



EGEA VIII Conference 2018

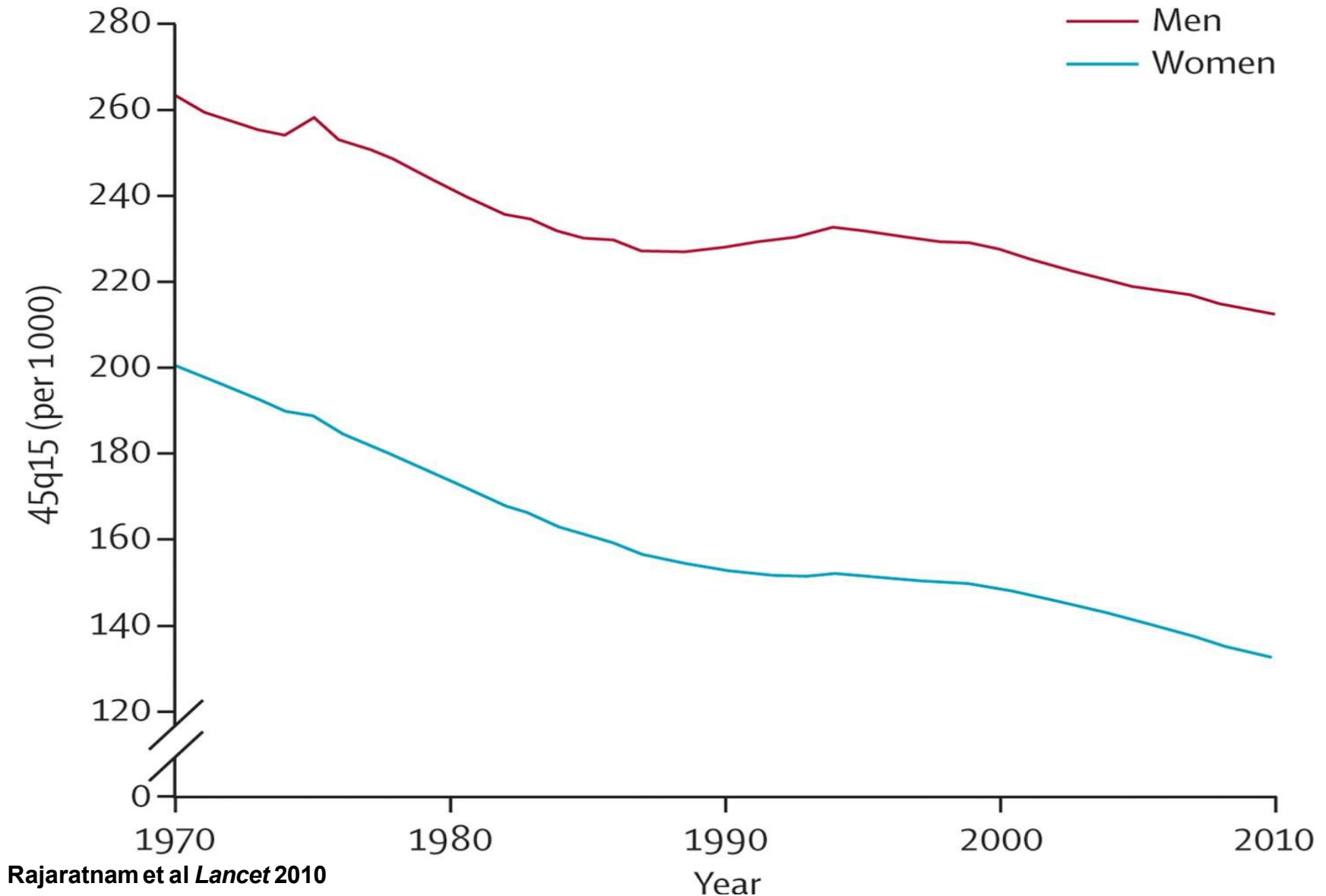
Nutrition & health: from science to practice

Introduction:

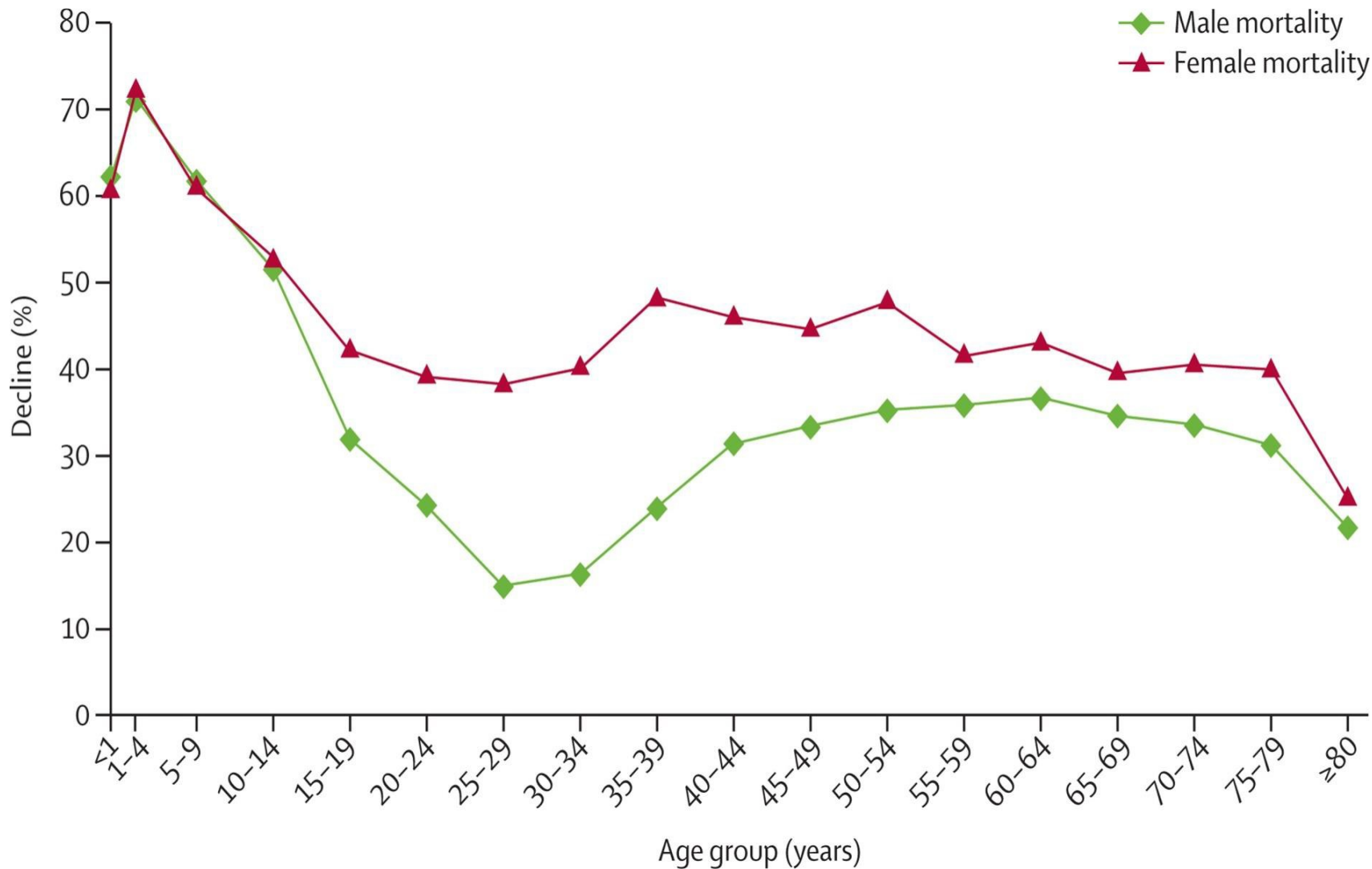
The role of F&V in disease prevention

Elio Riboli, MD, MPH, ScM, HonFPH-RCP, FMedSci
Professor in Cancer Epidemiology and Prevention
Imperial School of Public Health

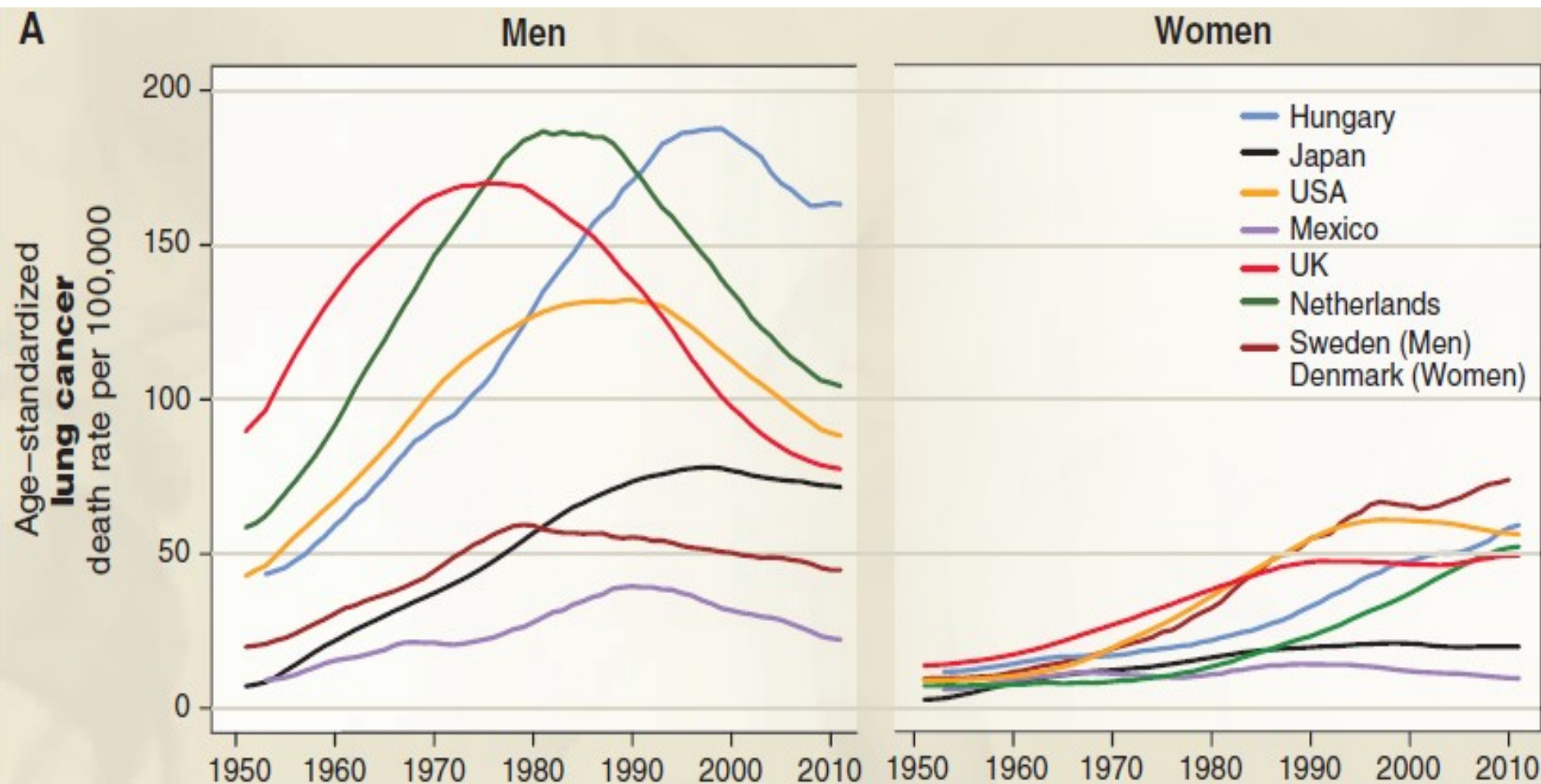
Trends in adult (15-59 years old) mortality worldwide, 1970-2010



