8 Countries Across Africa and Asia

Saverio Stranges, MD, PhD[1]; William Tigbe, MD, PhD[1]; Francesc Xavier Gómez-Olivé, MD[2,3]; Margaret Thorogood, PhD[1,2,3]; Ngianga-Bakwin Kandala, PhD[1]

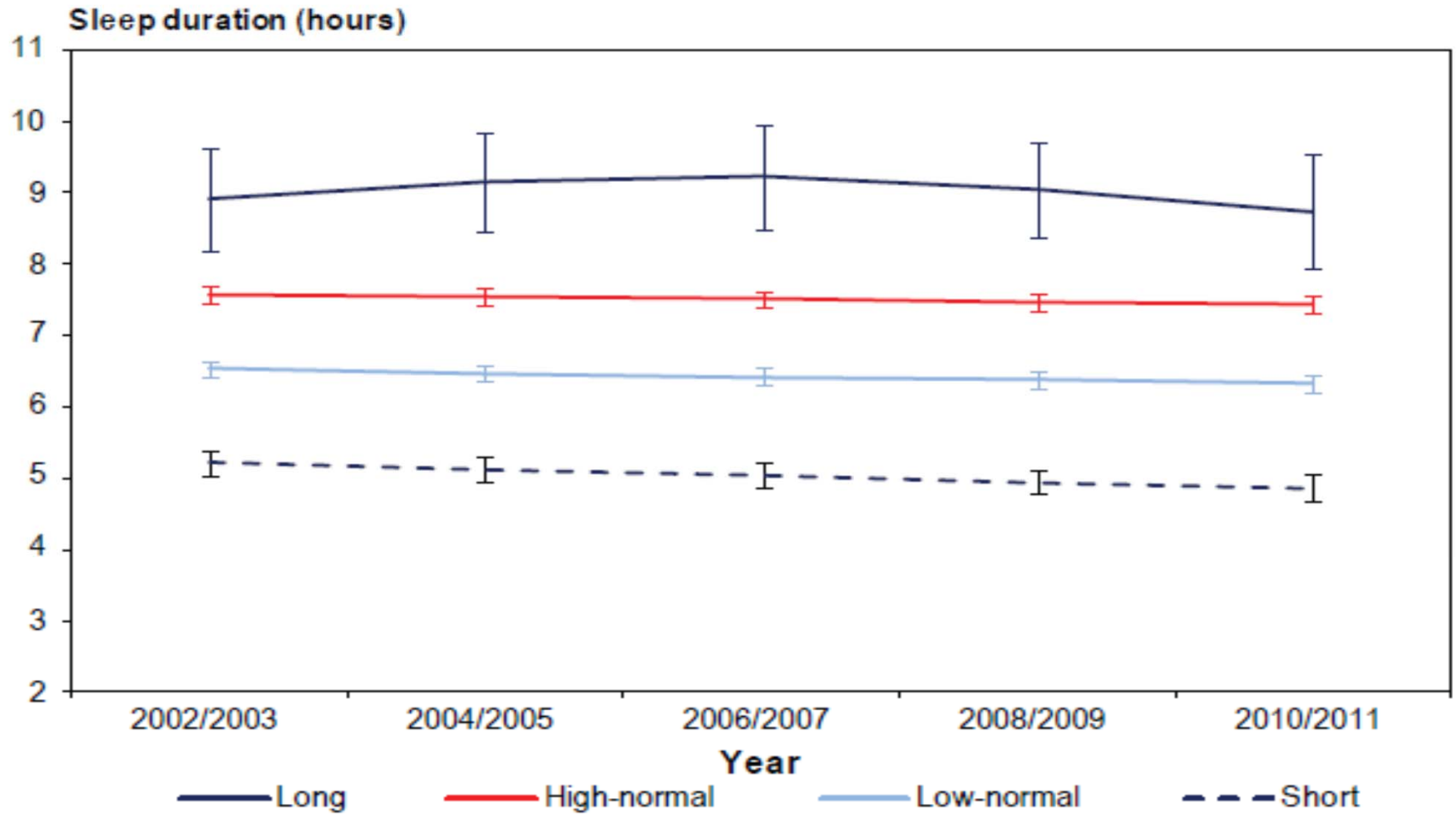
[1]Division of Health Sciences, University of Warwick Medical School, Coventry, UK; [2]MRC/Wits Rural Public Health and Health Transitions Research Unit (Agincourt), School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa; [3]INDEPTH Network, Accra, Ghana

Sleep Problems: an Emerging Global Epidemic?



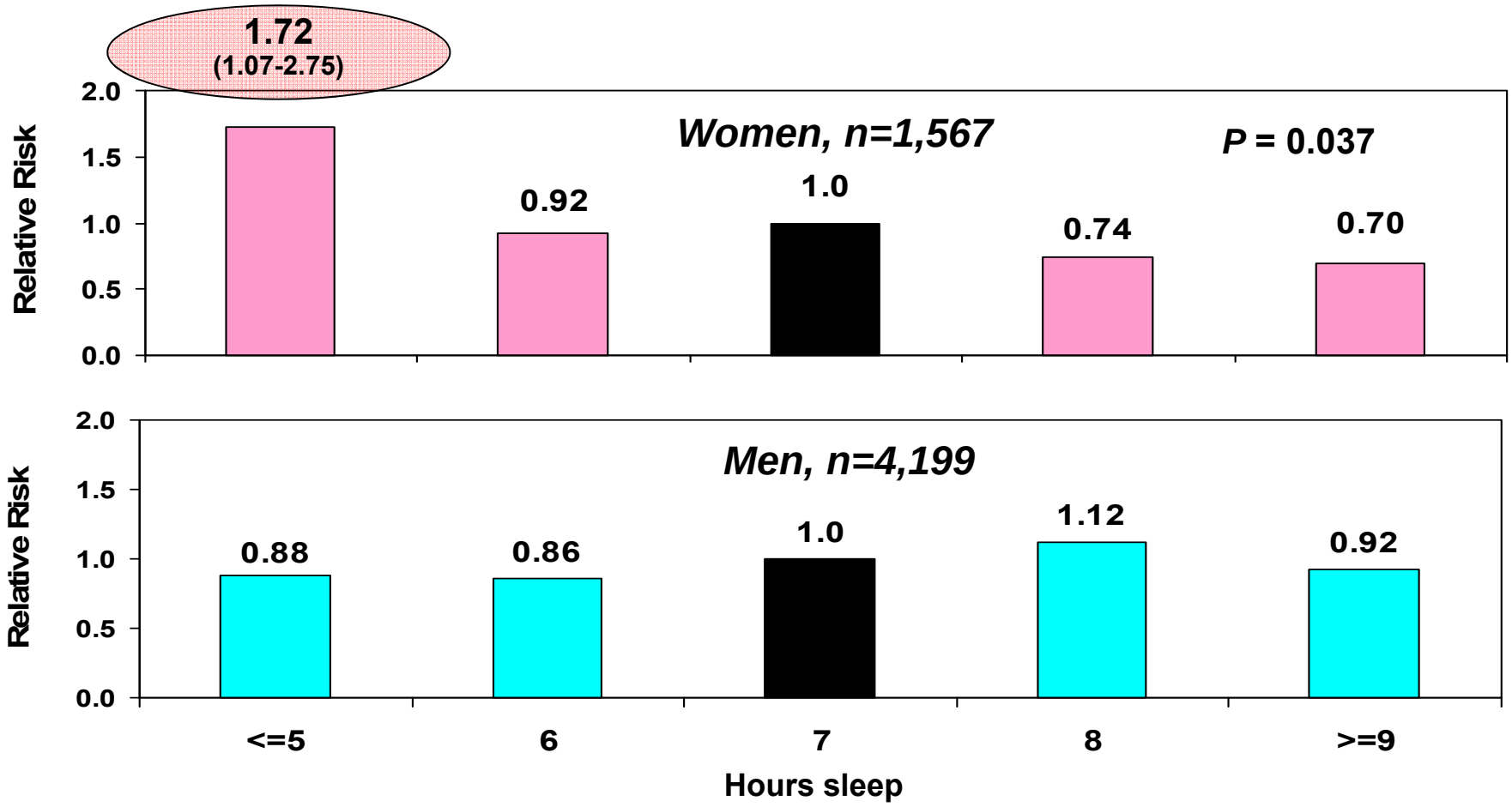
Stranges S, Kandala N-B, et al. Sleep. 2012;35:1173-1181

