A Scientific & Funding Challenge
Disease to Health, Aging to Birth

The Heart & The Brain (3)

Vienna, June 16, 2016

No Disclosures

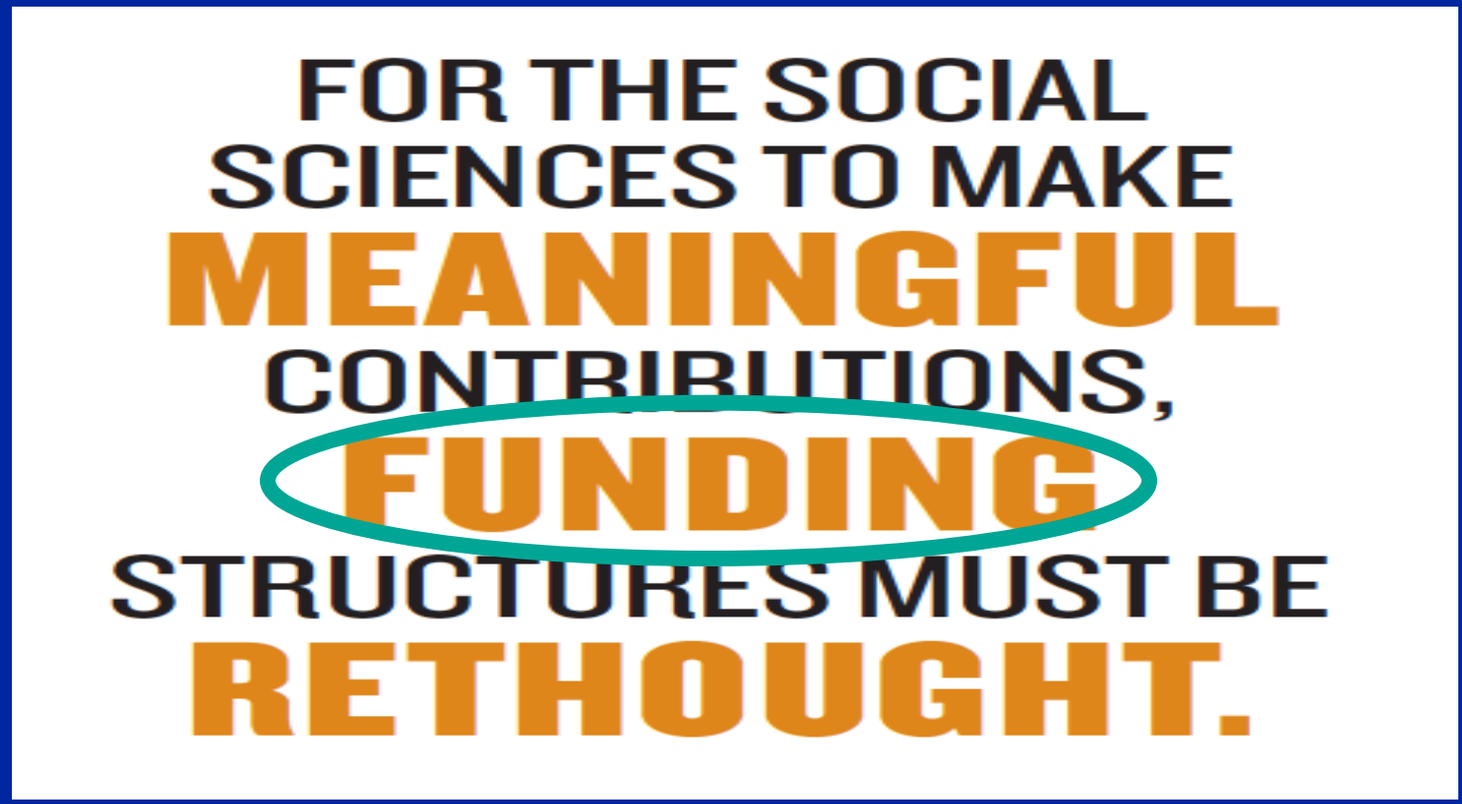
NHLBI Strategic Agenda - 2025

Goal 1: Human Health	To expand knowledge of the molecular and physiological mechanisms governing the normal function of HLBS systems as essential elements for sustaining human health.
Goal 2: Human Disease	To extend our knowledge of the pathobiology of HLBS disorders and enable clinical investigations that advance the prediction, prevention, preemption, treatment, and cures of human diseases.
Goal 3: Translational Research	To facilitate innovation and accelerate research translation, knowledge dissemination, and implementation science that enhances public health.
Goal 4: Workforce and Resources	To develop and enable a diverse biomedical workforce equipped with the essential skills and research resources to pursue emerging opportunities in science.

M Lauer, GH Gibbons et. al. JACC 2015; 65: 1130 - **Environment**

Integration of social science into research is crucial

Social scientists must be allowed a full, collaborative role if researchers are to understand and engage with issues that concern the public, says **Ana Viseu**.



A Viseu. Nature 2015;525:291

Disease to Health - Aging (A) to Birth (B)

Present

1. Health (QoL)

Early Economic — Late Expensive

B ← A

Health Policy

4. Environment

0 — 25 — 50 — 100

B ← A

Prom. Health — Subcl. Disease — Stable Disease

2. Science

Our Future

3. Education

Window Young — Behav. Change — Adherence Simplicity

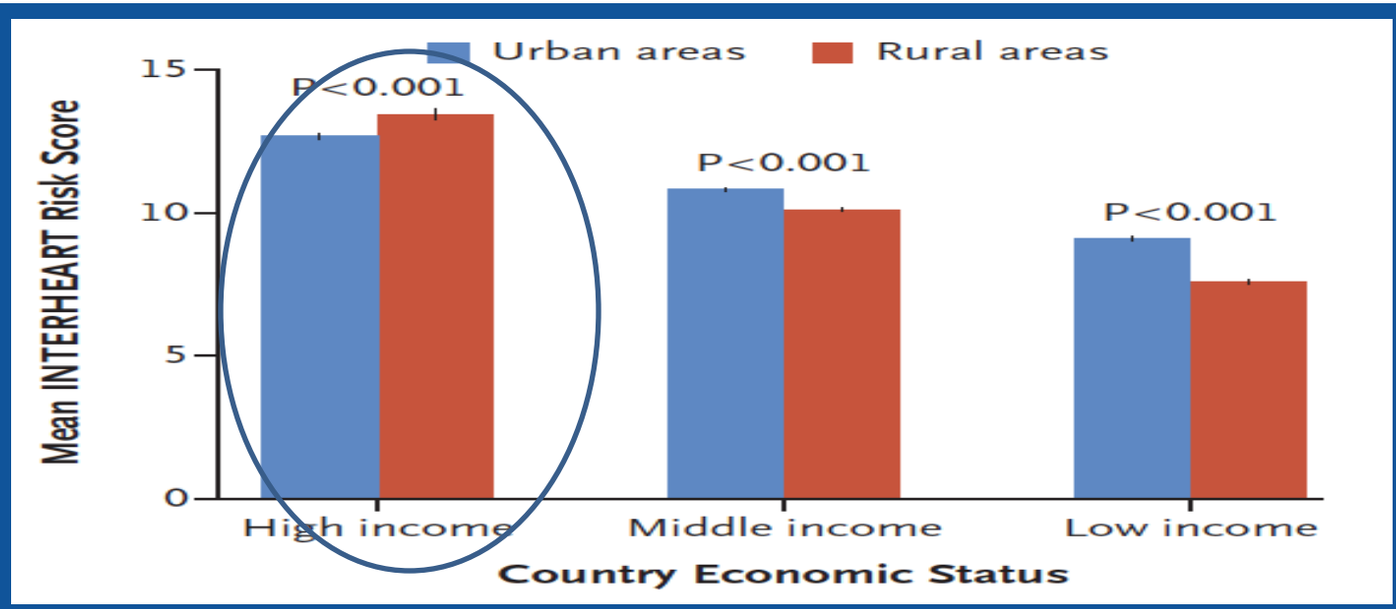
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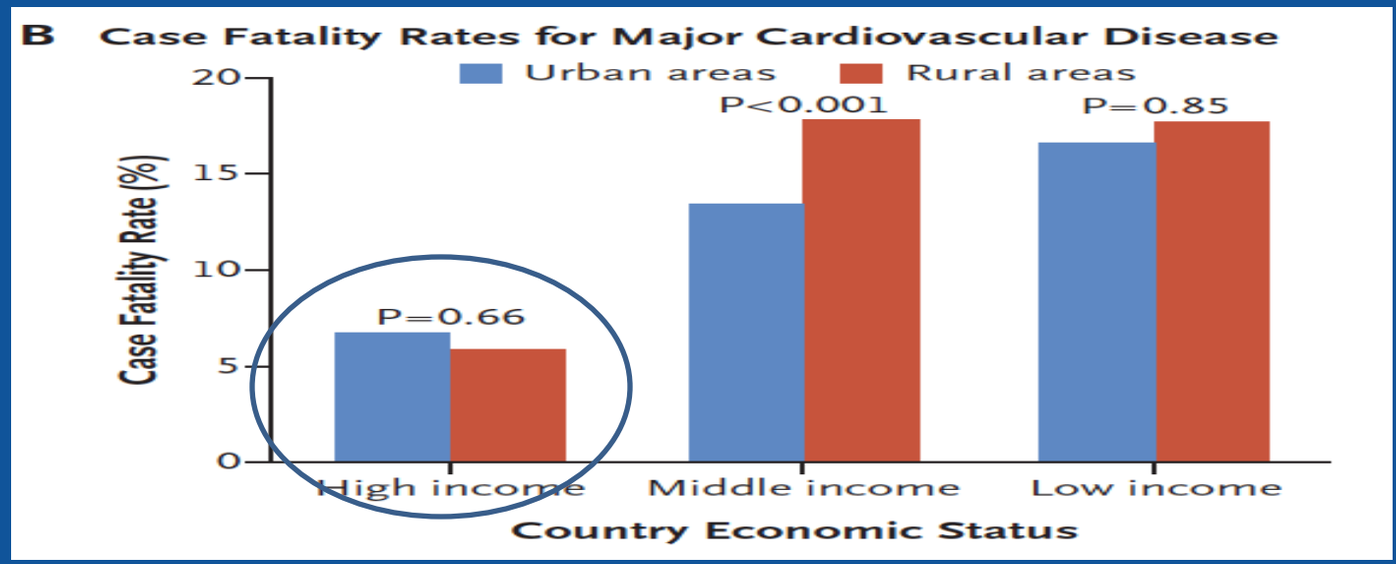
V Fuster, JACC 2015; 66: 1627

CV Risk-Factor Burden in HML I Countries

PARADOX



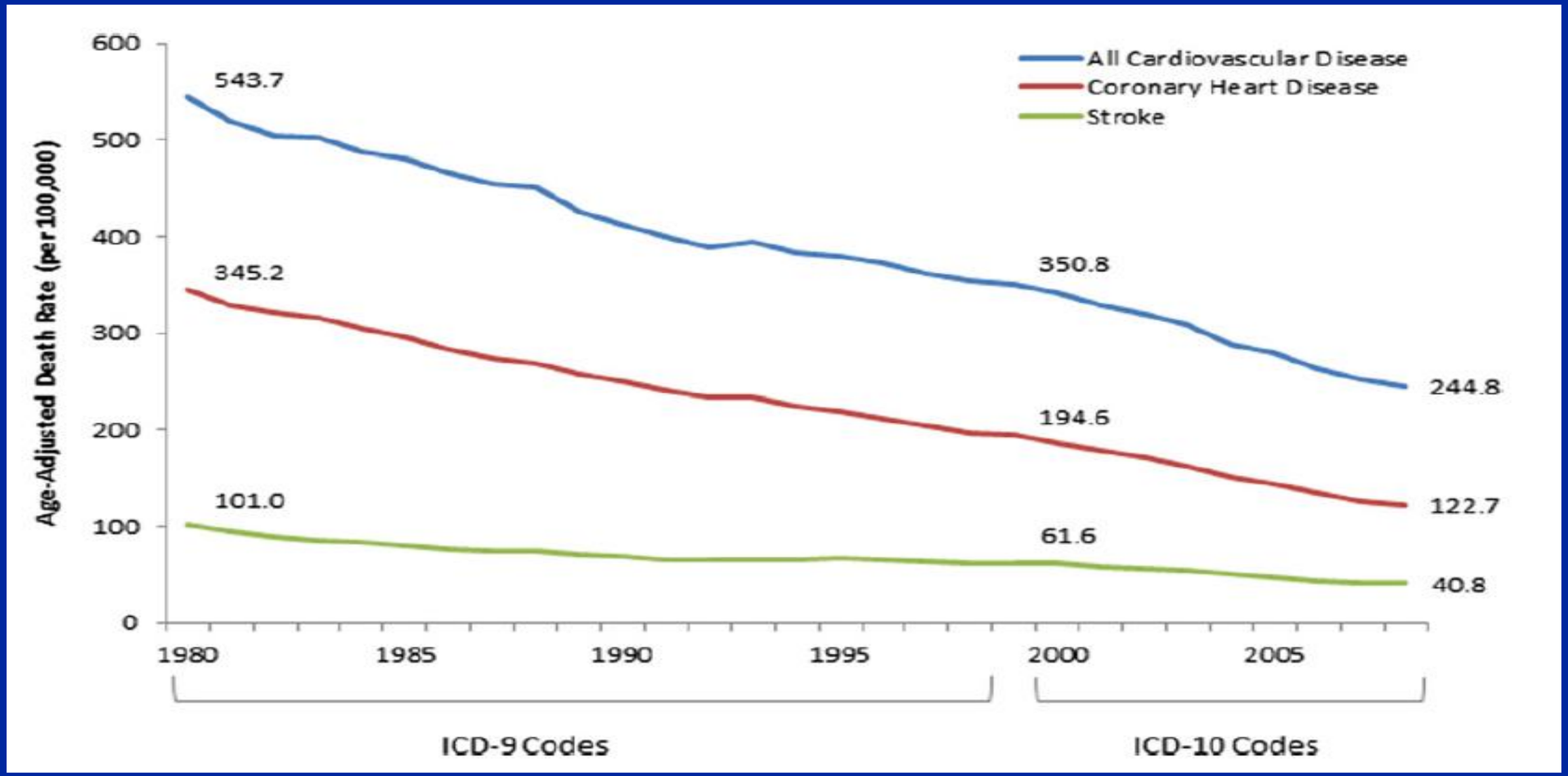
CV Case Fatality Rates in HML I Countries



