



8th Annual Emirates
Cardiac Society
Conference



ACC Middle East
Conference 2017

DUBAI

October 19-21, 2017



Global Burden of Cardiovascular Disease: Is Middle East Any Different?

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UNIQUE EDUCATIONAL EXPERIENCE
IN YOUR REGION

Global Burden of Cardiovascular Disease

- CVD are a leading cause of death in the world and a major barrier to sustainable human development.
- In 2011, the United Nations formally recognized NCD a major concern for global health with an ambitious plan to dramatically reduce the effect of these diseases.
- The third SDG recognized the importance of CVD by targeting a one-third reduction in premature NCD mortality.





SUSTAINABLE DEVELOPMENT GOALS



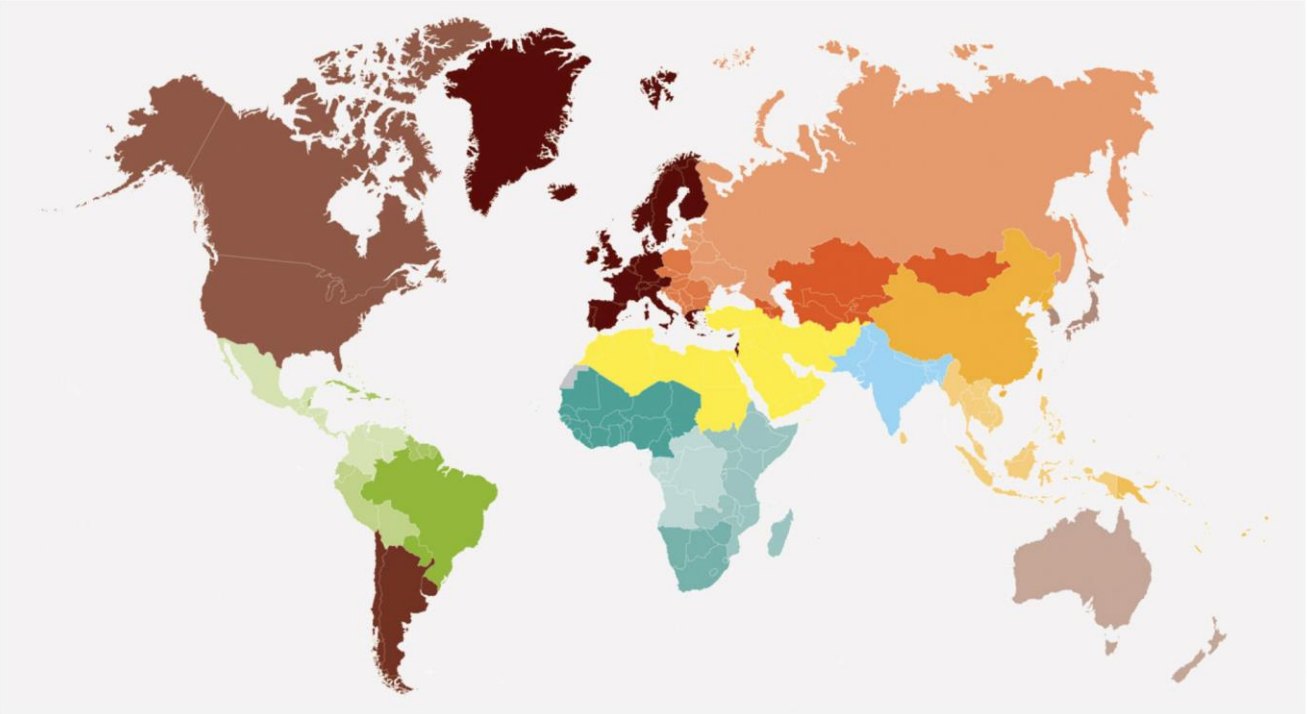
The third SDG recognized the importance of CVD by targeting a one-third reduction in premature NCD mortality.



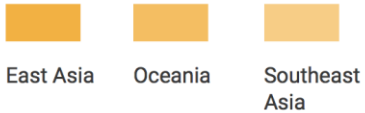
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21 GBD Regions

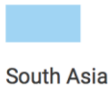
The seven Super Regions have been further sub-divided into 21 GBD Regions



South East Asia, East Asia & Oceania:



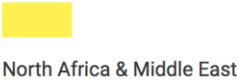
South Asia:



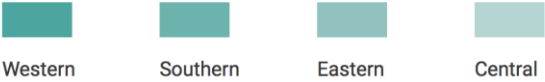
Central Europe, Eastern Europe & Central Asia:



North Africa & Middle East:



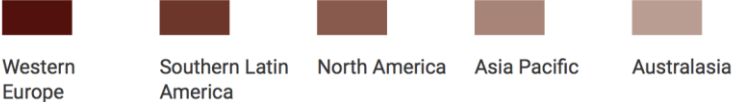
Sub-Saharan Africa:



Latin America & Caribbean:



High income:

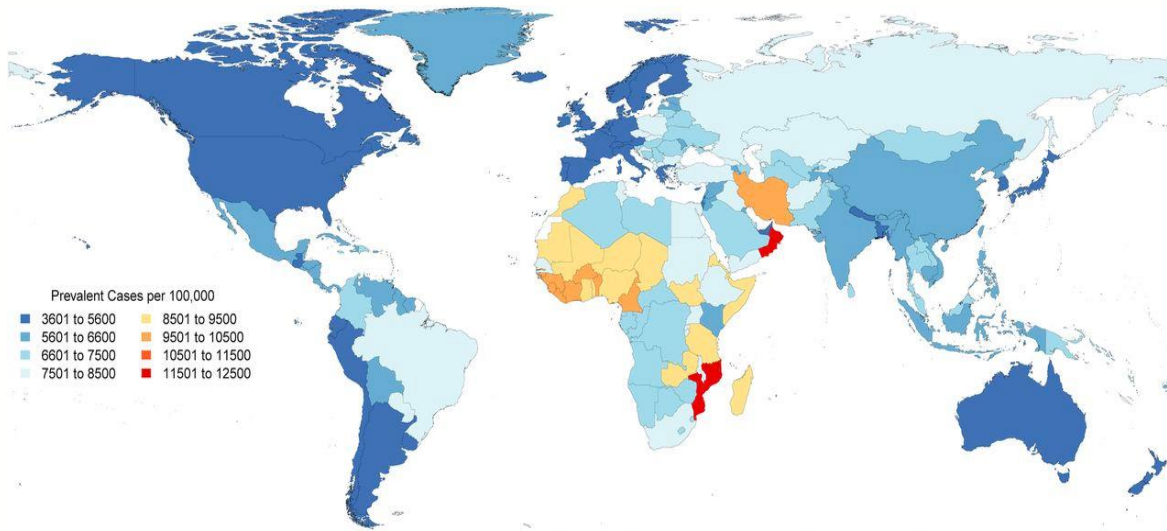


The number of global of CVD deaths and regional patterns were previously reported by GBD 2013. GBD 2015 results provided mortality time-series estimated from 1990-2015 as also national estimates. The study also addresses nonfatal burden of CVD.



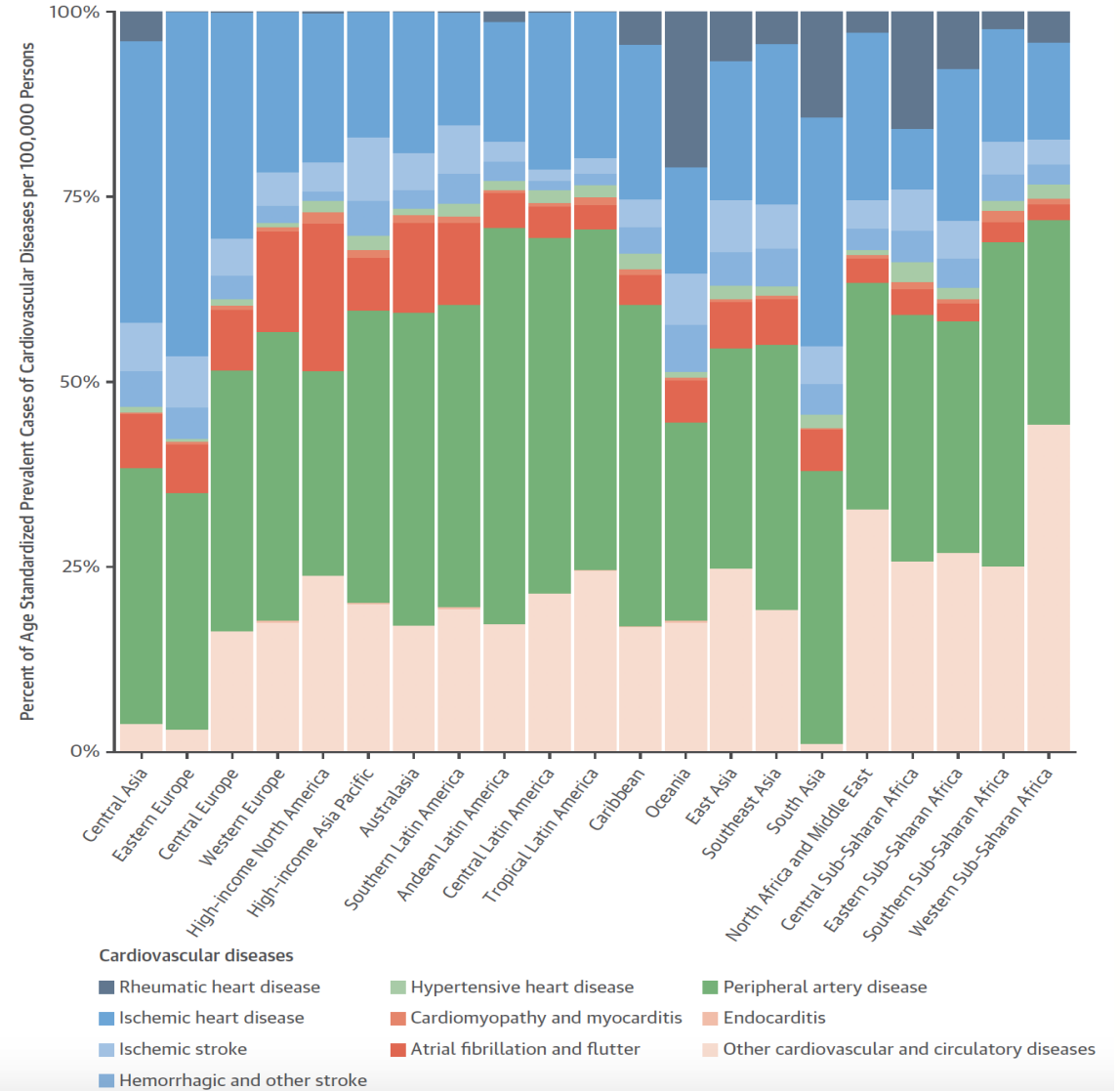
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GBD 2015: Global Prevalence of CVD



With 422 million prevalent cases, CVD is the leading cause of all health loss globally in every region, though varies by region, and steeply rises with old age.