Decline in Sleep Duration over time:
Canadian National Population Health Survey (2002-2011), N=8,673



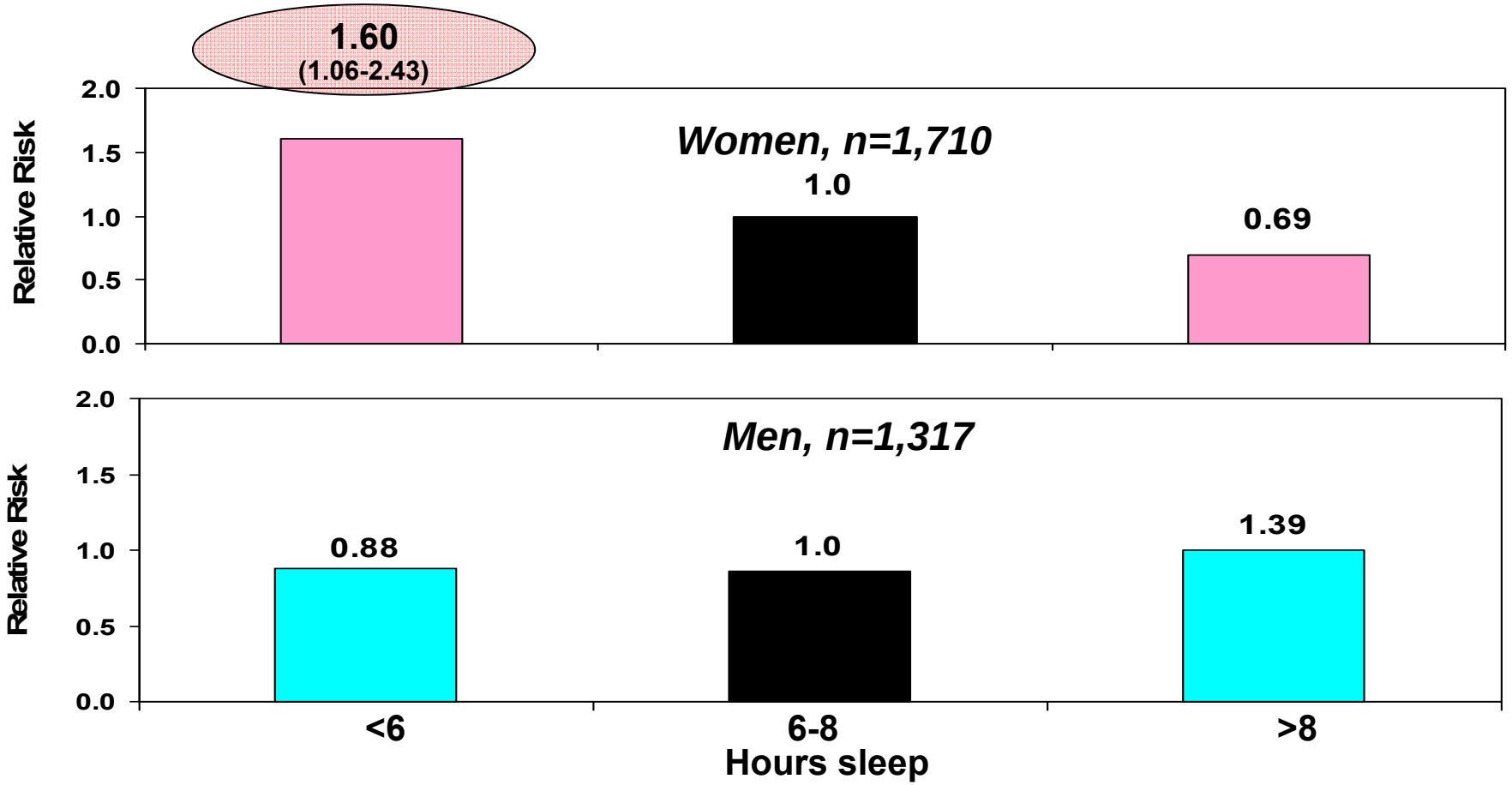
Gilmour H, Stranges S, et al. Health Rep. 2013;24:14-20