PARADOX

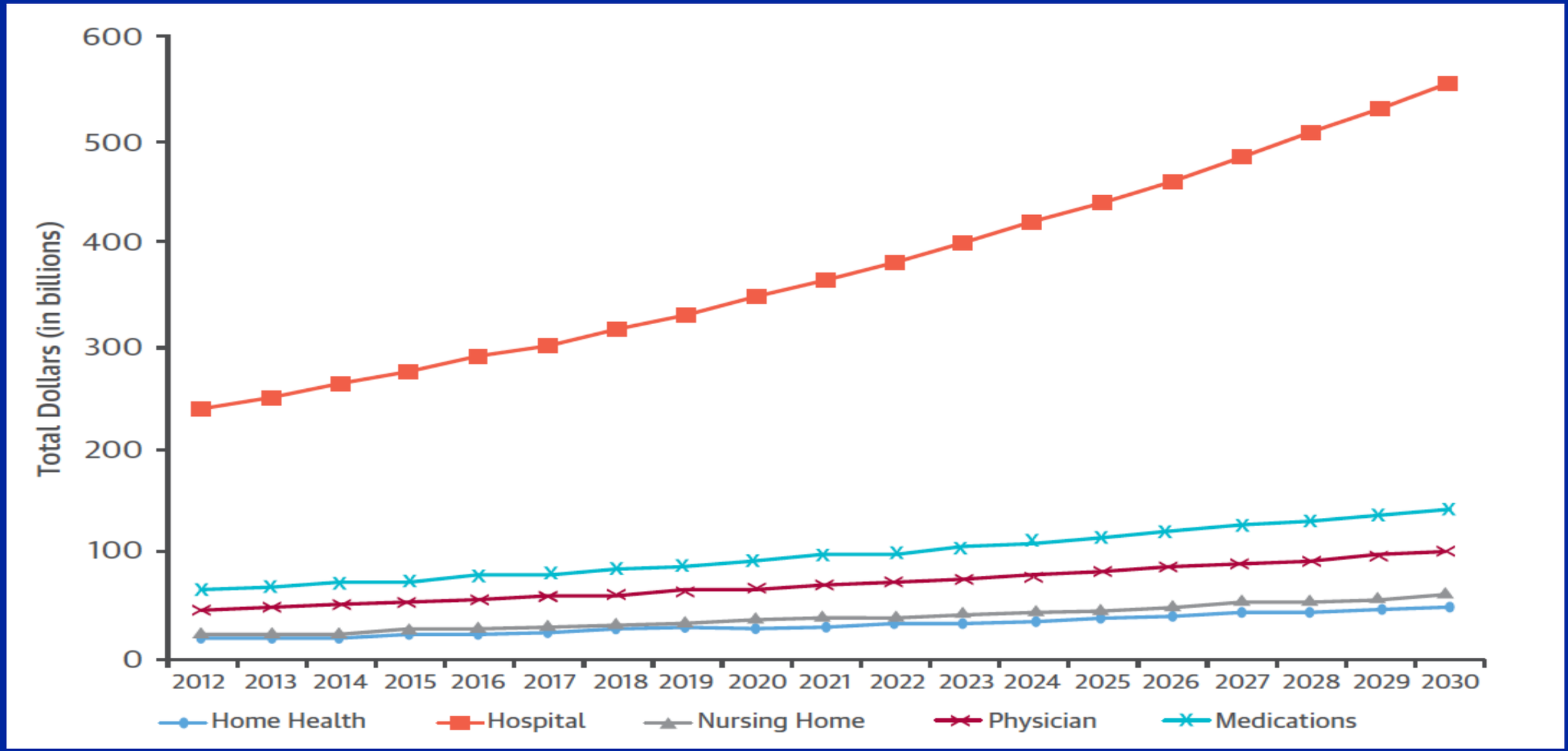
Interheart - PURE Inv. (S Yusuf et. al.) NEJM 2014; 371: 818

Age-Adjusted Deaths for CVD, CAD & Stroke
US 1980 to 2008 – The 50% / 50%



LJ Laslett et. al. JACC 2012;60:S1 –

Projected Direct Costs of Total CVD by Type of Cost (in Billions) - / 50%



ACC BOT' ESWG Members (L Laslett et. al.) JACC 2015; 66 (suppl D).

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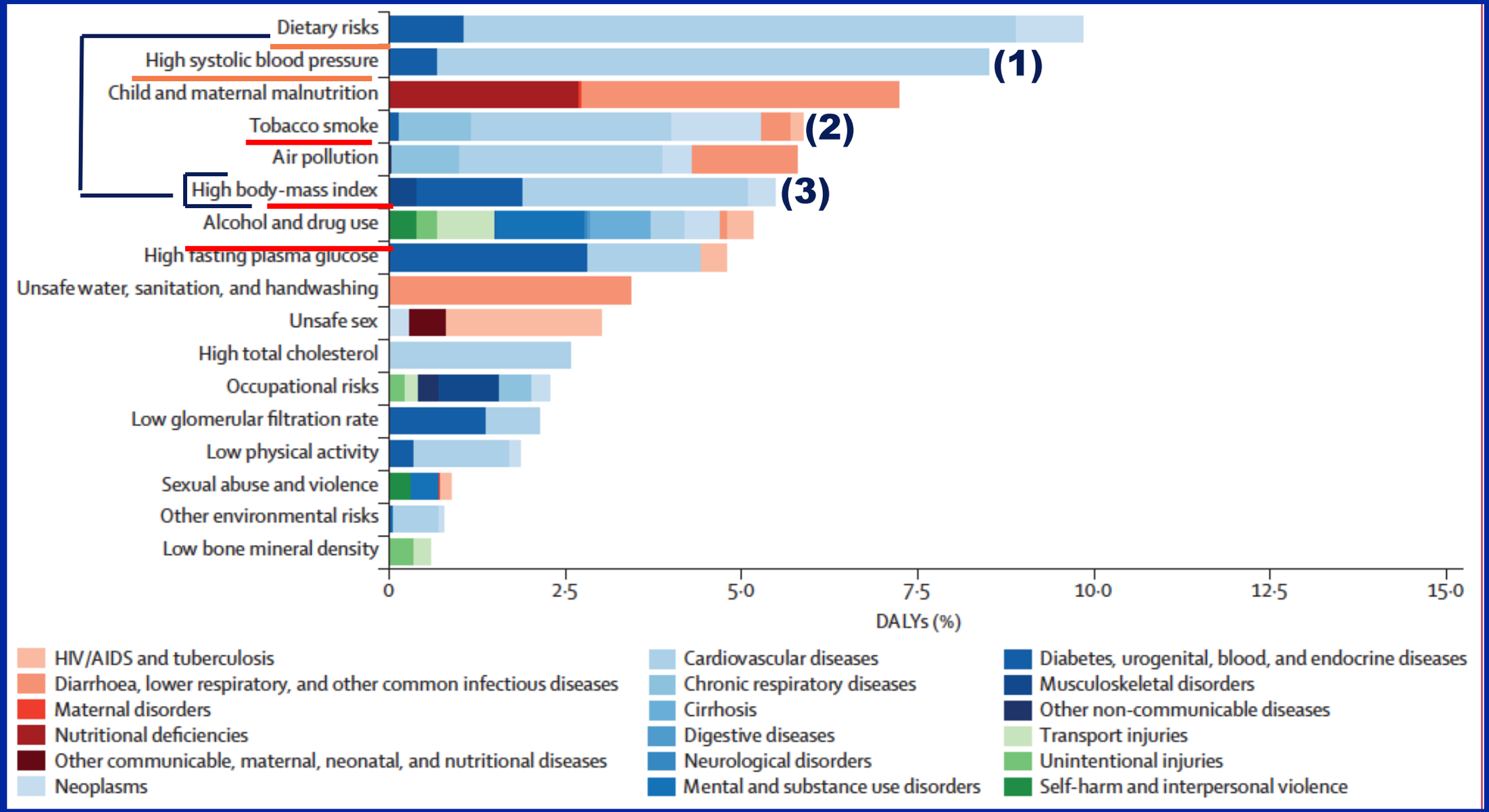
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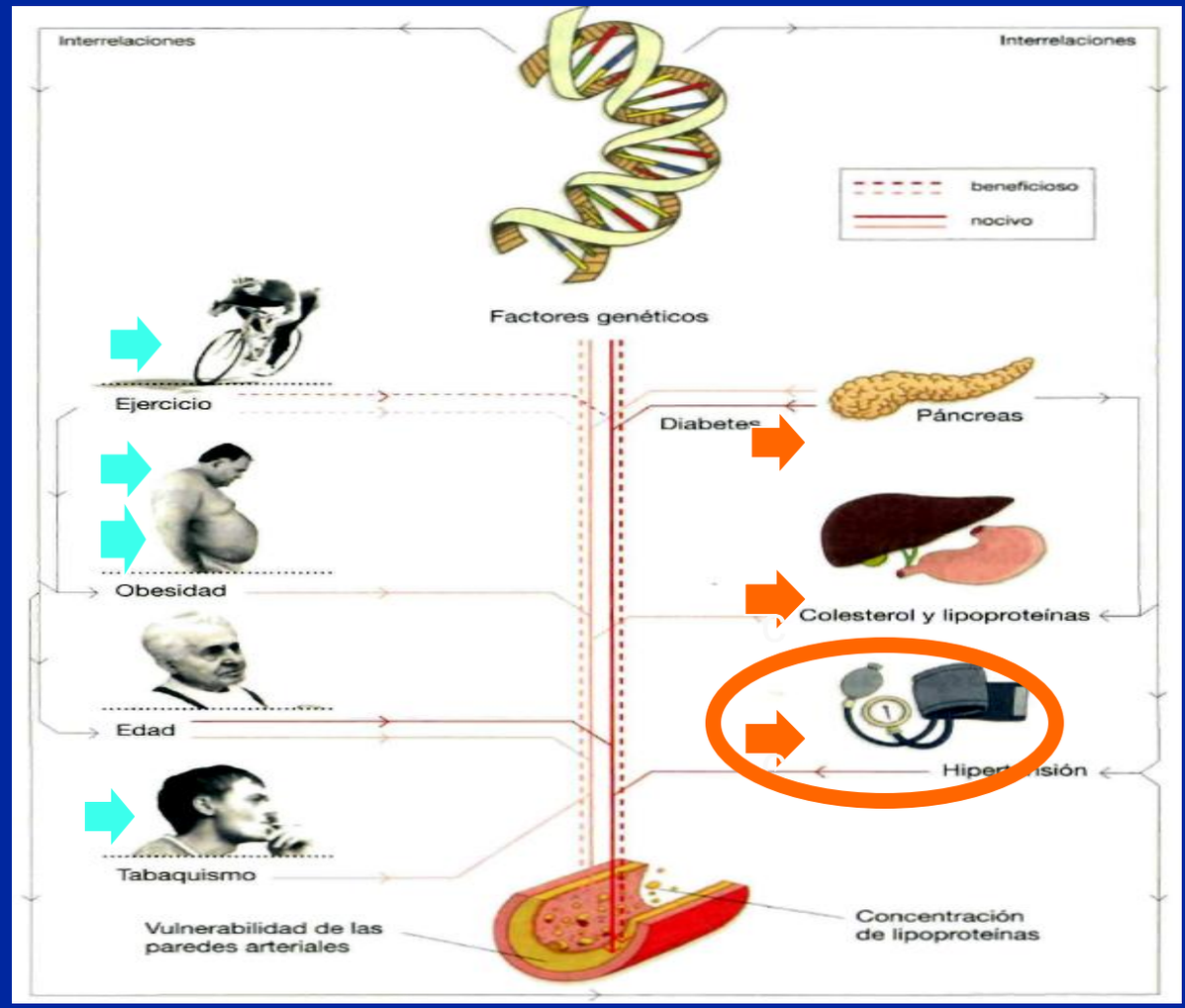
V Fuster, JACC 2015; 66: 1627

Global DALYs & Mortality – Risk Factors



GBD 2013 Risk Factors Collaborators (MH Forouzanfat et. al.) Lancet. 2015;386:2287

Minimizing Modifiable CV RFrs (7) & Life Style



"The practice of making a sharp division between normal and pathologically high blood pressure (HBP) is an entirely arbitrary artifact". GW Pickering 1955.

No Such Thing as Ideal Blood Pressure: A Case for Personalized Medicine (1)

1). HBP remains a leading risk factor for stroke & heart disease. Over 50% of such HBP population remains untreated or the BP is only partially under control (2,3).

2). Why HBP, untreated or partially treated is so prevalent ?. Negligence, low adherence and side effects such as fatigue (BB), GI (ACEI) or edema (CCB), or because the BP is too low, resulting in lightheadedness, dizziness or fainting.

(1) Fuster V. JACC 2016; 25: 2016
(2) Go AS et al. Hypertension. 2014; 63(4): 878.
(3) Kotchen TA et al. JAMA. 2016; 315: 343..

No Such Thing as an Ideal Blood Pressure: A Case for Personalized Medicine

3). There is a great deal of misinformation made to the public on medication side effects. The SPRINT trial on intensive vs standard-treatment revealed an absolute primary outcome risk reduction from 6.8% to 5.2% (25% lower relative risk), while the serious adverse events increase from 2.5% to 4.7% (88% higher relative risk) (1,2).