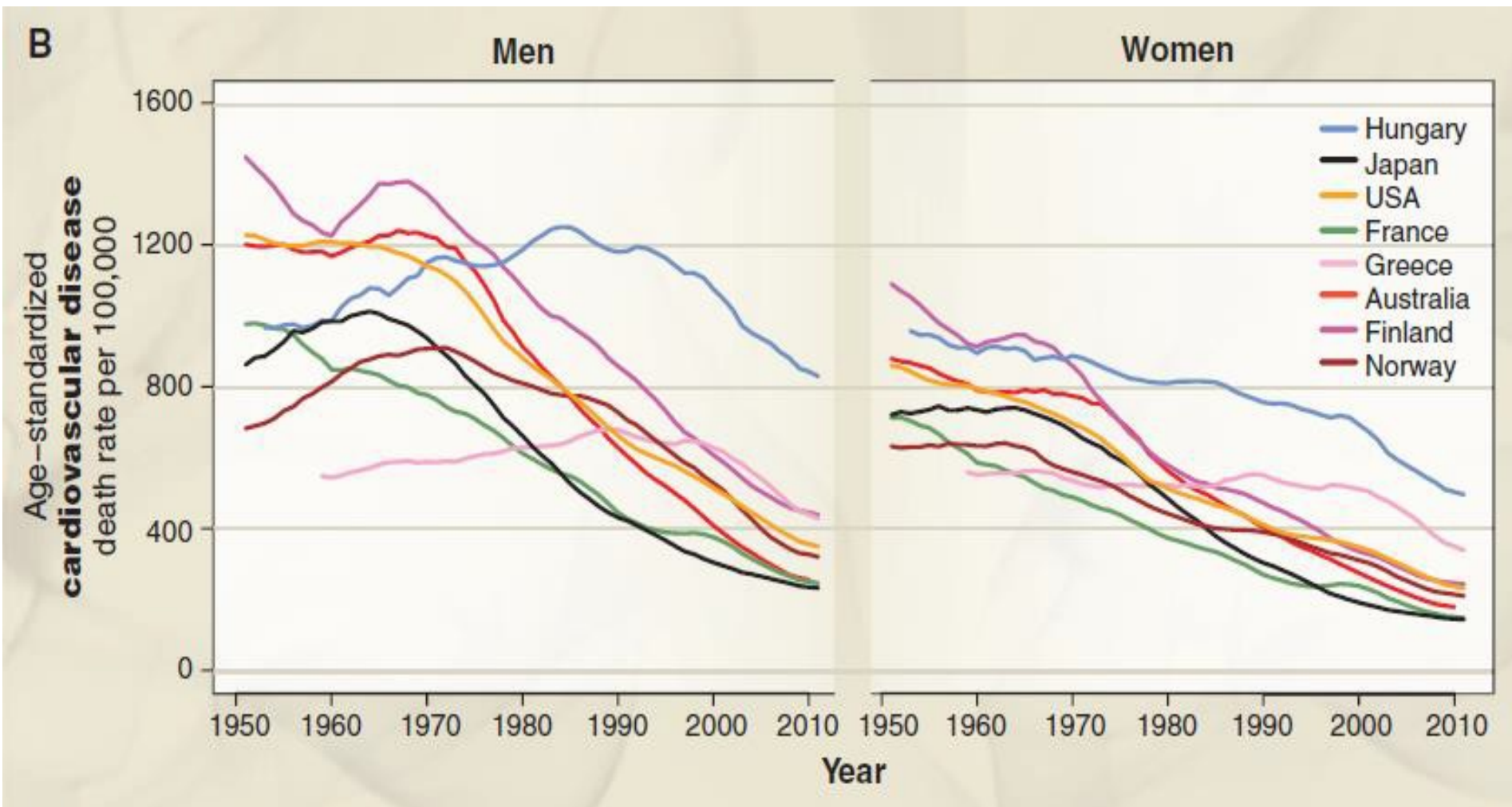
Percent decline in age-specific mortality between 1970 and 2010 in the world



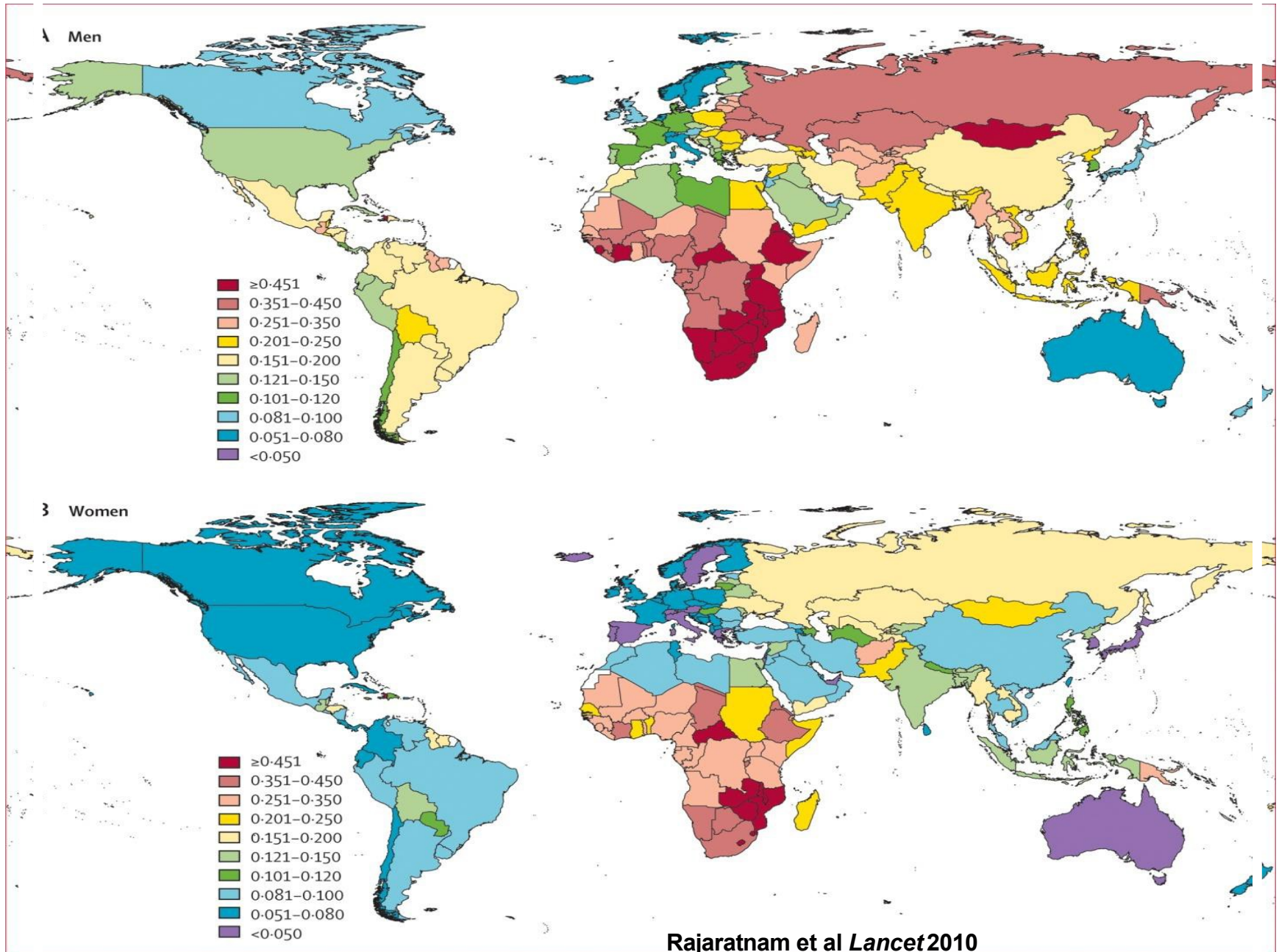
Lung Cancer Death Rate per 100,000/year, 1950-2010



