Southeast Asian Diaspora

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E.S.H. Working Group "Hypertension and Cardiovascular Risk Assessment in Subjects Living in or Emigrating from Low Resource Settings"

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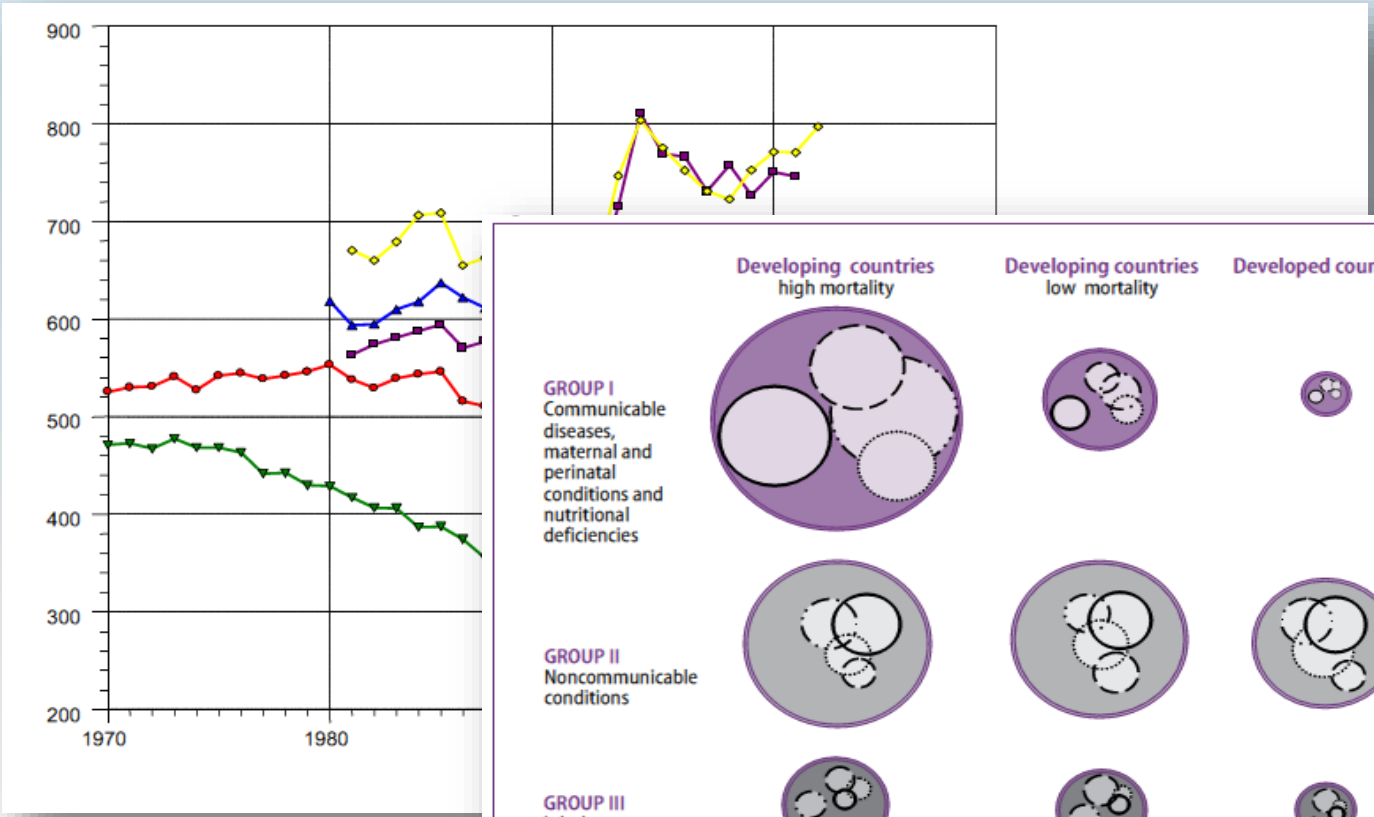
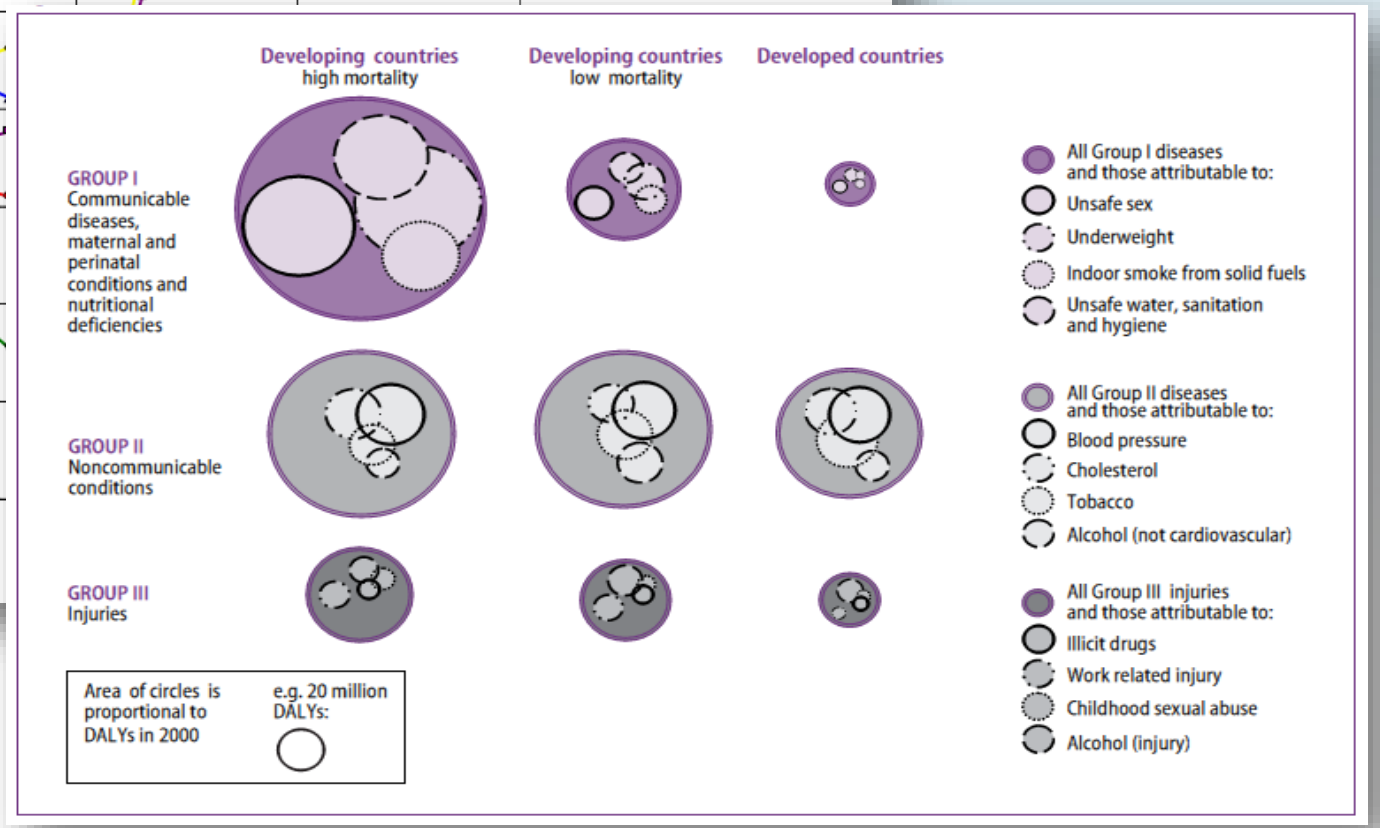
Conflicts of Interest Declaration

- None to declare

Health trends in Europe

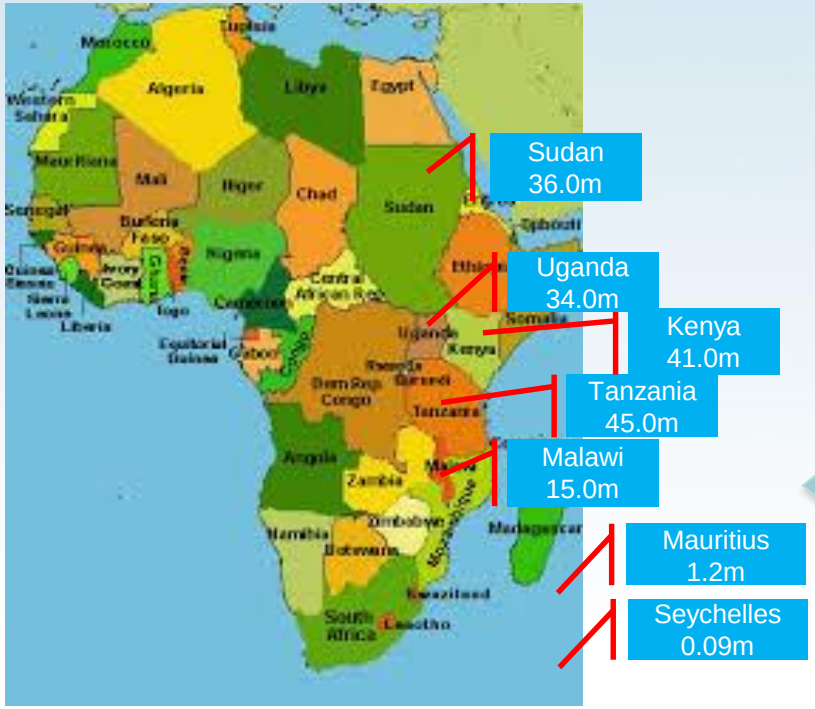




European health for all database. WHO Regional Office for Europe (Copenhagen), 2004
World Health Report. Reducing risks, promoting health life. WHO (Geneva), 2002