4). The HOPE study on Candesartan + Hctz vs Placebo at intermediate risk revealed no outcome difference between both groups, but the active arm had a higher risk of symptomatic hypotension, dizziness & lightheadedness (3)

(1) Fuster V. JACC 2015;66:2909 & 2016 (In Press)

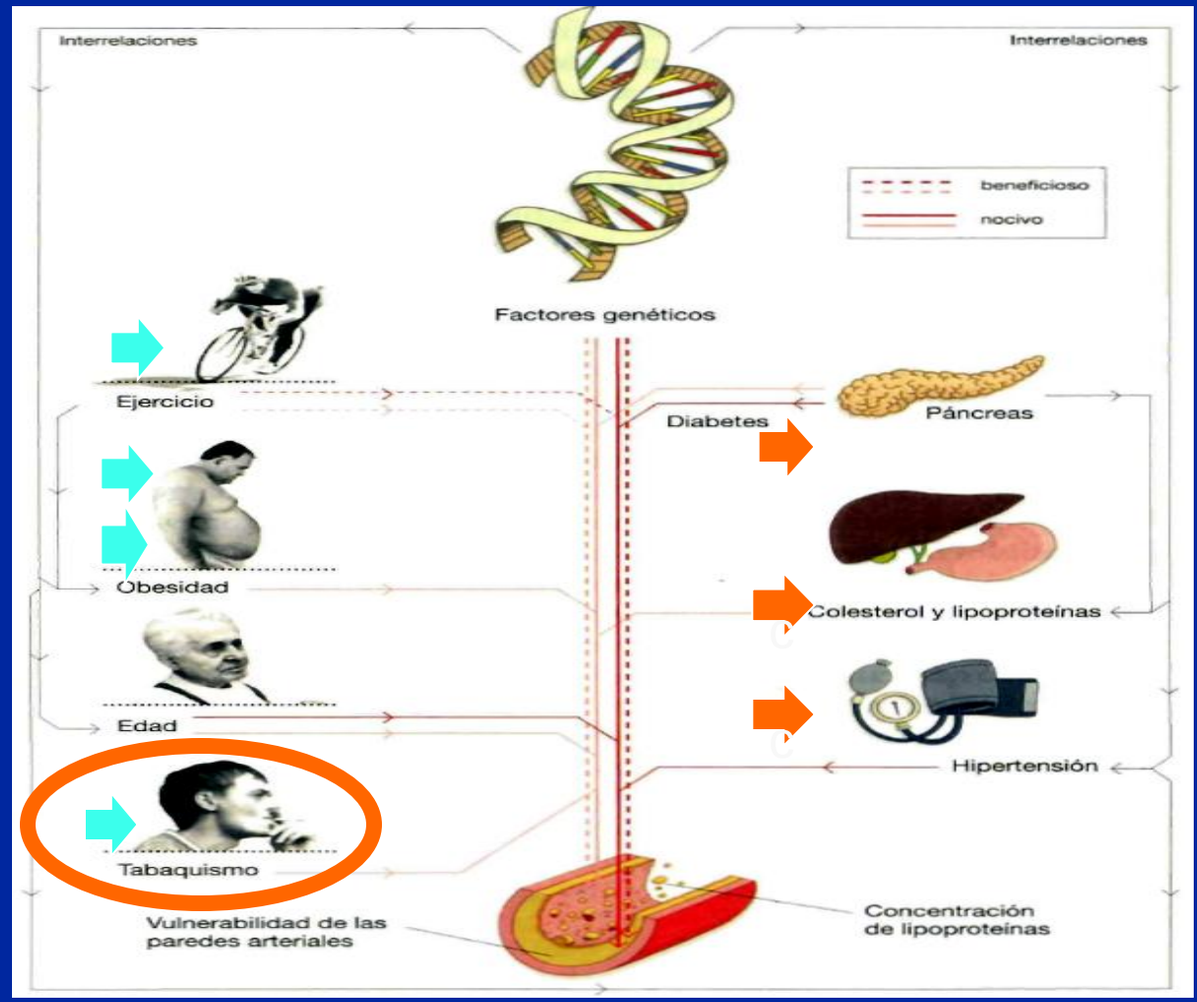
(2) SPRINT, NEJM 2015;373:2103 (3)HOPE 3, NEJM 2016;374:2009

No Such Thing as an Ideal Blood Pressure: A Case for Personalized Medicine (1)

5). In the CV field of antihypertensive medications, lower is the targeted level higher is the benefit, but also the side effects. On a recent systematic review and meta-analysis of 123 studies with over 600,000 participants, regardless of the baseline systolic BP (from <130mmHg to any higher), for every 10 mmHg decrease in systolic BP, there was a relative 20% reduction of major CV events (2). The challenge is the identification of all patients with HBP & a management personalized approach for each patient.

(1) Fuster V. JACC 2015;66:2909-2016 (In Press) - (2) Ettehad D. Lancet 2016;387:957

Minimizing Modifiable CV RFrs (7) & Life Style



S Salahuddin et. al. Global Heart. 2012;7:113

Nicotine: Sympathetic Stimulation

Toxic Quemicals: Pulmon. OxidativeStress

1). UN And Bretton Woods Agency Actions In Suport Of Tobacco Control - 1992

	Actions taken	End Results
UNICEF	Convention of the Rights of the Child & Tobacco; strong advocacy by Carol Bellamy	No follow-up
World Bank	Ended loans for tobacco farming	Little follow-up
UNDP	Weak support in 2000	21 of 120 countries obacco control in plans
Food /Agricult.	Support agriculture ministries	In 2013, sought support from WHO for continue but not Forthcoming
Int. Civil Aviation Organization	Strong support for a ban on smoking on airlines in 1992	Still in effect

D Yach, Lancet 2014; 383:1771

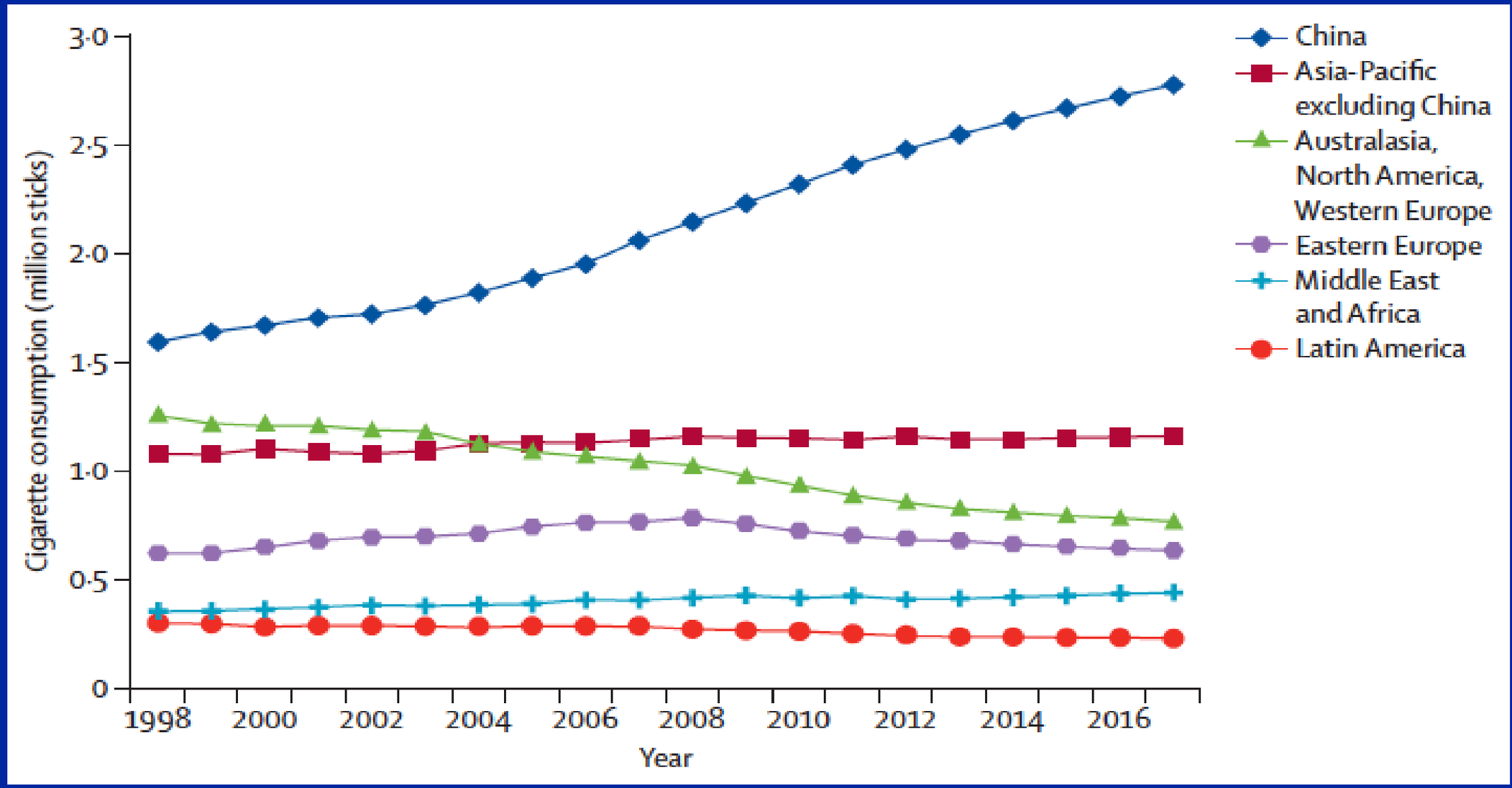
2). WHO Framework on Tobacco Control
The Origins, Development, Effects, Future - 2003

Worldwide, more than 1 billion people use tobacco, resulting in about 6 million deaths per year. The tobacco industry's documented history of subverting control efforts required innovative approaches by WHO—led by Gro Harlem Brundtland—including invocation of its constitutional authority to develop treaties. In 2003, WHO member states adopted the WHO Framework Convention on Tobacco Control or WHO FCTC. About 177 countries ratified and started to implement its full provisions. But today only 35% are on track

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D. Yach. The Lancet 2014; 383:1771

3). Cigarette Consumption By Region (Historical & Forecast), 1998–2017



AB Gilmore et. al. Lancet. 2015;385:1029

4). Tobacco-Free World: A Call to Action

1). The Cigarette Catastrophe Continues (1). Disease rates from smoking peak about 30 years after peak of consumption. Most of the cigarette problem is yet to come.

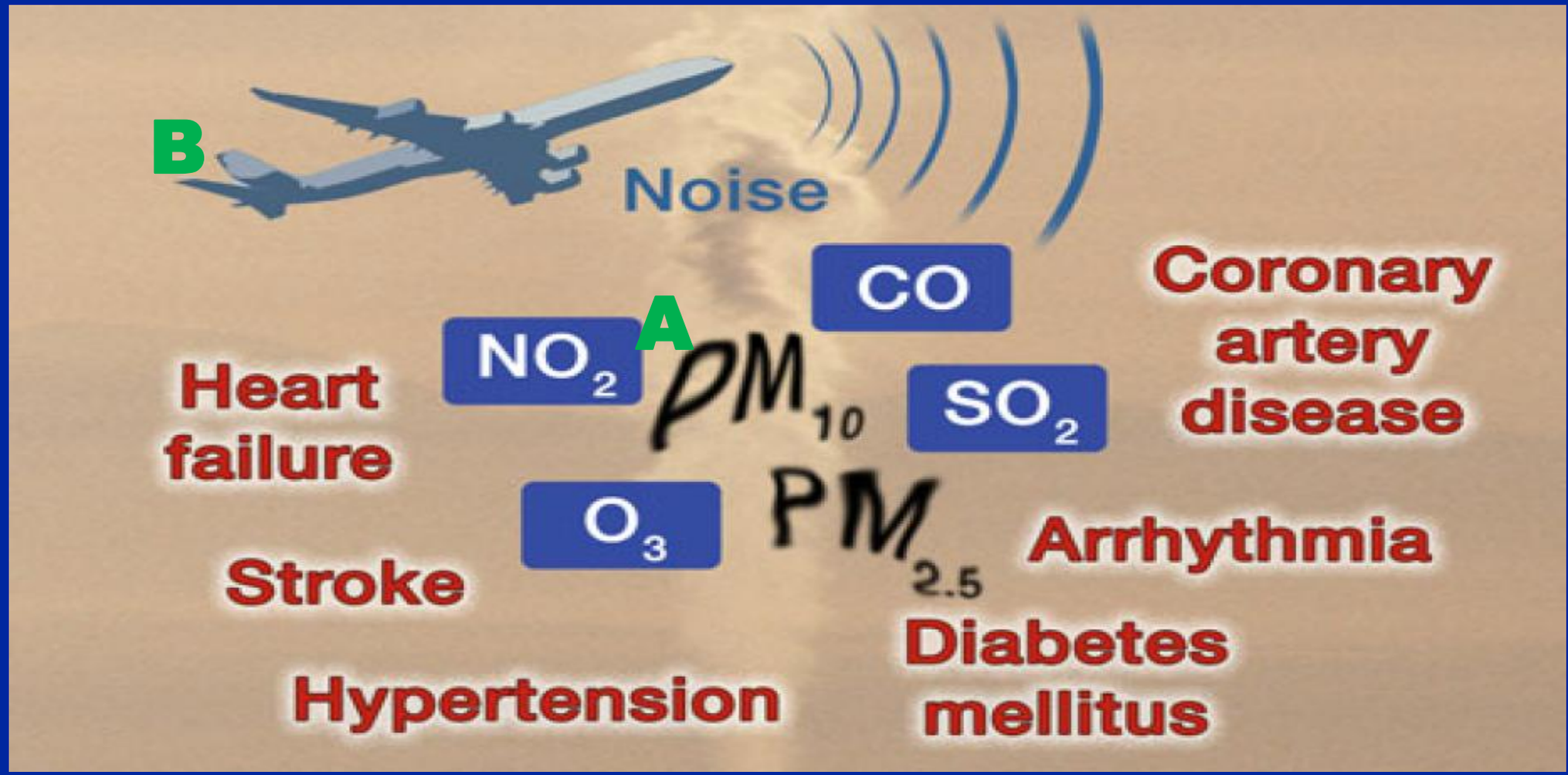
2). It is time to act on the unacceptability of the damage caused by the tobacco industry. There is an urgent priority for an ambitious tobacco reduction (2).