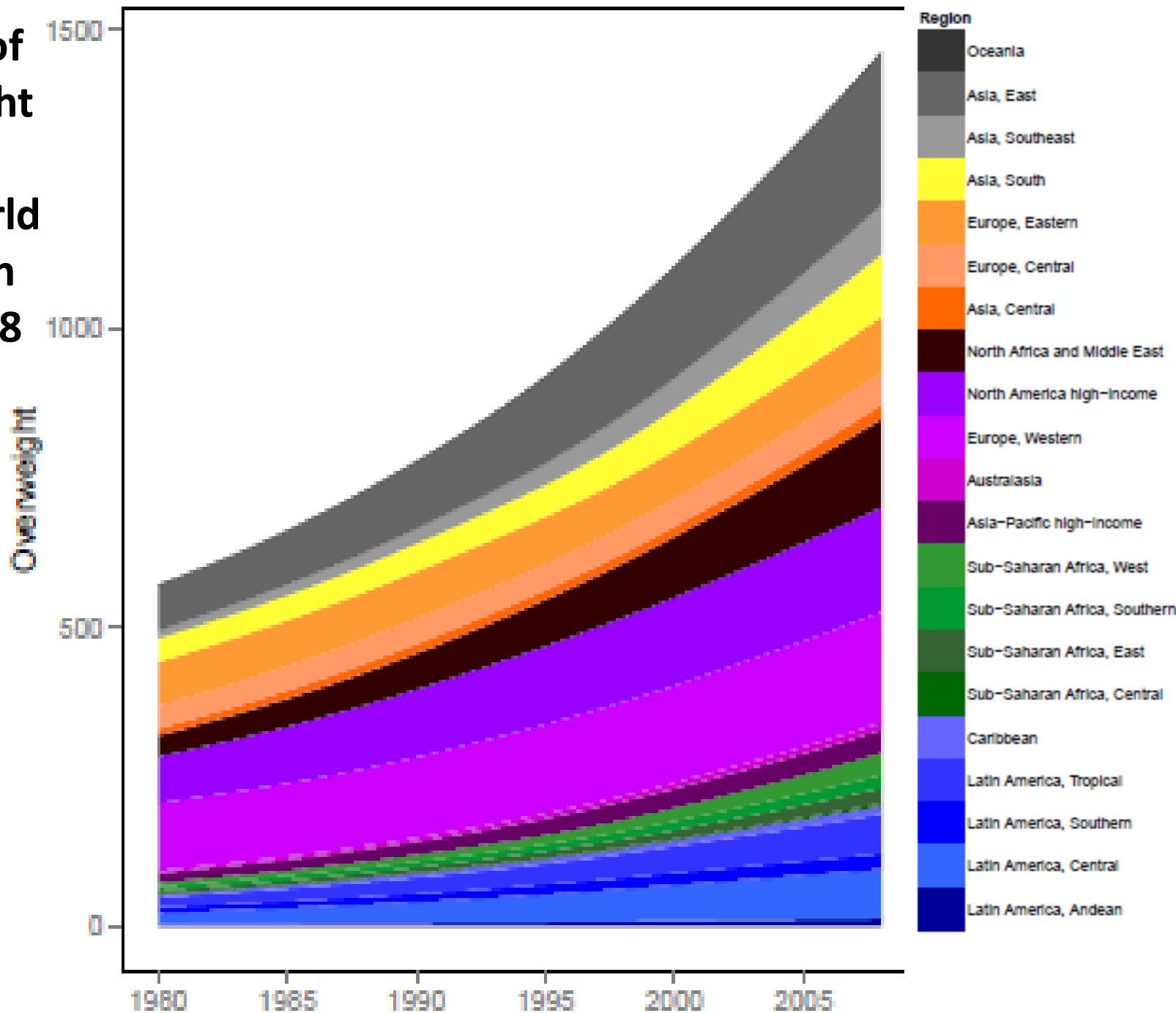
Cardiovascular Disease Death rate, 1950-2010



Adult mortality (15-59 years old) by country in 2010

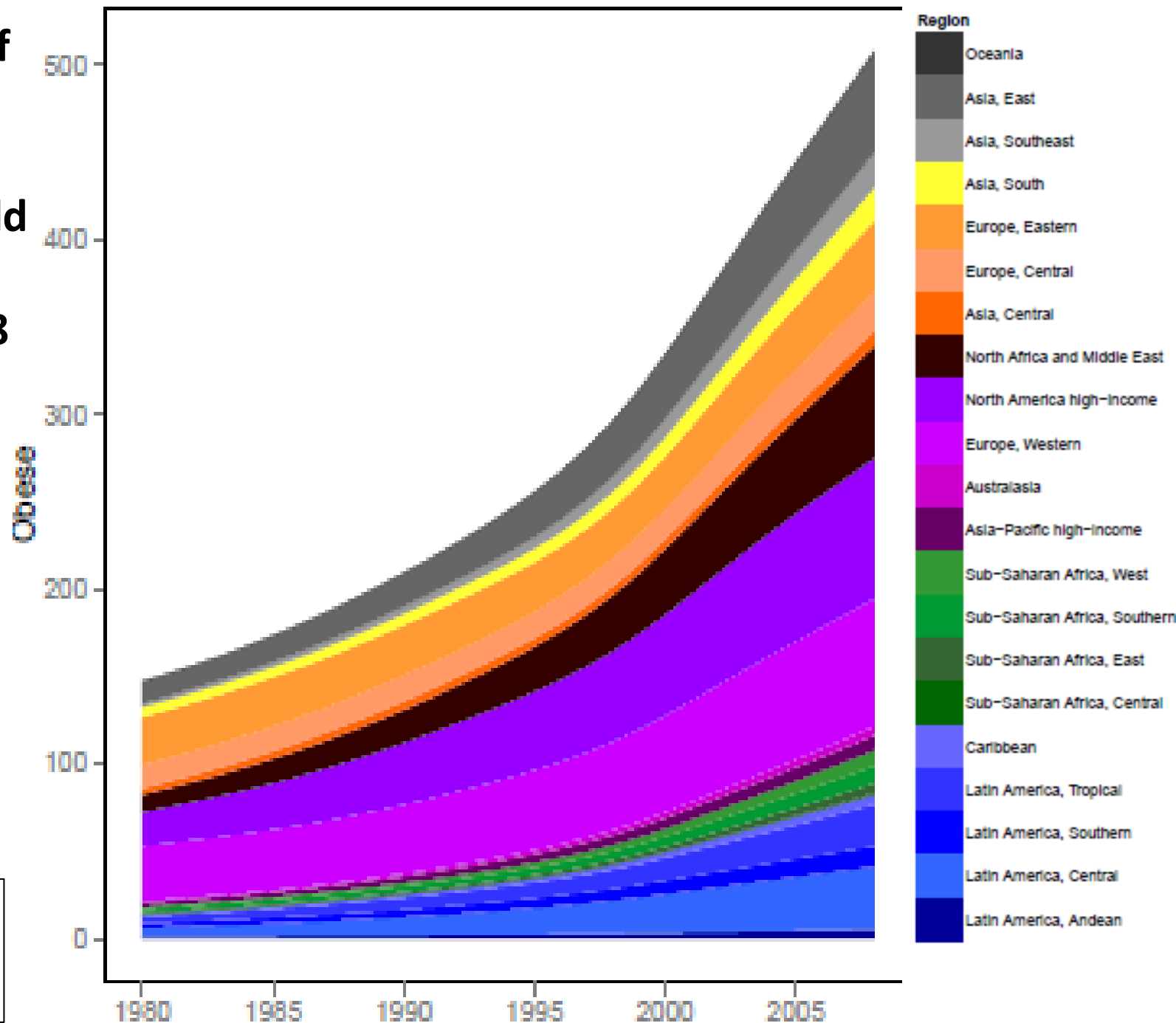


Millions of Overweight People In the World by Region 1990-2008



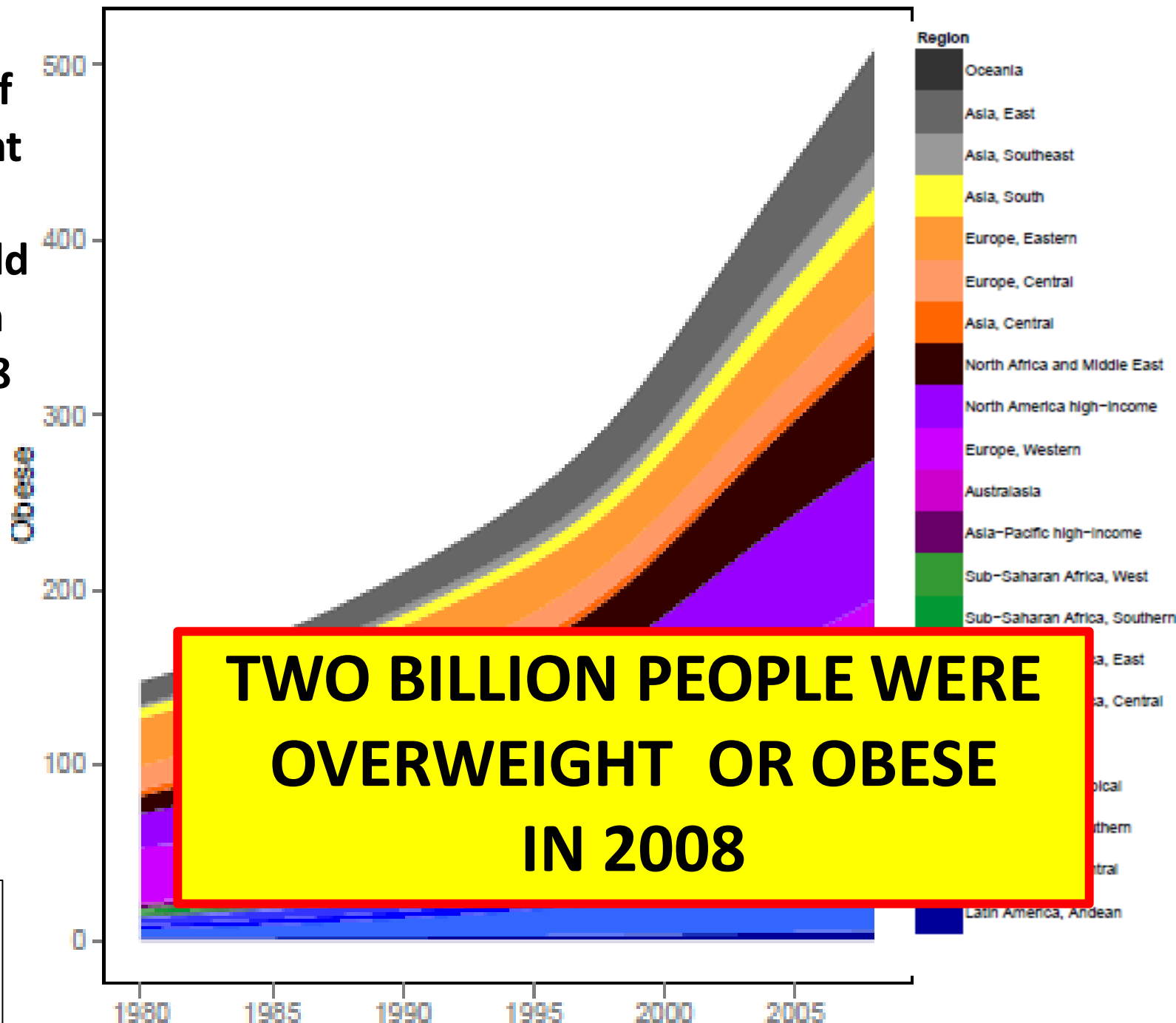
(Ezzati M,
& Riboli E
NEJM 2013)