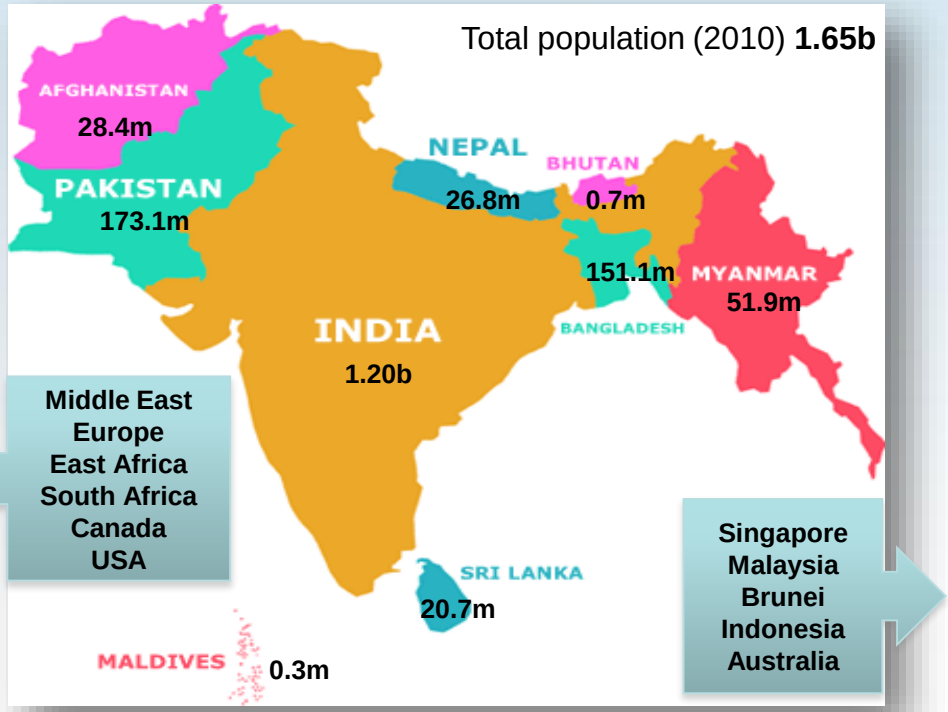
South Asian Diaspora

East Africa



Total population (2010) **172.3m**

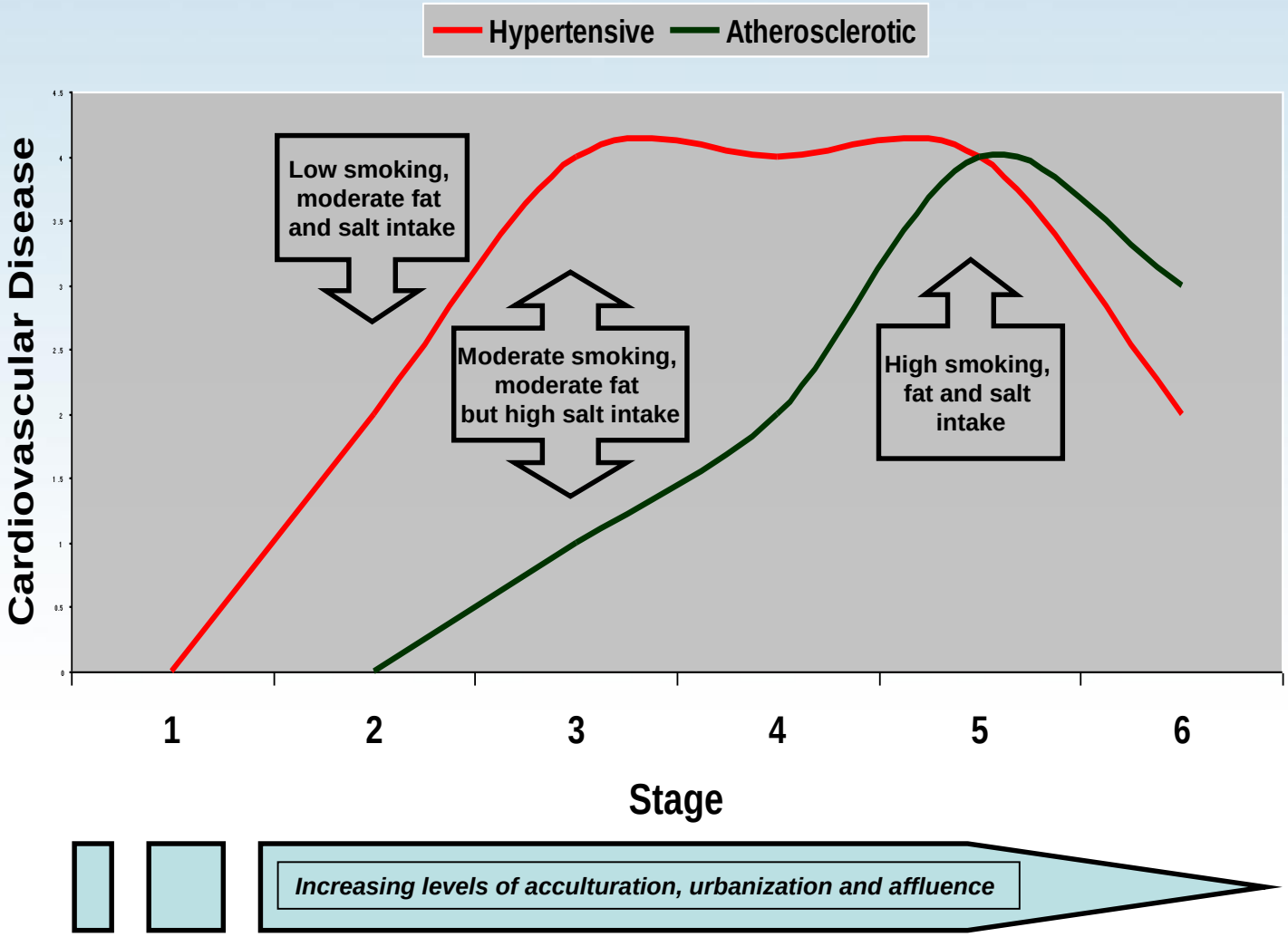
Indian sub-continent



South Asian Diaspora

Country	Migration (2005-10) million	Destination (World Bank 2010) million					
		US	Canada	UK	France	Germany	Italy
Afghanistan	0.7	0.06	0.04	0.06		0.08	
Pakistan	1.8	0.30	0.15	0.45	0.02	0.05	0.06
India	3.0	1.60	0.50	0.66	0.04	0.07	0.10
Nepal	0.8						
Bhutan	0.7						
Bangladesh	3.6	0.15	0.04	0.21			0.07
Myanmar	0.8						
Sri Lanka	0.4	0.03	0.12	0.11	0.04	0.05	0.08
Maldives	0.3						
TOTAL	11.4						