3). A UN high-level meeting on tobacco use is urgent. A need to Implement the WHO - FCTC in all countries, with engagement of all sectors. A Tobacco-free world by 2040 ?.

(1) RN Proctor. The Lancet 2015; 385:938

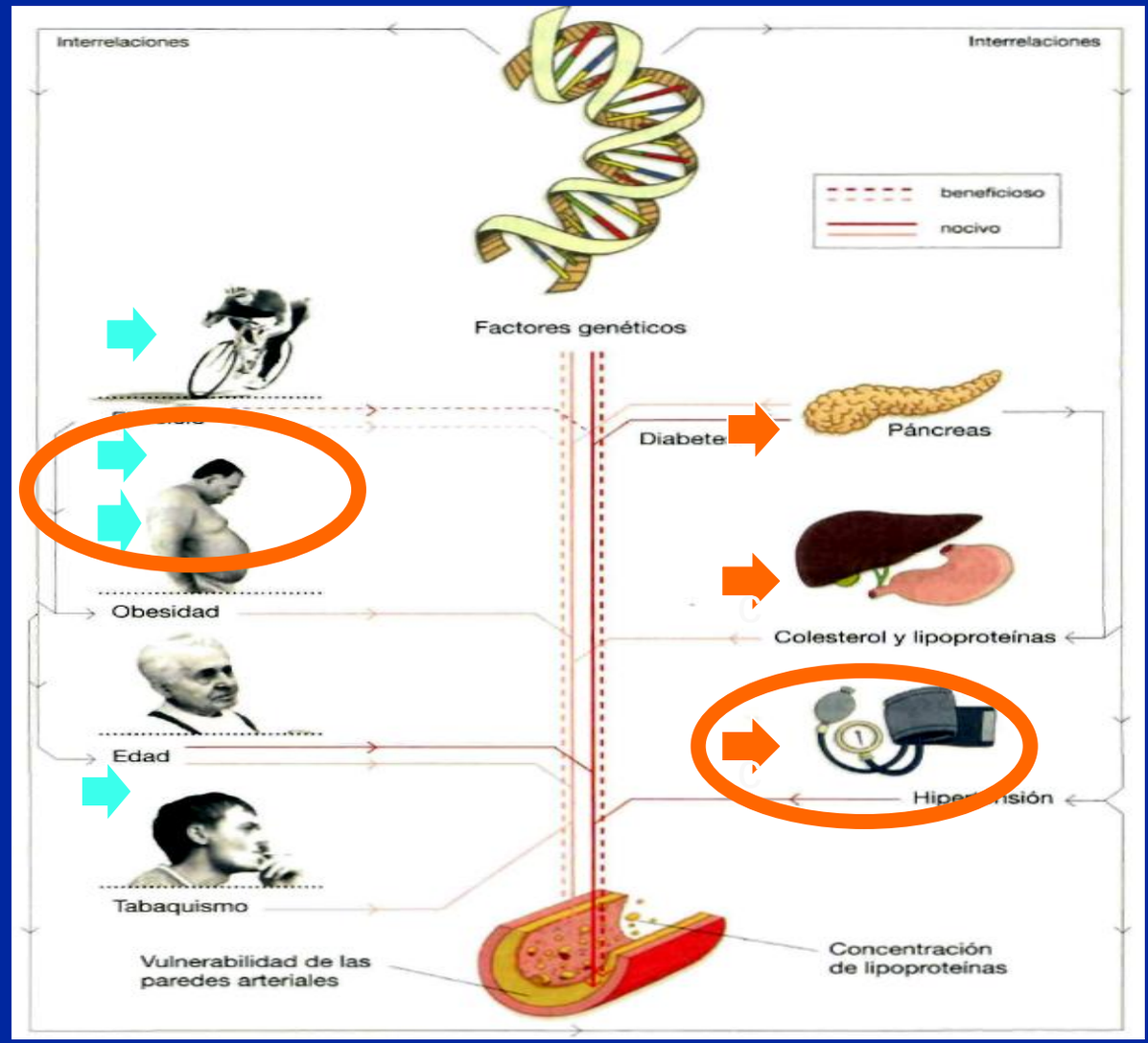
(2) R Beaglehole et al., The Lancet 2015; 385:1011

5). Proposed Cardiovascular Side Effects Of Noise & Air Pollution - ROS



T Münzel et al. Eur Heart J 2015;36:1777
KE Cosselman et. al. Nat. Rev. Cardiol. 2015;12:627
Pulmonary. Oxidative Stress

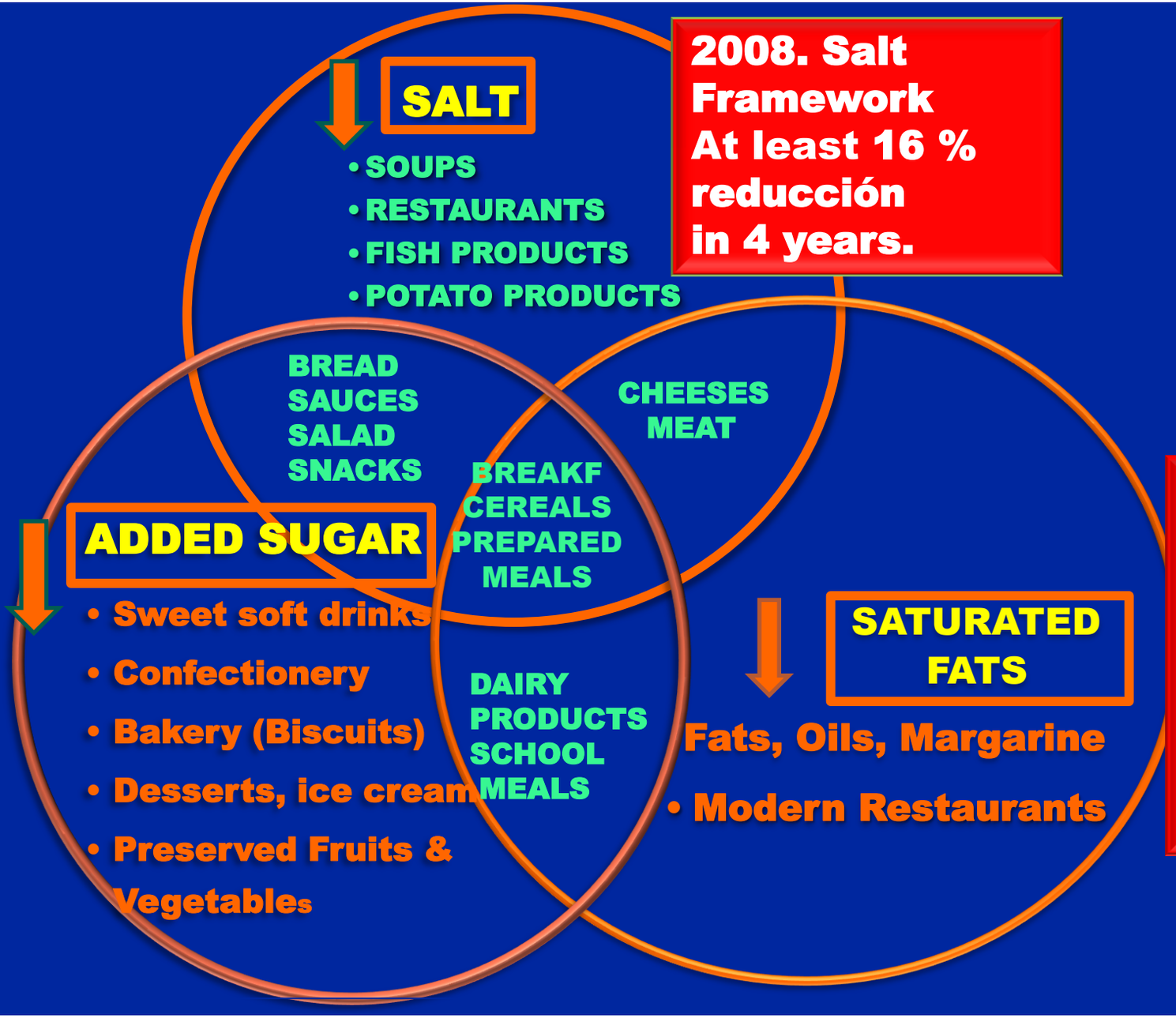
Minimizing Modifiable CV RFrs (7) & Life Style



In contrast to confronting the Tobacco Industry with a "yes or a no" to tobacco, the Food Industry can be address on partial bases

HLG European Frameworks on Nutrition & PA

Priority Products to Reformulation



2008. Salt Framework At least 16 % reducción in 4 years.

2015. Annex II At least 10% in 2020, (acordina 2015 data).

2012: Annex I At least 5 % in 4 years. Extra 5% reducción in 2020.



HLG SPAIN – NAOS & AECOSAN - 2016

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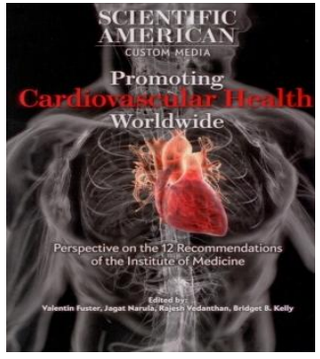
B ← A

0 — 25 — 50 — 100

V Fuster, JACC 2015; 66: 1627

Translation Studies Towards Promoting Healthy Aging

VF





secondary

primary

primordial

1) TAN NIP

2) FOCUS Fixed Dose Combination Drug for Secondary cardiovascular Prevention

SECURE
SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE IN THE ELDERLY

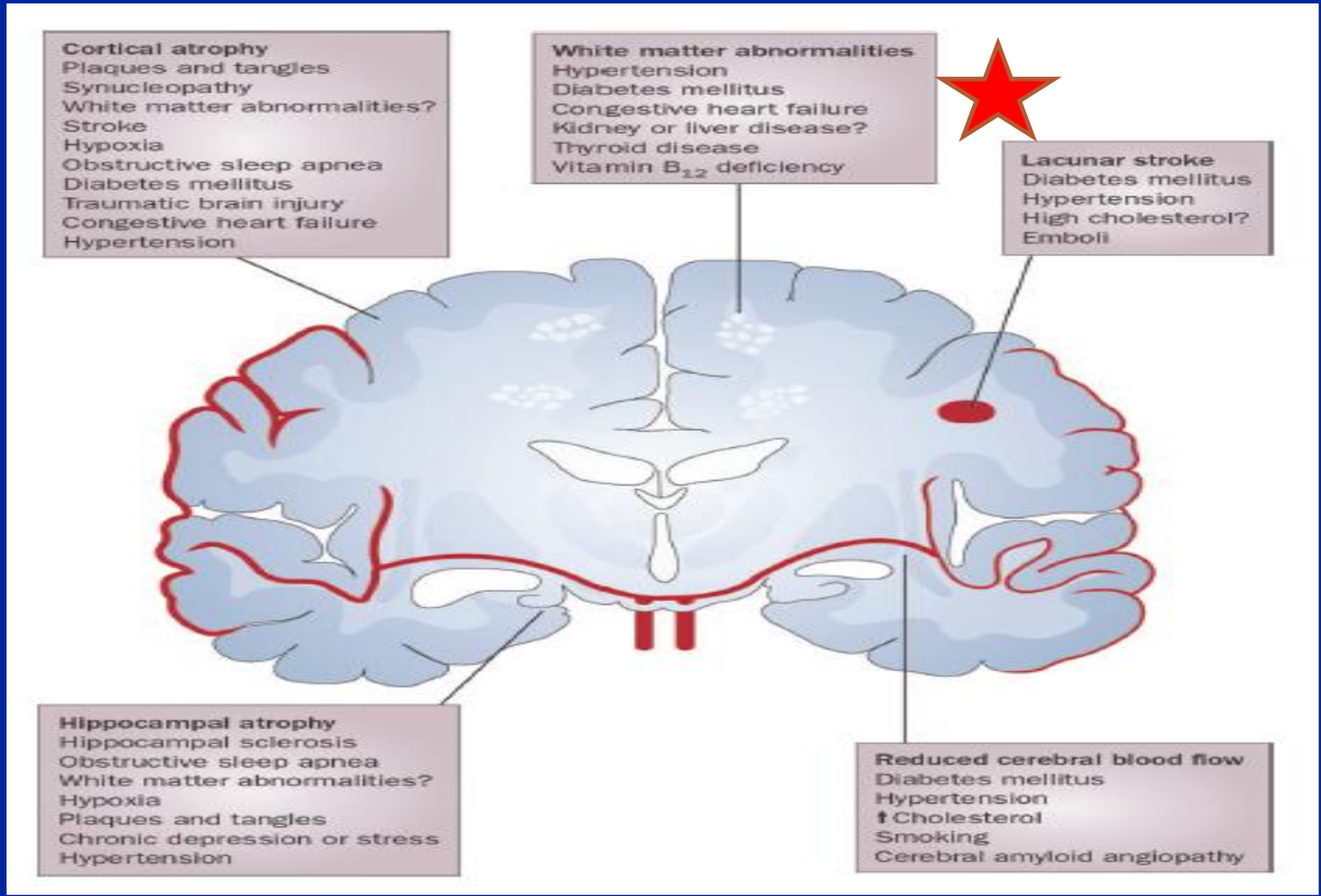
3) HRP PESA AWHS

4) IIIP

5) 50/50

6) Si! Programa de Salud Integral

1). Risk Factors of CV Disease
White Matter & Lacunar Lesions (DBD)