Short Sleep duration and Hypertension
The Whitehall II Study - UK



Stranges S, Kandala N-B, et al. Hypertension 2007:50:694-701

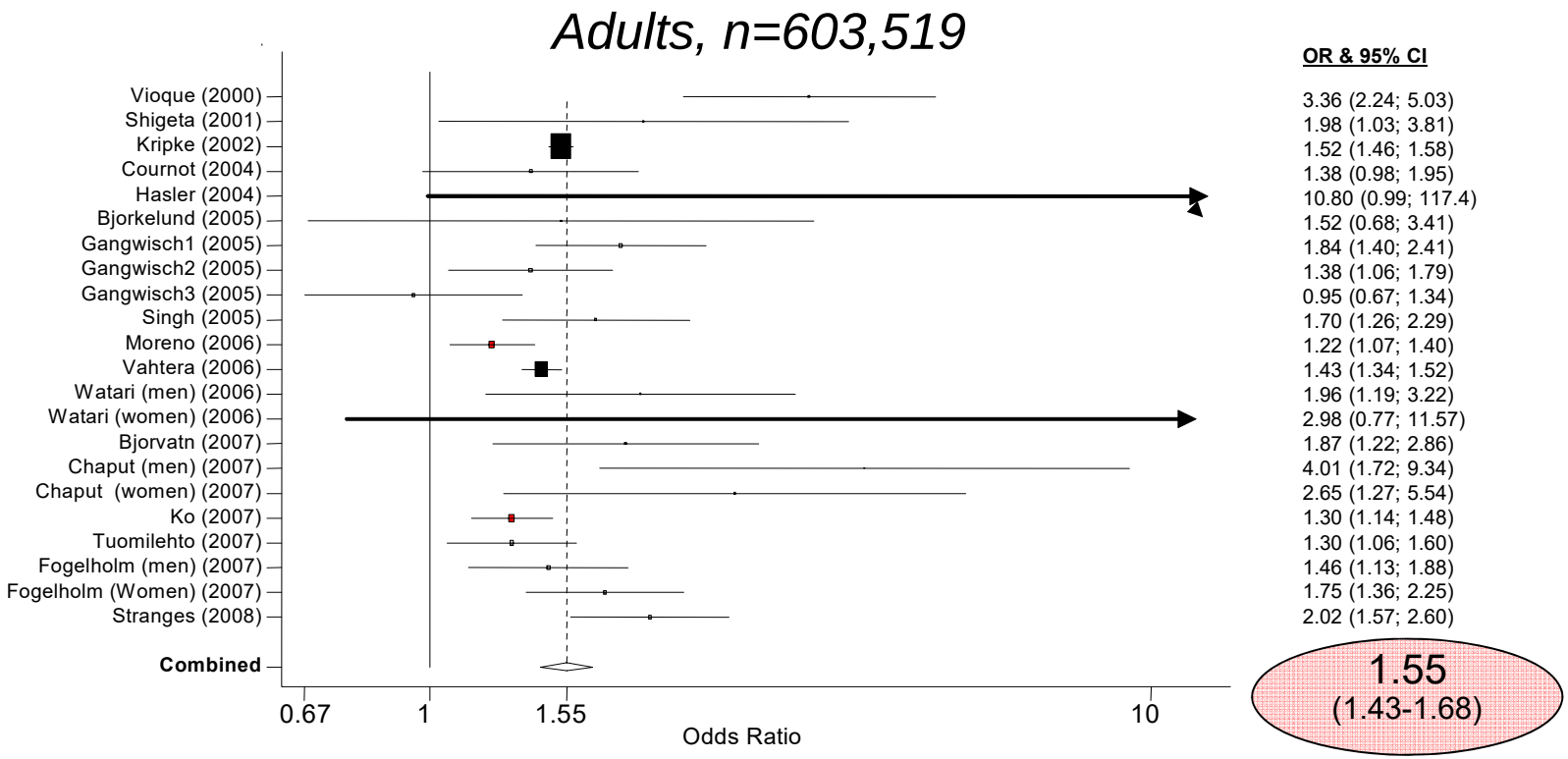
Short Sleep duration and Hypertension
The Western NY Health Study - US



Stranges S, Kandala N-B, et al. J Hypertension. 2010;28:896-902

Short Sleep Duration (<5h) and Obesity*

Meta-analysis of Cross-Sectional Studies

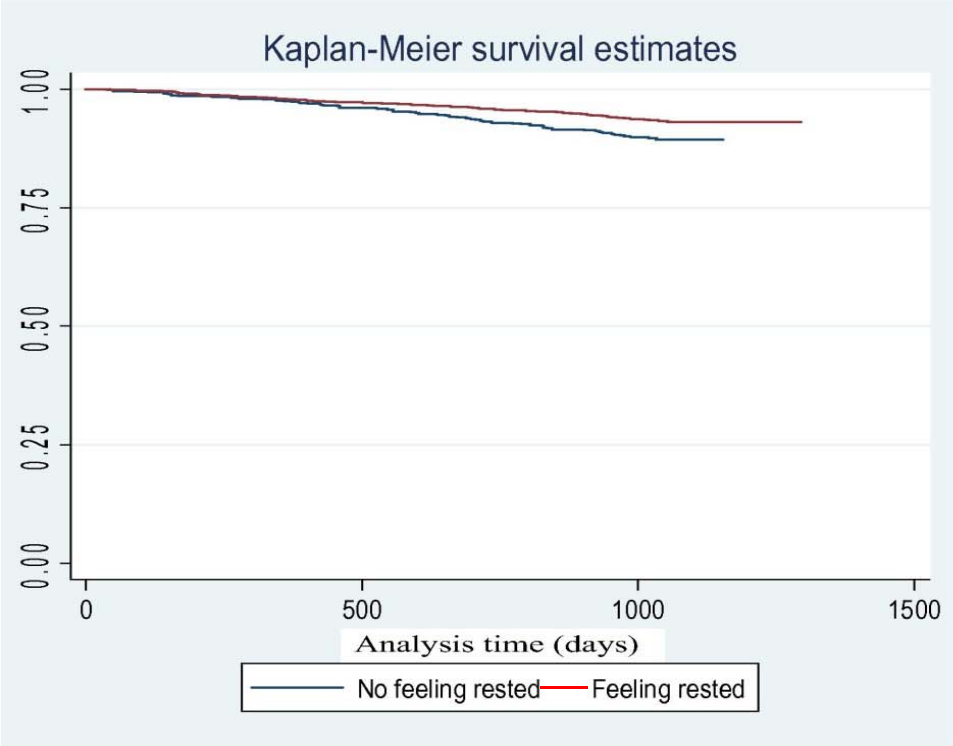


*BMI ≥ 30

Kandala N-B, Stranges S, et al. Sleep 2008;31:619-26

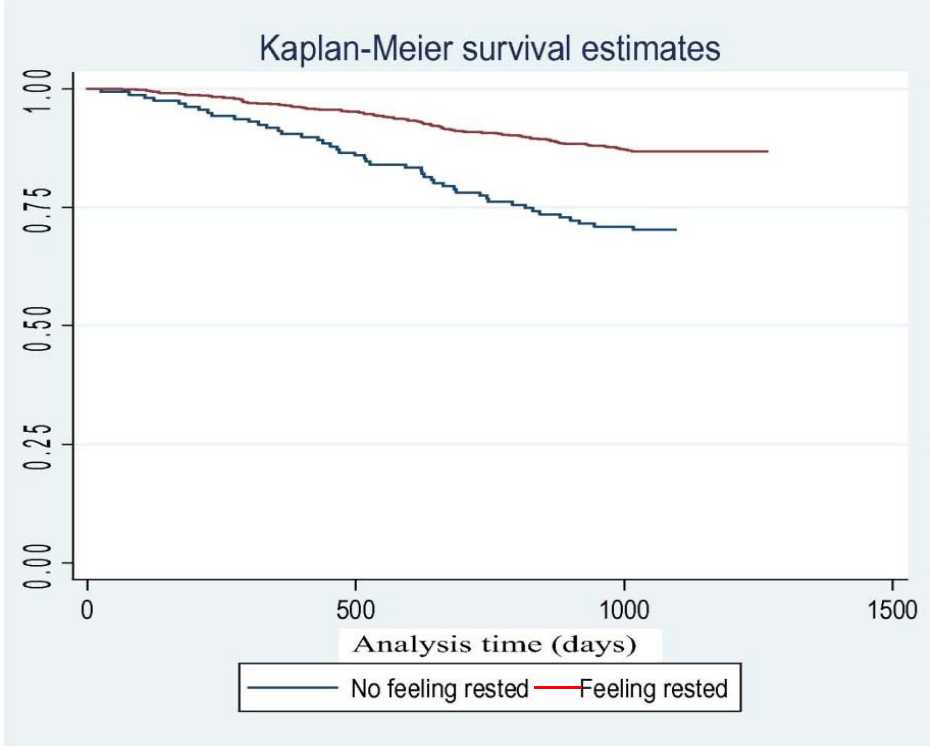
Sleep problems and mortality in South Africa:
Agincourt Study, Health & Demographic Surveillance System (HDSS)