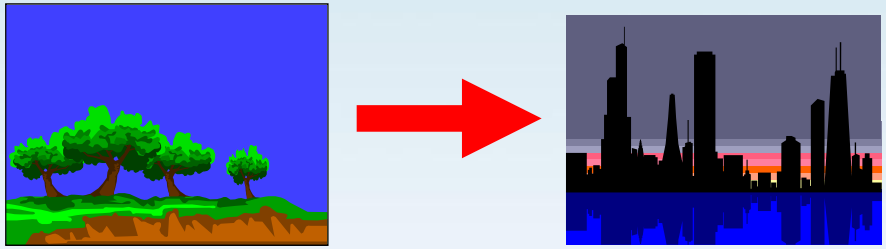
Epidemiological Transition



Cappuccio FP. Int J Epidemiol 2004; 33: 387-8

Migration studies: models

Model 1: high risk acquired after migration

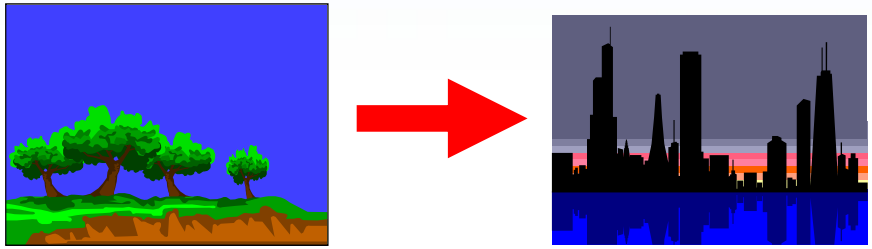


Low risk

High risk

Mainly Environmental

Model 2: high risk present before migration and carried over with migration



High risk

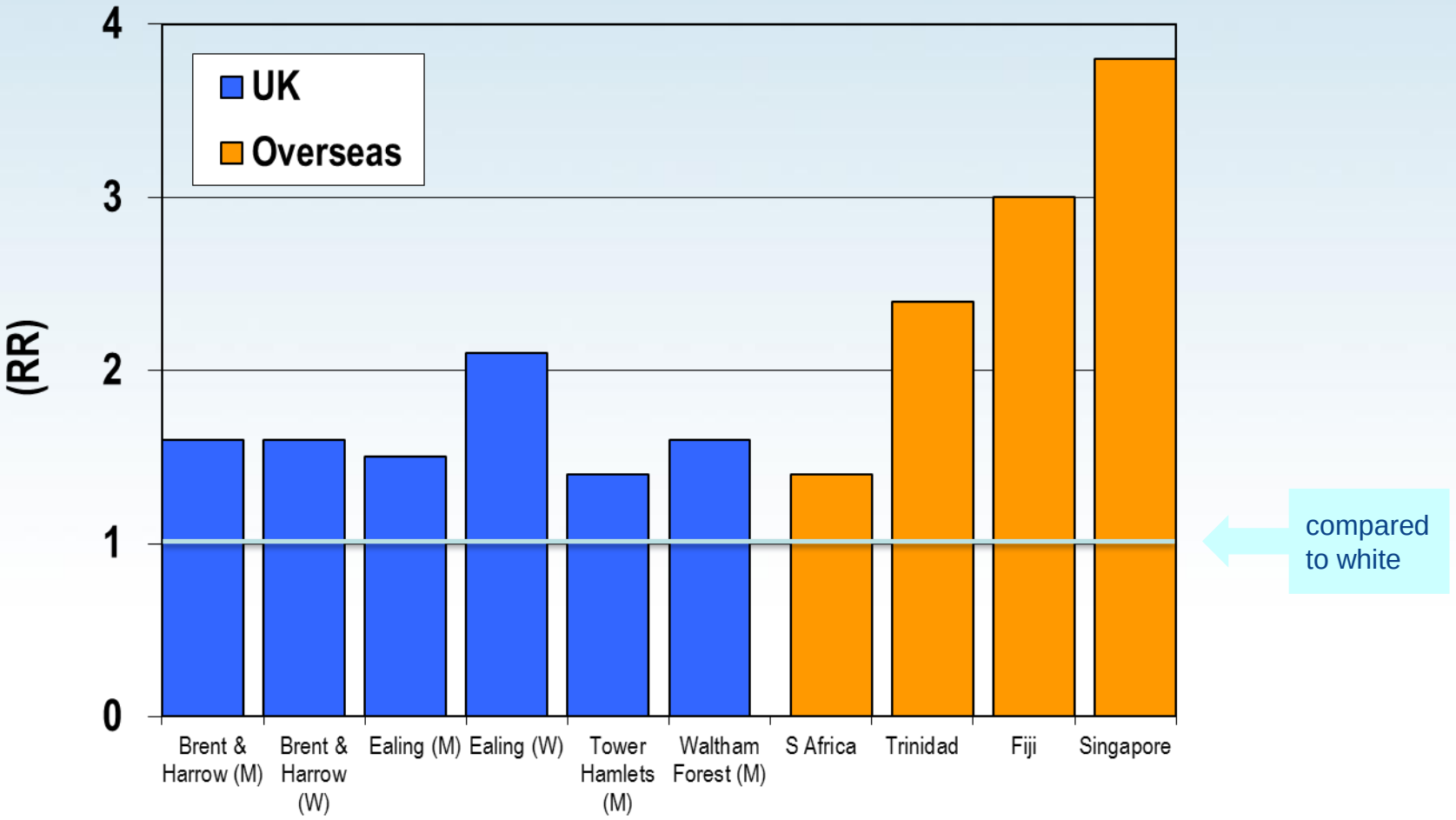
High risk

Genetic predisposition

Early environmental influences

Environmental exposures kept

CHD Mortality in South Asians in the UK and Overseas

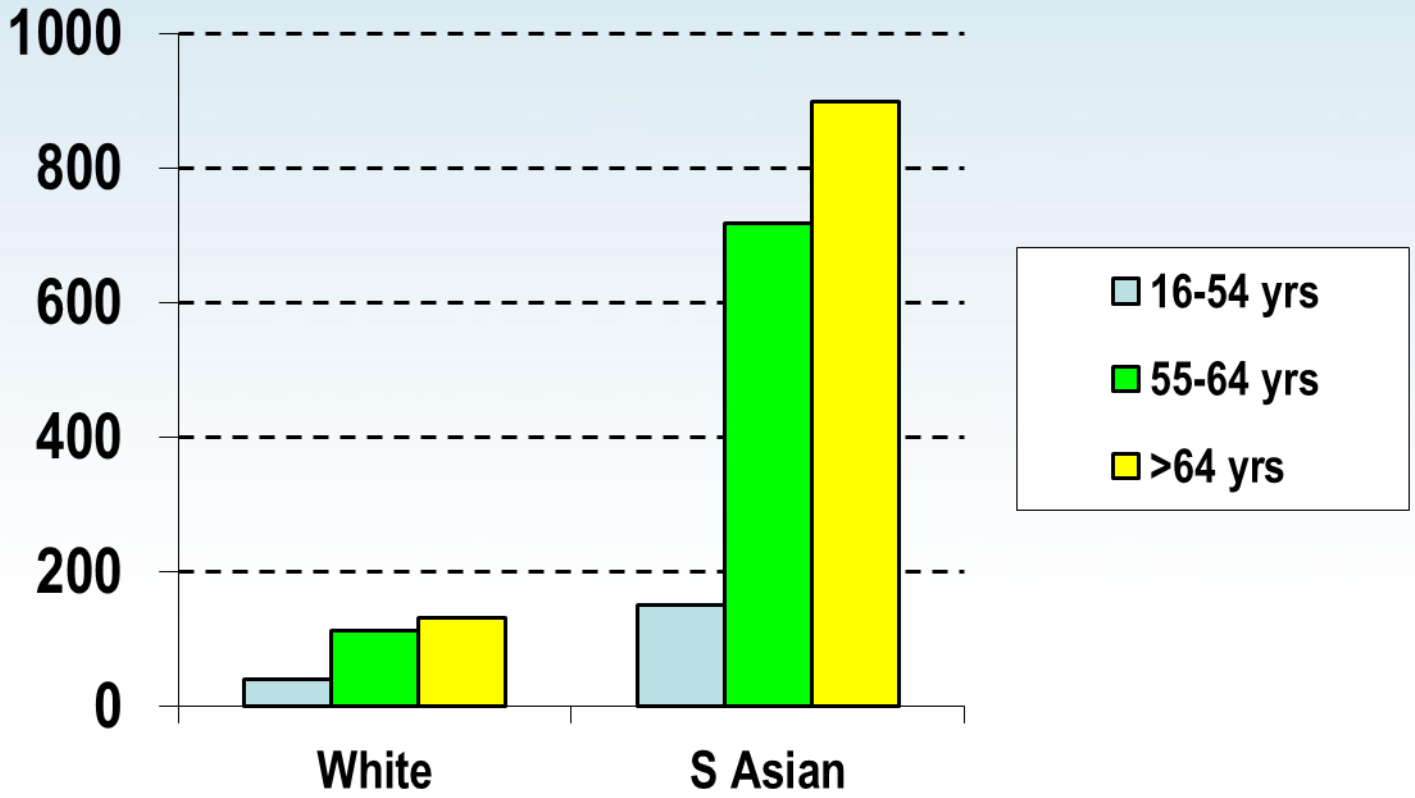


Stroke in South Asians in the UK

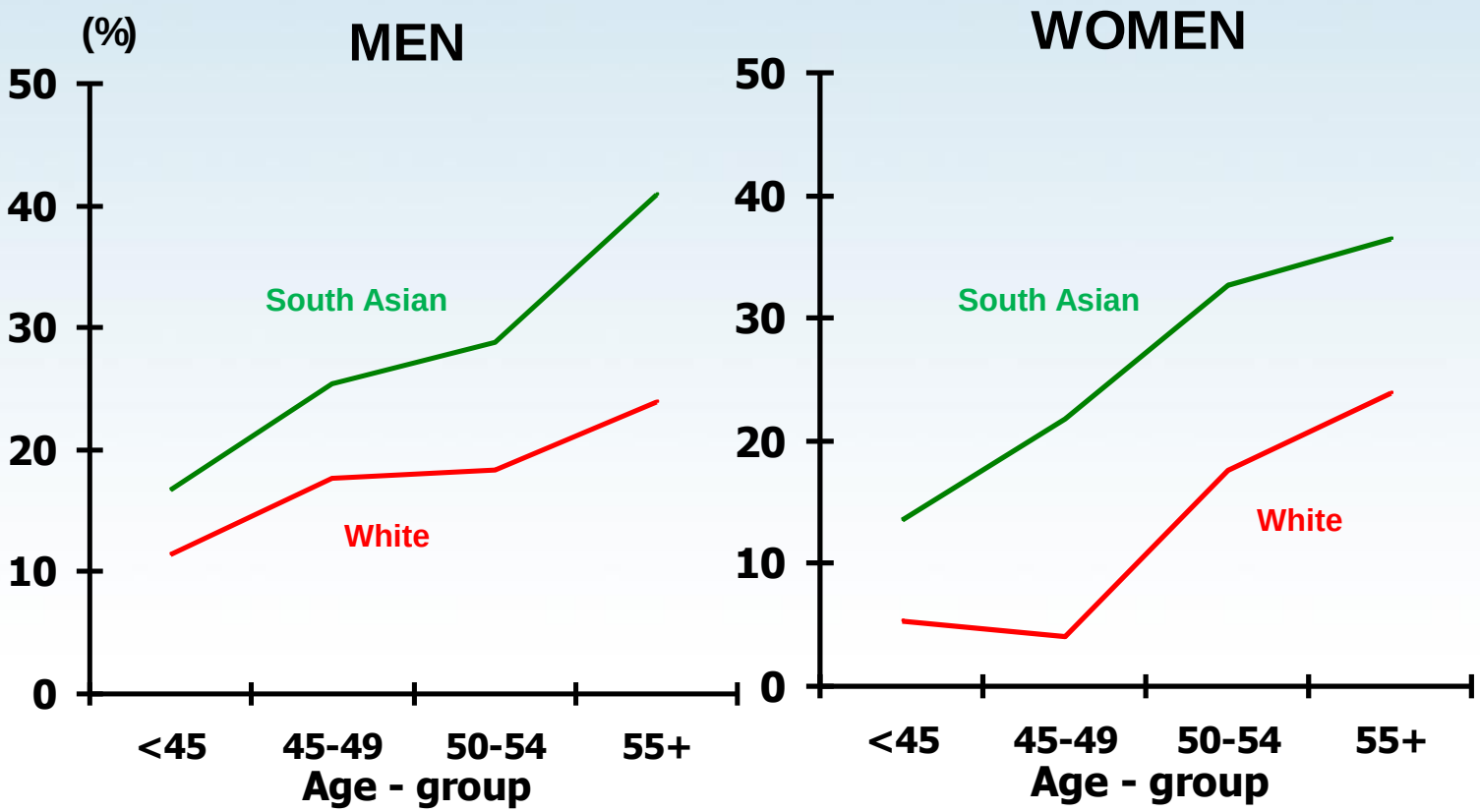
Compared to whites, South Asians:

- **have a greater incidence of CHD**
- **have also a higher risk of stroke and renal failure**
- **some sub-groups have high blood pressure and some have very high smoking rates**
- **metabolic abnormalities more common**

Acceptance Rates (per million pop.) for Renal Replacement Therapy in England (1991-92)



Prevalence of hypertension* in South London



*BP ≥160 and/or ≥95 mmHg or on therapy

Cappuccio FP et al. Heart 1997; 78: 555-63

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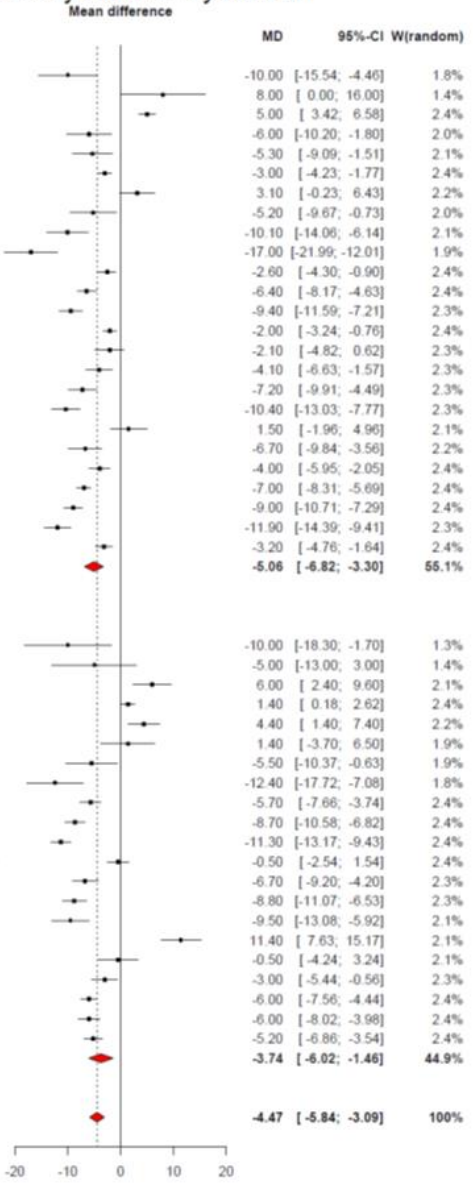
South Asians by Gender - Systolic BP



Study	South Asians Total	Mean	SD	Europeans Total	Mean	SD	MD	95%-CI	W(random)
Men									
McKeigue et al 1988	76	119.0	17.4	90	129.0	19.0	-10.00	[-15.54; -4.46]	1.8%
Cruickshank et al 1991	47	137.0	20.0	49	129.0	20.0	8.00	[0.00; 16.00]	1.4%
McKeigue et al 1991	1421	126.0	28.8	1515	121.0	9.9	5.00	[3.42; 6.58]	2.4%
Knight et al 1992	96	131.4	16.7	148	137.4	15.8	-6.00	[-10.20; -1.80]	2.0%
Knight et al 1993	128	133.0	16.5	160	138.3	16.1	-5.30	[-9.09; -1.51]	2.1%
Simmons et al 1993	2144	131.0	20.0	2539	134.0	23.0	-3.00	[-4.23; -1.77]	2.4%
Cappuccio et al 1998	253	131.0	18.7	233	127.9	18.7	3.10	[-0.23; 6.43]	2.2%
Bhopal et al 1999 (Indiani)	105	123.9	16.3	142	129.1	19.5	-5.20	[-9.67; -0.73]	2.0%
Bhopal et al 1999 (Pakistani)	156	119.0	14.8	142	129.1	19.5	-10.10	[-14.06; -6.14]	2.1%
Bhopal et al 1999 (Bangladeshi)	64	112.1	15.6	142	129.1	19.5	-17.00	[-21.99; -12.01]	1.9%
HSE 1999 (Indiani)	401	130.8	15.6	1800	133.4	16.2	-2.60	[-4.30; -0.90]	2.4%
HSE 1999 (Pakistani)	319	127.0	14.6	1800	133.4	16.2	-6.40	[-8.17; -4.63]	2.4%
HSE 1999 (Bangladeshi)	214	124.0	15.4	1800	133.4	16.2	-9.40	[-11.59; -7.21]	2.3%
Whitty et al 1999	357	121.4	11.3	6159	123.4	15.7	-2.00	[-3.24; -0.76]	2.4%
Lane 2002	231	127.6	19.9	1534	129.7	18.2	-2.10	[-4.82; 0.62]	2.3%
HSE 2004 (Indiani)	265	127.3	19.2	1369	131.4	19.2	-4.10	[-6.63; -1.57]	2.3%
HSE 2004 (Pakistani)	162	124.2	16.3	1369	131.4	19.2	-7.20	[-9.91; -4.49]	2.3%
HSE 2004 (Bangladeshi)	99	121.0	12.3	1369	131.4	19.2	-10.40	[-13.03; -7.77]	2.3%
Agyemang et al 2005	135	128.4	16.3	253	126.9	17.0	1.50	[-1.96; 4.96]	2.1%
Lyratzopoulos et al 2005	110	124.8	16.6	5128	131.5	18.3	-6.70	[-9.84; -3.56]	2.2%
Glenday et al 2006 (Pakistan)	244	129.0	15.0	1662	133.0	11.0	-4.00	[-5.95; -2.05]	2.4%
Glenday et al 2006 (Sri Lanka)	603	126.0	15.0	1662	133.0	11.0	-7.00	[-8.31; -5.69]	2.4%
Glenday et al 2006 (Vietnam)	244	124.0	13.0	1662	133.0	11.0	-9.00	[-10.71; -7.29]	2.4%
Gualdi-Russo et al 2009	78	117.7	9.2	104	129.6	7.4	-11.90	[-14.39; -9.41]	2.3%
Gray et al 2011	665	138.6	18.0	2209	141.8	18.0	-3.20	[-4.76; -1.64]	2.4%
Random effects model	8617			35040			**-5.06**	**[-6.82; -3.30]**	**55.1%**
Heterogeneity: I-squared=93.5%, tau-squared=17.59, p<0.0001									
Women									
McKeigue et al 1988	45	113.0	20.1	42	123.0	19.4	-10.00	[-18.30; -1.70]	1.3%
Cruickshank et al 1991	60	123.0	25.0	52	128.0	18.0	-5.00	[-13.00; 3.00]	1.4%
McKeigue et al 1991	291	126.0	26.1	246	120.0	16.0	6.00	[2.40; 9.60]	2.1%
Simmons et al 1993	2251	122.6	23.0	2969	121.2	21.1	1.40	[0.18; 2.62]	2.4%
Cappuccio et al 1998	250	127.9	17.7	291	123.5	17.8	4.40	[1.40; 7.40]	2.2%
Bhopal et al 1999 (Indiani)	154	122.6	23.0	133	121.2	21.1	1.40	[-3.70; 6.50]	1.9%
Bhopal et al 1999 (Pakistani)	149	115.7	20.5	133	121.2	21.1	-5.50	[-10.37; -0.63]	1.9%
Bhopal et al 1999 (Bangladeshi)	56	108.8	15.0	133	121.2	21.1	-12.40	[-17.72; -7.08]	1.8%
HSE 1999 (Indiani)	418	123.8	18.6	2161	129.5	19.3	-5.70	[-7.66; -3.74]	2.4%
HSE 1999 (Pakistani)	362	120.8	16.4	2161	129.5	19.3	-8.70	[-10.58; -6.82]	2.4%
HSE 1999 (Bangladeshi)	259	118.2	13.8	2161	129.5	19.3	-11.30	[-13.17; -9.43]	2.4%
Whitty et al 1999	220	119.5	14.8	2814	120.0	15.9	-0.50	[-2.54; 1.54]	2.4%
HSE 2004 (Indiani)	320	119.2	20.4	1692	125.9	23.5	-6.70	[-9.20; -4.20]	2.3%
HSE 2004 (Pakistani)	207	117.1	14.5	1692	125.9	23.5	-8.80	[-11.07; -6.53]	2.3%
HSE 2004 (Bangladeshi)	144	116.4	20.8	1692	125.9	23.5	-9.50	[-13.08; -5.92]	2.1%
Agyemang et al 2005	159	126.9	19.0	255	115.5	19.1	11.40	[7.63; 15.17]	2.1%
Lyratzopoulos et al 2005	77	125.1	16.6	4862	125.6	17.8	-0.50	[-4.24; 3.24]	2.1%
Glenday et al 2006 (Pakistan)	196	121.0	17.0	2014	124.0	12.0	-3.00	[-5.44; -0.56]	2.3%
Glenday et al 2006 (Sri Lanka)	398	118.0	15.0	2014	124.0	12.0	-6.00	[-7.56; -4.44]	2.4%
Glenday et al 2006 (Vietnam)	291	118.0	17.0	2014	124.0	12.0	-6.00	[-8.02; -3.98]	2.4%
Gray et al 2011	688	131.2	19.5	2479	136.4	20.2	-5.20	[-6.86; -3.54]	2.4%
Random effects model	6995			32010			**-3.74**	**[-6.02; -1.46]**	**44.9%**
Heterogeneity: I-squared=94.4%, tau-squared=25.13, p<0.0001									
Random effects model	**15612**			**67050**			**-4.47**	**[-5.84; -3.09]**	**100%**
Heterogeneity: I-squared=93.8%, tau-squared=19.85, p<0.0001									

Test for subgroup differences (random effects model):
Between groups Q=0.81, p=0.3681