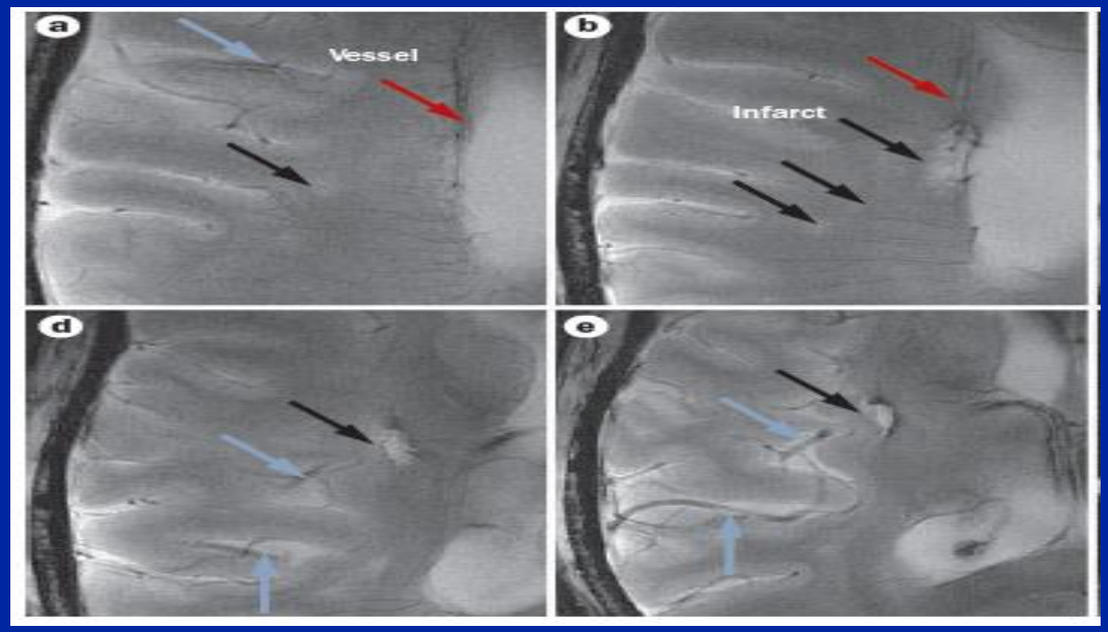


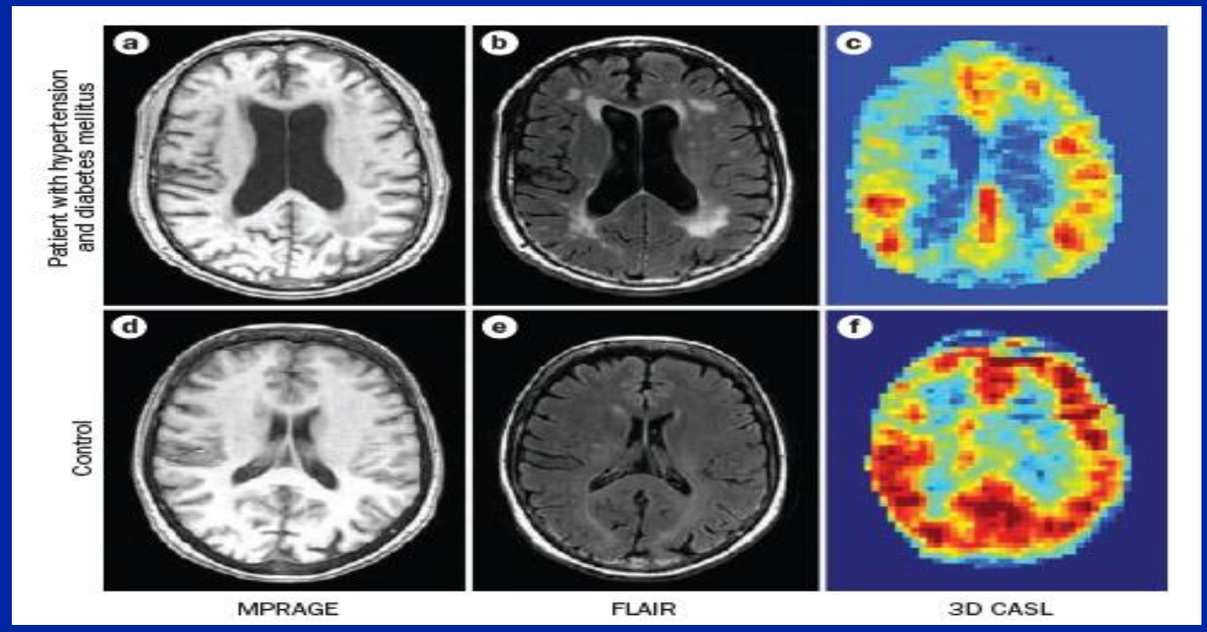
1B

MA Lim et. al. Clin Geriatr Med. 2009;25:191.

JC Kovacic, V Fuster et. al. Circulation. 2011;123:1900

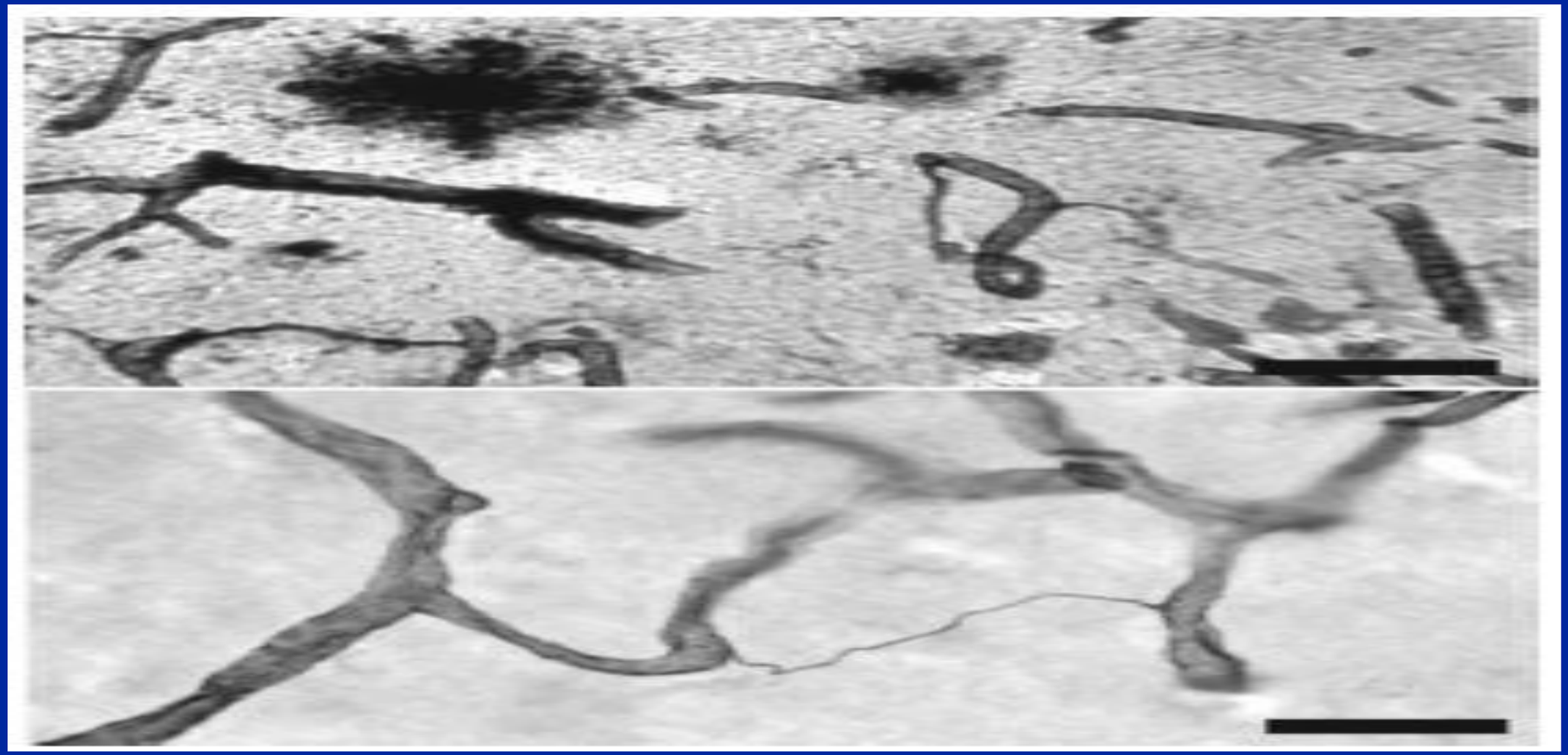
Cerebral Microcirculation - 6 Studies





1. V Novak, I Hajjar. Nat. Rev. Cardiol. 2010; 7:686 – A'sD
2. HW Querfurth et al NEJM 2010; 362:329 - Ischemia 60-90% A'sD
3. JT O'Brien et. al. Lancet. 2015;386:1698 - Autopsy
4. CARDIA (K Yaffe et al) Circ 2014;129:1560 - CV RFrs , Cognitive
5. JI Friedman et al. JACC CV Imag. 2014;7:1039 - Imaging
6. FINGER (T Ngandu et al)., Lancet 2015; 385:2255 - Intervention

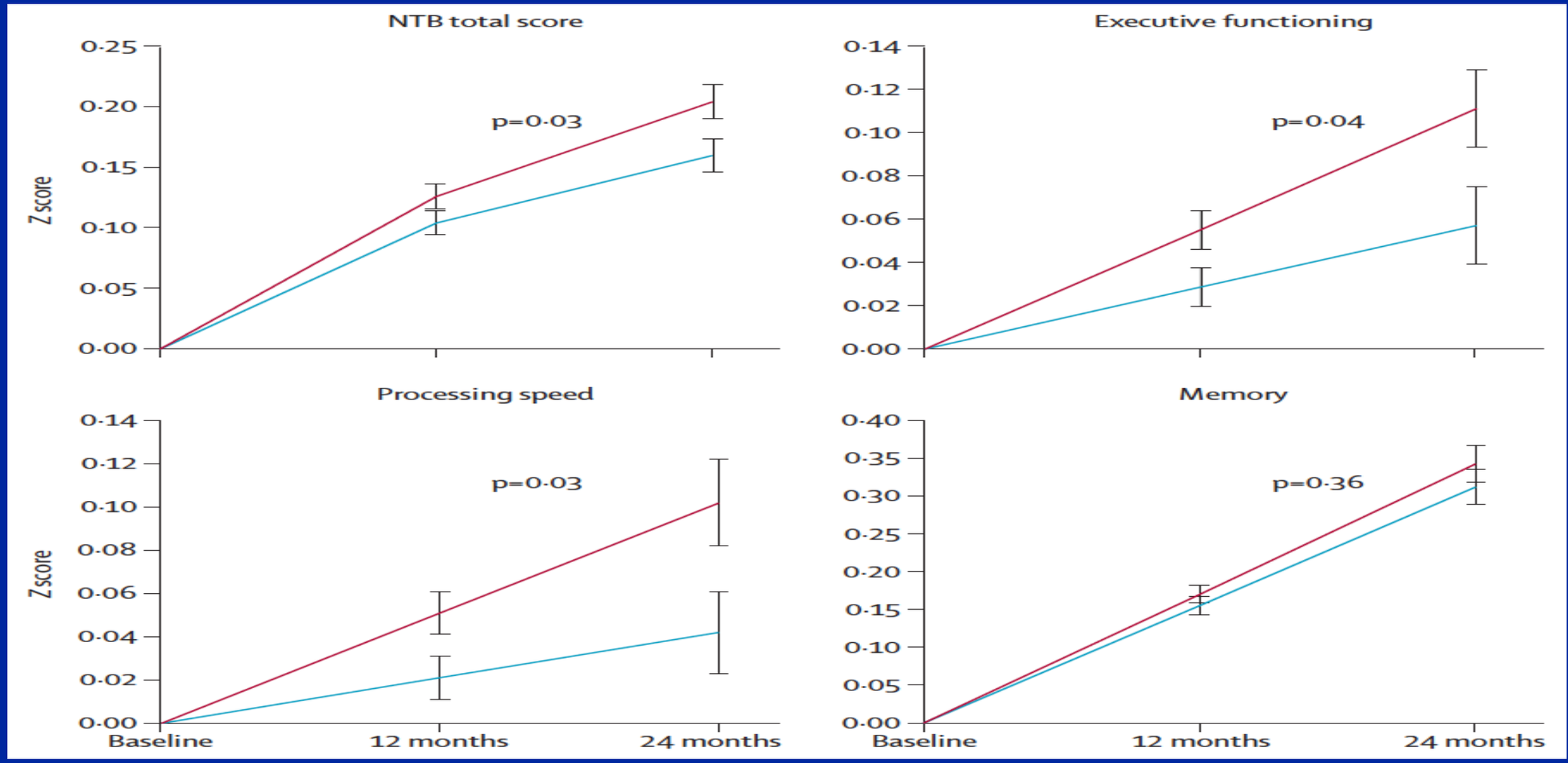
A'sD Vascular – Amyloid, Atherosclerosis ?



1. V Novak, I Hajjar. Nat. Rev. Cardiol. 2010;7:686
2. HW Querfurth, FM LaFerla. NEJM 2010; 362:329

Ischemia affects 60 to 90% of patients with Alzheimer's – RFs ?

Change In Cognitive Performance During The 2 Year Intervention



6. FINGER (T Ngandu et al)., The Lancet 2015; 385:2255

2). CV Drugs – Underused

Risk Factors - Proportion of Participants at Goal % – 1 year

Trials	L	SBP	DBP	Hb A1C	Meet Goals	
					Base	FU
BARI-2D	75	56	70	52	14	20
COURAGE	51	55	55	59	12	19
FREEDOM	55	63	53	55	12	20

Freedom, Bari-2D, Courage Investigators, JACC 2013;61:1607
PURE (S Yusuf et al.) Lancet 2011; Aug 28 - Poor Countries,7% !!!
NHANES, AHA, NHLBI-JNC-7, NHLBI-NCEP – < Adherence
P Muntner, V Fuster et al., AHJ 2011; 161: 719 – 49 seconds !!!!

CV Drugs Underuse - Polypill, 2ary Prevention.

FOCUS 1 & 2

- Argentina
- Brazil
- Paraguay
- Italy
- Spain

FREEDOM

AETNA-DIABETES

SECURE-EC 2015



Am. H J 2011;162:811

Semin.Thor.Cardiov.Surg 2011;23:24

JACC, 2014; 64:2071

Approved in 27 Countries

HOPE-3-NEJM 2016;374:2032 – Concept Polypill for 1ary Prevention ?