Millions of Obese People In the World by Region 1990-2008



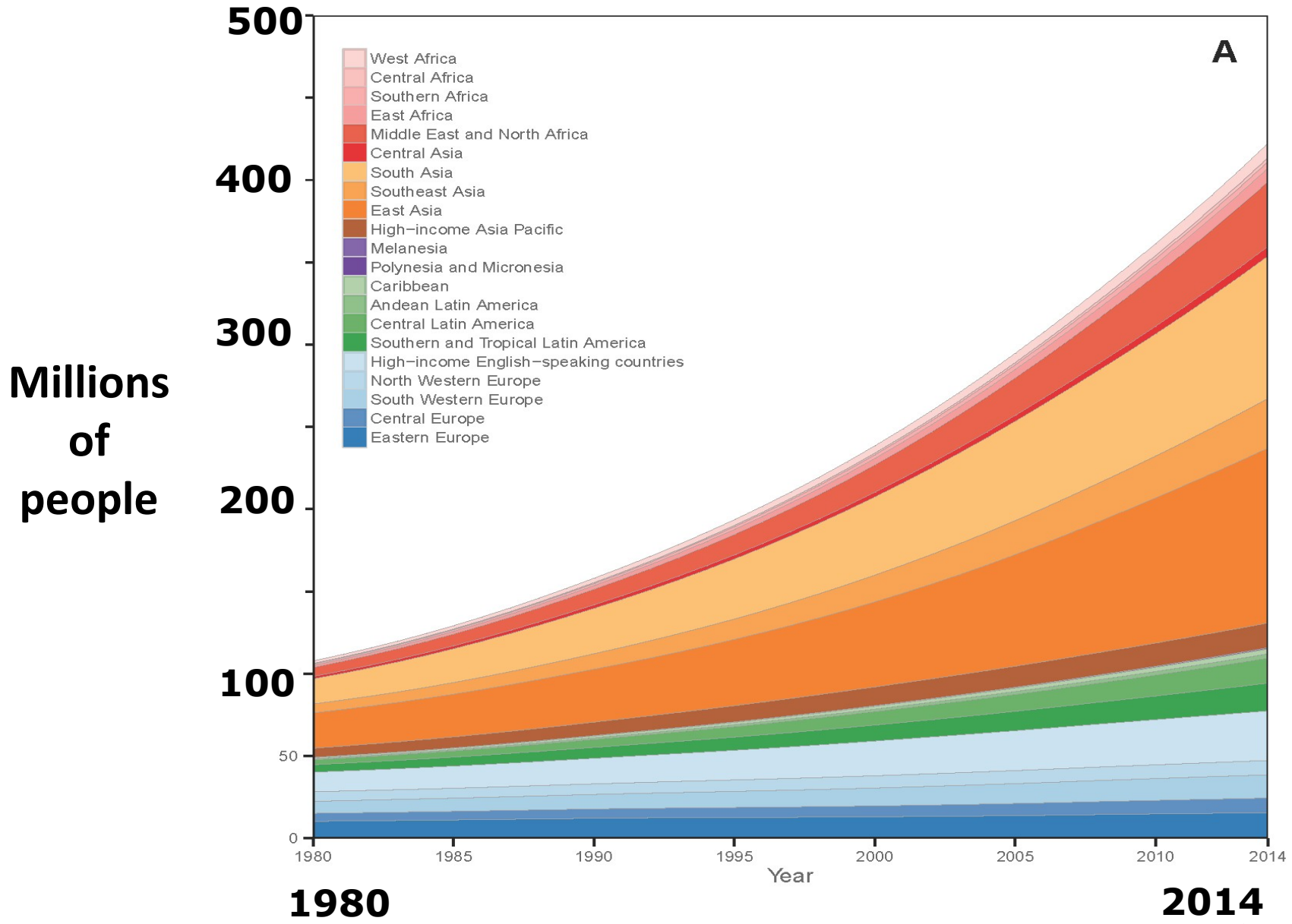
(Ezzati M,
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NEJM 2013)

Millions of Overweight People In the World by Region 1990-2008



(Ezzati M,
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NEJM 2013)

Trends in the number of people with diabetes



Global cost of obesity-related illness to hit \$1.2tn a year from 2025

Health bill will be 'enormous burden' without check worsening epidemic, say experts



2,115

Sarah Boseley Health editor

Tuesday 10 October 2017 00.01 BST



i In 2014, 34% of men and women in the US were obese; by 2025 that is predicted to be 41%. In the UK, 27% were obese in 2014, a figure set to rise to 34% by 2025. Photograph: Alamy Stock Photo

The cost of treating ill health caused by obesity around the world will top \$1.2tn every year from 2025 unless more is done to check the rapidly worsening epidemic, according to new expert estimates.

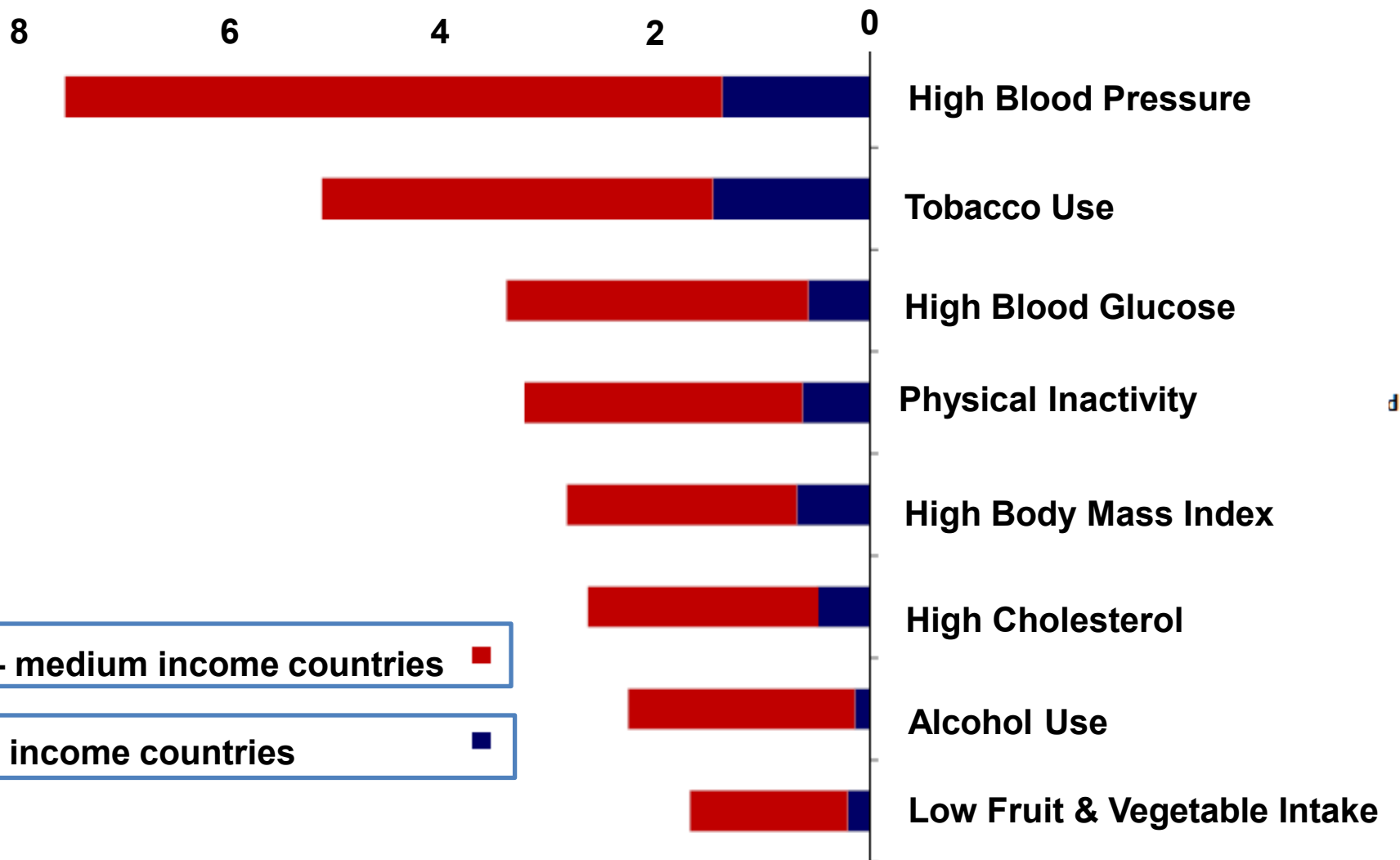
Obesity and smoking are the two main drivers behind the soaring numbers of

\$1.2tn is the equivalent of:

- 1- The total sum of the GDP of the 104 countries with the lowest GDPs in the world**
- 2- 90% of Spain annual GDP**
- 3- 40% of France annual GDP**

The “Causes of the Causes” of Chronic Disease (WHO)