Modesti P et al. 2014; in preparation

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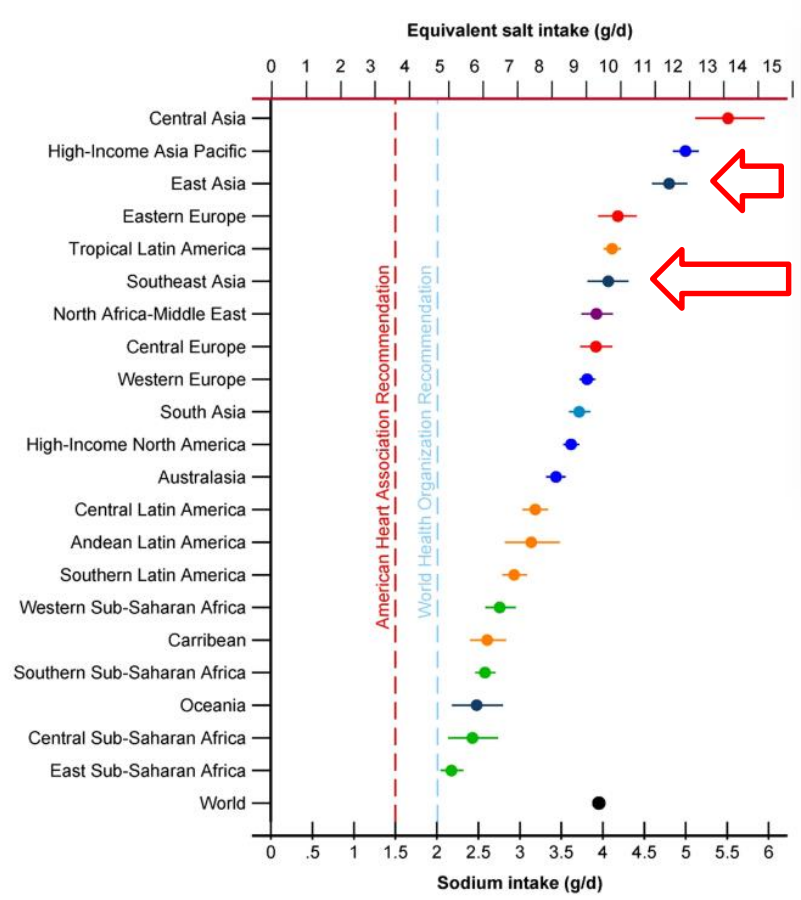
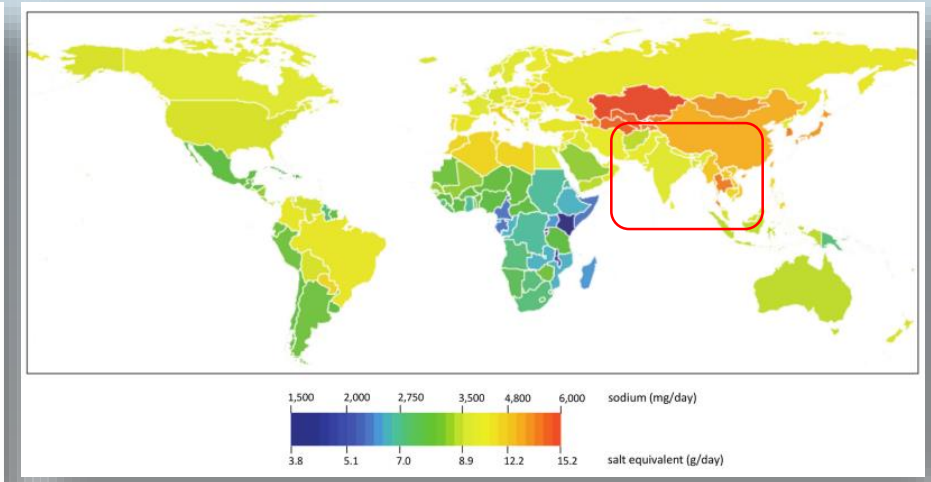
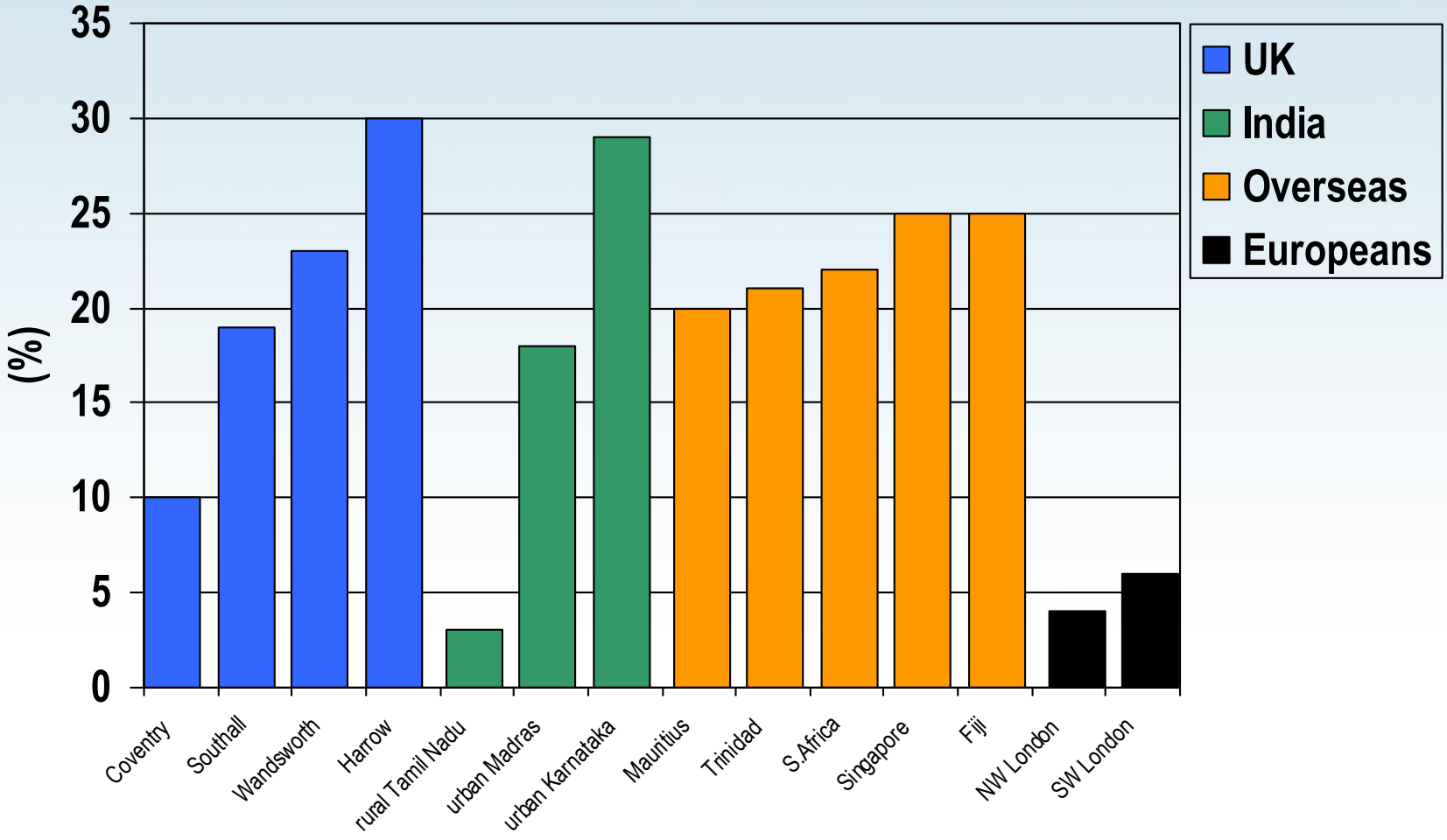
Salt intake around the world





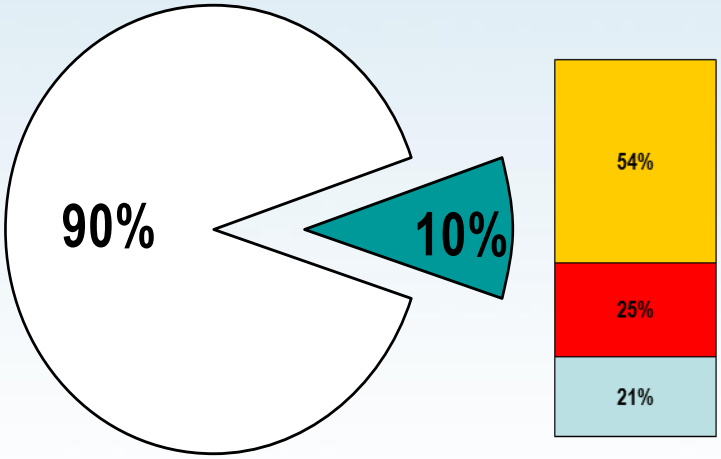
Powles J et al. BMJ Open 2013; 3: e003733

PREVALENCE OF DIABETES IN SOUTH ASIAN POPULATIONS IN THE WORLD

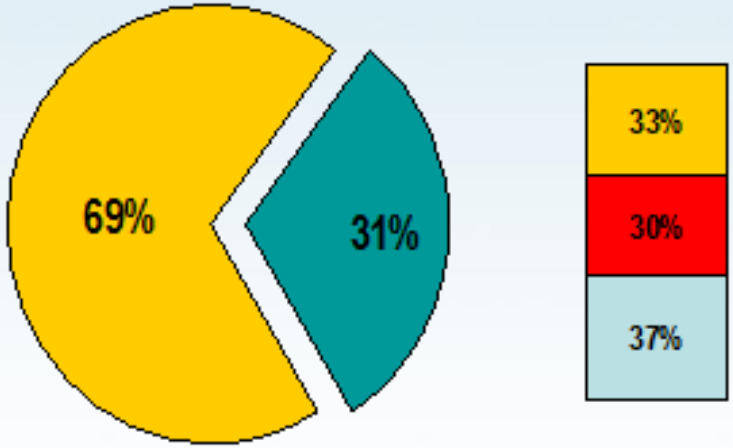


Prevalence and management of diabetes

Whites (n=380)