%Deaths per 100,000 for CVD Causes, 2015

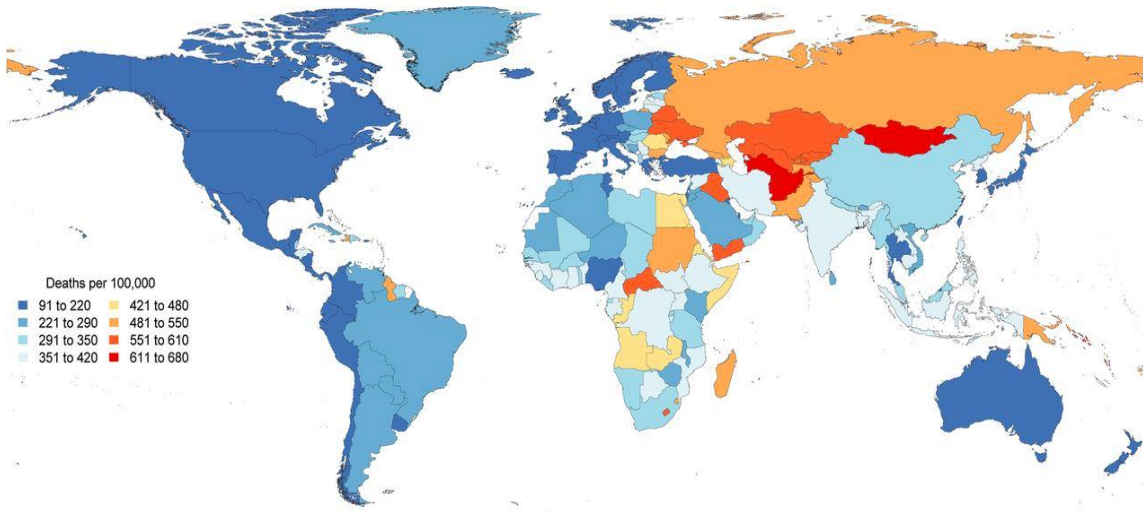


Roth et al. JACC 2017



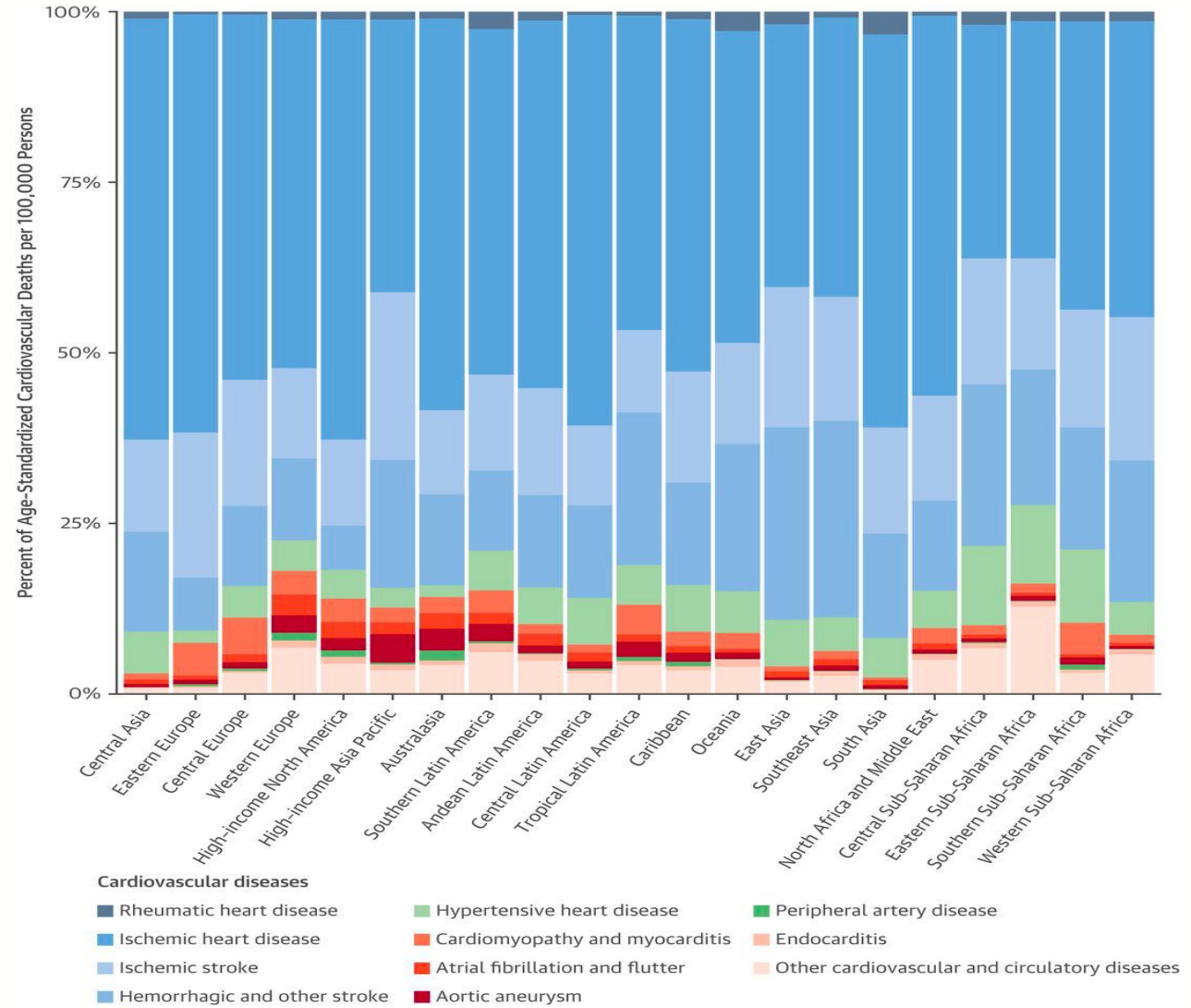
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IHD is the Leading Cause of Death: GBD 2015

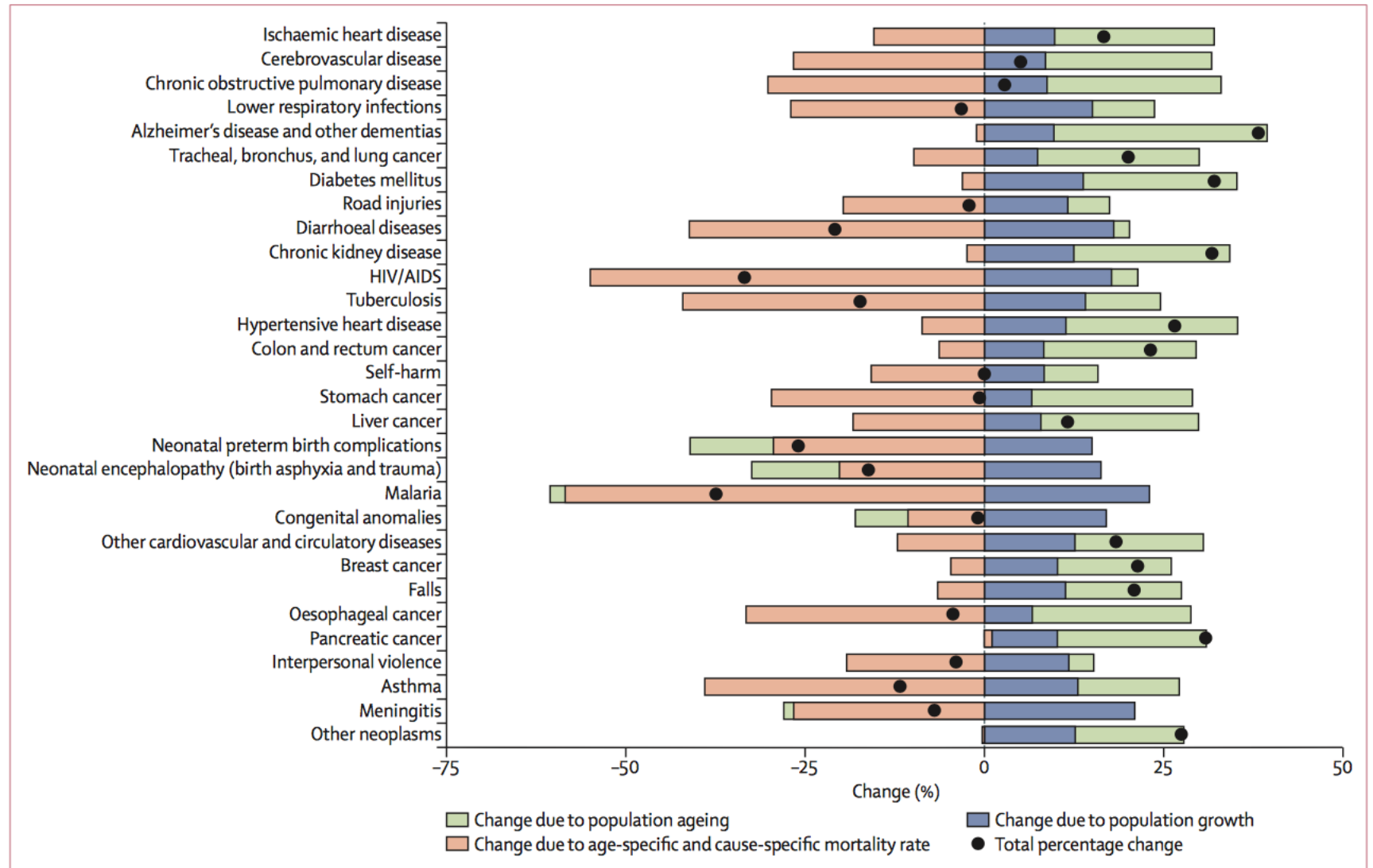


18 million CVD deaths accounts for 1/3rd of all deaths, widely variable by countries.

%CVD Deaths/ 100,000 by Causes, 2015

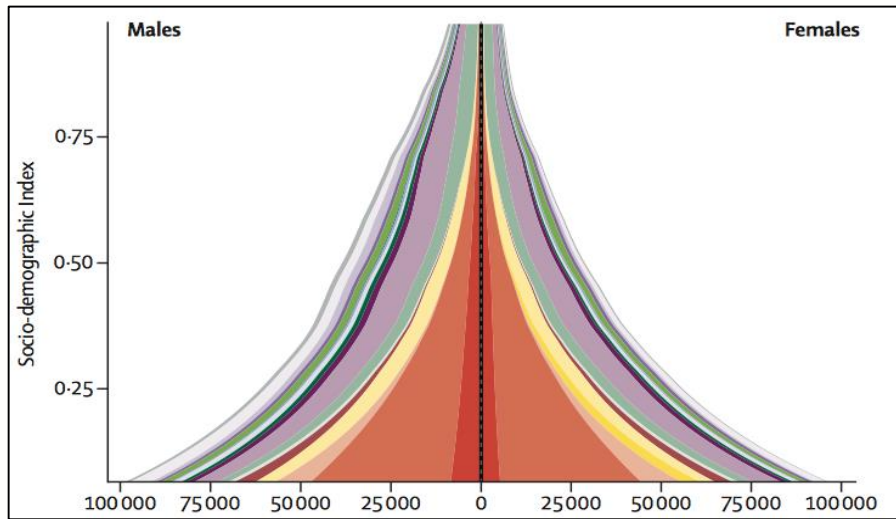


Global decomposition of changes in leading 30 causes of death, 2005 to 2015

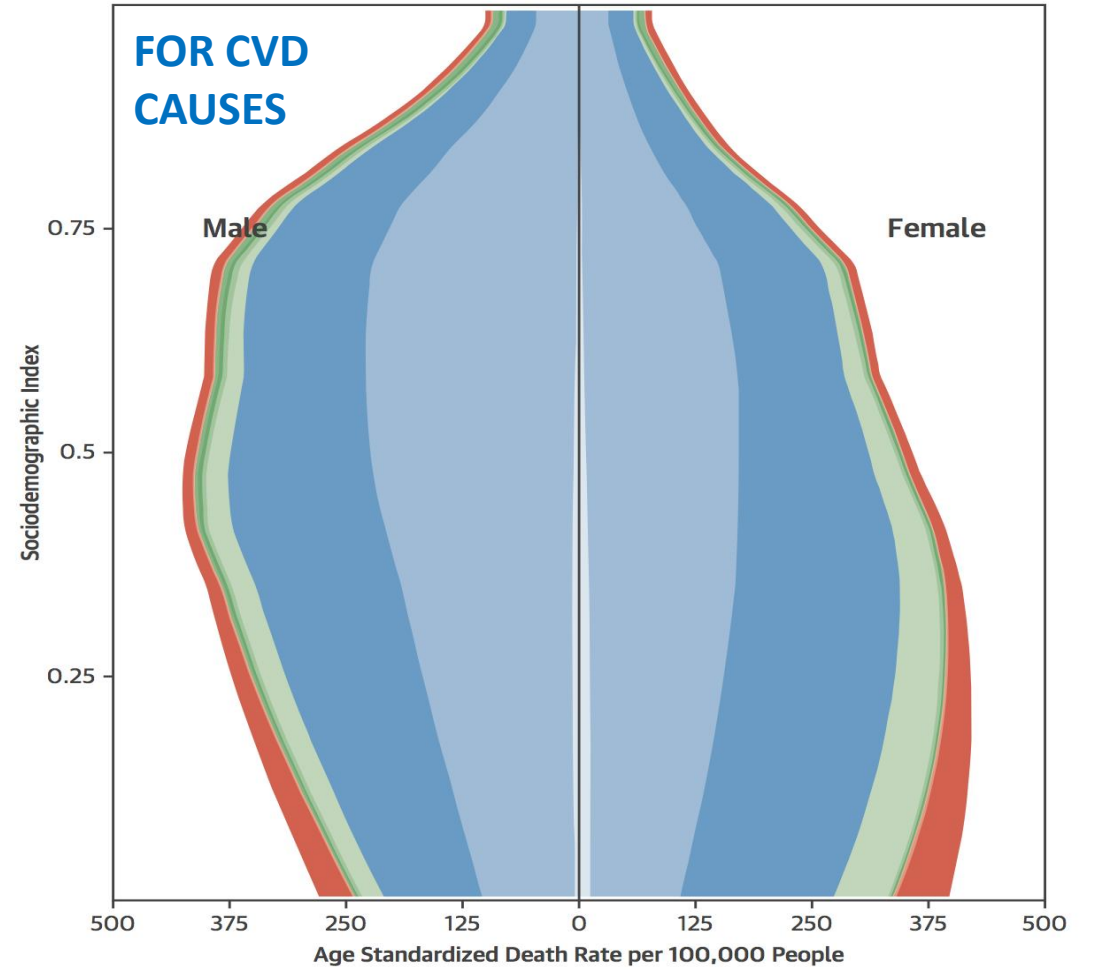


Premature deaths (<70 years) owing to CVD, cancer, ch. respiratory disease or diabetes totaled about 13 million in 2015, accounting for 43% of all premature deaths globally. From 2000-2015, the risk of dying between 30-70 years from 1 of 4 causes decreased from 23 to 19%, falling short of the rate required to meet the 2030 target of a 1/3rd reduction.