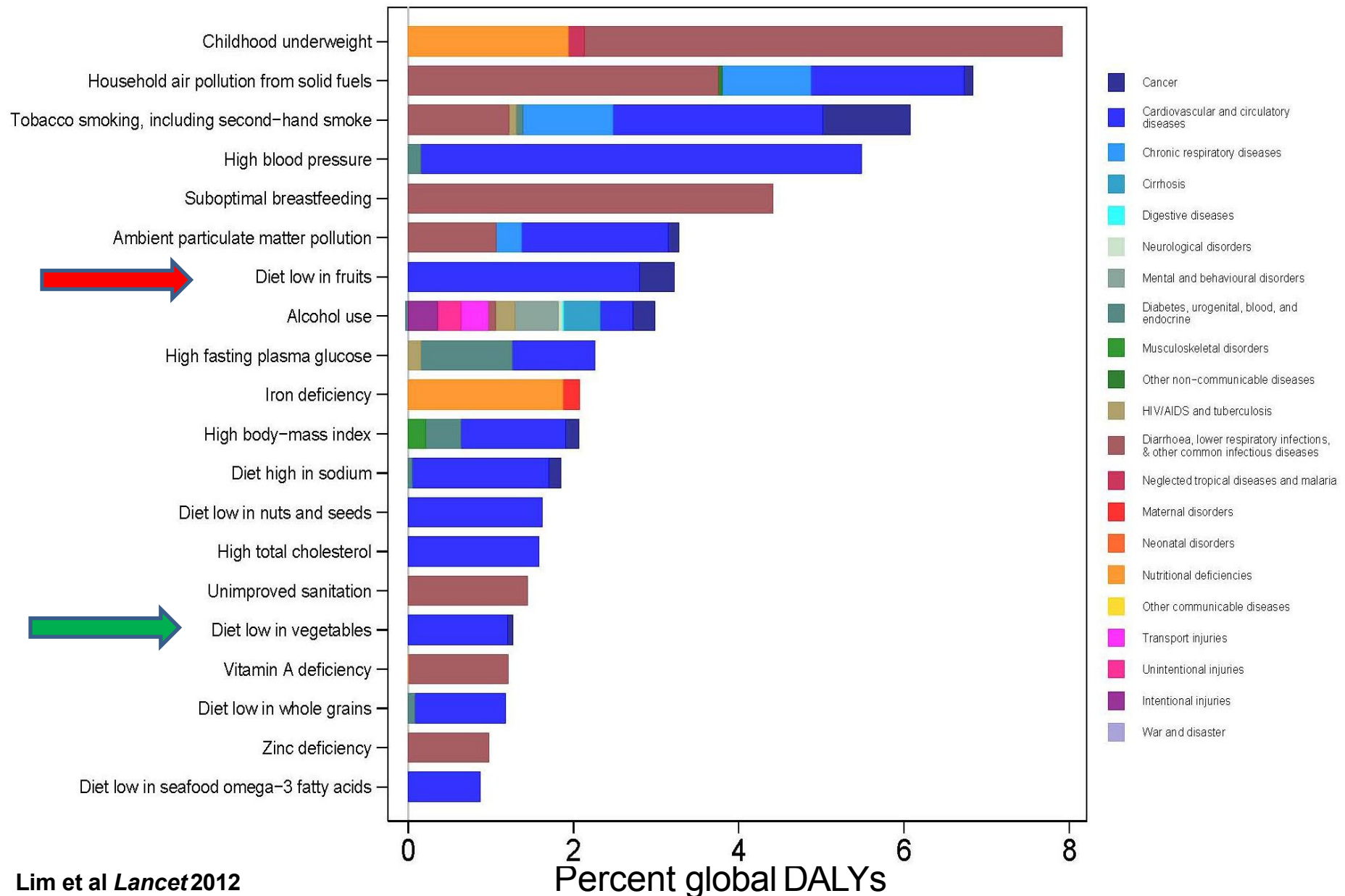
Deaths attributable to different causes out of 56 million deaths per year



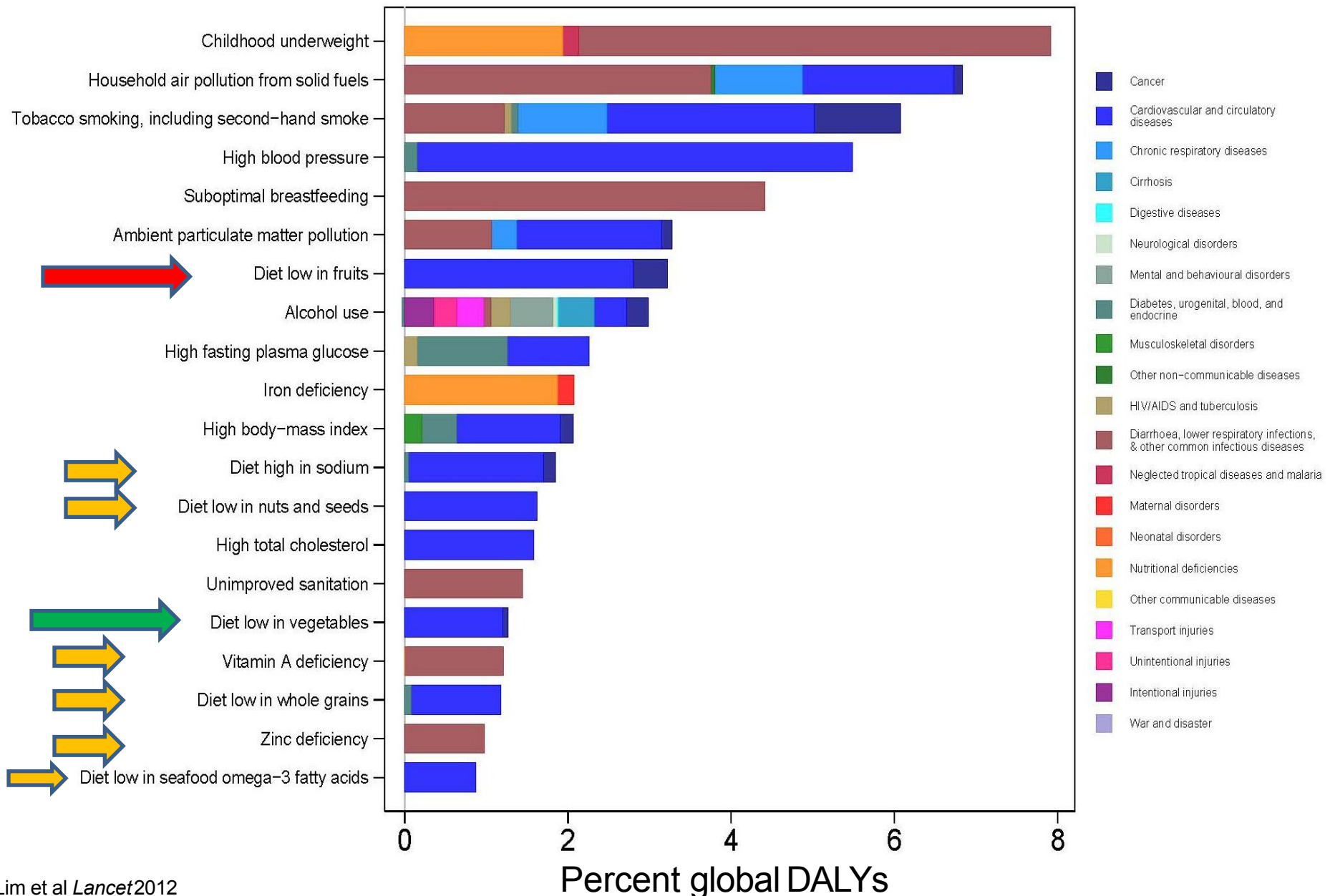
Low- medium income countries

High income countries

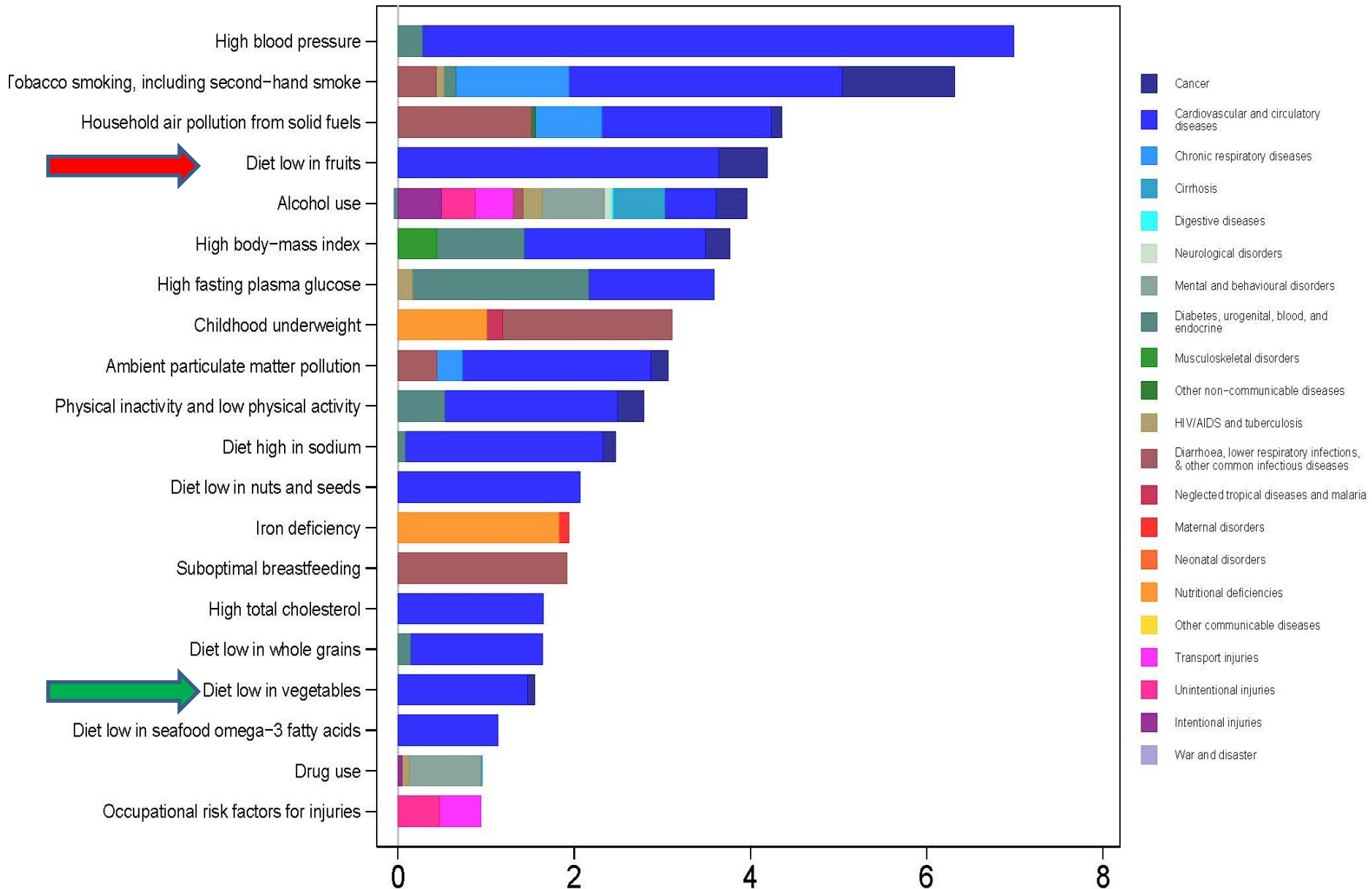
Burden of disease attributable to risk factors in the world in 1990, as percent of global DALYs