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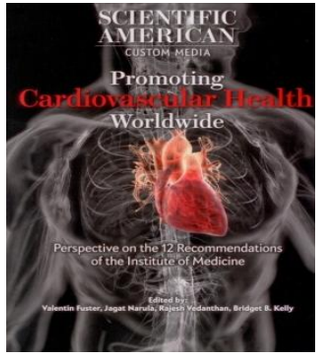
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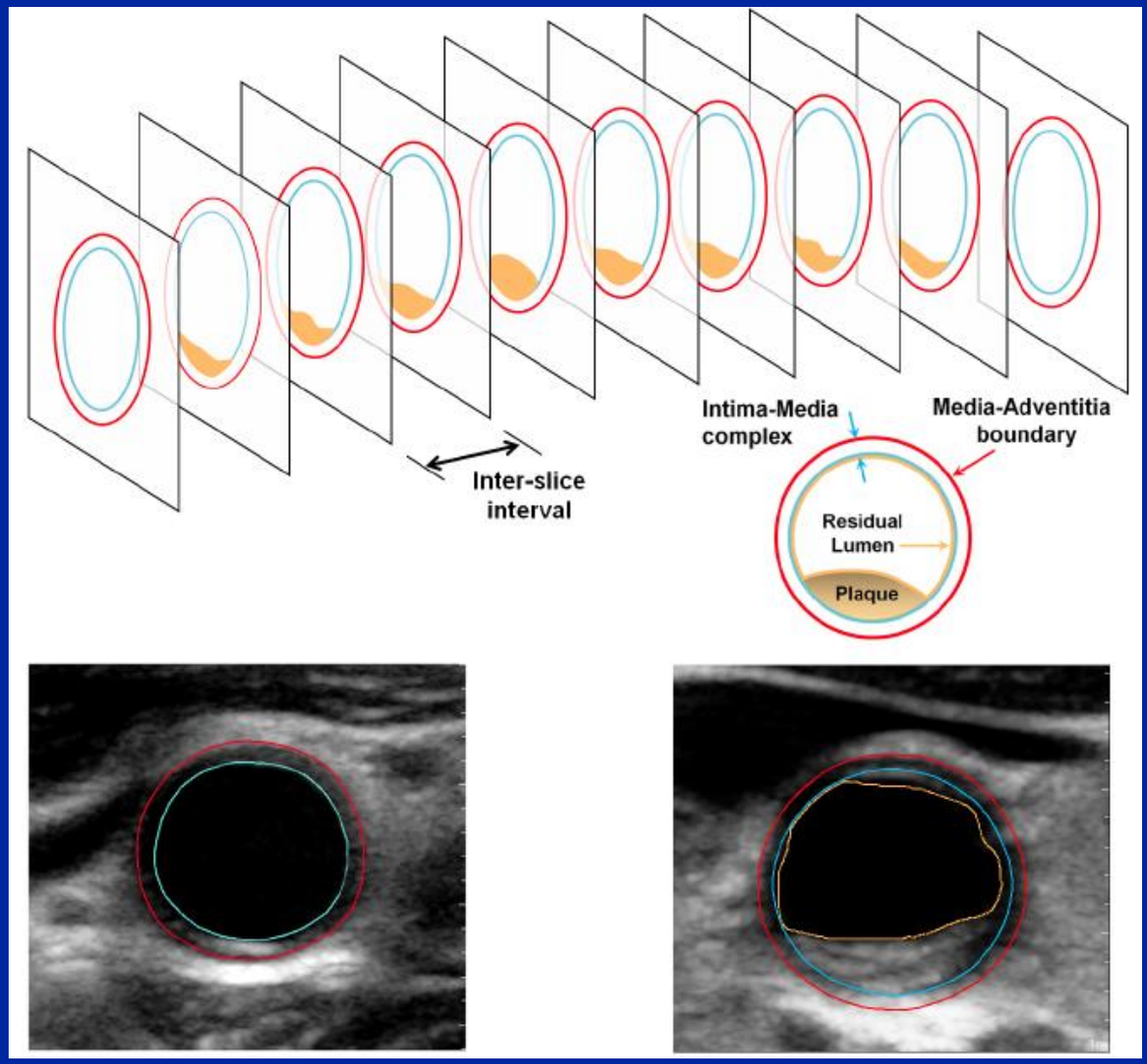
3) HRP
PESA
AWHS

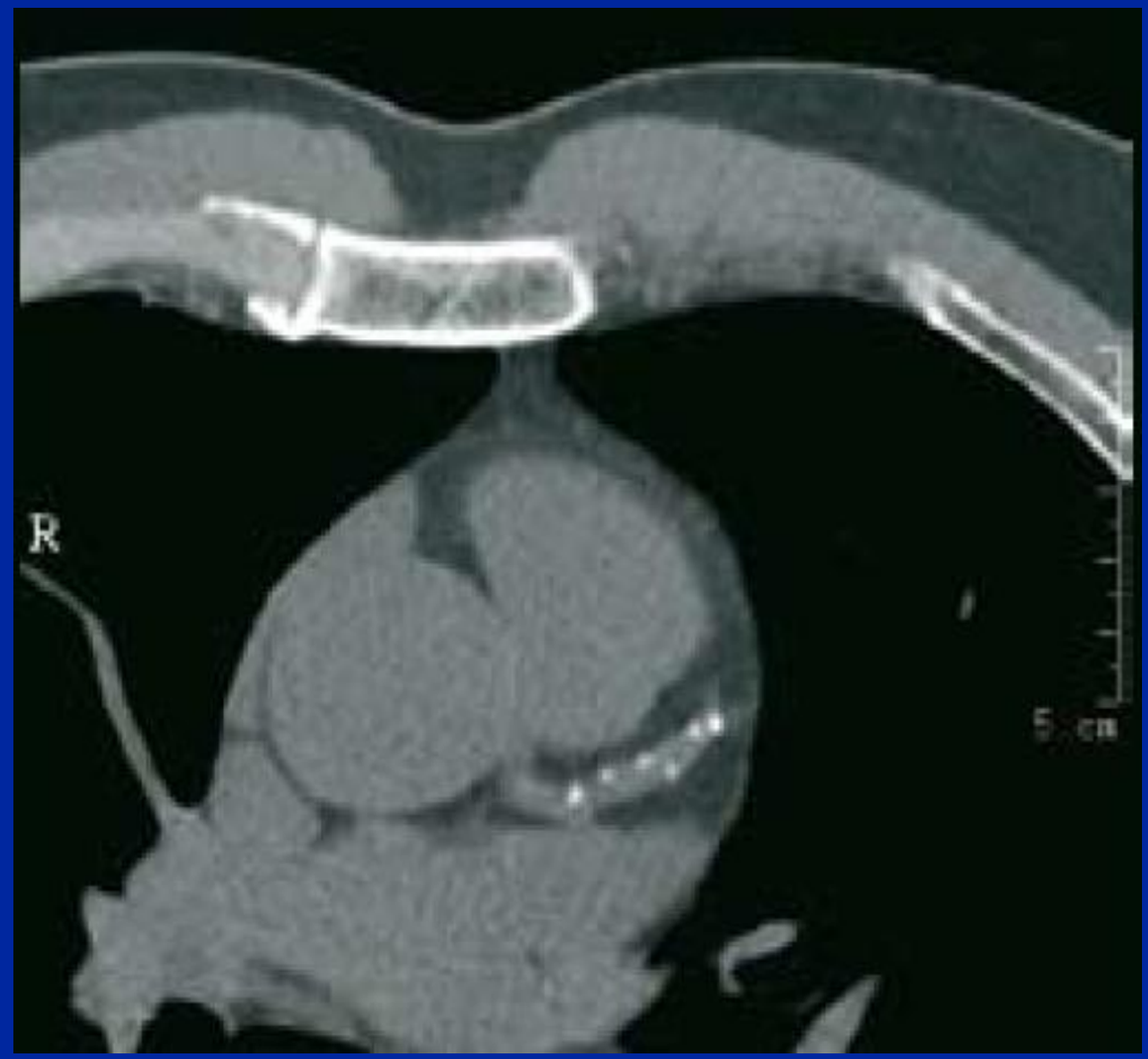
4) IIIP

5) 50/50

6) Si! Programa de Salud Integral

3). Plaque Burden (N=12,000)
Carotid 3D-US, Coronary Calcification





PI: Valentin Fuster, Mobile Units - AHJ 2010;160:49

H Sillesen, P Muntendam, E Falk, V Fuster et.al JACC Imag. 2012;7:681.

3a). Science, Transatlantic Round Trip





1).MSSM

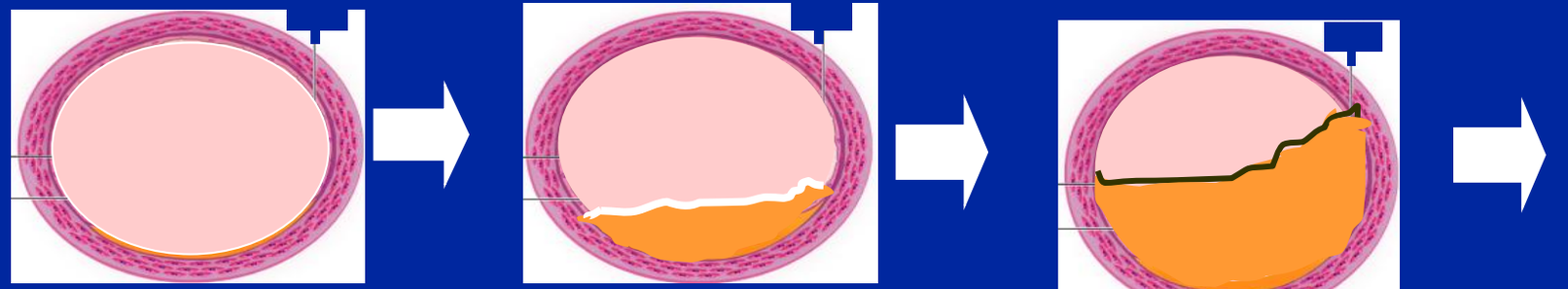
2). CNIC

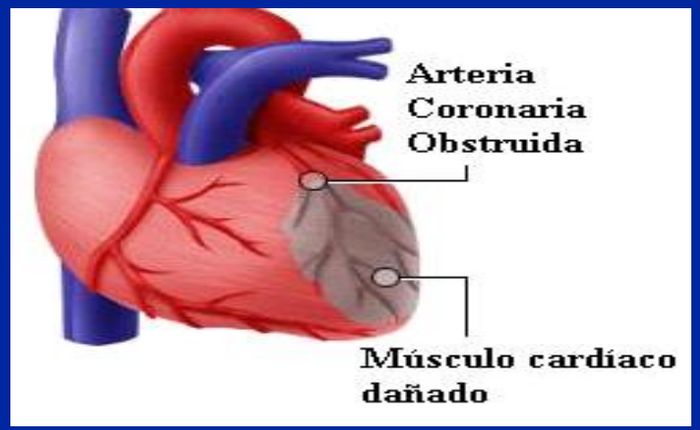
PESA & AWHS
40-54y, N= 6,000, FU 0,3,6 y