Age-Standardized Mortality Rate by SDI & Sex



- | | |
|--|--|
| <ul style="list-style-type: none"> Forces of nature, war, and legal intervention Self-harm and interpersonal violence Unintentional injuries Transport injuries Other non-communicable diseases Musculoskeletal disorders Diabetes, urogenital, blood, and endocrine diseases Mental and substance use disorders Neurological disorders Digestive diseases Cirrhosis and other chronic liver diseases | <ul style="list-style-type: none"> Chronic respiratory diseases Cardiovascular diseases Neoplasms (cancers) Other communicable, maternal, neonatal, and nutritional diseases Nutritional deficiencies Neonatal disorders Maternal disorders Neglected tropical diseases and malaria Diarrhoea, lower respiratory, and other common infectious diseases HIV/AIDS and tuberculosis |
|--|--|



- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Rheumatic heart disease Ischemic heart disease Cerebrovascular disease | <ul style="list-style-type: none"> Hypertensive heart disease Cardiomyopathy and myocarditis Atrial fibrillation and flutter Aortic aneurysm | <ul style="list-style-type: none"> Peripheral vascular disease Endocarditis Other cardiovascular and circulatory |
|--|--|---|



GBD 2015 STUDY: A CAUTIONARY NOTE

CVD mortality shows less decline in the past 5 years than >25 years. This trend is not limited to only HIC. Regions with very high rates that declined rapidly, have revealed moderation in decline. Rising rates of obesity and air pollution may have increased CVD risk. A crowning achievement for public health is no longer apparent in many regions.

Any broad conclusions on the global influence of socio- economic development must be tempered by the fact that rapid increases in CVD burden have occurred due to a diverse and evolving set of health risks. Economic crises in Eastern Europe in the 1990s and excessive use of alcohol was a major contributor. South Africa experienced increased mortality in 2000 due to “colliding” epidemics of HIV/AIDS.



GBD in Middle Eastern Region

- There was a much larger jump in the death rate from diabetes, the rate of deaths from diabetes-related kidney disease alone rose by 179%.
- Poorer countries, including Yemen, Djibouti, and Iraq, continue to struggle with a high communicable disease burden.
- The rapid shifts in disease burden place poor in LMIC at high risk of not having access to appropriate services and incurring payments for health care that push them deeper into poverty.
- Among the starkest changes was a 1,027% increase in deaths from war, terrorism and state-sanctioned punishment for crimes.

To compensate for a lack of hard numbers, imputations have been performed, hence the margins of error could be wide.



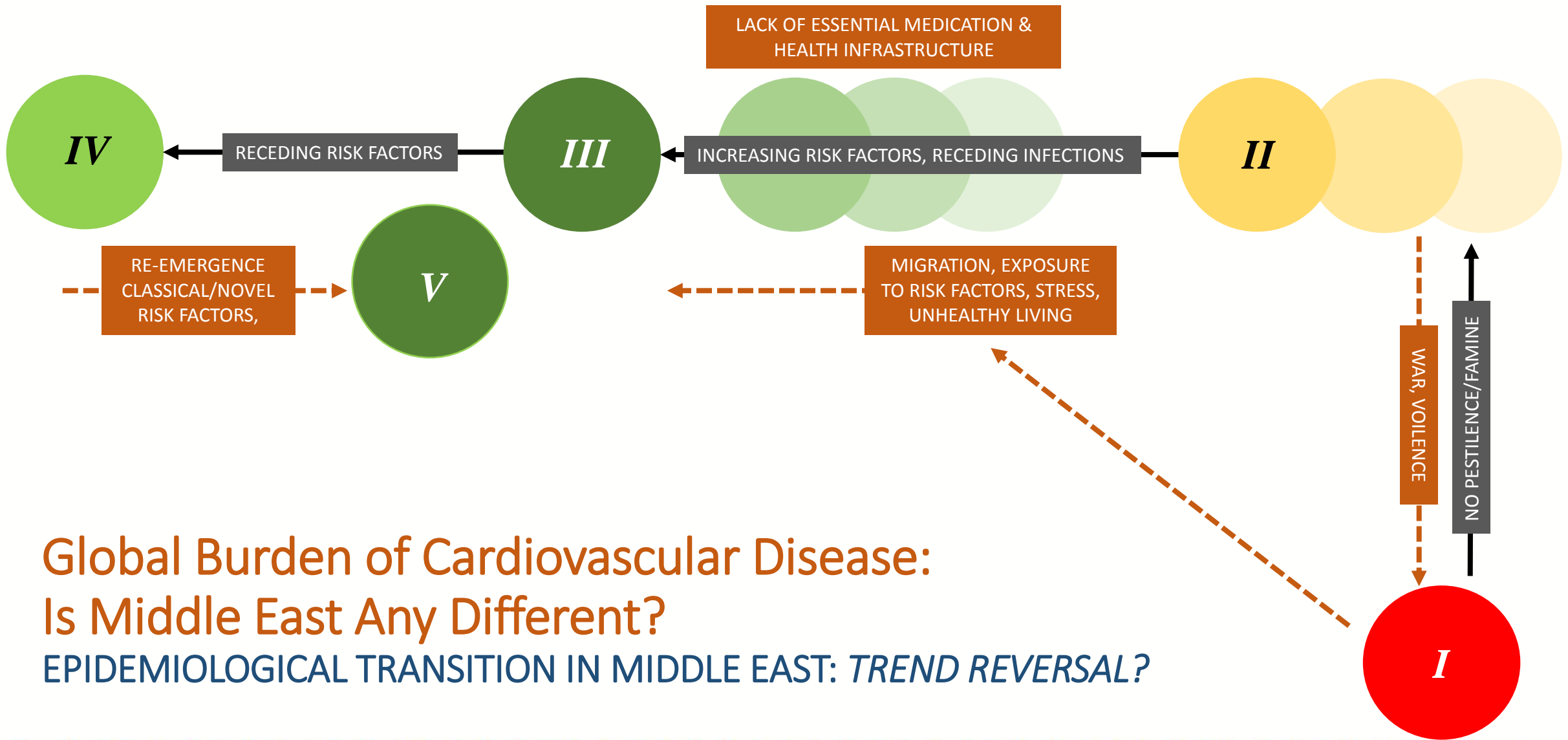
In Middle East and North Africa, Health Challenges are Similar to Those in Western Countries

GBD 2010: Generating Evidence, Guiding Policy for Middle East and North Africa Region



- CVD is the biggest killer in the region, just as it is worldwide. In 2015, CVD were responsible for 34% of all deaths in the Middle Eastern region.
- IHD 44%↑, Stroke 35%↑, Diabetes 87%↑
- Low back pain: 77%↑, Major depressive disorder 58%↑, Road injuries 46%↑
- LRI 47%↓, Preterm birth complications 23%↓, Congenital anomalies 36%↓, Diarrheal diseases 69%↓.
- Top 10 risk factors for premature death and disability and %change 1990-2010:
Dietary risks 64%↑, HBP 59%↑, High BMI 138%↑, Smoking 10%↑, High FBS 66%↑, High TC 51%↑, Occupational risk 38%↑
Physical activity ?, pollution ?



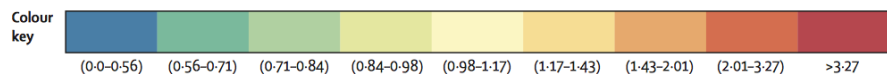


Global Burden of Cardiovascular Disease: Is Middle East Any Different?

EPIDEMIOLOGICAL TRANSITION IN MIDDLE EAST: *TREND REVERSAL?*



Leading 10 causes of YLL with the ratio of observed-to-expected YLL in 2015 in the Middle East & North Africa



	1	2	3	4	5	6	7	8	9	10
Global	IHD (0.98)	Stroke (0.98)	LRI (0.67)	NN preterm (0.72)	Diarrhoea (0.74)	NN encephalitis (1.18)	HIV (0.63)	Road injuries (0.78)	Malaria (4.98)	COPD (1.34)
North Africa and Middle East	IHD (1.2)	War (2001.28)	NN preterm (0.79)	Congenital (1.21)	Road injuries (0.98)	Stroke (0.87)	LRI (0.52)	Diabetes (0.97)	Diarrhoea (0.33)	CKD (1.02)
Afghanistan	War (2145.26)	LRI (0.7)	IHD (4.49)	Congenital (1.6)	Stroke (2.22)	NN preterm (0.76)	Road injuries (2.41)	Oth Unint (11.93)	Diarrhoea (0.23)	Violence (4.04)
Algeria	IHD (0.67)	NN preterm (0.75)	Stroke (0.72)	Road injuries (0.68)	Congenital (0.91)	Diabetes (0.85)	LRI (0.31)	NN sepsis (1.57)	CKD (0.79)	NN encephalitis (0.49)
Bahrain	IHD (0.81)	Diabetes (4.21)	Road injuries (0.58)	Congenital (0.84)	Self-harm (0.37)	CKD (1.54)	Stroke (0.33)	LRI (0.57)	Breast C (0.98)	NN preterm (0.58)
Egypt	IHD (1.39)	Congenital (1.32)	Stroke (1.08)	LRI (0.78)	Cirr hep C (7.38)	NN preterm (0.47)	Road injuries (0.47)	CKD (1.29)	Diabetes (0.92)	CMP (4.07)
Iran	IHD (1.3)	Road injuries (1.75)	Stroke (0.78)	Congenital (1.05)	NN preterm (0.95)	HTN HD (3.19)	Other cardio (2.86)	LRI (0.55)	Self-harm (0.51)	Diabetes (0.87)
Iraq	War (5558.67)	IHD (1.92)	Congenital (1.23)	NN preterm (0.7)	Stroke (1.18)	NN sepsis (2.44)	Road injuries (0.67)	LRI (0.4)	Violence (2.27)	Diabetes (1.48)
Jordan	Congenital (1.1)	IHD (0.7)	Road injuries (0.68)	NN preterm (0.69)	LRI (0.58)	Stroke (0.45)	Diabetes (1.18)	CKD (1.07)	NN sepsis (1.72)	NN encephalitis (0.48)
Kuwait	IHD (1.98)	Congenital (2.02)	Road injuries (1.43)	NN preterm (2.89)	Stroke (0.77)	LRI (1.21)	Self-harm (0.17)	CKD (1.3)	Breast C (0.73)	Diabetes (1.4)
Lebanon	IHD (1.07)	Stroke (0.45)	Congenital (0.97)	Lung C (0.78)	Diabetes (1.39)	Road injuries (0.43)	Colorect C (0.85)	Alzheimer's (1.17)	Breast C (1.09)	CKD (0.84)
Libya	War (6283.28)	IHD (0.96)	Road injuries (0.83)	Congenital (1.08)	Stroke (0.75)	Other transport (11.51)	NN preterm (0.61)	LRI (0.38)	CKD (1.01)	Lung C (1.02)
Morocco	IHD (0.62)	NN preterm (0.56)	Stroke (0.51)	Diabetes (1.41)	Road injuries (0.6)	Congenital (0.75)	LRI (0.27)	NN encephalitis (0.42)	Lung C (1.48)	CKD (0.8)
Palestine	IHD (1.36)	NN preterm (0.68)	Congenital (0.84)	Road injuries (0.49)	Stroke (0.71)	LRI (0.26)	CKD (1.32)	NN sepsis (0.93)	NN encephalitis (0.29)	Violence (0.81)
Oman	Road injuries (1.65)	IHD (0.8)	Other cardio (5.29)	Congenital (0.67)	Diabetes (2.06)	LRI (0.79)	Stroke (0.47)	NN preterm (0.51)	Other NN (1.73)	Self-harm (0.21)
Qatar	Road injuries (1.58)	IHD (0.63)	Congenital (1.16)	Self-harm (0.27)	Diabetes (2.48)	NN preterm (1.59)	Stroke (0.45)	Falls (1.17)	Mech (1.21)	Breast C (1.17)
Saudi Arabia	IHD (0.85)	Road injuries (1.29)	Congenital (1.26)	NN preterm (1.08)	Stroke (0.57)	LRI (0.66)	CKD (1.42)	NN sepsis (3.78)	Self-harm (0.22)	Falls (1.04)
Sudan	NN preterm (1.22)	Congenital (1.59)	IHD (1.66)	LRI (0.52)	Road injuries (1.58)	Diarrhoea (0.51)	Stroke (1.08)	NN encephalitis (0.3)	Other NN (0.89)	HIV (0.26)
Syria	War (26105.82)	IHD (1.39)	Stroke (0.91)	Congenital (0.76)	LRI (0.33)	Road injuries (0.36)	NN preterm (0.19)	NN encephalitis (0.33)	Asthma (1.54)	Alzheimer's (1.33)
Tunisia	IHD (0.46)	Stroke (0.62)	Diabetes (1.33)	Road injuries (0.59)	Congenital (0.79)	Lung C (1.23)	NN preterm (0.59)	LRI (0.42)	CKD (0.72)	Alzheimer's (1.16)
Turkey	IHD (0.56)	Congenital (1.0)	Stroke (0.42)	Lung C (1.2)	NN preterm (0.85)	Road injuries (0.51)	COPD (0.79)	Alzheimer's (1.38)	Diabetes (0.65)	LRI (0.32)
United Arab Emirates	IHD (2.73)	Road injuries (3.54)	Stroke (2.25)	CKD (3.87)	COPD (4.24)	Diabetes (3.39)	Self-harm (0.22)	Falls (2.15)	Congenital (1.18)	Med treat (12.7)
Yemen	War (2398.83)	NN preterm (1.05)	IHD (2.11)	Congenital (1.37)	Road injuries (1.55)	LRI (0.38)	Stroke (1.19)	Diarrhoea (0.28)	Other NN (0.79)	NN encephalitis (0.25)