Women



Log rank test $P<.001$

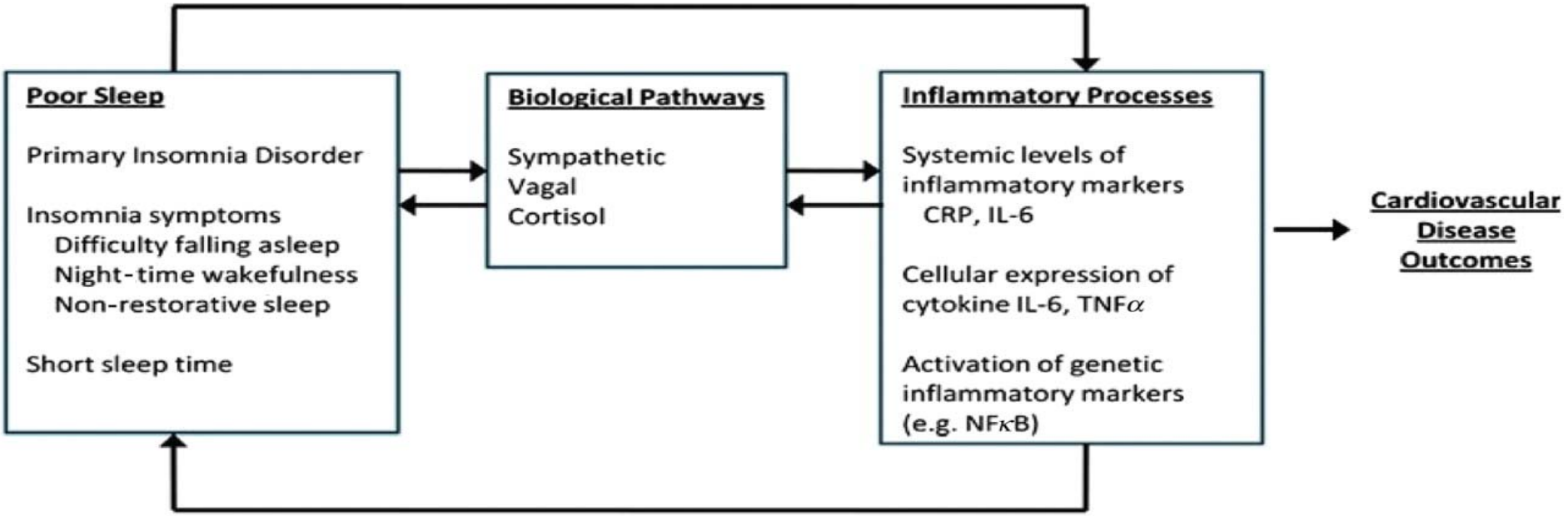
Men



Log rank test $P<.001$.

Stranges S, Kandala N-B, Tigbe W, et al. Sleep Medicine 2014;15:56-63

Poor sleep: an emerging risk factor for CVD?

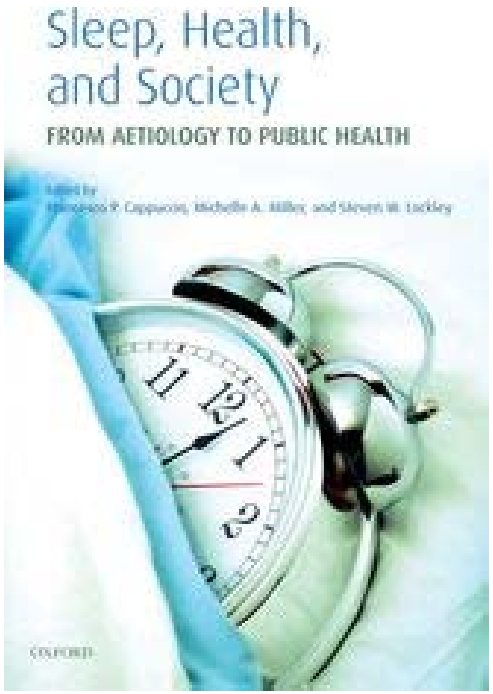


Demographic and Behavioural Moderators and Mediators

Age
Gender
Depressive Status
Obesity
Alcohol consumption
Cigarette Smoking

Int. J. Epidemiol. 2011;40:1431-1437

From association to causation…



Chapter 3

Sleep duration: risk factor or risk marker for ill-health?