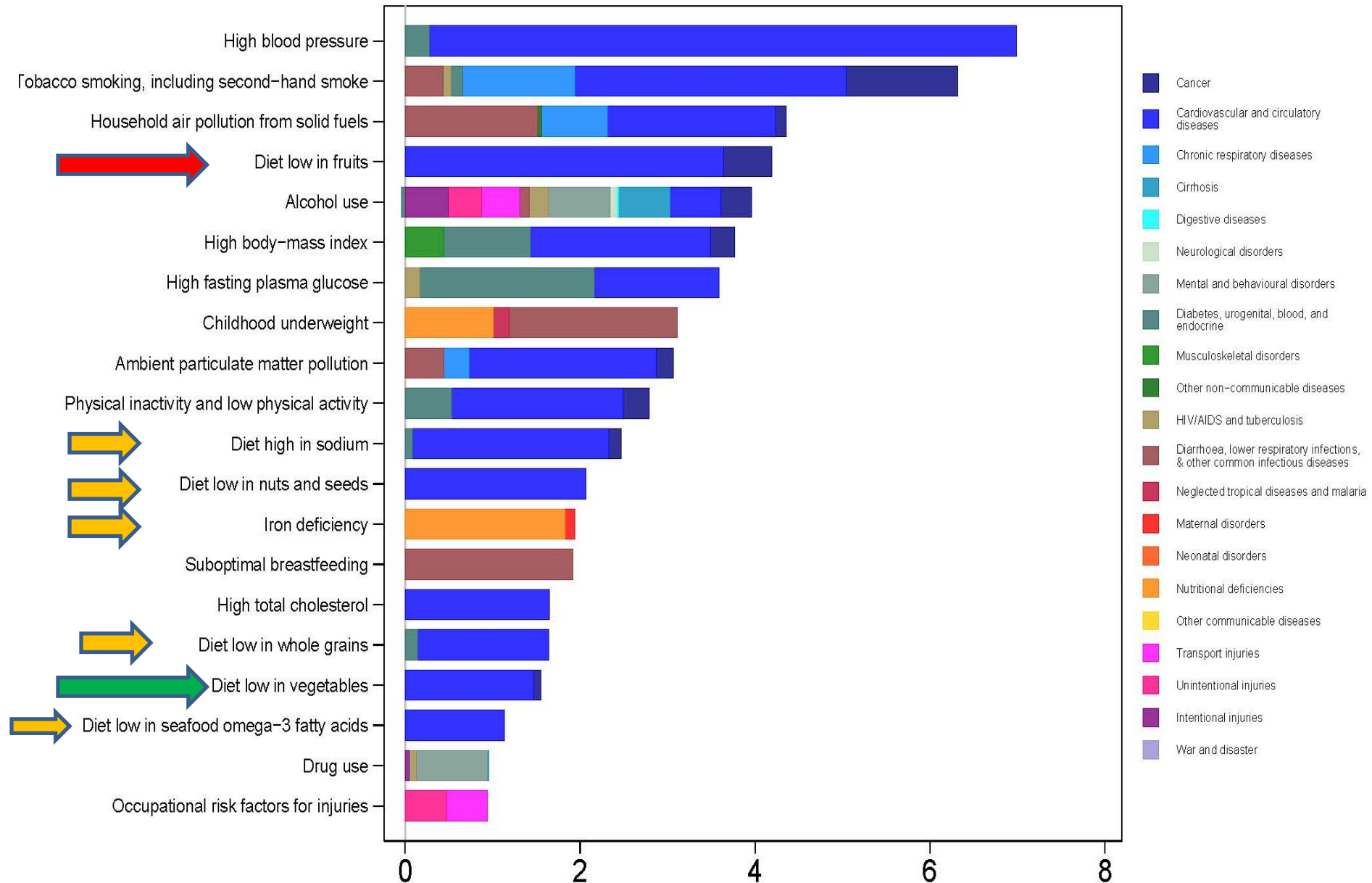
Burden of disease attributable to risk factors in the world in 1990, as percent of global DALYs



Burden of disease attributable to risk factors in the world in 2010, as percent of global DALYs



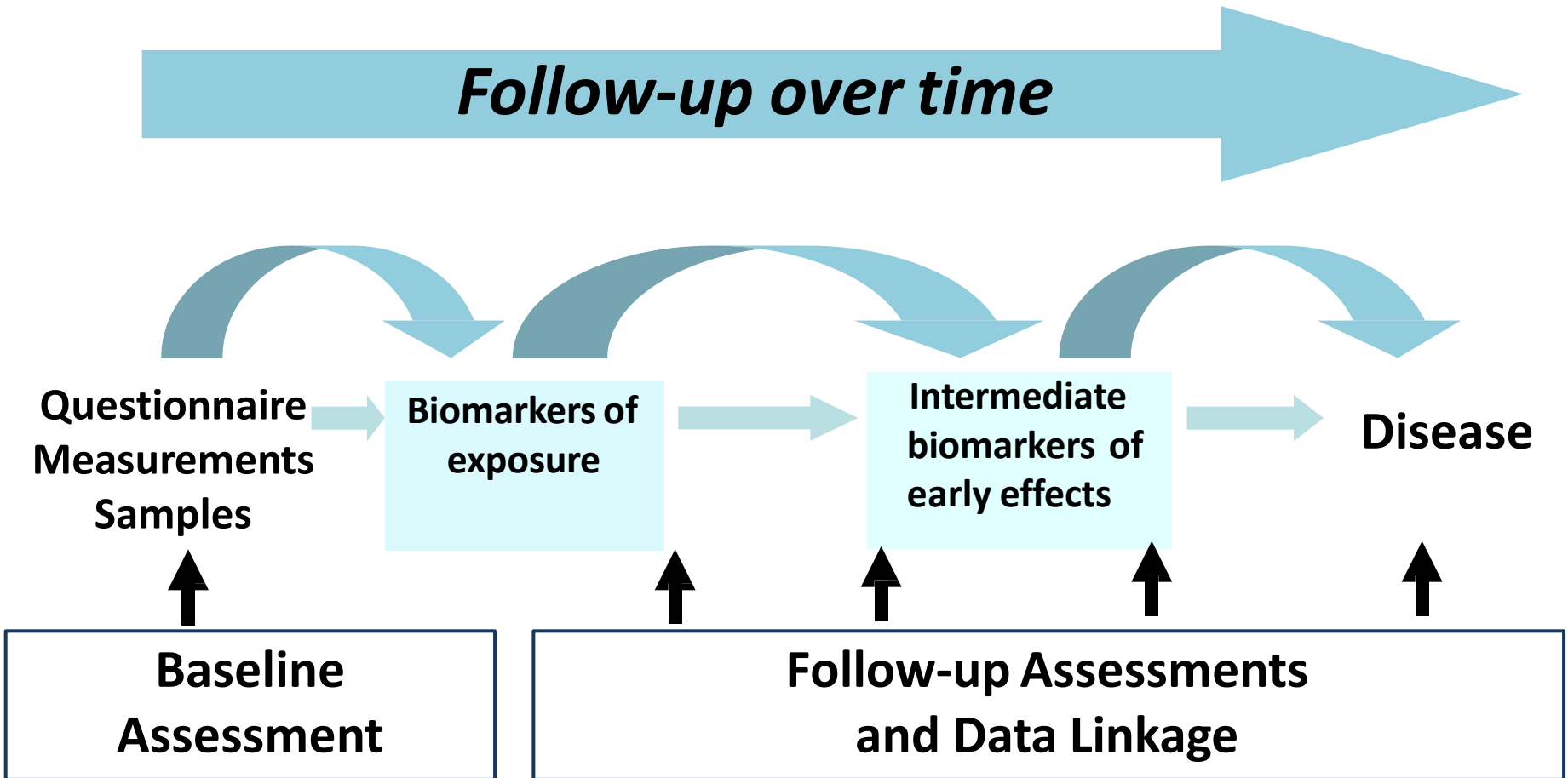
Burden of disease attributable to risk factors in the world in 2010, as percent of global DALYs



The worldwide epidemiological transition and its public health implications

- 1. Overall reduction in mortality rates across the world, except in parts of Eastern Europe and parts of sub-Saharan Africa.**
- 2. Large declines in child infectious diseases and in the burden of its key risk factors.**
- 3. More people leaving until older ages and larger share of disease burden from diet and other lifestyle factors.**
- 4. Shifting burden of smoking from high-income to low-and-middle-income countries.**
- 5. Worldwide rise in body weight and diabetes.**
- 6. Decline in high blood pressure in high-income countries and some middle-income countries; BP stable in East Asia and rising in sub-Saharan Africa and South Asia**

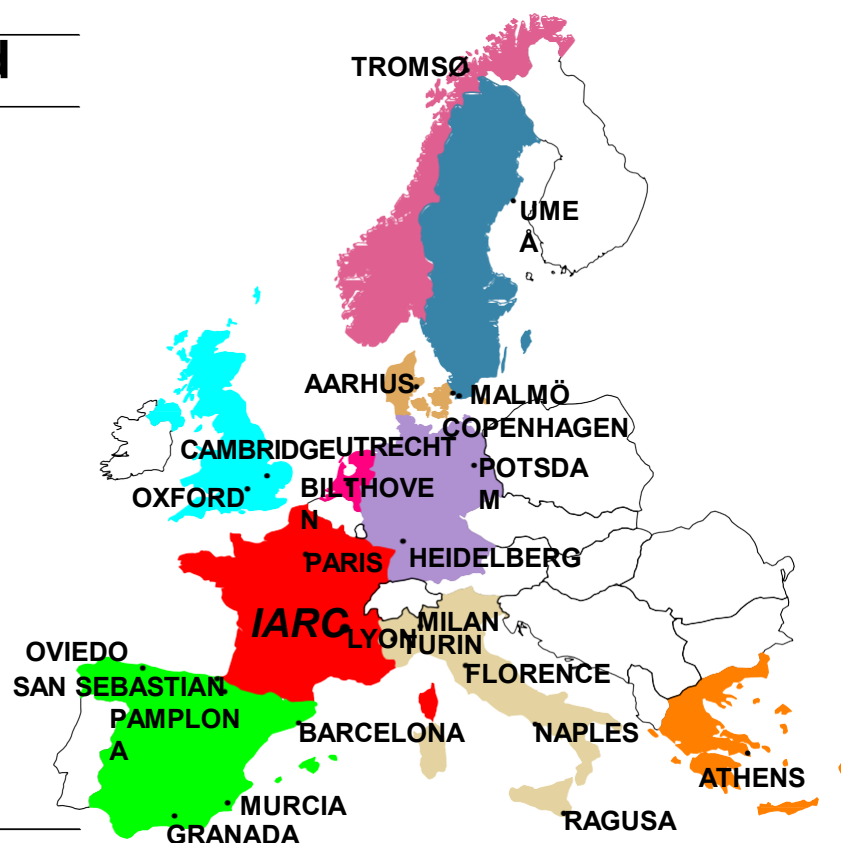
DESIGN of Prospective Cohort Study





EPIC: European Prospective Investigation on Cancer

	Participating Subjects	
	Questionnaire	Q + Blood
France	74 524	28 053
Italy	47 749	47 725
Spain	41 440	39 579
U.K.	87 942	43 141
Netherlands	40 072	36 318
Greece	28 555	28 483
Germany	53 091	50 678
Sweden	53 826	53 781
Denmark	57 054	56 131
Norway	37 215	31 000
Total	521 468	414 889