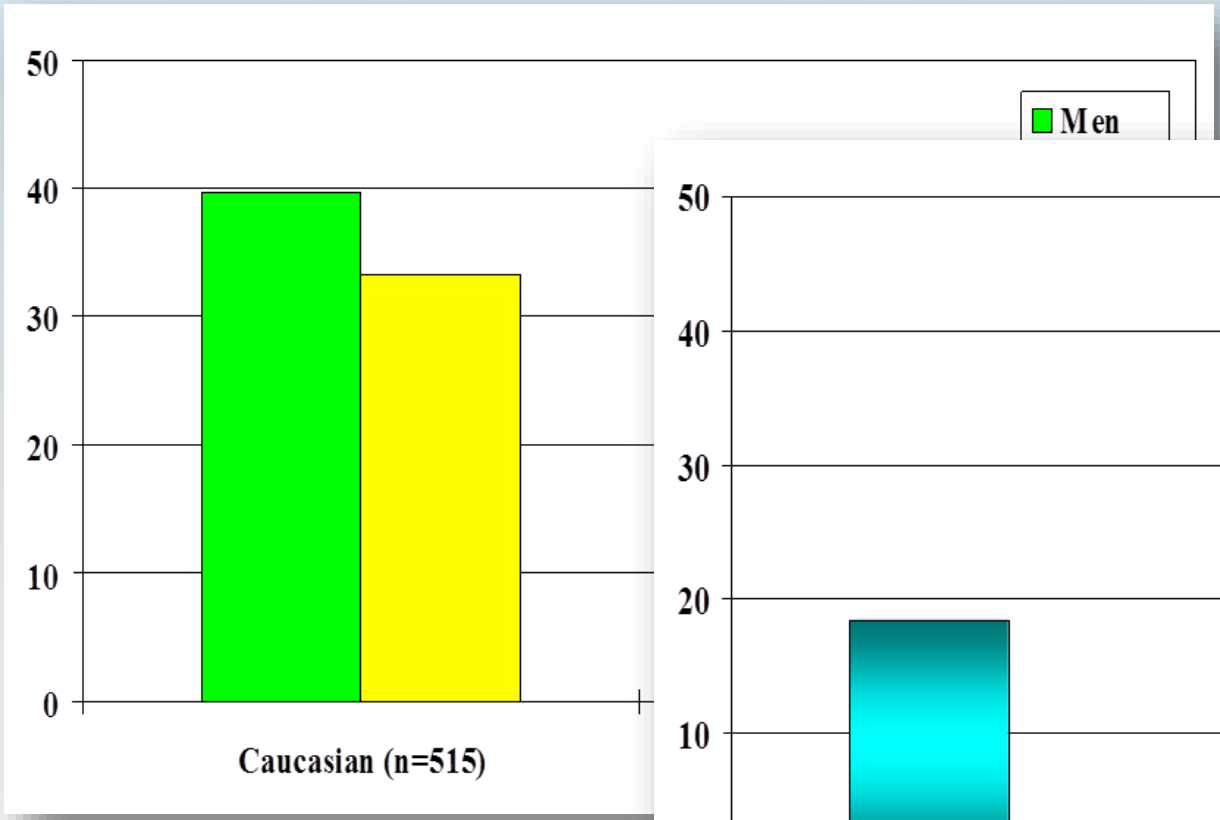
South Asian (n=340)

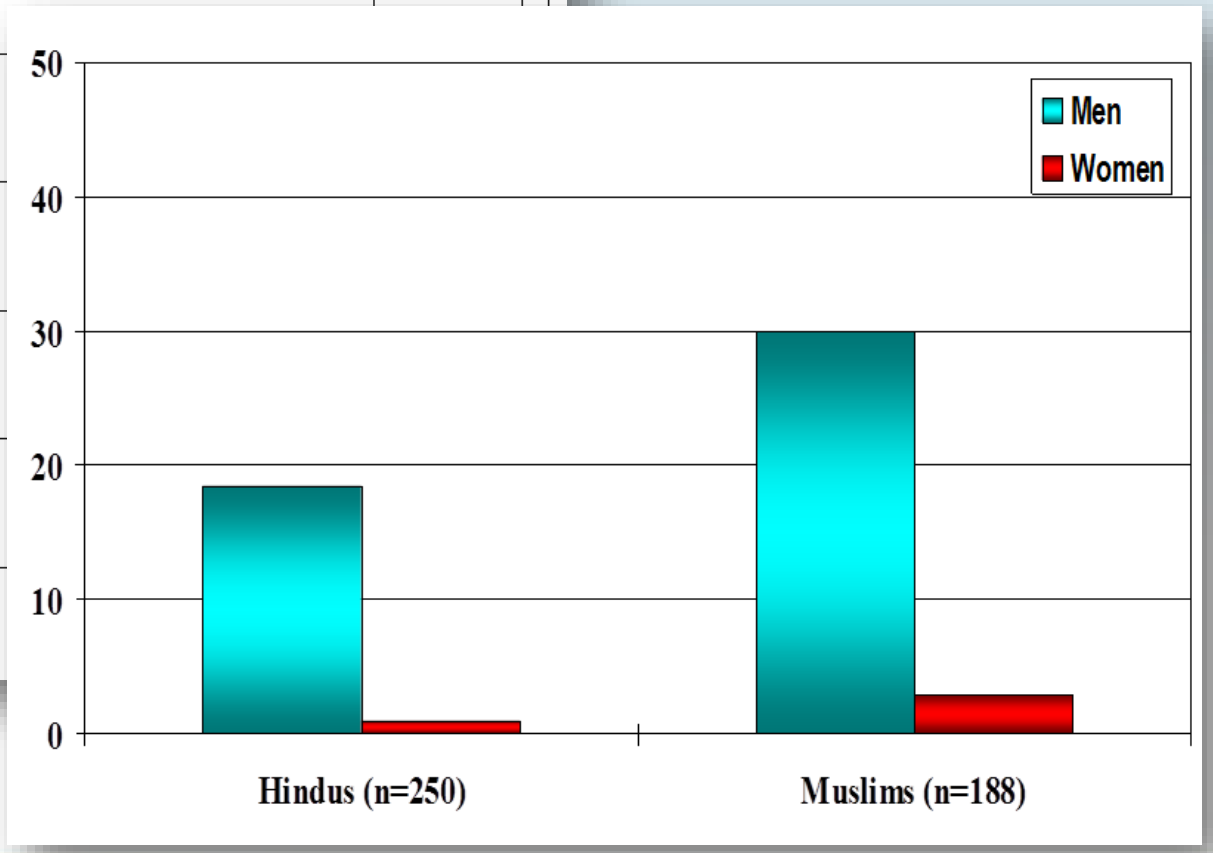


New
Known untreated
Known treated

Cappuccio FP et al. Br J Diabetes Vasc Dis 2003; 3: 286-93

Smoking prevalence



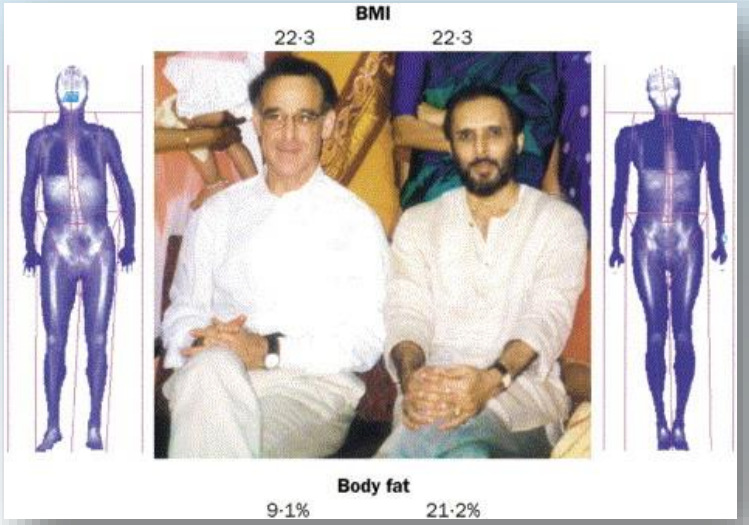


Cappuccio FP et al. Br J Diabetes Vasc Dis 2003; 3: 286-93

Body mass and adiposity

		White (n=524)	S Asian (n=505)
BMI (kg/m^2)	♂	25.8	24.8*
	♀	26.1	27.1*
Waist:Hip	♂	0.92	0.94*
	♀	0.80	0.85*

*P<0.001

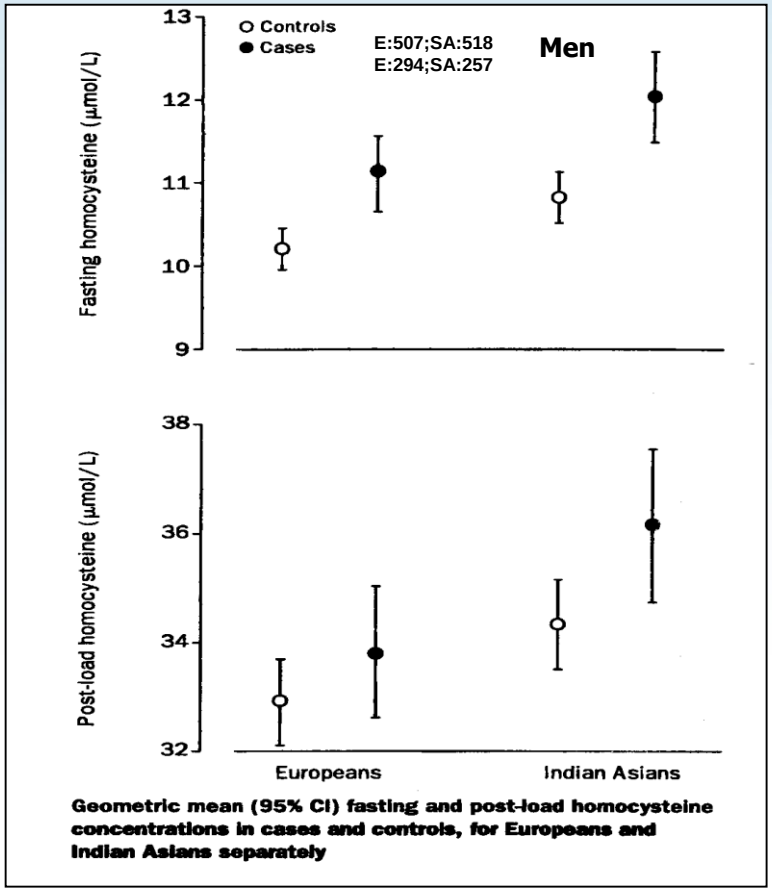


The two authors have an identical BMI, but as dual X-ray absorptiometry shows, Yainik (R) has substantially more body fat than Yudkin (L) (21.2% v 9.1%). Lifestyle may be relevant: Yudkin runs marathons whereas Yajnik's main exercise is running to beat the closing doors of the elevator in the hospital every morning. The image is a useful reminder of the limitations of BMI as a measure of adiposity across populations.