N.S. Marshall and S. Stranges

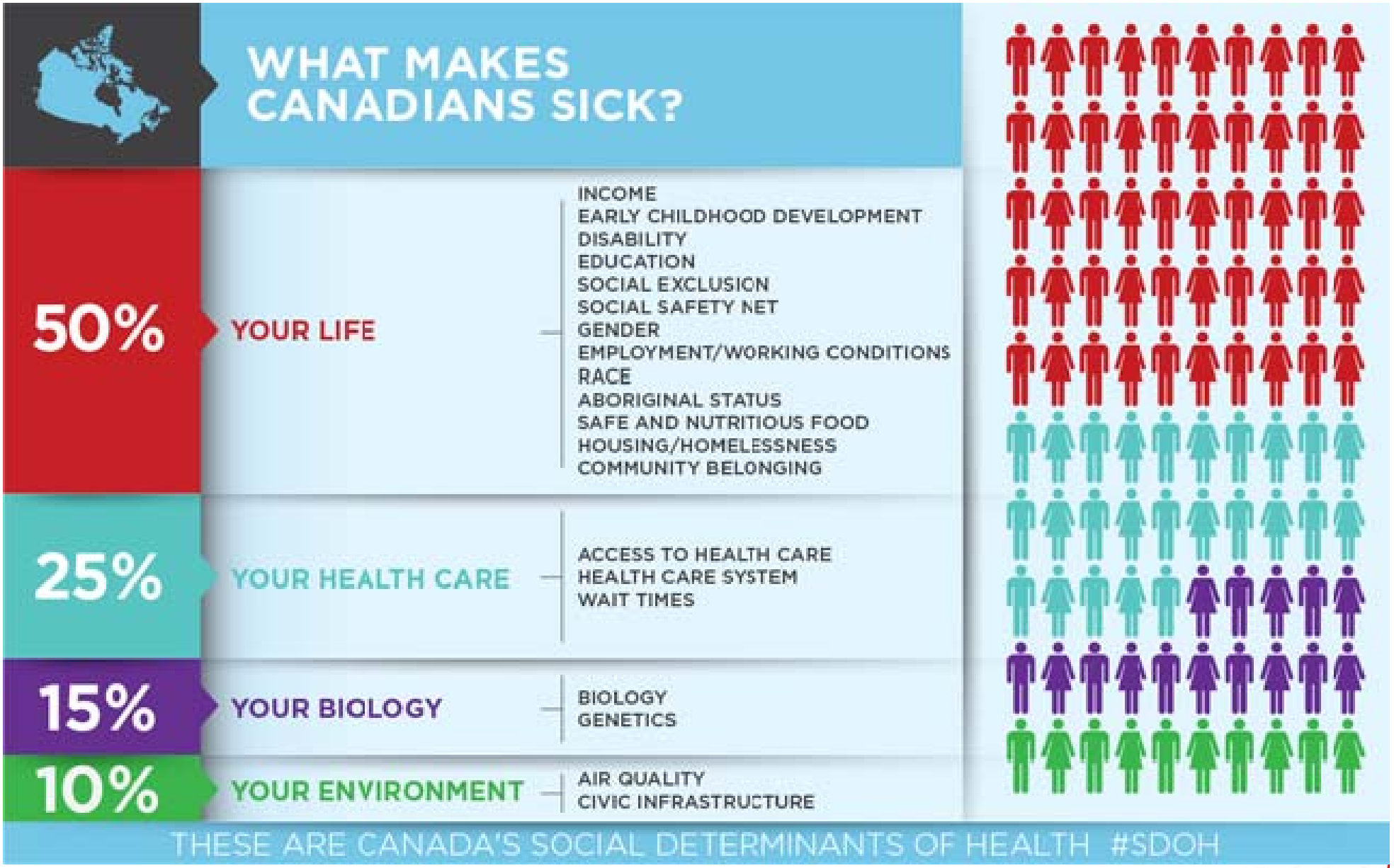
Open access Research

BMJ Open

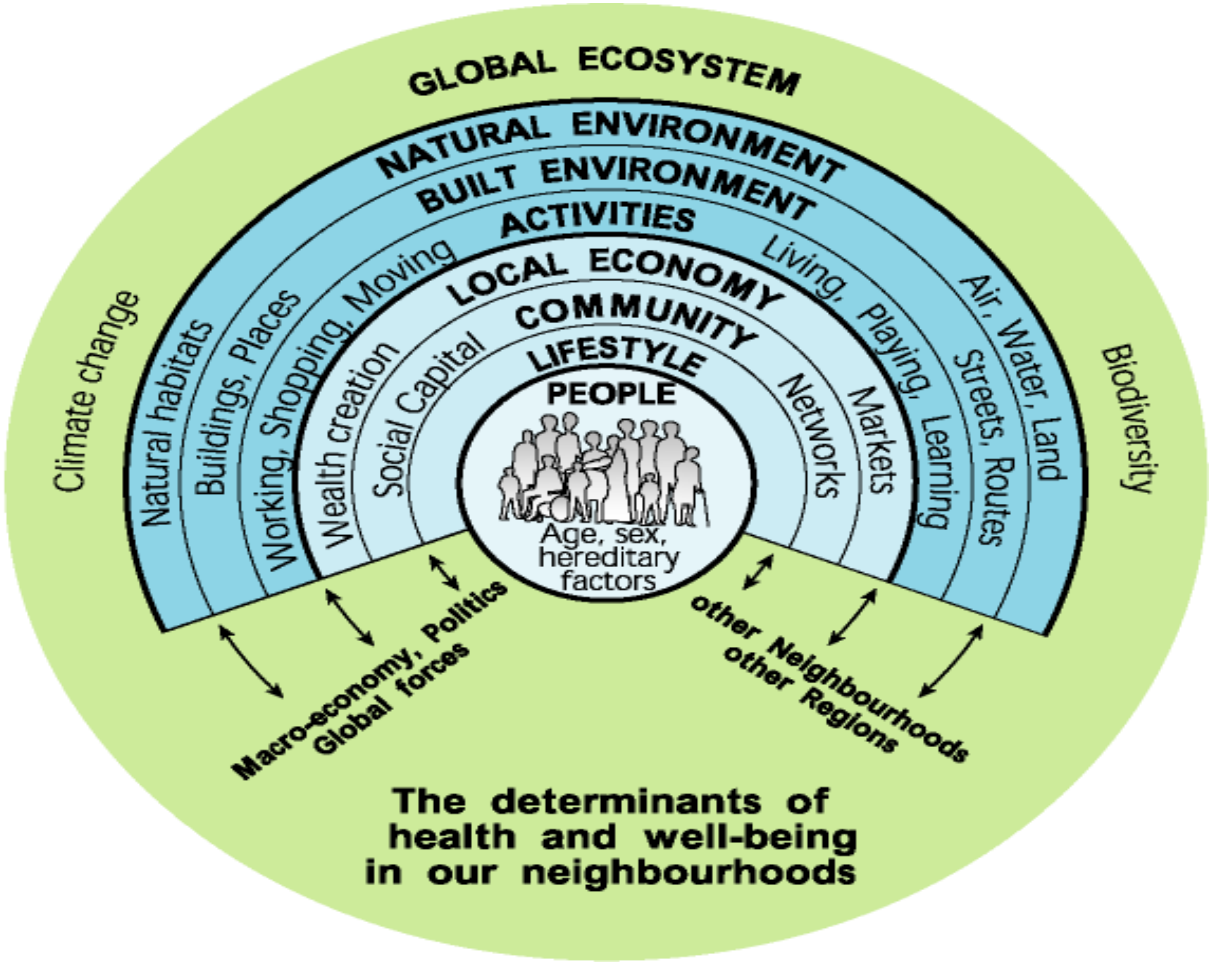
Sleep duration and multimorbidity in Luxembourg: results from the European Health Examination Survey in Luxembourg, 2013–2015

Maria Ruiz-Castell,[1] Tatjana T Makovski,[1,2] Valéry Bocquet,[3] Saverio Stranges[4,5]

BMJ Open. 2019;9(8):e026942


WHAT MAKES CANADIANS SICK?
50%
YOUR LIFE
INCOME
EARLY CHILDHOOD DEVELOPMENT
DISABILITY
EDUCATION
SOCIAL EXCLUSION
SOCIAL SAFETY NET
GENDER
EMPLOYMENT/WORKING CONDITIONS
RACE
ABORIGINAL STATUS
SAFE AND NUTRITIOUS FOOD
HOUSING/HOMELESSNESS
COMMUNITY BELONGING
25%
YOUR HEALTH CARE
ACCESS TO HEALTH CARE
HEALTH CARE SYSTEM
WAIT TIMES
15%
YOUR BIOLOGY
BIOLOGY
GENETICS
10%
YOUR ENVIRONMENT
AIR QUALITY
CIVIC INFRASTRUCTURE
THESE ARE CANADA'S SOCIAL DETERMINANTS OF HEALTH #SDOH