Chronic diseases spike in Middle East as conflicts rage

Rising rates of chronic disease and deaths from violence can be curbed only if fighting is brought to an end

Amy Maxmen, NATURE, 04 August 2017



Ibrahim Hassan, Ramtha, Jordan,
DP from Syria

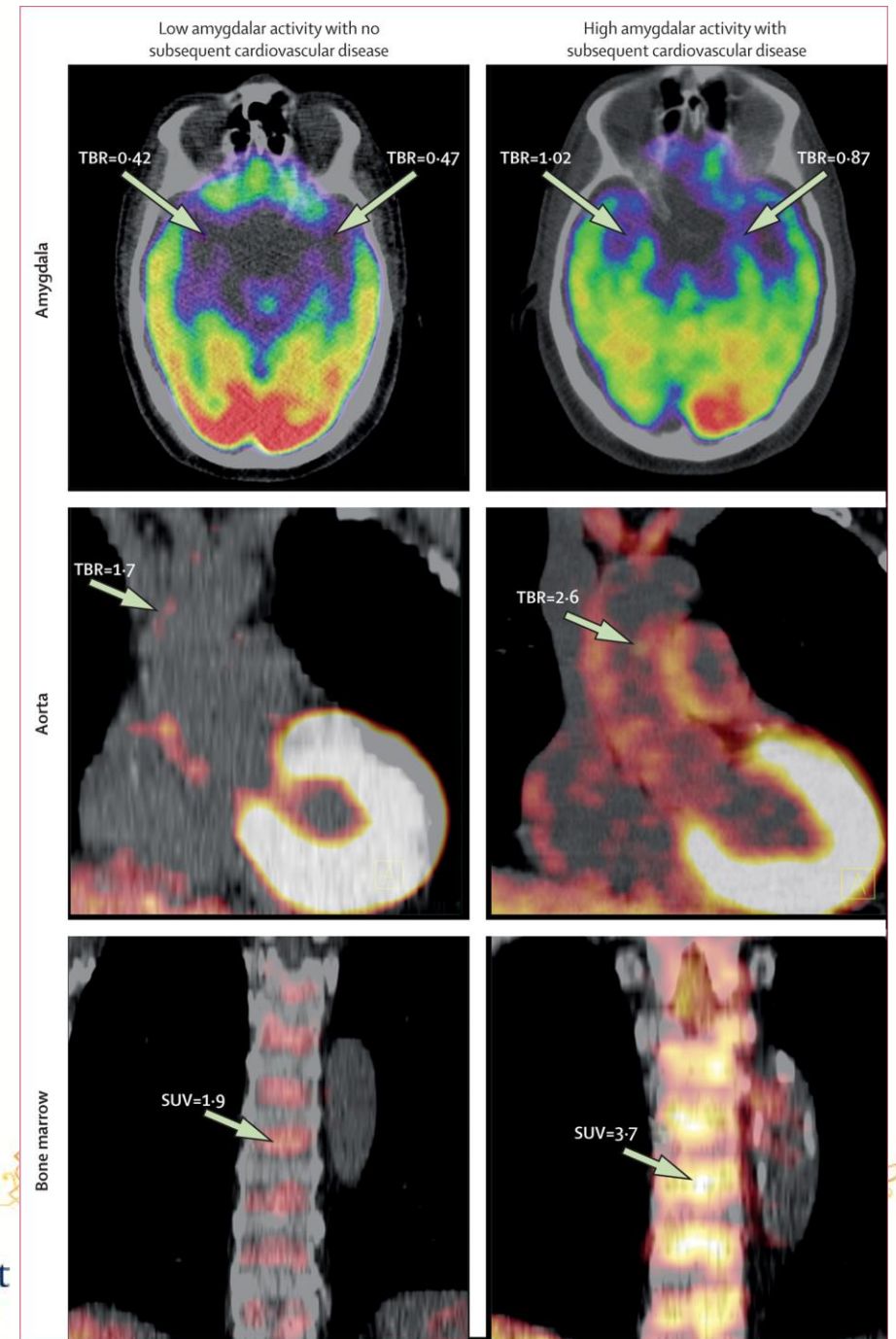
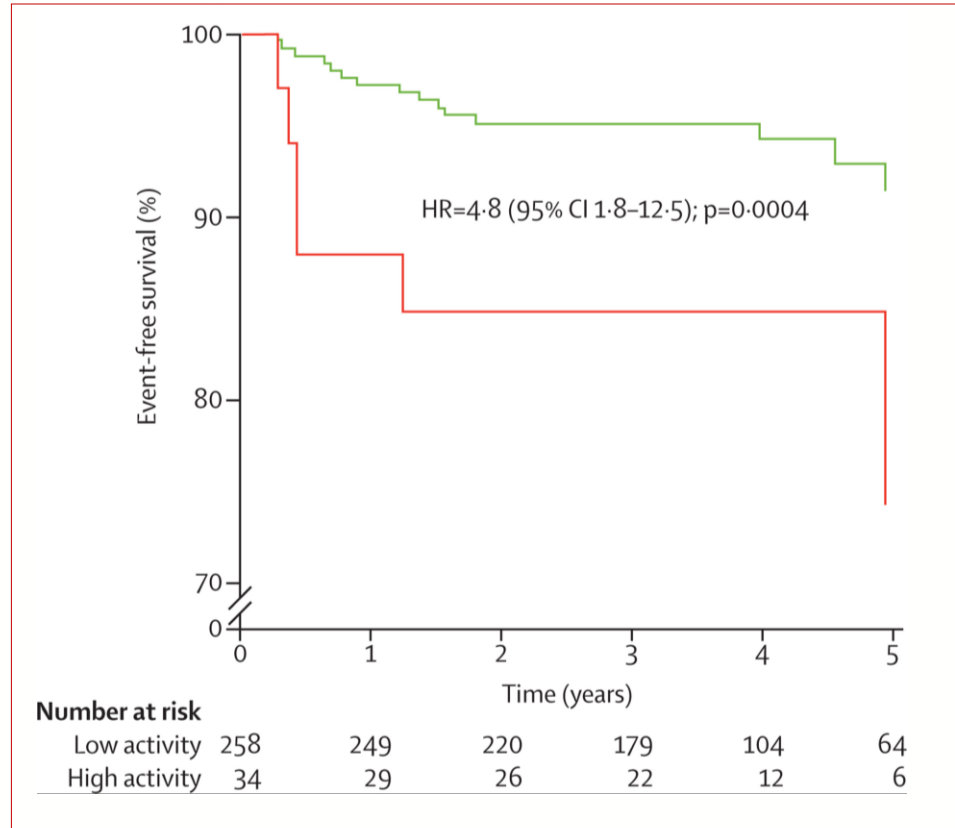
Across the Middle East, deaths resulting from violence grew by >1000% between 1990 and 2015; the increase accelerated especially after the Arab spring movement and wars in Syria and Iraq.

At the same time, the incidence of many chronic diseases arose dramatically; the death rate from diabetes grew >200%. Generations of people are being exposed to shock and stress that will impact their health throughout life, given a strong link between mental health and diabetes and CVD. Stressed are less likely to stop smoking, seek medical care, or eat a balanced diet.

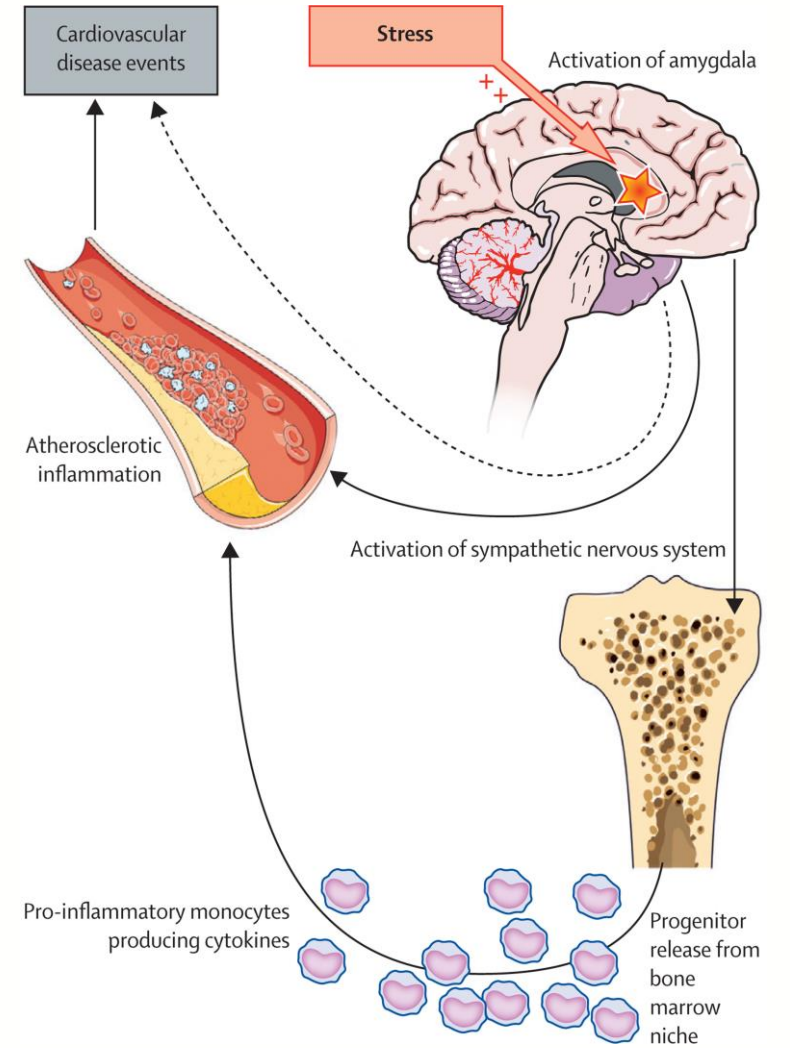
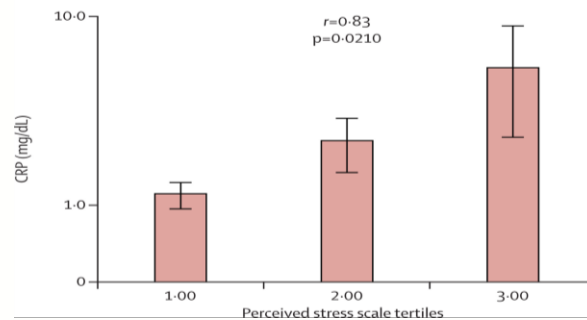
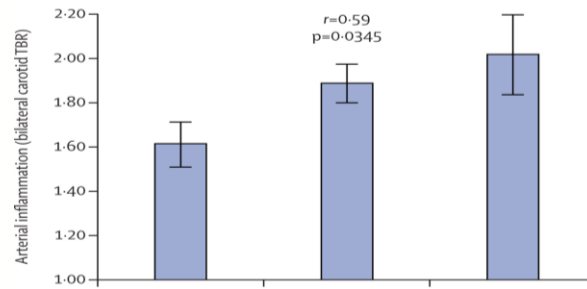
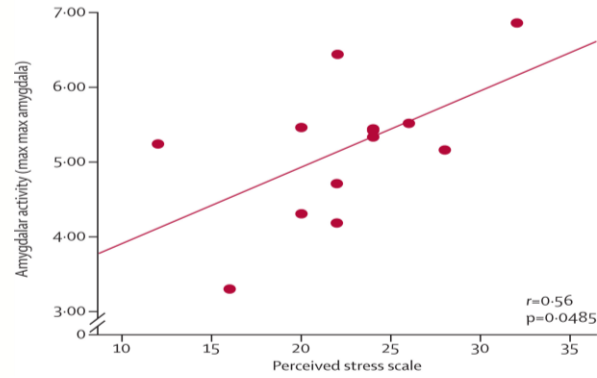