Yajnik CS & Yudkin JS. Lancet 2004; 363: 163

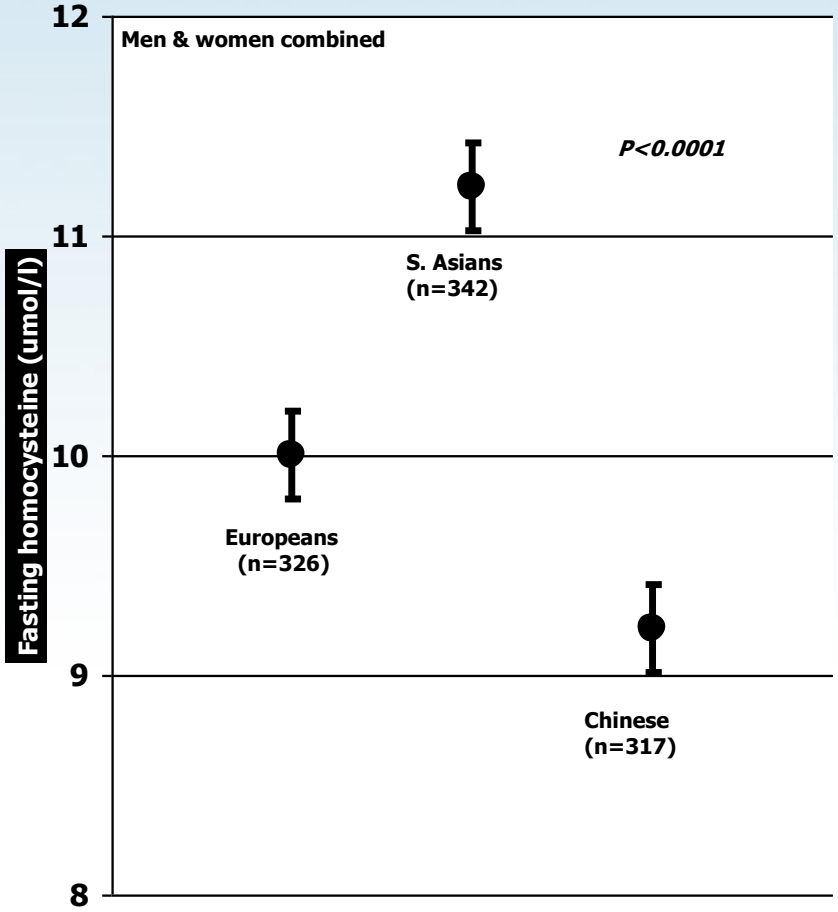
Homocysteine in South Asians

Case-control study in the UK



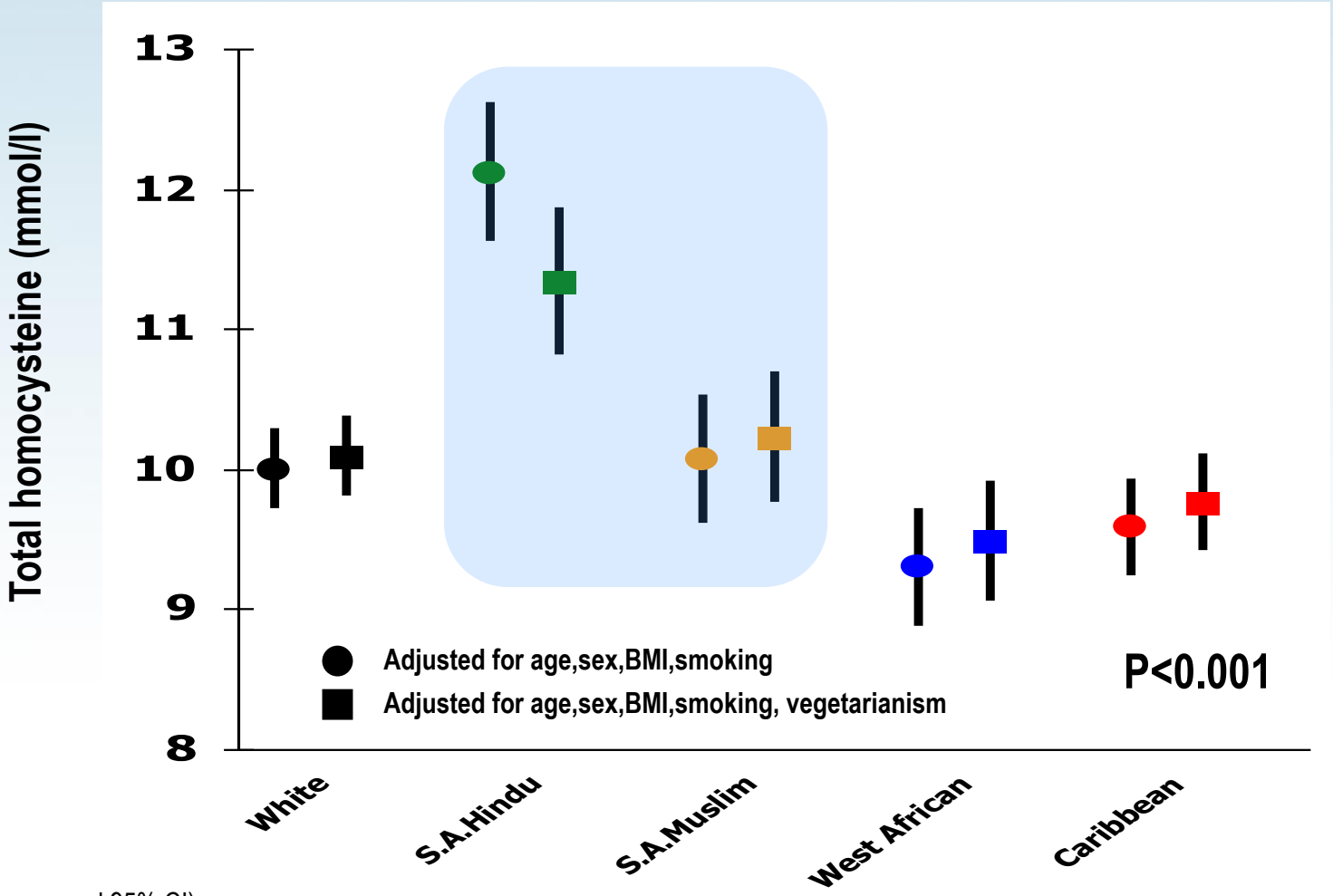
Geometric mean (95% CI) fasting and post-load homocysteine concentrations in cases and controls, for Europeans and Indian Asians separately

Cross-sectional study in Canada



Chambers JC et al. Lancet 2000; 355: 523-7
Anand SS et al. Lancet 2000; 356: 279-84

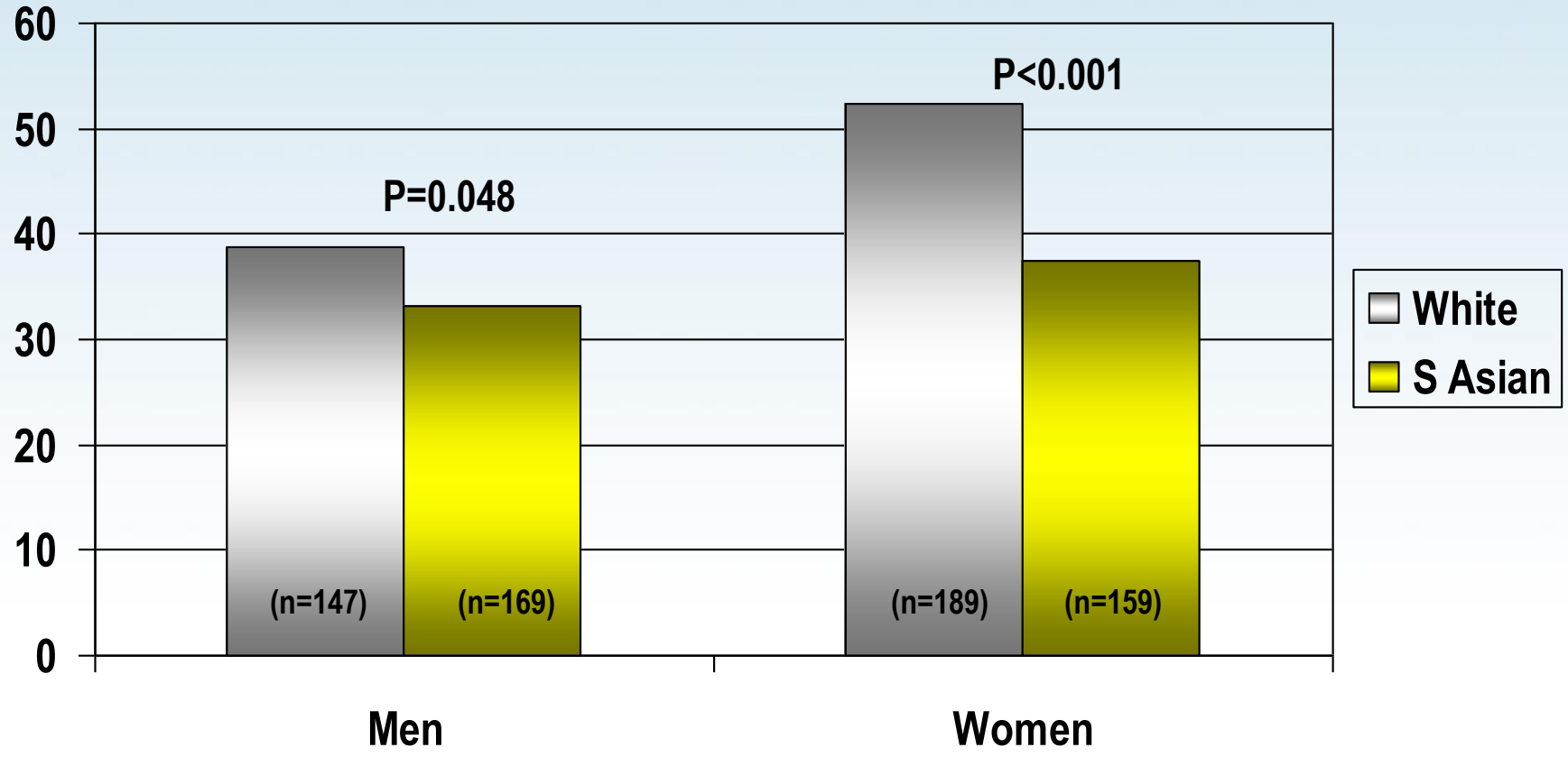
Plasma homocysteine levels by ethnic and cultural background