Environment, health & wellbeing

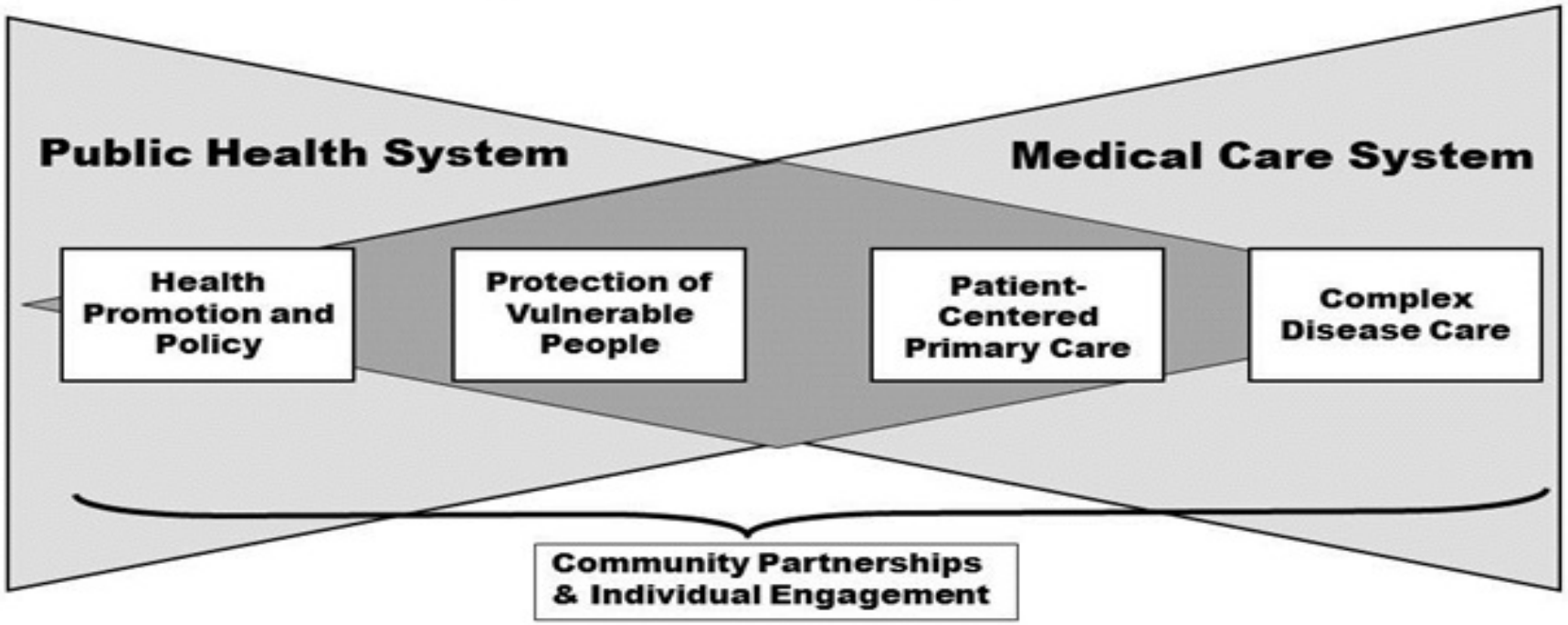


Barton H, Grant M. 2006

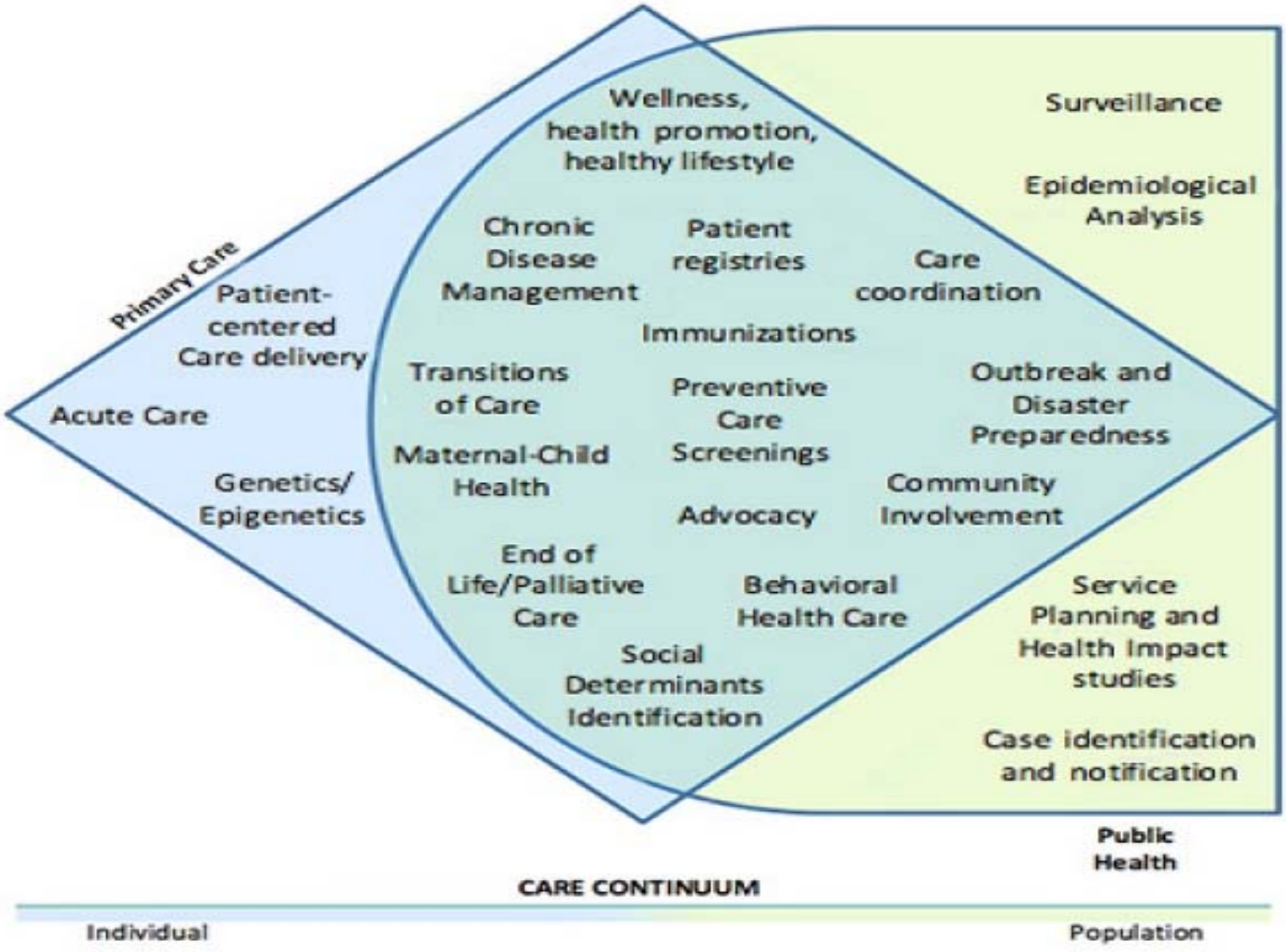
INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

FIGURE: Degrees of Primary Care and Public Health Integration

Big "I" Integration



*Adapted from Centers for Disease Control and Prevention, "A Health System: Health Protection for Life!", 2007.