EPIC: European Prospective Investigation on Cancer and Chronic Diseases



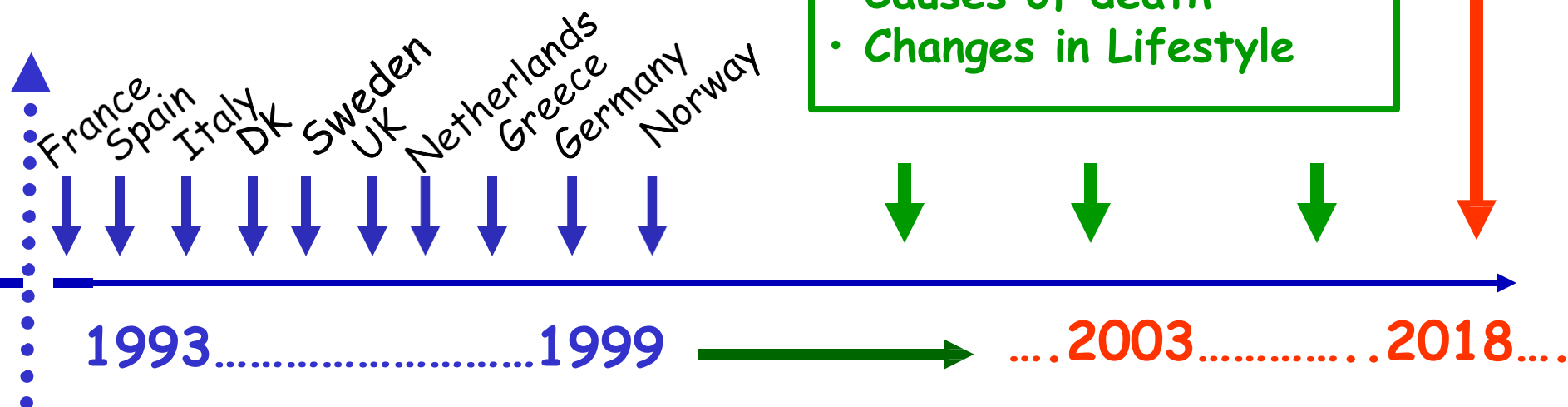
BASELINE

- Subjects recruitment
- Questionnaires data on diet, lifestyle, medical history etc.
- Anthropometry data
- Blood/DNA collection
- Data Base & Biorepository

AETIOLOGICAL STUDIES

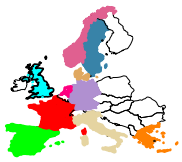
FOLLOW-UP:

- Cancer diagnosis
- Vital status
- Causes of death
- Changes in Lifestyle



Development of common/standardized Nutrient and Lifestyle Data Base
Setting up of lab facilities for sample handling / DNA extraction etc

Modifiable causes of death in middle-age EPIC

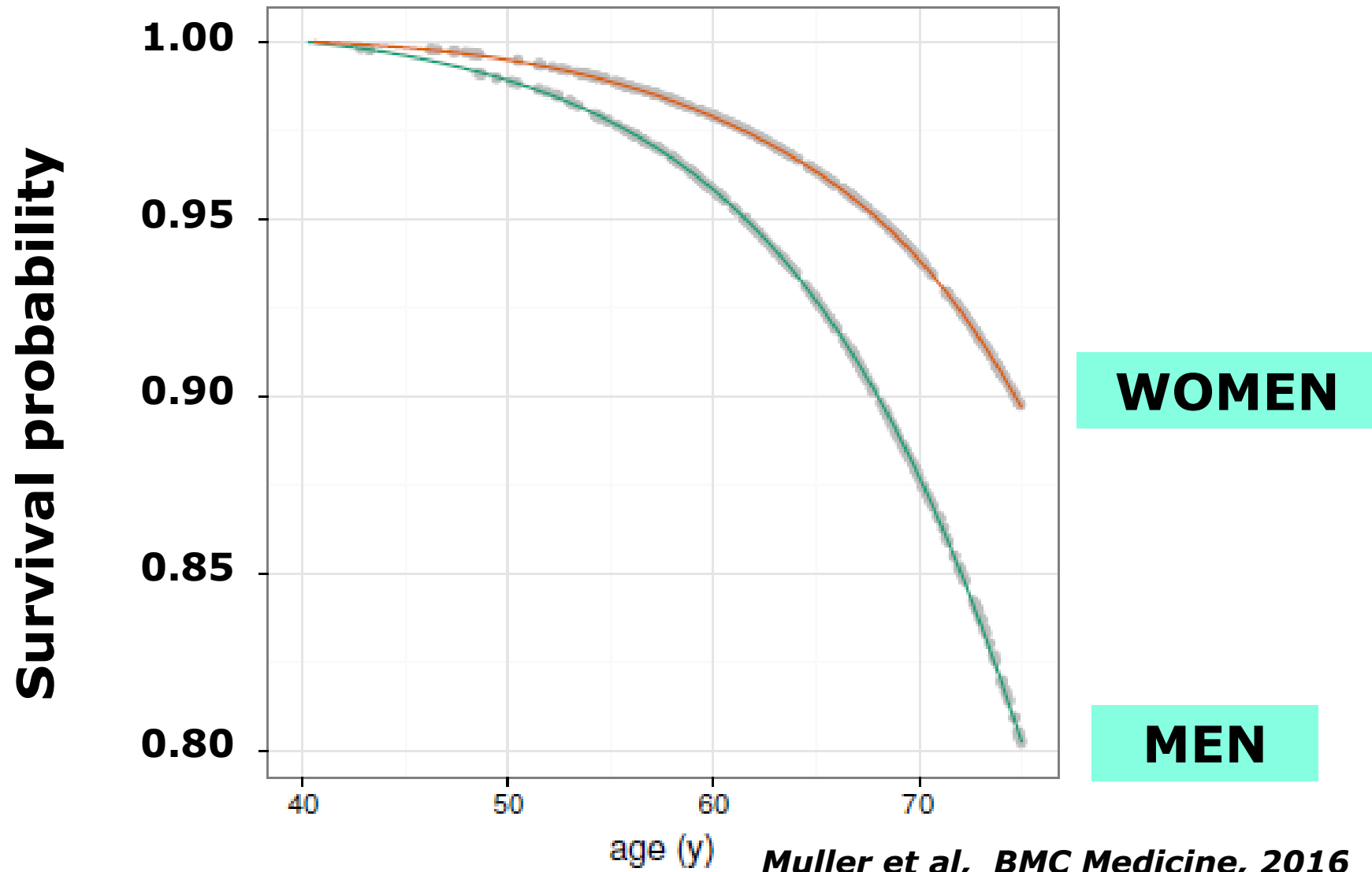
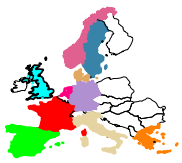


Analyses of individual data considering:

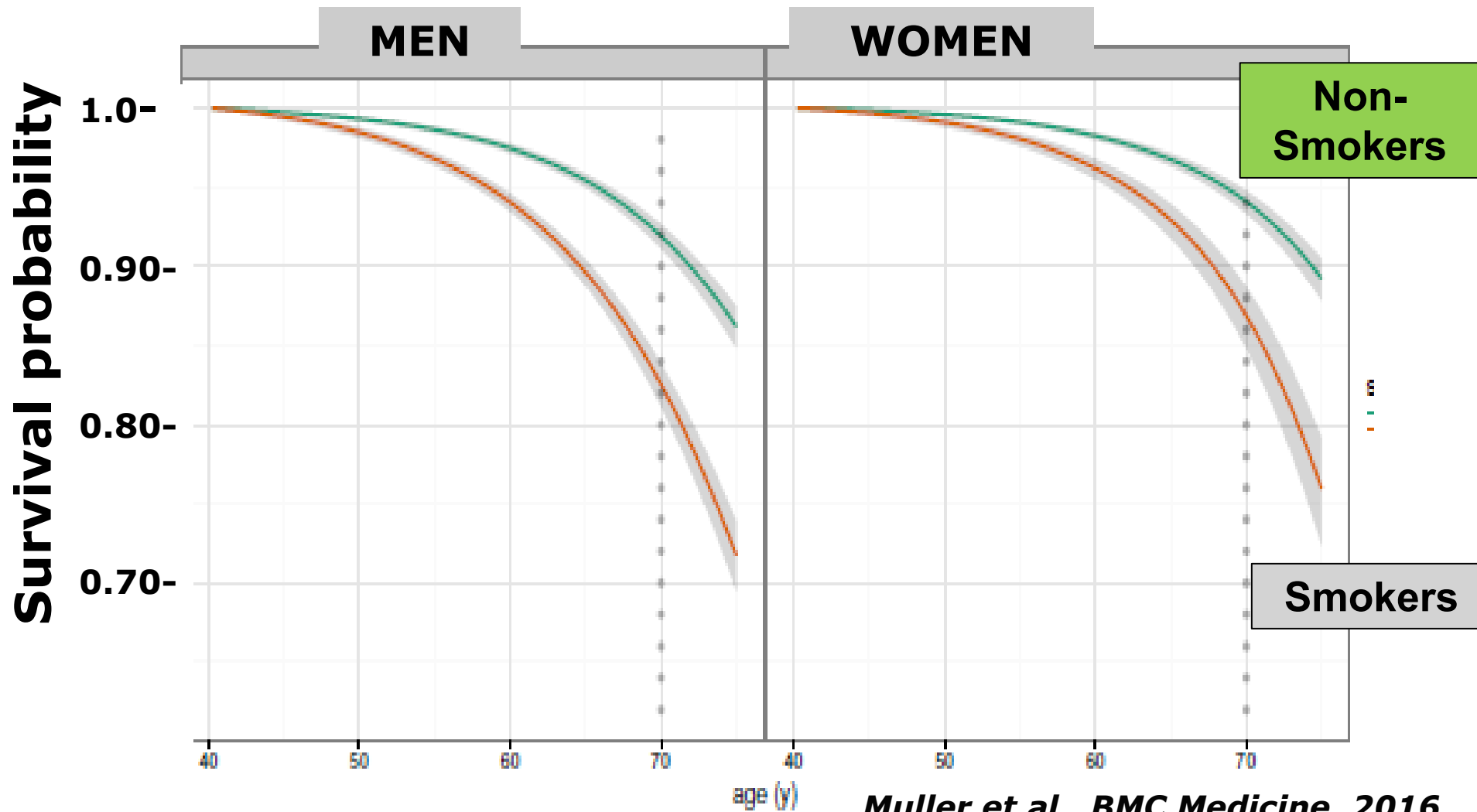
- Tobacco use (smoking status)**
- Alcohol intake (standard drinks/day)**
- BMI**
- Diet score (low intake of fruit and vegetables, low intake of fibre, high intake of red and processed meat, high intake of sugary drinks)**
- Physical activity index**
- Blood pressure**