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Amygdalar Activity and Mental Stress



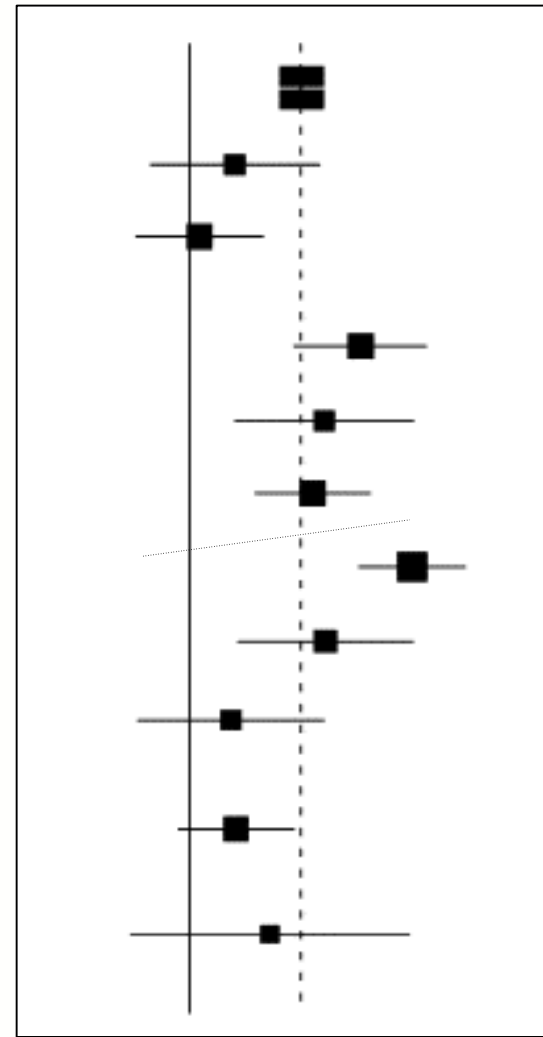
STRESS – MARROW ACTIVATION & PLAQUE INFLAMMATION



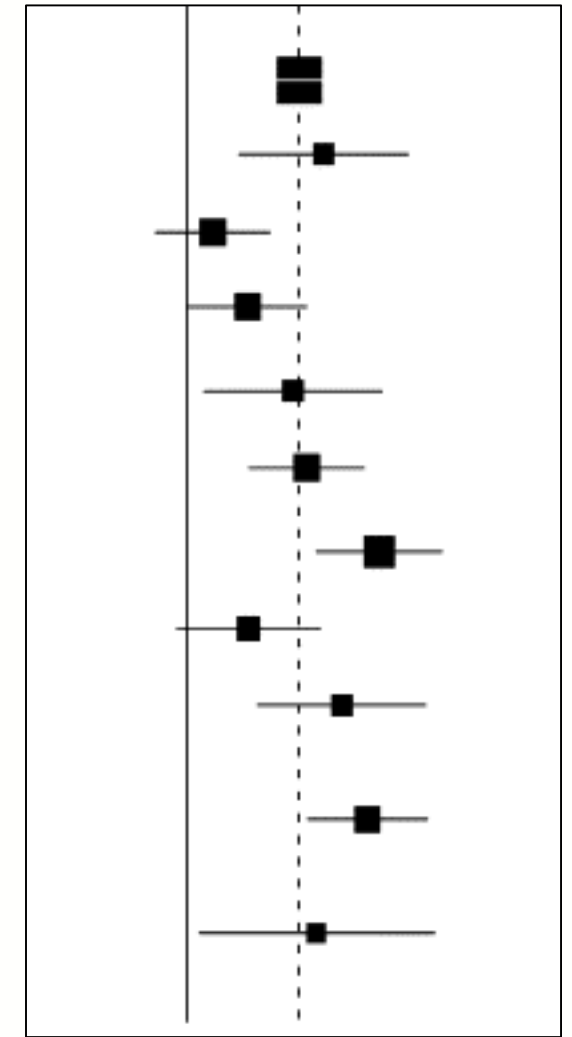
INTERHEART

STRESS & MACE

Region	Number
Overall	24767
Western Europe	1375
Central and eastern Europe	3473
Middle East	2892
Africa	1259
South Asia	3300
China and Hong Kong	5894
Asia	1921
Australia and New Zealand	1255
South America and Mexico	2783
North America	615



STRESS



DEPRESSION



INTER-HEART STUDY

52 Countries, 27K Subjects

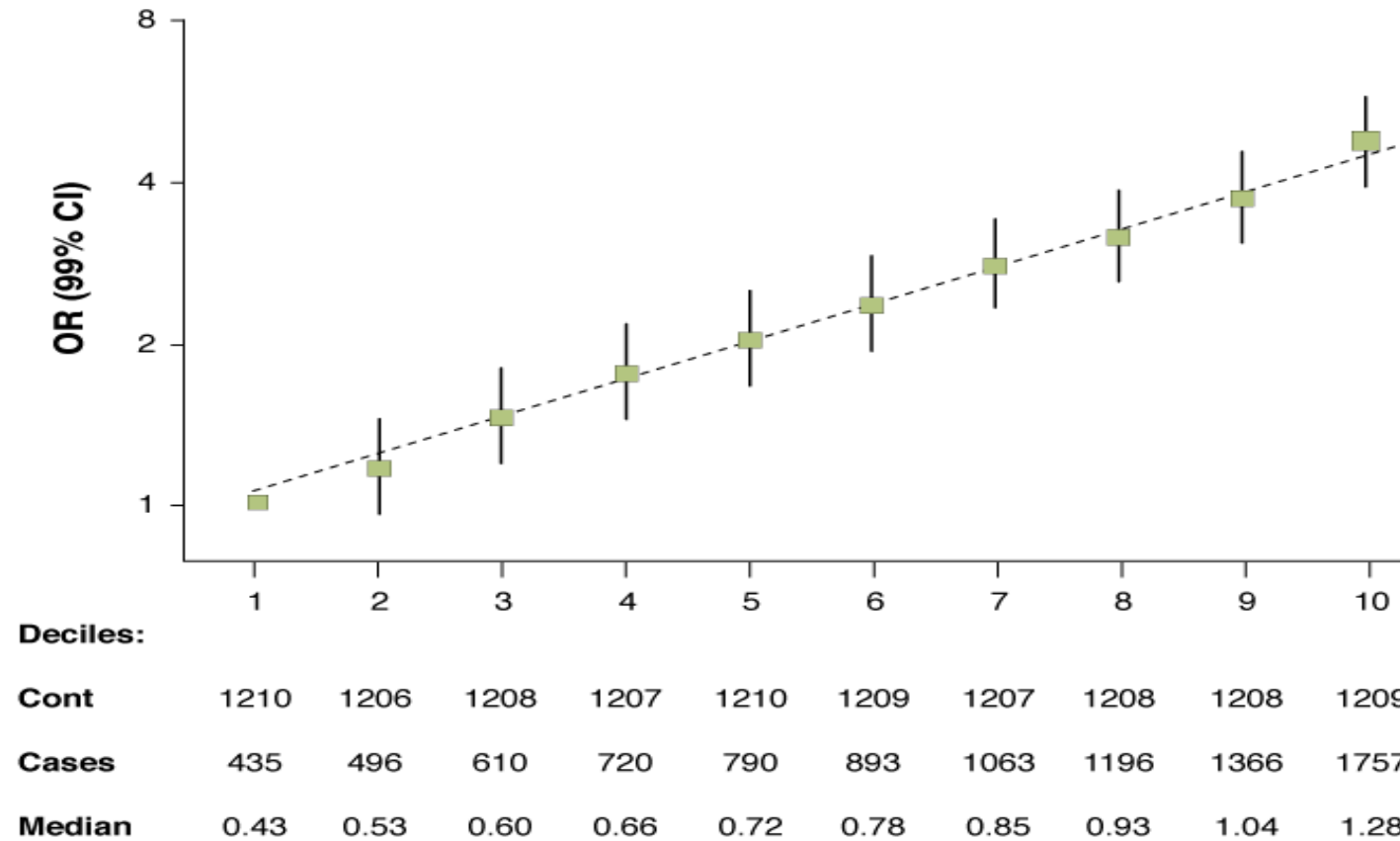
RF	Lipid	Smoke	HTN	DM	Obese	Psych	V&F	Alc	PE
OR	3.25	2.37	1.91	2.37	1.12	2.67	-0.7	-0.86	-0.91
PAR	49.2	35.7	17.2	9.9	20.1	32.5	13.7	12.2	6.7
	→ 66		→ 75		→ 90+				

Yusuf et al. Lancet 2006



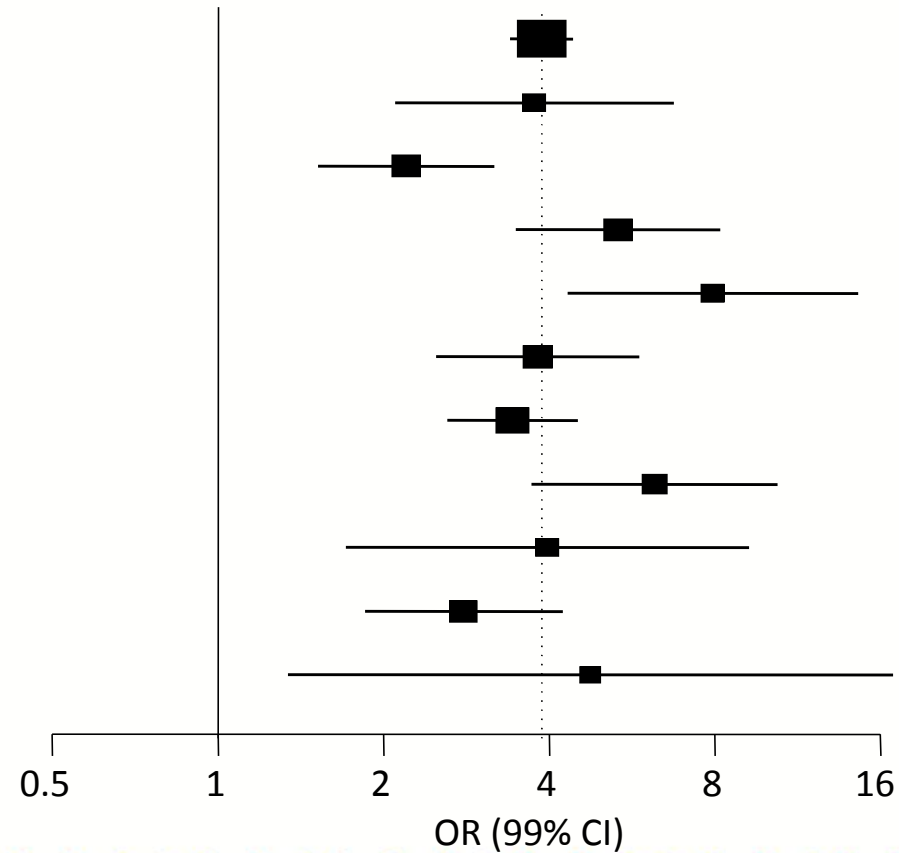
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INTERHEART: Apo B/A-1 and MI