American Academy of Family Physicians (AAFP), 2015

Annals of Internal Medicine

POSITION PAPER

Addressing Social Determinants to Improve Patient Care and Promote Health Equity: An American College of Physicians Position Paper

Hilary Daniel, BS; Sue S. Bornstein, MD; and Gregory C. Kane, MD; for the Health and Public Policy Committee of the American College of Physicians*

Social determinants of health are nonmedical factors that can affect a person's overall health and health outcomes. Where a person is born and the social conditions they are born into can affect their risk factors for premature death and their life expectancy. In this position paper, the American College of Physicians acknowledges the role of social determinants in health, examines the complexities associated with them, and offers recommendations on better integration of social determinants into the health care system while highlighting the need to address systemic issues hindering health equity.

Ann Intern Med. 2018;168:577-578. doi:10.7326/M17-2441 Annals.org

For author affiliations, see end of text.

THE MILBANK QUARTERLY

A MULTIDISCIPLINARY JOURNAL OF POPULATION HEALTH AND HEALTH POLICY

Opinion

Forty Years After Alma-Ata: At the Intersection of Primary Care and Population Health

SANDRO GALEA and MARGARET E. KRUK

Integrating Primary Care and Public Health

A Strategic Priority

Sarah Linde-Feucht, MD, Natasha Coulouris, MPH

Valaitis et al. BMC Health Services Research (2018) 18:420
https://doi.org/10.1186/s12913-018-3194-7

BMC Health Services Research

RESEARCH ARTICLE Open Access

Organizational factors influencing successful primary care and public health collaboration

Ruta Valaitis[1*], Donna Meagher-Stewart[2], Ruth Martin-Misener[2], Sabrina T. Wong[3], Marjorie MacDonald[4], Linda O'Mara[1] and The Strengthening Primary Health Care through Primary Care and Public Health Collaboration Team

Primary Health Care Research & Development 2018; **19**: 378–391
doi:10.1017/S1463423617000895

RESEARCH

Strengthening primary health care through primary care and public health collaboration: the influence of intrapersonal and interpersonal factors

Ruta K. Valaitis[1], Linda O'Mara[2], Sabrina T. Wong[3], Marjorie MacDonald[4], Nancy Murray[5], Ruth Martin-Misener[6] and Donna Meagher-Stewart[7]

[1]Associate Professor and Dorothy C. Hall Chair in Primary Health Care Nursing, School of Nursing, Faculty of Health Sciences, McMaster University, Hamilton ON, Canada
[2]Associate Professor, School of Nursing, McMaster University, Hamilton, ON, Canada
[3]Professor, School of Nursing, University of British Columbia, Vancouver, BC, Canada
[4]Professor, School of Nursing, University of Victoria, Victoria, BC, Canada
[5]Research Coordinator, School of Nursing, McMaster University, Hamilton, ON, Canada
[6]Professor, School of Nursing, Dalhousie University, Halifax, NS, Canada
[7]Associate Professor, School of Nursing, Dalhousie University, Halifax, NS, Canada

International Journal of Public Health
https://doi.org/10.1007/s00038-019-01278-1

COMMENTARY

The integration of primary care and public health to improve population health: tackling the complex issue of multimorbidity

Kathryn Nicholson[1] · Tatjana T. Makovski[2,3,4] · Saverio Stranges[1,2,5]

EDITORIALS

Immorality of inaction on inequality

Our collective failure to reverse inequality is at the heart of a global malaise

Kate E Pickett *professor of epidemiology*, Richard G Wilkinson *honorary visiting professor*

Department of Health Sciences, University of York, York, UK; Correspondence to: K E Pickett kate.pickett@york.ac.uk

Lessons learned

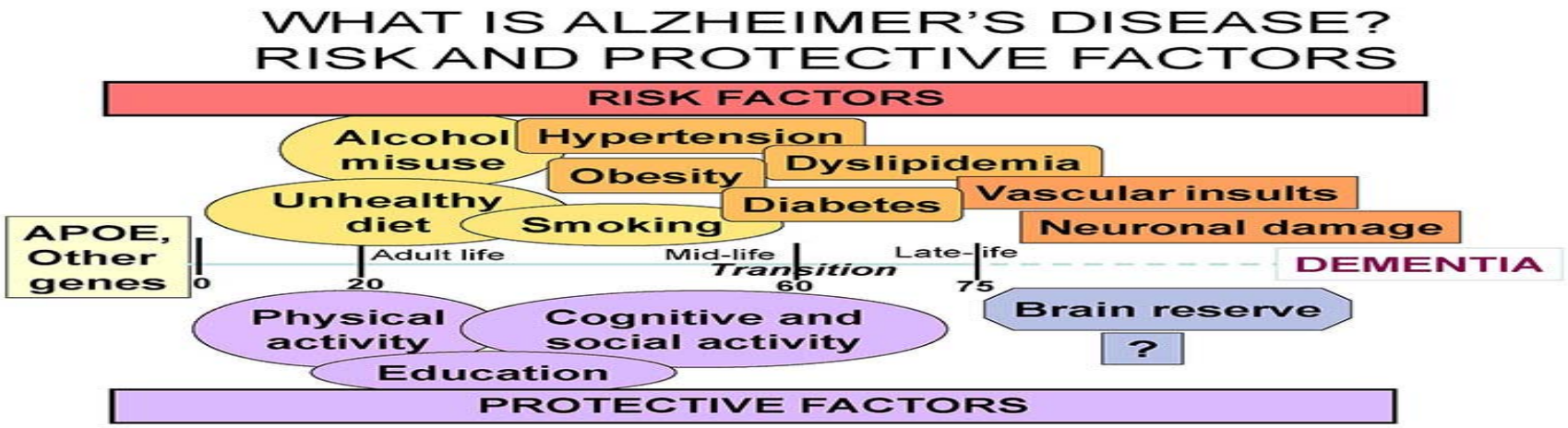
- ✓ Dietary patterns & other behaviors play a major role in CVD prevention
- ✓ Current evidence does not support the use of nutritional supplements
- ✓ Poor sleep may represent an emerging risk factor for CVD outcomes
- ✓ CVD are an additional public health burden in LMICs
- ✓ Socioeconomic determinants play a major role in CVD outcomes
- ✓ Geographic variation analyses are important for public health policy
- ✓ Have we seen the end of long term decline in CVD mortality?