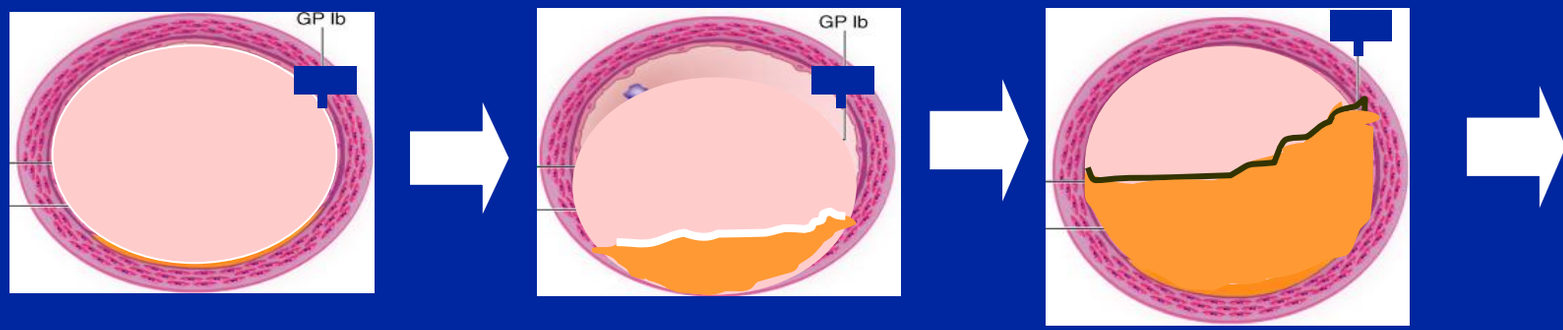
HRP > 55y,
N=5808 FU3y

1. Predicting Progression
2. Three Life Style Approaches

Predicting Events
Economics -- Behavior





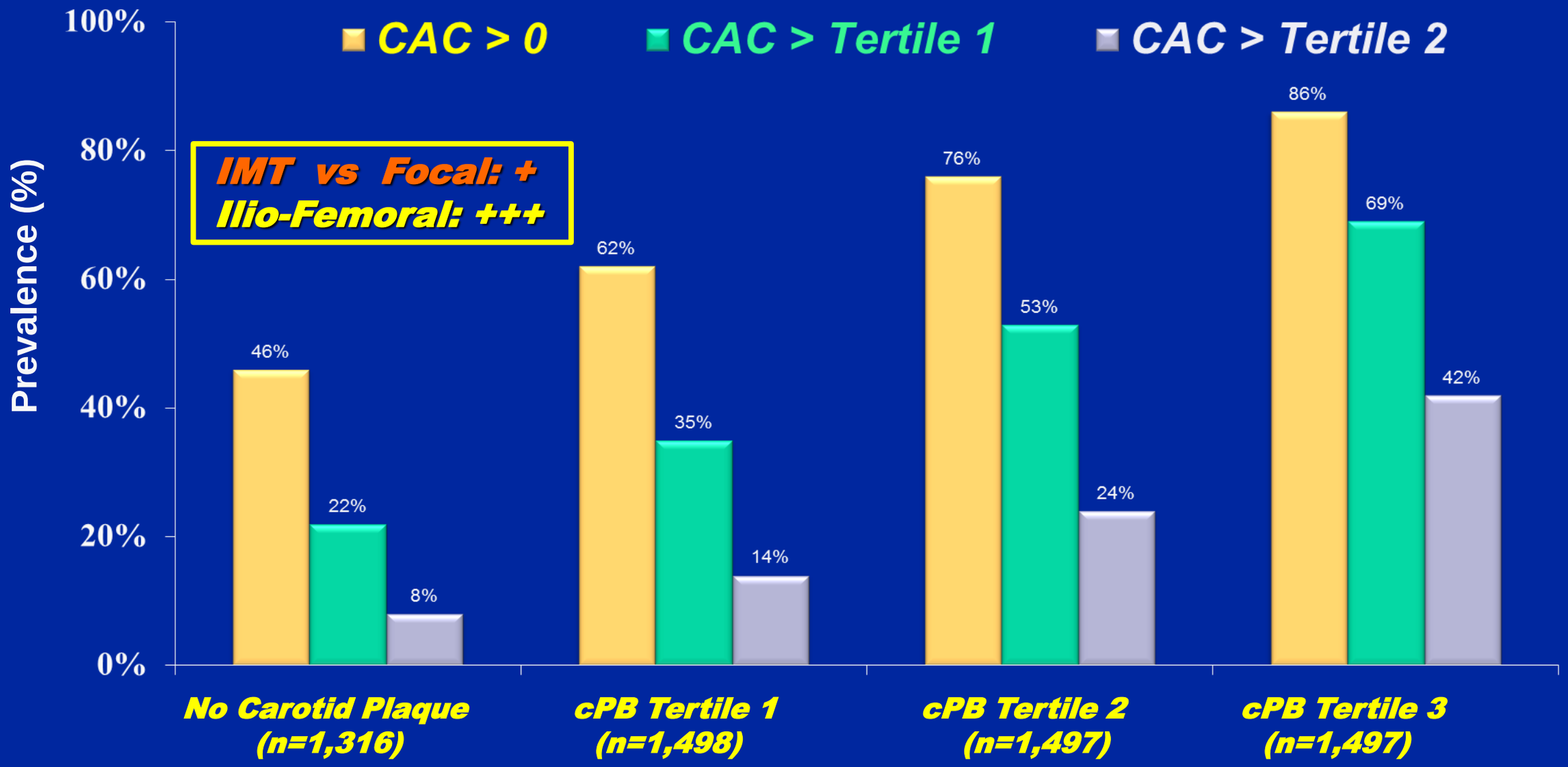




3. TAN-SNIP Study - 4. Telomeres (S.blot, qPCR, Fresh)

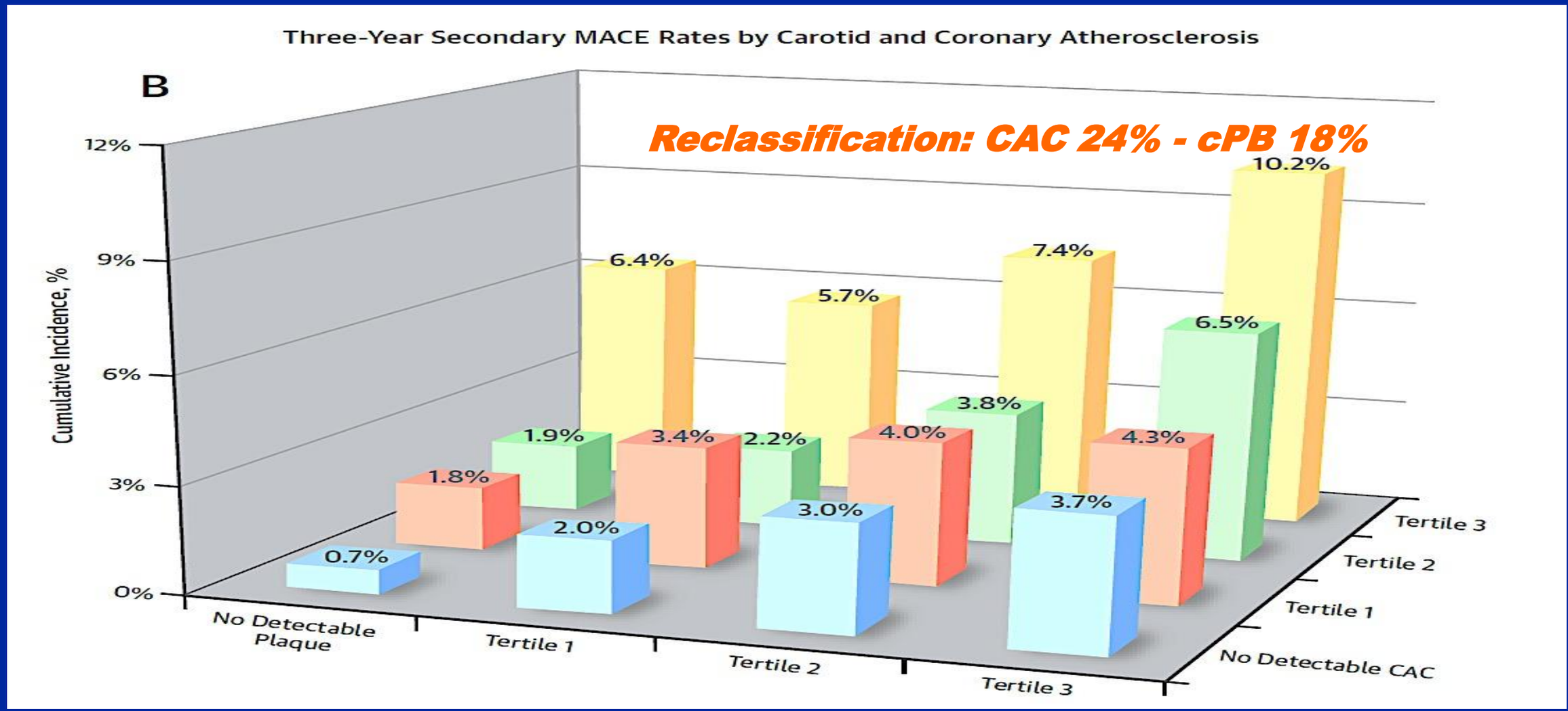
U Baber, R Mehran, V Fuster, et al. J. Am. Coll. Card. 2015; 65: 1065

Cross Interaction (n=5808) Between Carotid Plaque & CAC



U Baber, R Mehran, V Fuster, et al. J. Am. Coll. Card. 2015; 65: 1065

Three Year All-Cause MACE Rates (N=216) by Carotid and Coronary Atherosclerosis



U Baber, R Mehran, V Fuster, et al. J. Am. Coll. Card. 2015; 65: 1065

Upcoming 8 Year Follow up

3b). Science, Transatlantic Round Trip





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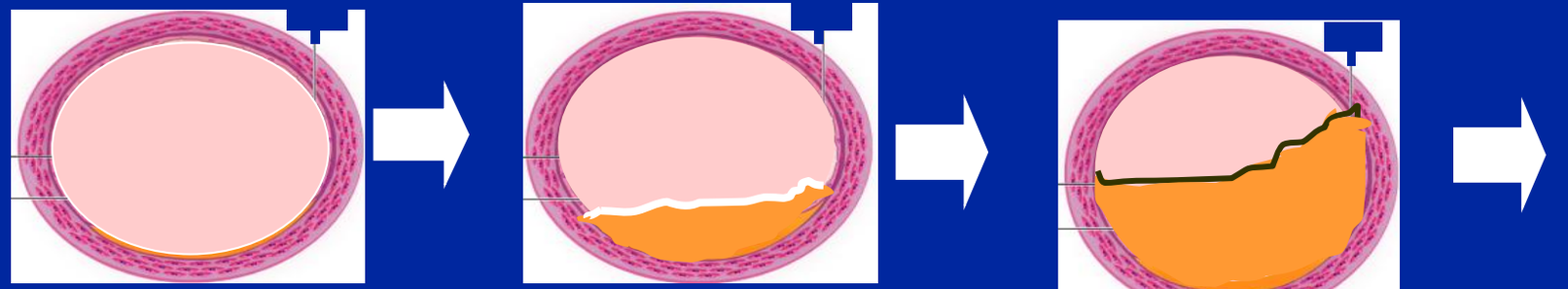
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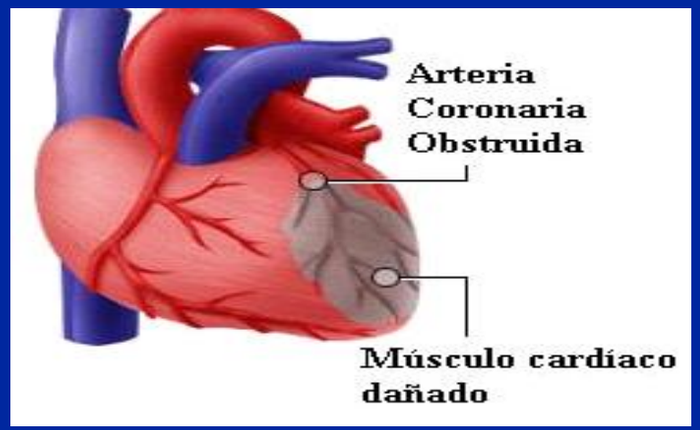
PESA & AWHS
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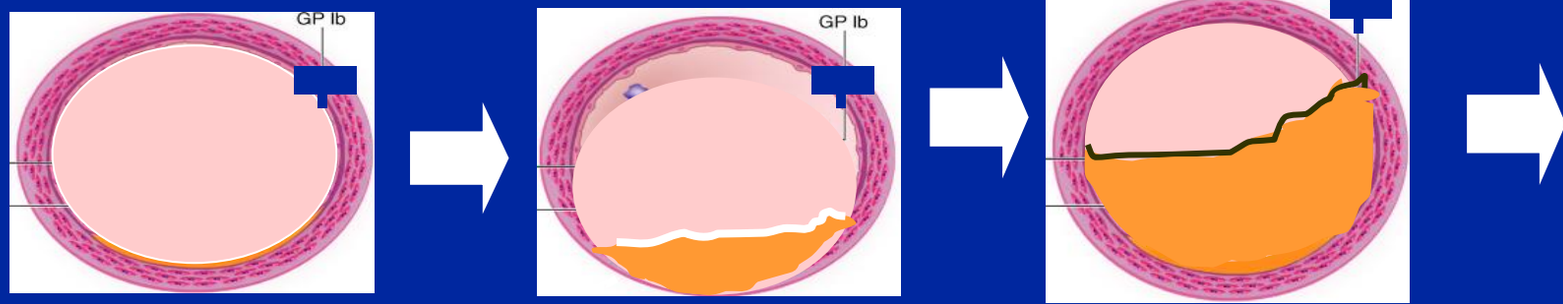
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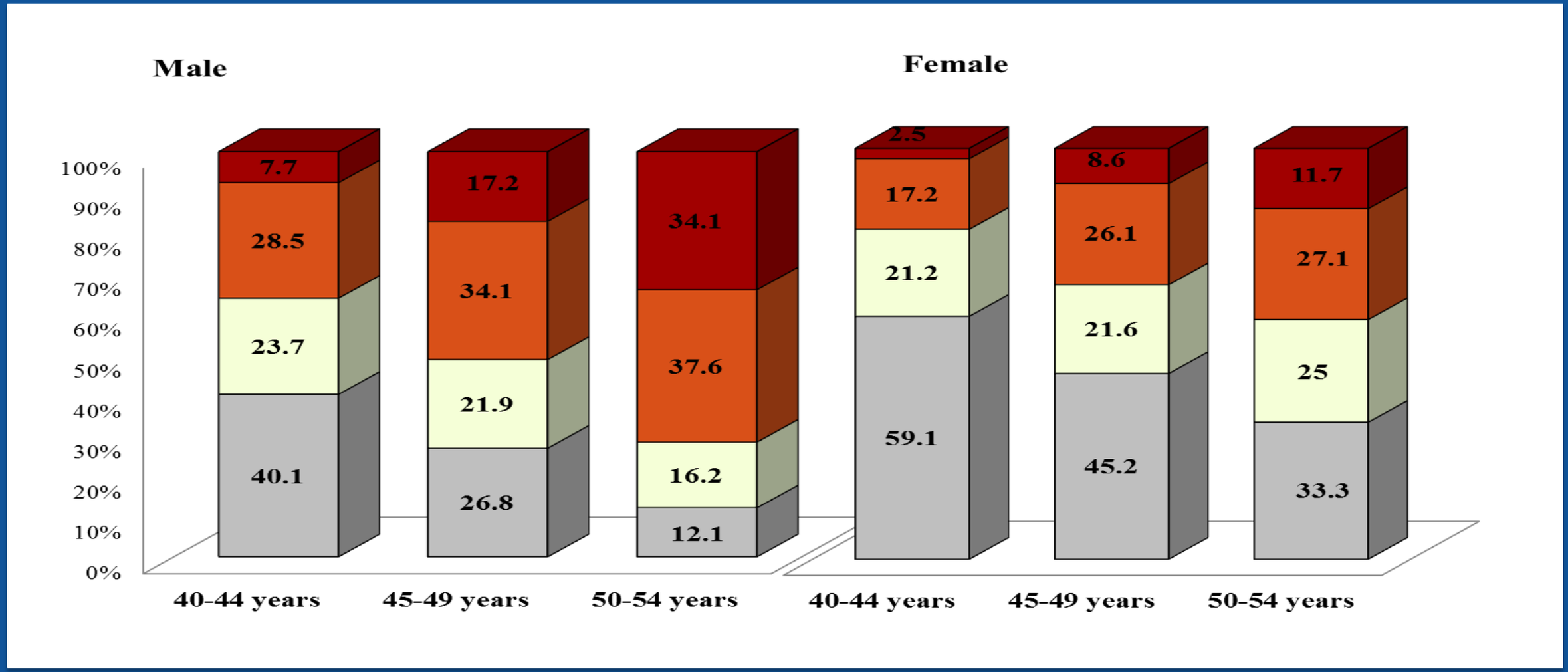