Focus on risk of death prior to 70 years of age

Survival probability, men and women EPIC 1992-2012



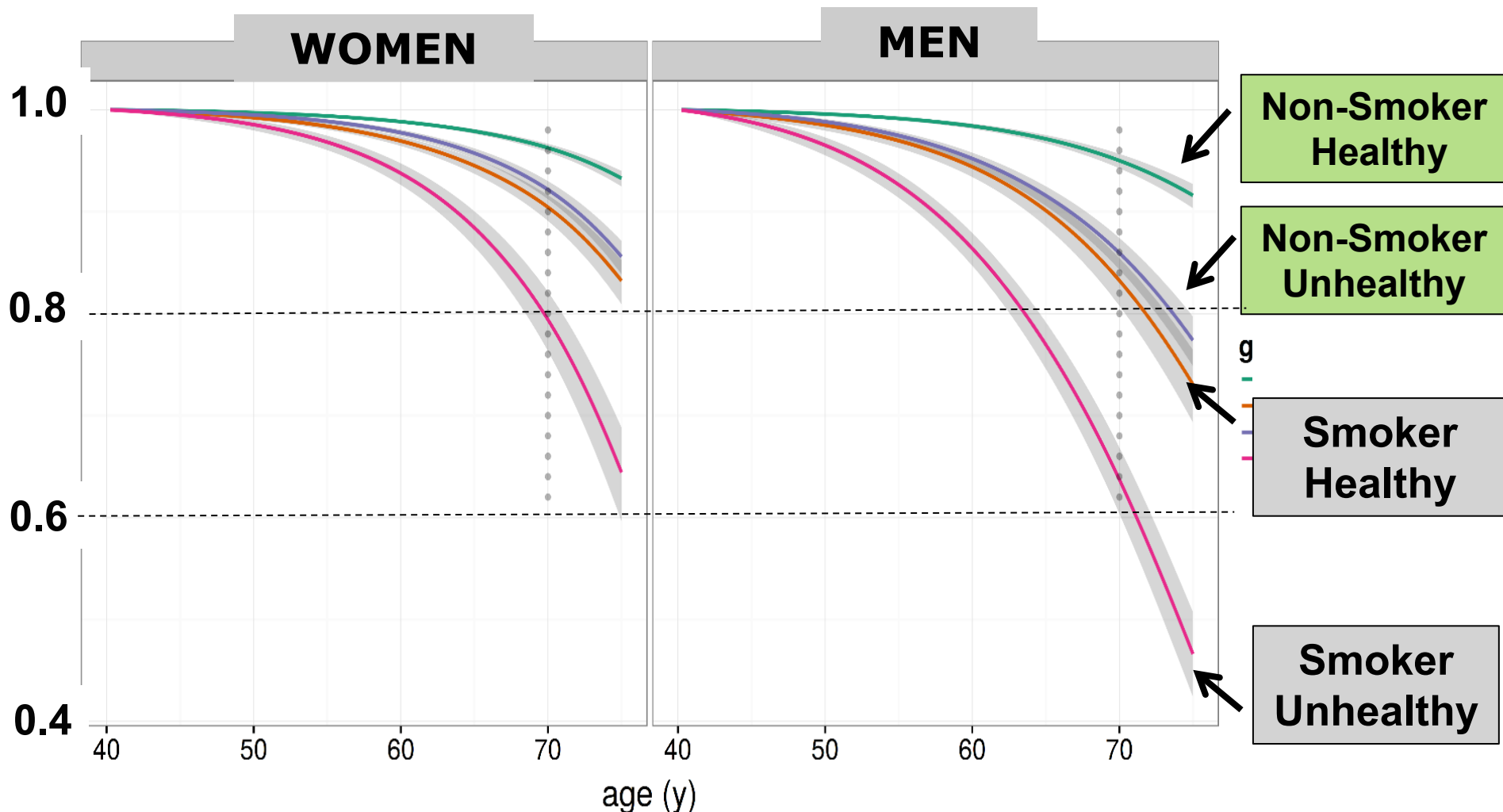
Survival probability, men and women by smoking status, EPIC 1993-2012



Survival probability, EPIC: 1993-2012

Healthy: **healthy diet**, 1-2 drinks/day, moderately active, BMI 22-25, normal BP

Unhealthy: **unhealthy diet**, 2+ drinks/day, physically inactive, BMI 30-35, hypertensive



Proportion of preventable death prior to age 70 years- EPIC

	Overall	Incremental
Smoking	0.28	0.28
Diet	0.18	0.13
High blood pressure	0.18	0.11
Physical Activity	0.05	0.02
High alcohol intake	0.04	0.02
Overweight and Obesity	0.02	0.01
Combined		0.56



Conclusions

1. **Smoking** is the most important single factor causing early death worldwide
2. **Risk of death by age 70** varies strongly by smoking status, but a **combination of other factors** also contribute to substantial variation in risk.
3. **Poor diet, low in fruit and vegetables**, account for a substantial proportion of premature deaths.

Conclusions

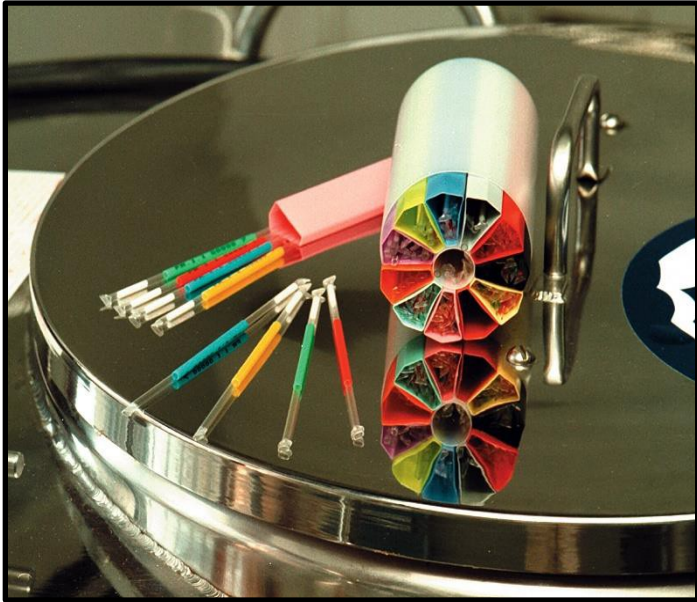
4. **The major disease risk factors are “modifiable”** to improve health. More research is needed on how to promote healthy lifestyle and healthy diet.
5. **Different risk factors require various combinations of intervention:**
 - Regulation and legislation,
 - Environmental changes
 - Cultural and behavioural changes.

Leading causes of death, 1990 and 2010

1990		2010		
Mean rank (95% UI)	Disorder	Disorder	Mean rank (95% UI)	% change (95% UI)
1.0 (1 to 2)	1 Ischaemic heart disease	1 Ischaemic heart disease	1.0 (1 to 1)	35 (29 to 39)
2.0 (1 to 2)	2 Stroke	2 Stroke	2.0 (2 to 2)	26 (14 to 32)
3.0 (3 to 4)	3 Lower respiratory infections	3 COPD	3.4 (3 to 4)	-7 (-12 to 0)
4.0 (3 to 4)	4 COPD	4 Lower respiratory infections	3.6 (3 to 4)	-18 (-24 to -11)
5.0 (5 to 5)	5 Diarrhoea	5 Lung cancer	5.8 (5 to 10)	48 (24 to 61)
6.1 (6 to 7)	6 Tuberculosis	6 HIV/AIDS	6.4 (5 to 8)	396 (323 to 465)
7.3 (7 to 9)	7 Preterm birth complications	7 Diarrhoea	6.7 (5 to 9)	-42 (-49 to -35)
8.6 (7 to 12)	8 Lung cancer	8 Road injury	8.4 (5 to 11)	47 (18 to 86)
9.4 (7 to 13)	9 Malaria	9 Diabetes	9.0 (7 to 11)	93 (68 to 102)
10.4 (8 to 14)	10 Road injury	10 Tuberculosis	10.1 (8 to 13)	-18 (-35 to -3)
10.8 (8 to 14)	11 Protein-energy malnutrition	11 Malaria	10.3 (6 to 13)	21 (-9 to 56)
12.8 (11 to 16)	12 Cirrhosis	12 Cirrhosis	11.8 (10 to 14)	33 (25 to 41)
13.2 (9 to 18)	13 Stomach cancer	13 Self-harm	14.1 (11 to 20)	32 (8 to 49)
15.6 (12 to 20)	14 Self-harm	14 Hypertensive heart disease	14.2 (12 to 18)	48 (39 to 56)
15.8 (13 to 19)	15 Diabetes	15 Preterm birth complications	14.4 (12 to 18)	-28 (-39 to -17)
16.1 (12 to 20)	16 Congenital anomalies	16 Liver cancer	16.9 (14 to 20)	63 (49 to 78)
16.9 (13 to 20)	17 Neonatal encephalopathy*	17 Stomach cancer	17.0 (13 to 22)	-2 (-10 to 5)
18.3 (14 to 22)	18 Hypertensive heart disease	18 Chronic kidney disease	17.4 (15 to 21)	82 (65 to 95)
21.1 (6 to 44)	19 Measles	19 Colorectal cancer	18.5 (15 to 21)	46 (36 to 63)
21.1 (12 to 36)	20 Neonatal sepsis	20 Other cardiovascular and circulatory	19.7 (18 to 21)	46 (40 to 55)

EPIC

Blood Collection and Storage (1993-1998)



- 30 ml venous blood:
 - 20 ml citrated + 10 ml dry
- 28 aliquots of 500 μ l :
 - plasma 12 (red straws)
 - serum 8 (yellow straws)
 - buffy coat 4 (blue straws)
 - RBC 4 (green straws)

28 aliquots x 300.000 subjects = 8.4 Million aliquots stored,
half in each EPIC centre, half at IARC-Lyon

Plus: 12 x 110,000 = 1.3 Million in Sweden and Denmark