CVD Prevention: the way forward

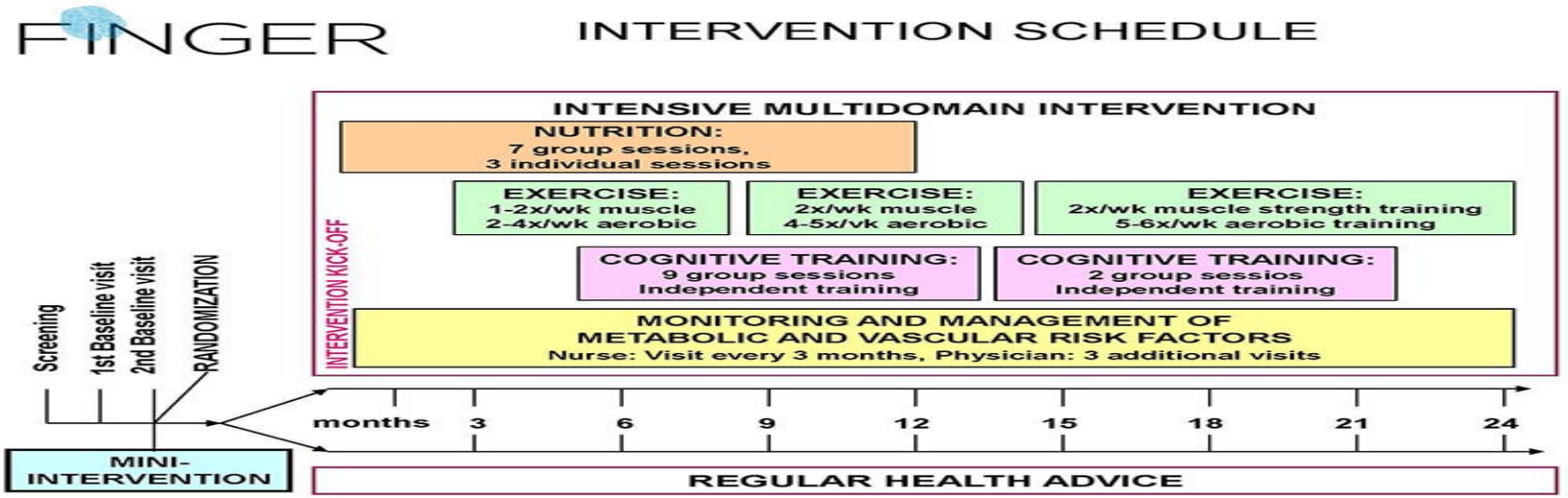
- ✓ Translate research findings in “real-world” settings
- ✓ From “what works” to “how can we make this happen…”
- ✓ Increase the proportion of people with ideal cardiovascular health
- ✓ Combining population and high-risk strategies
- ✓ Increase research focus on disadvantaged population subgroups
- ✓ Increase awareness and improve control of CVD risk factors
- ✓ Need for transdisciplinary research and “systems science” approaches

Stranges S & Guallar E. Nutr Metab Cardiovasc Dis. 2012;22:1013-8

FINGER TRIAL- Multidomain lifestyle intervention



Mangialasche, Kivipelto et al., 2012



Kivipelto et al., Alzheimer & Dementia 2013

Health Promotion International, 2019;34:877–886
doi: 10.1093/heapro/day038
Advance Access Publication Date: 8 June 2018
Debate

OXFORD

Debate

Physical activity promotion in primary care: a Utopian quest?

Alexis Lion[1,2], Anne Vuillemin[3], Jane S. Thornton[4], Daniel Theisen[1], Saverio Stranges[5,6,7], and Malcolm Ward[8,*]

Study Populations

- Western New York Health Study, USA
- Nutritional Prevention of Cancer Trial, USA
- National Health & Nutrition Examination Survey, USA
- National Population Health Survey, Canada
- Canadian Longitudinal Study on Aging, Canada
- National Diet & Nutrition Survey, UK
- Whitehall II Study, UK
- PRECISE Trial, UK
- PRECISE Trial, DK, Denmark
- EPIC Study & Olivetti Heart Study, Italy
- Demographic & Health Surveys (DHS), LMICs
- INDEPTH-WHO-SAGE, LMICs
- ORISCAV & EHES, Luxembourg

James R Marshall

Mary E Reid

Mika Kivimäki

Jane Ferrie

Alaa AlKerwi

Maria Ruiz-Castell

Richard P Donahue

Joan M Dorn

Maurizio Trevisan

Kelly Anderson

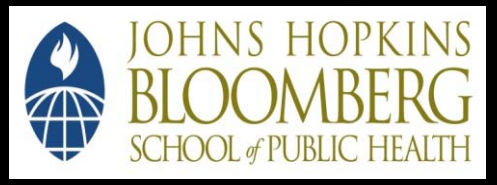
Kathryn Nicholson

N-B Kandala

Karen Rees

Ana Navas-Acien

Eliseo Guallar

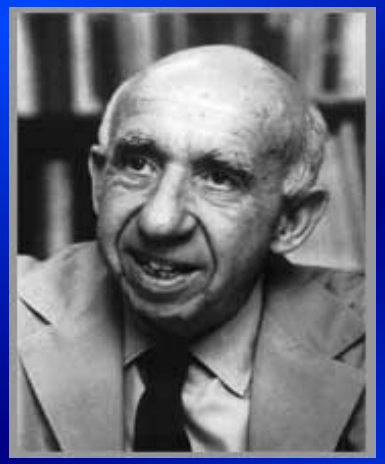


Margaret Rayman

Eduardo Farinaro

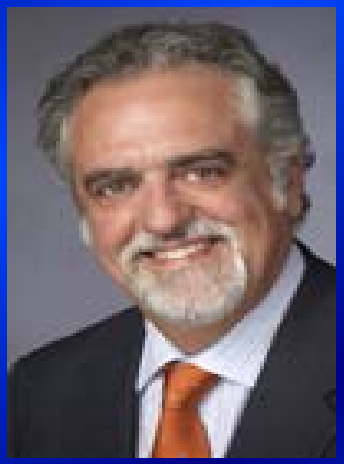
Vittorio Krogh

The Usual Suspects



J. Stamler

E. Farinaro



M. Trevisan

J. Dorn

J. Marshall

R. Donahue

E. Guallar

M. Rayman

"The primary determinants of disease are mainly economic and social, and therefore remedies must also be economic and social."

Geoffrey Rose

"*Beyond the ingredients themselves, eating the traditional Mediterranean way is a philosophy in itself: life is for savouring, and food is a glorious and beautiful expression of life…"*

"The Mediterranean Diet"
Marissa Cloutier (2004)

To Continue The Conversation . . .

International Multimorbidity Symposium

Friday, November 15th, 2019

Attendees will have an opportunity to present their completed or ongoing research and collaborate with other international multimorbidity researchers to identify and operationalize the next steps to move international multimorbidity research forward!

For More Information kathryn.nicholson@schulich.uwo.ca

Jointly Organized and Hosted By: Department of Epidemiology & Biostatistics and Department of Family Medicine, Schulich School of Medicine & Dentistry, Western University.

Funded by the CIHR

Venue: Western Centre for Public Health and Family Medicine, Western University, London, Ontario, Canada