INTERHEART: ApoB/ApoA-1 and MI (top quintile vs. lowest quintile)

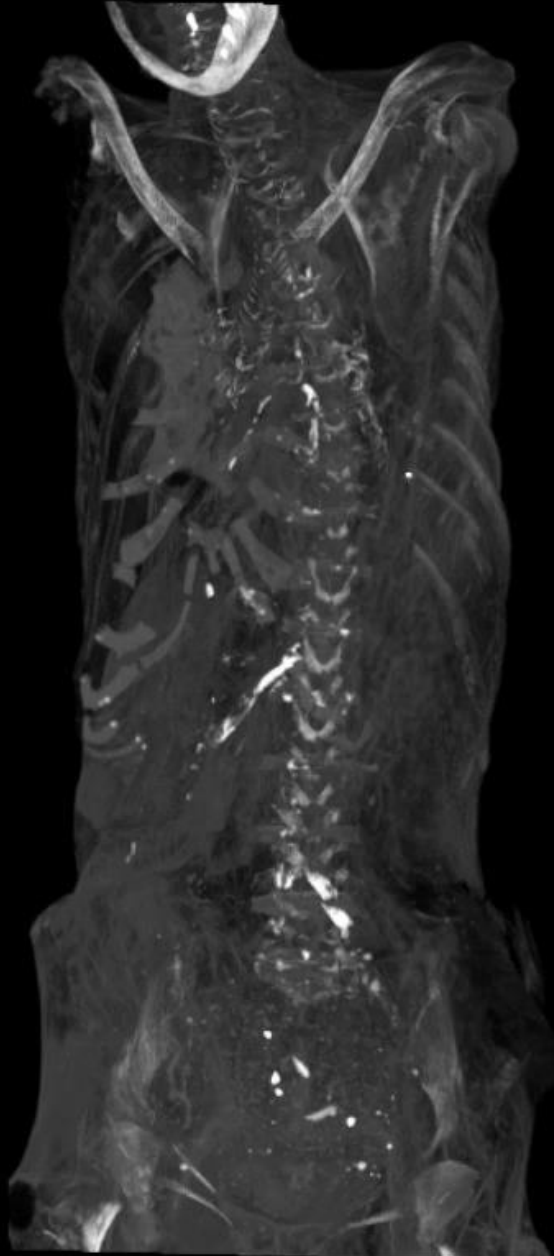
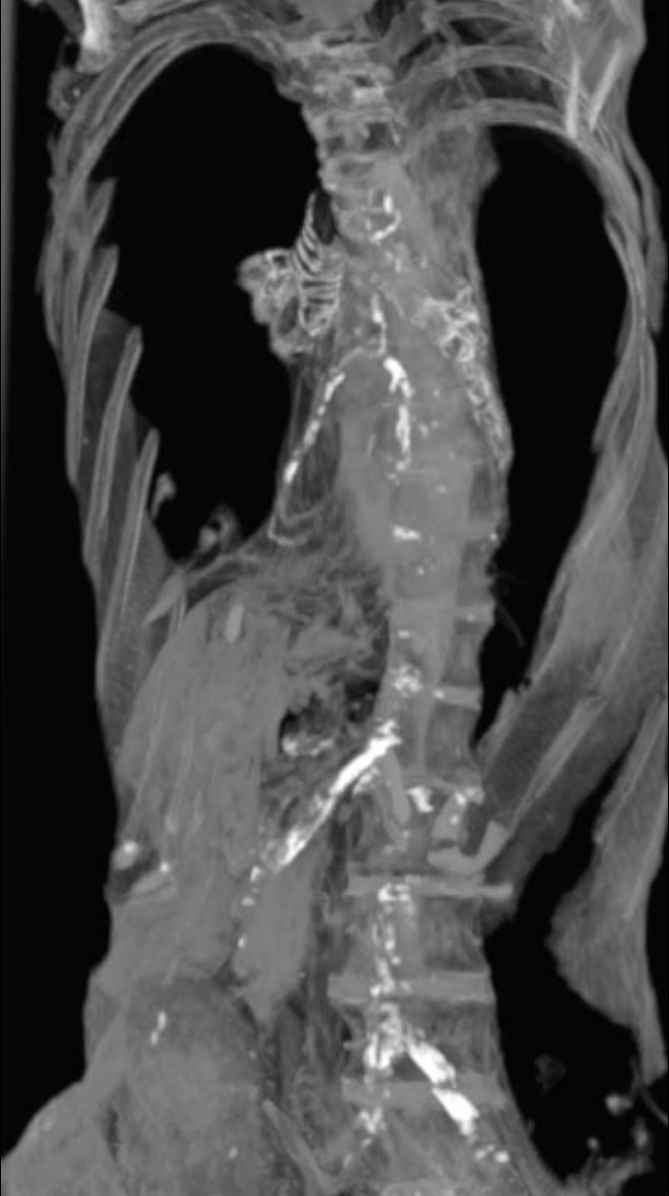
Region	N
Overall	21408
Western Europe	1047
Central & Eastern Europe	2618
Middle-Eastern Countries	3291
Africa	1037
South Asia	2820
China/Hong Kong	5400
Southeast Asia	1858
Australia/New Zealand	487
South America	2644
North America	206



Hatiay, male scribe, died 45-50 yrs,
New Kingdom, 1570–1293 BCE

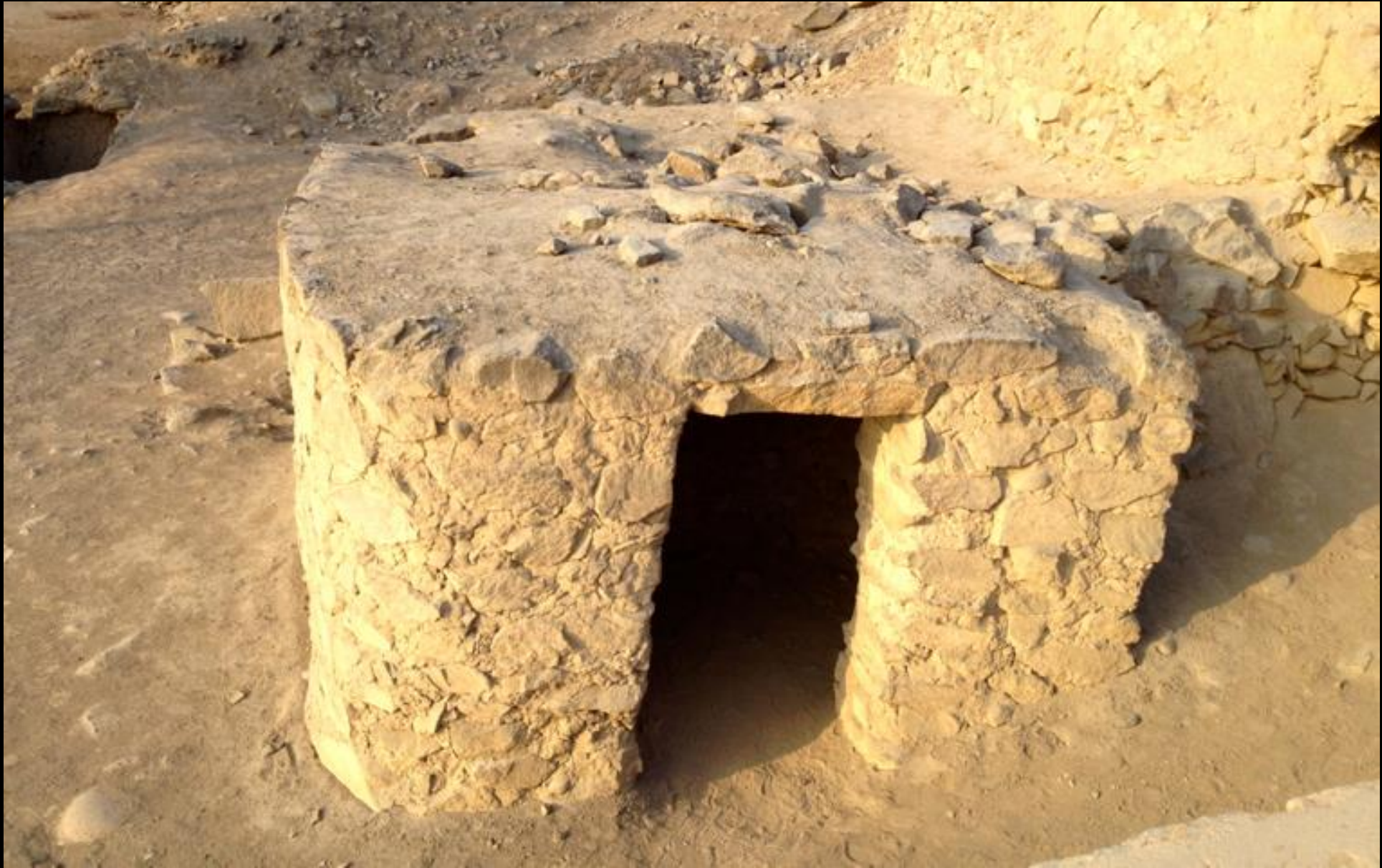


RP



LA

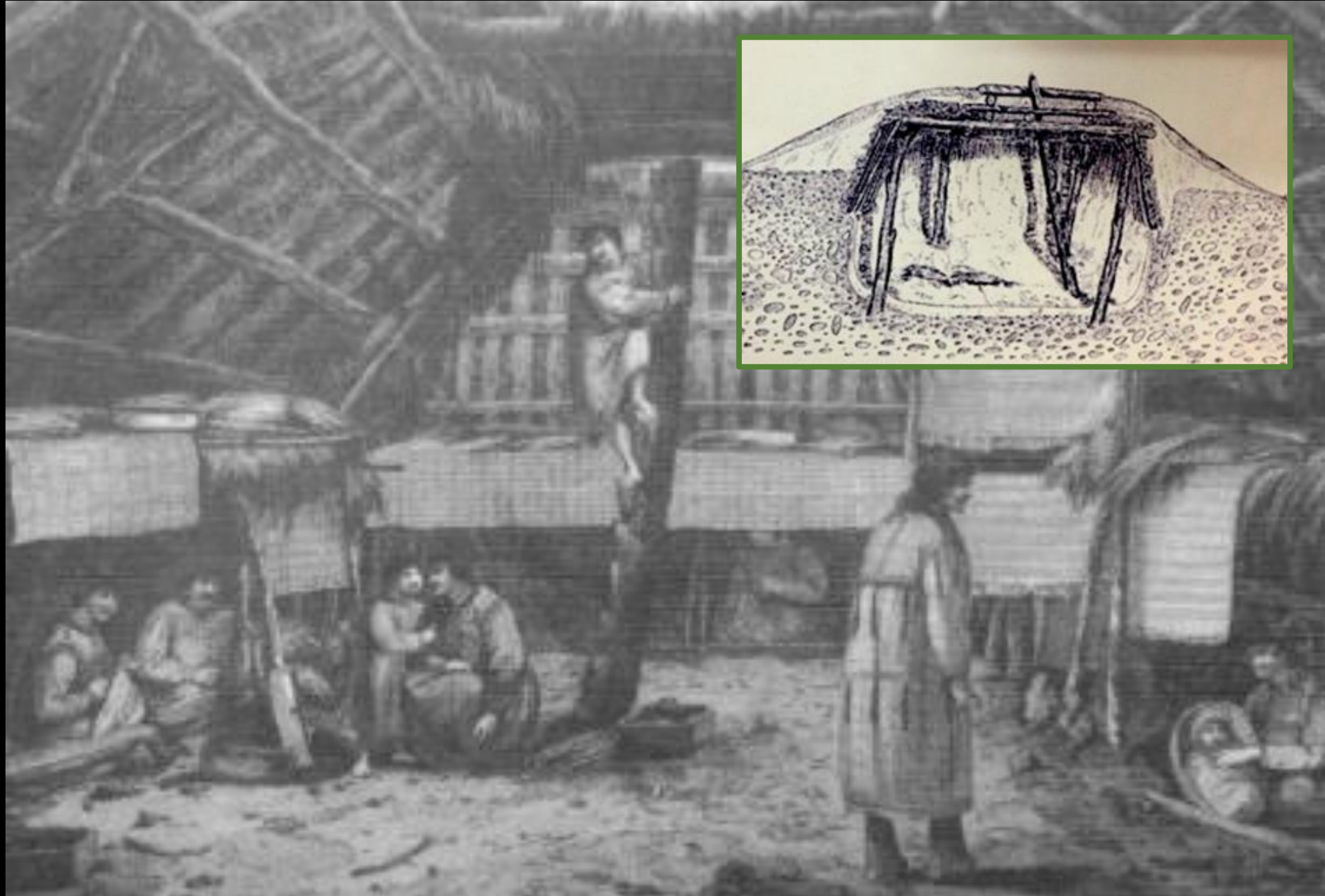
Vascular Calcification and Atherosclerosis, PERU 1000 AD