(geometric mean and 95% CI)

Cappuccio FP et al. Atherosclerosis 2002;164: 95-102

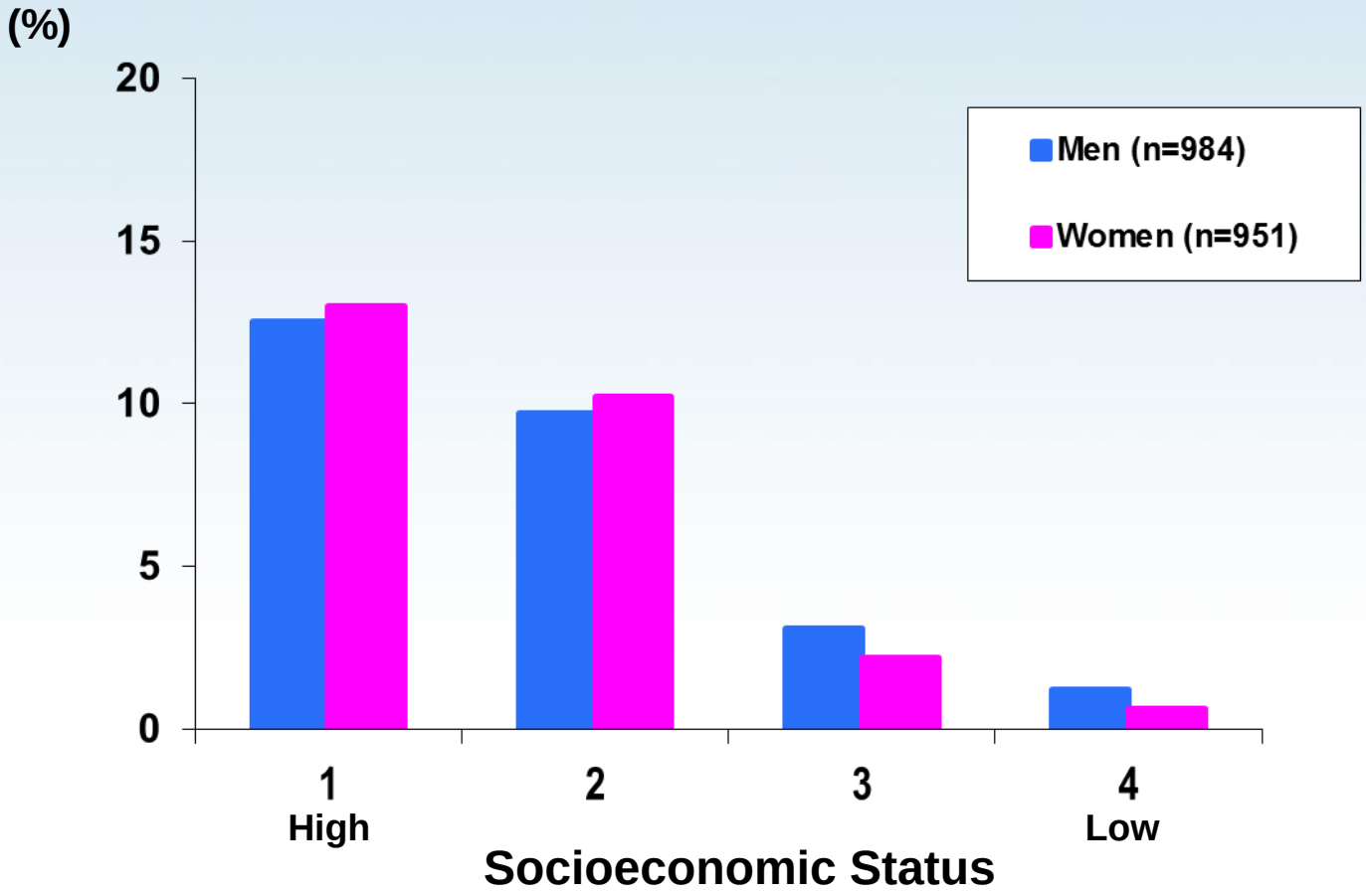
Plasma Vitamin C (μmol/l) by Gender and Ethnic Group



adjusted for age, BMI, smoking, supplement use and vegetarianism

Ness AR et al. Int J Epidemiol 1999;28:450-5

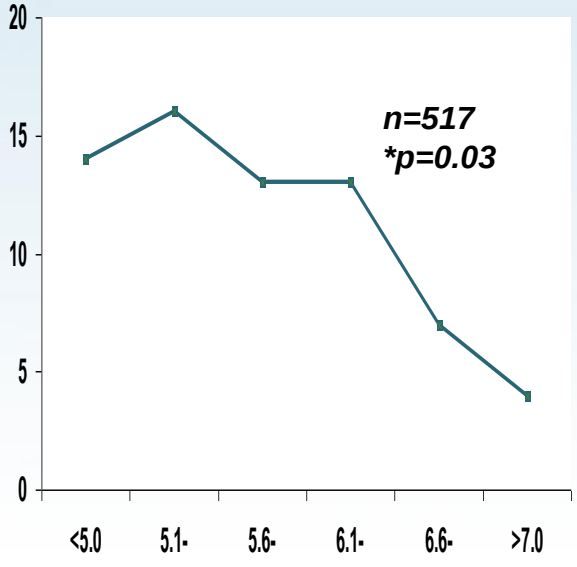
Prevalence of hypertension by social class in rural India



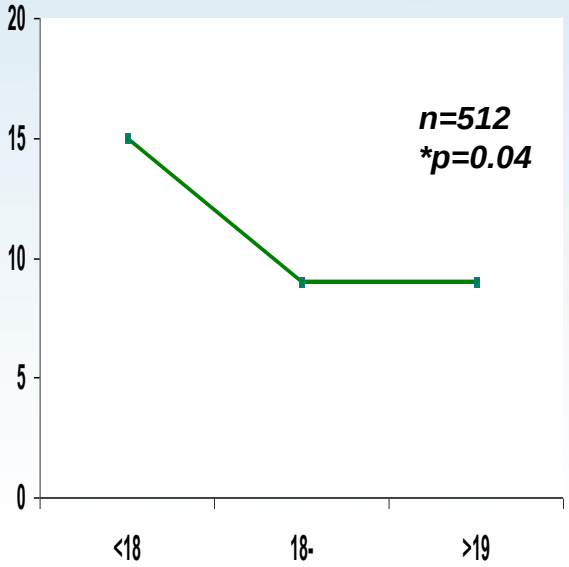
RB Singh et al. J Hum Hypertens 1997

Fetal growth and CHD in South India: study in men and women born between 1934 and 1954

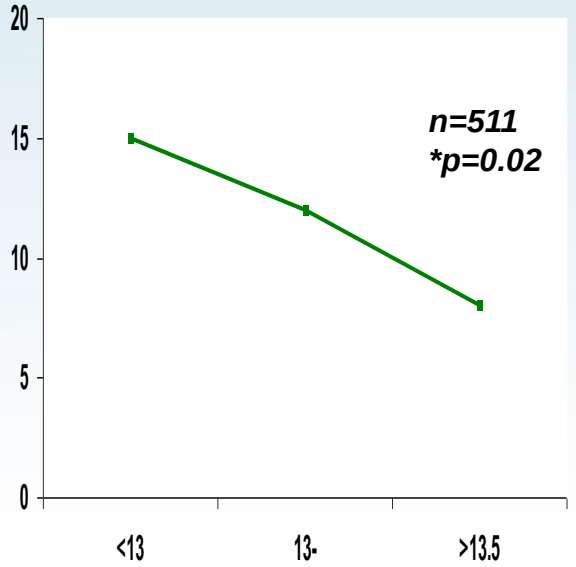
CHD prevalence (%)



Birth weight (lb)



Birth length (inches)



Head circumference at birth (inches)

*Adjusted for age and sex

CE Stein et al. Lancet 1996

Conclusions

- South Asians are at higher risk of coronary heart disease, stroke and renal failure
- They have more central adiposity, diabetes and insulin resistance.
- Hypertension prevalence varies by subgroups, is not well diagnosed and diabetes is not well controlled
- Vegetarian Hindus have higher homocysteine and lower vitamin C as a result of vegetable overcooking

- **To improve understanding of risk stratification in migrant populations from the Indian Sub-continent and East Asia**
- **To develop culturally appropriate preventive strategies**
- **To improve detection and management**
- **To study interaction between genes and environment**