Aleutian Island, 1756-1930 CE The Unangan Hunter Gatherers

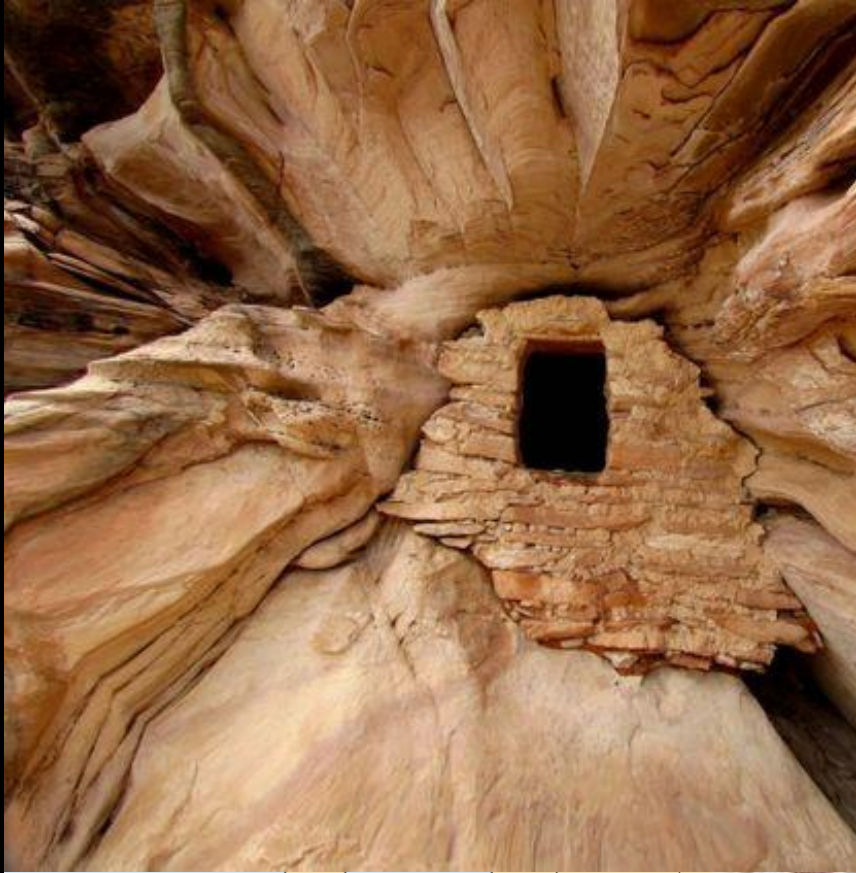


Aleutian Island; 1756-1930 CE



Anasazi Puebloans

Southeastern Utah, Northeastern Arizona, Northwestern New Mexico and Southwestern Colorado

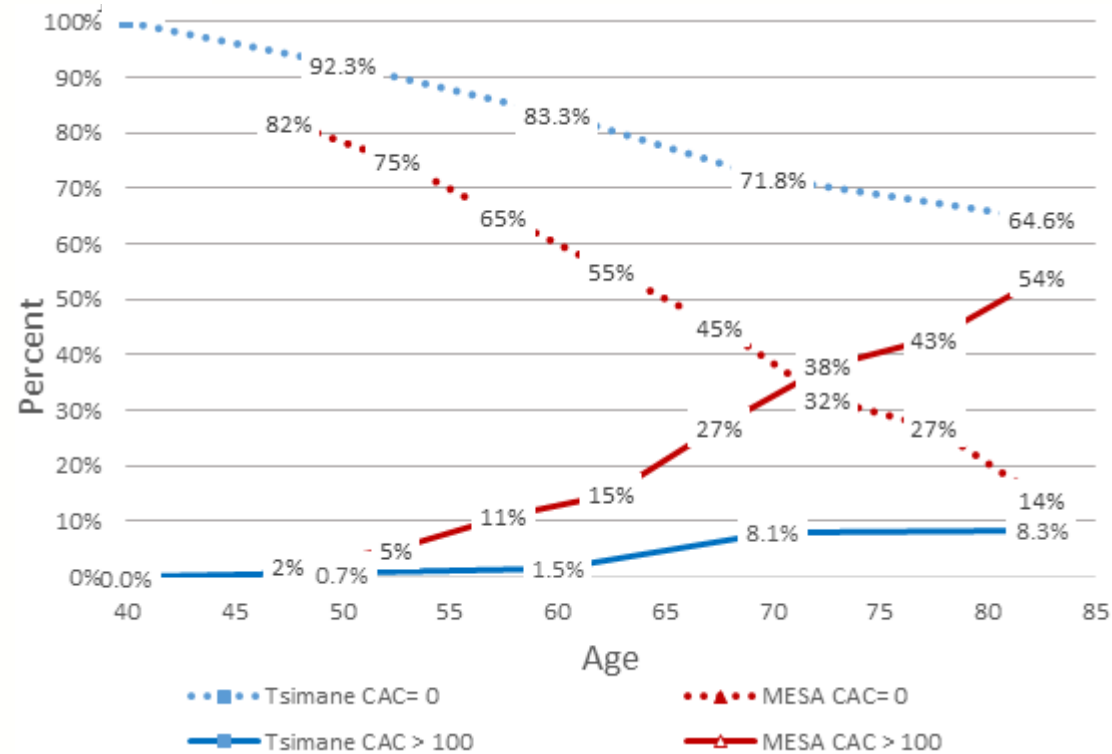


Seeking Living Population with Low Atherosclerotic Burden Bolivian Amazon...



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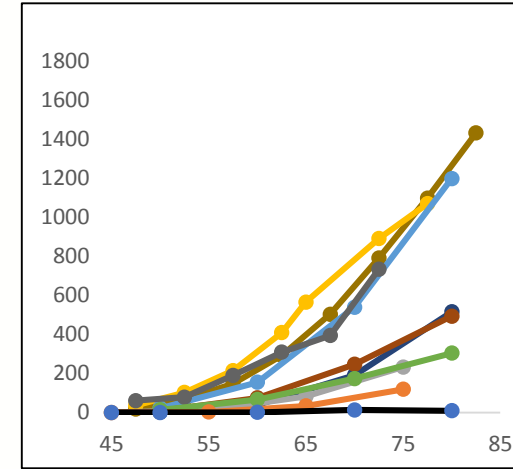
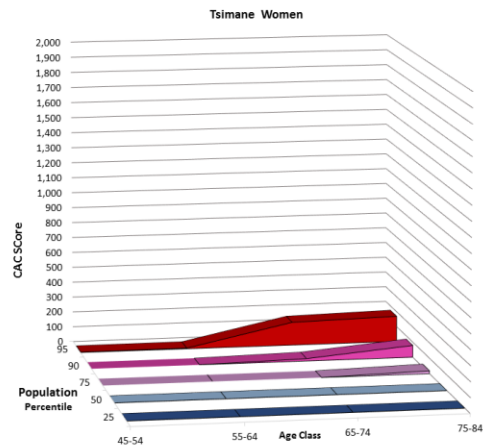
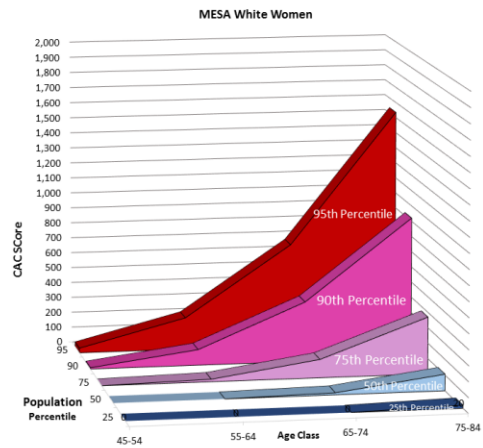
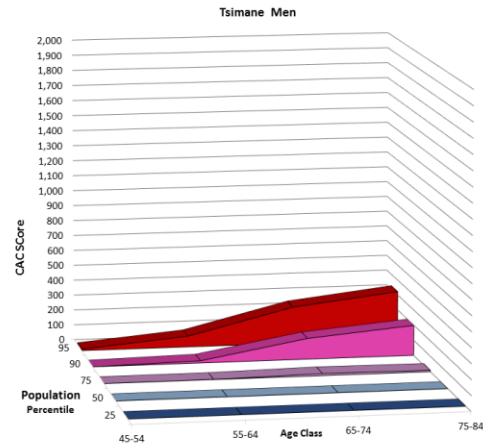
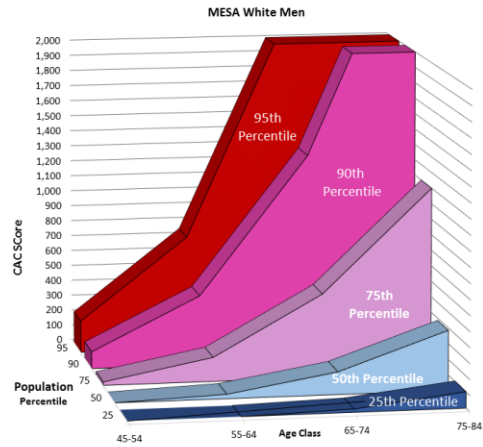
Coronary Calcium Scores by Age in US and Tsimane Samples



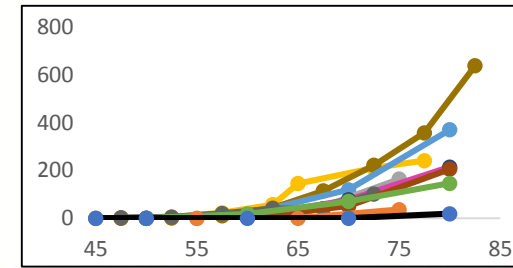
CACS ABSENT VS. ≥ 100 FOR US [MESA] AND TSIMANE SAMPLES. THE POINTS FOR EACH AGE REPRESENT THE MID-POINTS OF 5-YEAR AGE-GROUPS FOR MESA AND 10-YEAR FOR TSIMANE. THE LAST POINT FOR TSIMANE AT AGE 81.3 CORRESPONDS TO THE 75+ GROUP THAT INCLUDES NUMEROUS INDIVIDUALS OF >85 YEARS



CACS by Age & CAC %ile in US and Tsimane Samples



USA: MAHI, UIC, MESA White, MESA Black, MESA Hispanic, Chinese
 European: HNR
 Korean, Japanese, TSIMANE

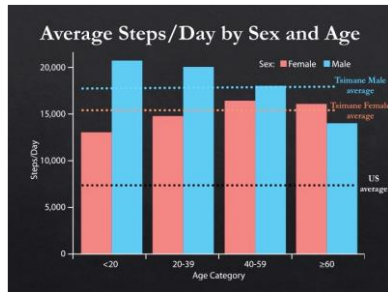


Kaplan et al. Lancet 2017



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CAN CORONARY ARTERY DISEASE BE ELIMINATED IN OUR LIFETIME?



15,000 steps/day
<10% sedentary time

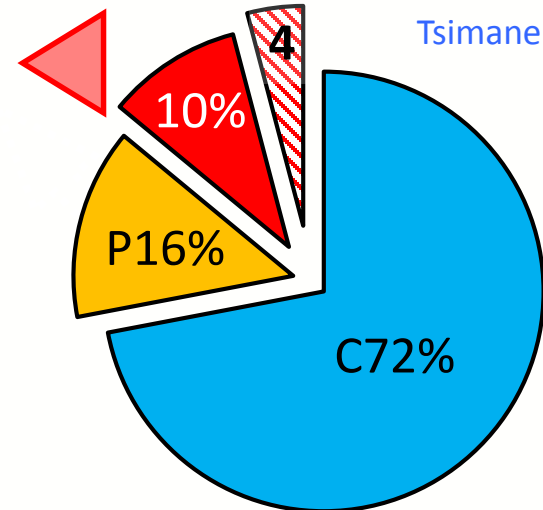
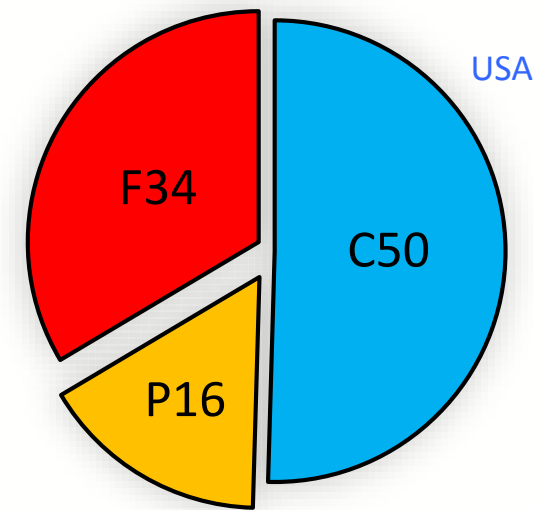


No air pollution

LDL 70
BP 116/73
FBS ≈79, BMI 24

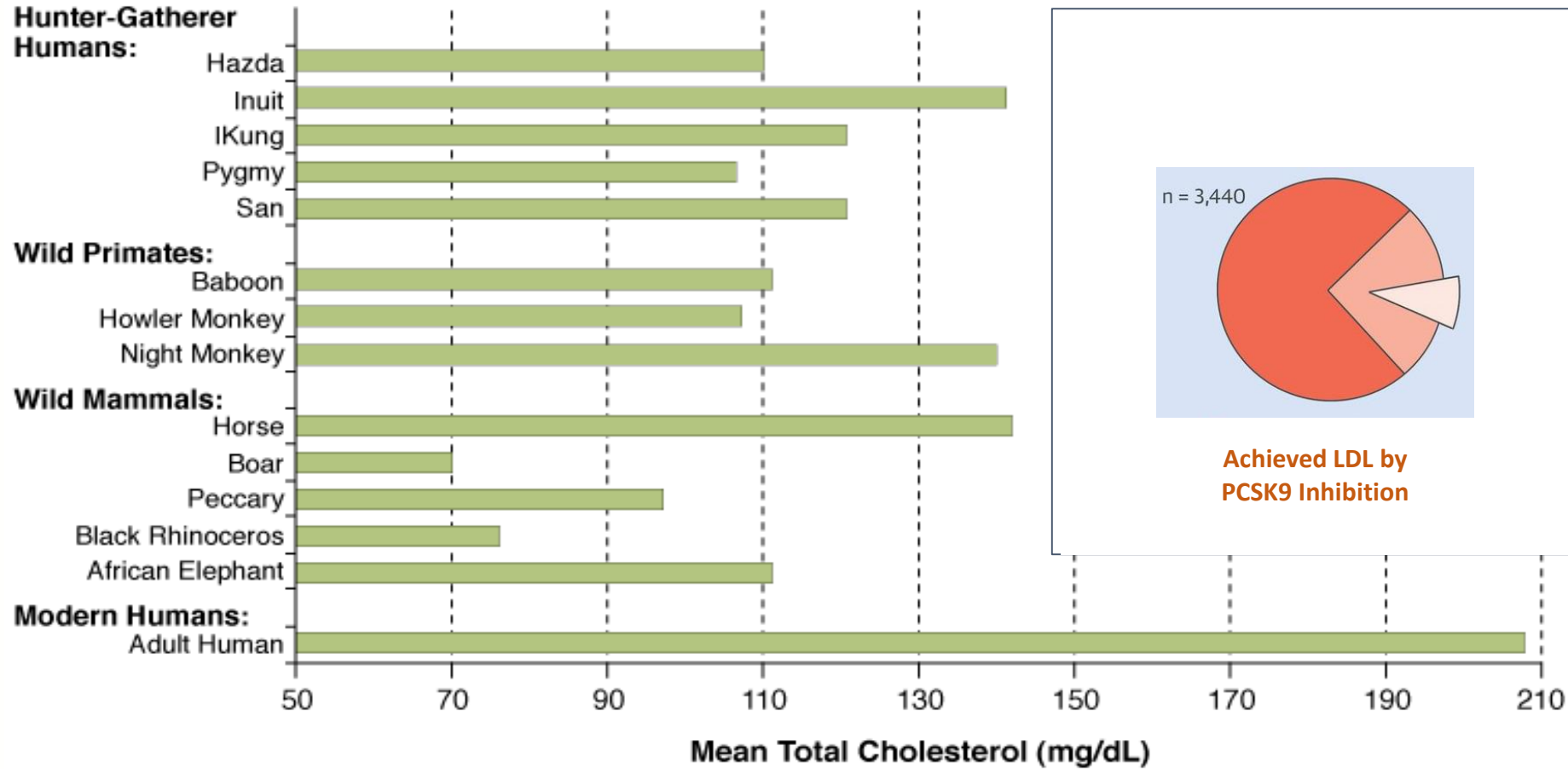


No or minimal CAC throughout life

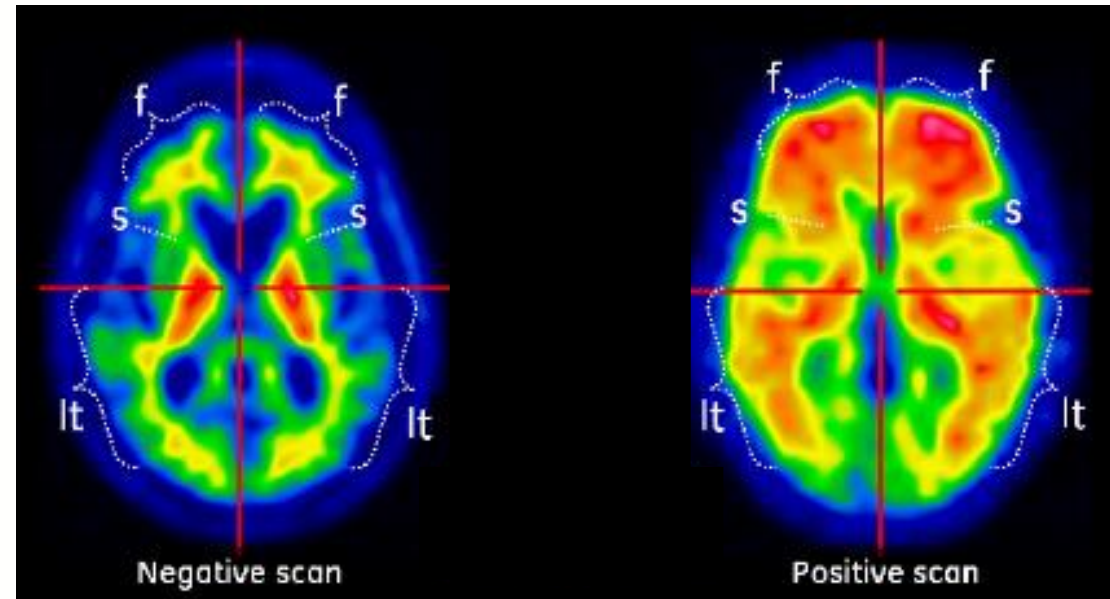


Very low sat fat, No trans fats
Minimal added sugar

WHAT IS THE IDEAL CHOLESTEROL LEVEL



Association Between Midlife Vascular Risk Factors and Estimated Brain Amyloid Deposition



Adjusted Odds Ratios for the Association of Midlife and Late-Life Vascular Risk Factors With Global Cortex SUVR >1.2 (N = 322)

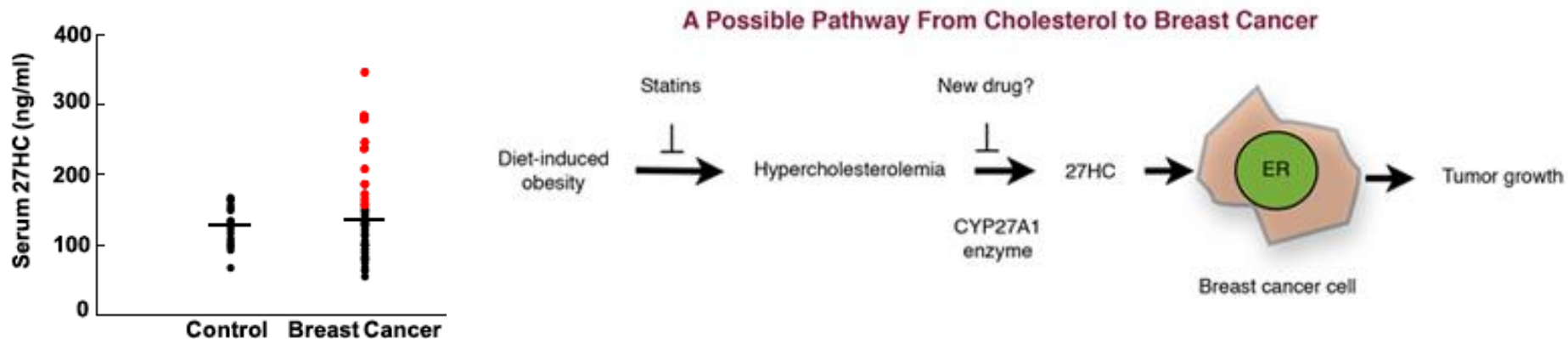
Risk Factors	Midlife (Study Visit 1, 1987-1989)			Late Life (Study Visit 5, 2011-2013)		
	No. With Vascular Risk Factor and SUVR >1.2/Total No. With Vascular Risk Factor (%)	No. Without Vascular Risk Factor and SUVR >1.2/Total No. Without Vascular Risk Factor (%)	Adjusted OR (95% CI) ^a	No. With Vascular Risk Factor and SUVR >1.2/Total No. With Vascular Risk Factor (%)	No. Without Vascular Risk Factor and SUVR >1.2/Total No. Without Vascular Risk Factor (%)	Adjusted OR (95% CI) ^a
Body mass index $\geq 30^b$	54/83 (65.1)	110/239 (46.0)	2.06 (1.16-3.65)	66/121 (54.6)	98/201 (48.8)	1.44 (0.85-2.44)
Current smoking	30/55 (54.6)	134/267 (50.2)	1.15 (0.61-2.19)	9/16 (56.3)	155/306 (50.7)	1.53 (0.50-4.62)
Hypertension	55/95 (57.9)	109/227 (48.0)	1.30 (0.75-2.28)	125/230 (54.4)	39/92 (42.4)	1.29 (0.74-2.26)
Diabetes	10/20 (50.0)	154/302 (51.0)	1.06 (0.39-2.86)	68/130 (52.3)	96/192 (50.0)	1.06 (0.65-1.74)
Total cholesterol ≥ 200 mg/dL	101/180 (56.1)	63/142 (44.4)	1.33 (0.82-2.19)	54/94 (57.5)	110/228 (48.3)	1.17 (0.67-2.05)

Gottesman R et al. JAMA 2017;317:1443-1450



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Cholesterol & Breast Cancer



European Society of Cardiology > The ESC > ESC Press Office > Press releases



Study suggests statins associated with lower rates of breast cancer and mortality

28 Aug 2017

Topic(s): *Cardio-Oncology*;

Barcelona, Spain - 28 Aug 2017: A 14 year study in more than one million people has found that women with



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Heart Healthy in the Amazon, NY Times April 6, 2017

The Death of Diseases

That our grand children will not know what CVD is, and ask us ...”
Granpa or Granma... it must have been a terrible time when there were all those nasty diseases....plague, small pox, polio and heart disease...Why did those diseases die?”

- Salim Yusuf 2012

Addressing the Rise in Chronic Diseases in Middle East

But a significant improvement is unlikely in areas where conflict continues. People are resilient, and we should be optimistic that the medical sectors can rebuild, but must remain equally pessimistic because there is no end in sight to the war. *The best intervention IS TO STOP the violence.*

- Ali Mokdad [IHME] Nature 2017



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