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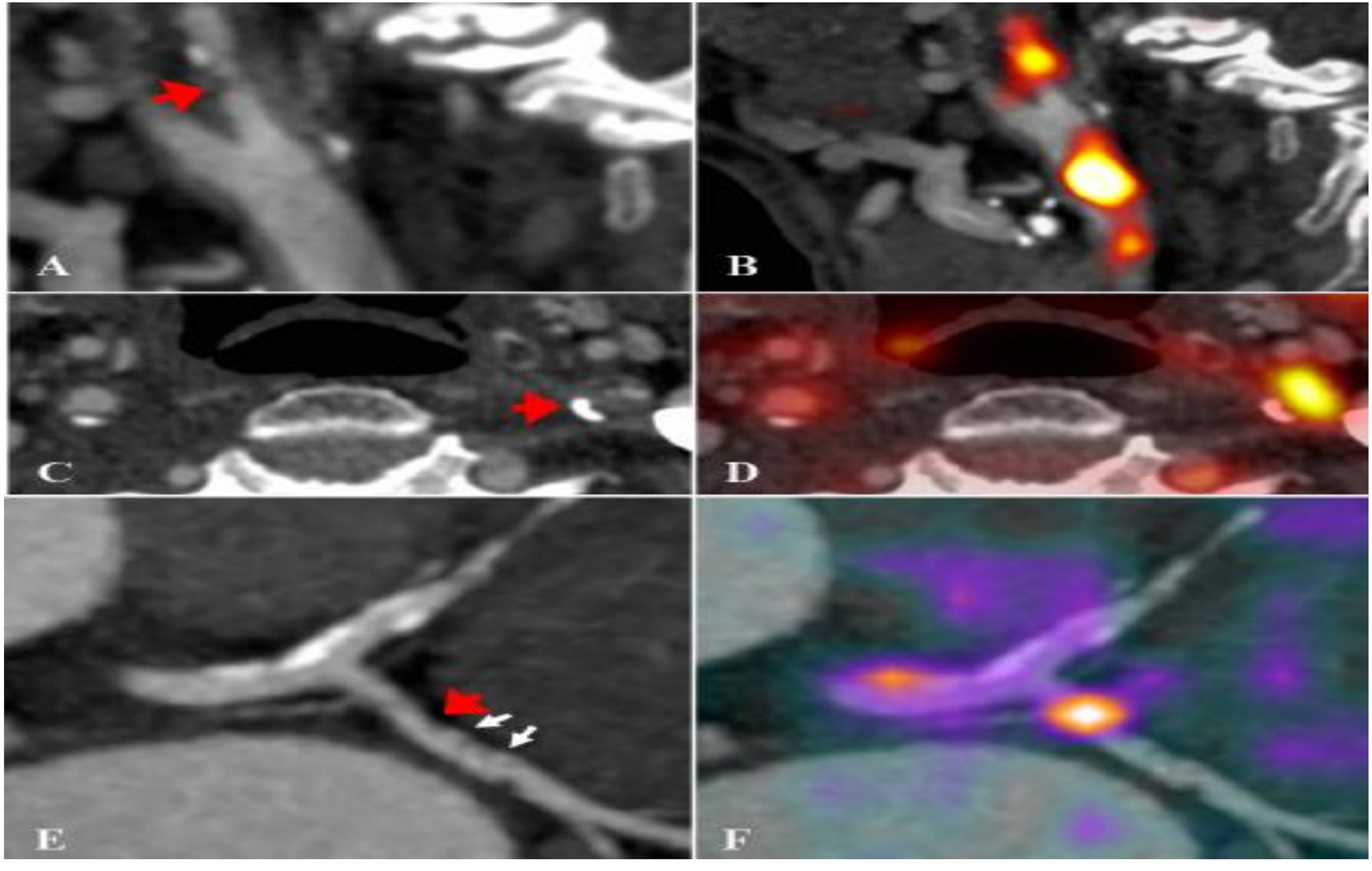
U Baber, R Mehran, V Fuster, et al. J. Am. Coll. Card. 2015; 65: 1065

Distribution Of The Systemic Extent Of Subclinical Atherosclerosis



PESA (L Fernandez-Friera, A Fernandez-Ortiz, V Fuster et.al)
Circulation 2015;131:2104

CT / PET – Carotid and CxCA Plaques and Inflammation



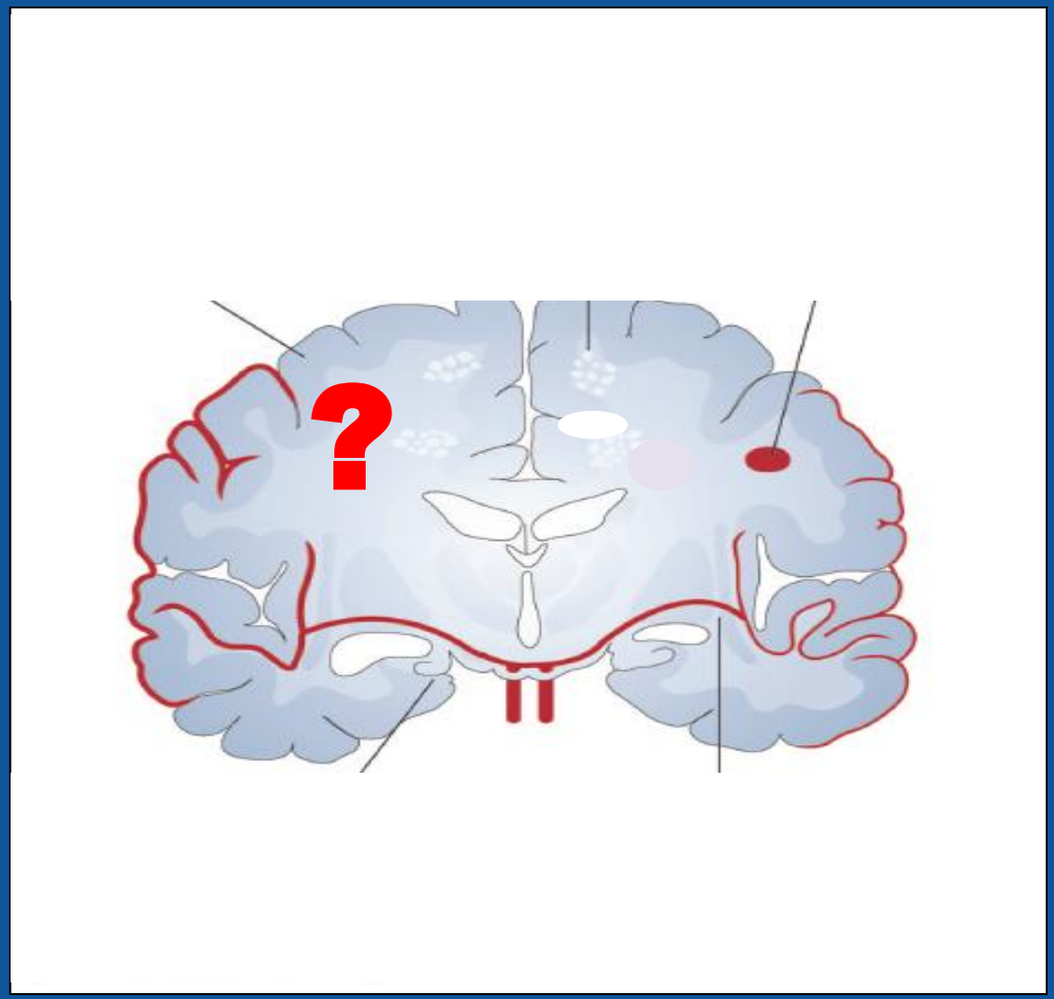
Tarkin JM, Dweck M, Fayad ZA et al. Circ Research 2016 (in Press)

3c). Framingham, When Positive Coronary Artery Calcification Score and Ultrasound are Added



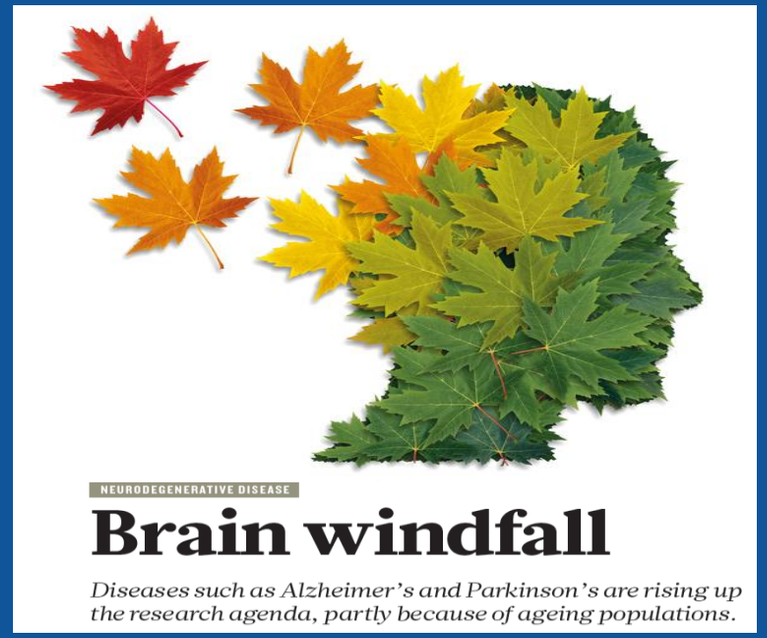
***AWHS** - M Lacaustra, V Fuster et al. JACC 2016; 67: 1263*

4,5). A Health Center In The Adult Brain (?)



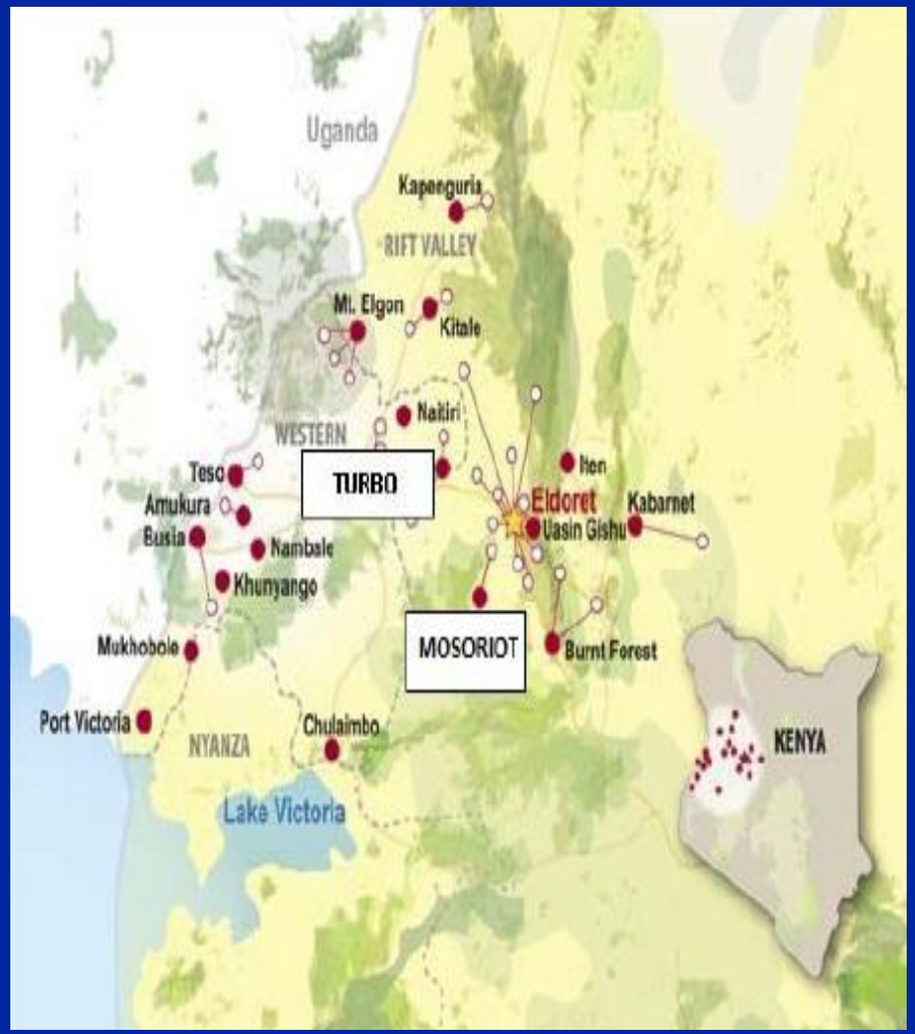


2B



To Stimulate / Motivate

4). AMPATH Centers In Kenya
BP Control / Non MD / High Technology





R Vedanthan, V Fuster, NHLBI / Kenya Model (2012-2016)

5). The Seven Community Study

N=552

86
69
96
104
127
70



Spain - E. Gomez, V Fuster et al JACC 2016; 67:476
Cardona Integral – "Fifty-fifty" - 2014
Global Demonstration Project – GHP – 2013

Disease to Health - Aging (A) to Birth (B)

Present

1. Health (QoL)

Early Economic — Late Expensive

B ← A

Health Policy

4. Environment

0 — 25 — 50 — 100

B ← A

Prom. Health — Subcl. Disease — Stable Disease

2. Science

Our Future

3. Education

Window Young — Behav. Change — Adherence Simplicity

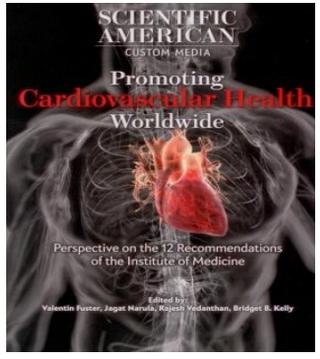
B ← A

0 — 25 — 50 — 100

V Fuster, JACC 2015; 66: 1627

Translation Studies Towards Promoting Healthy Aging

VF





secondary

primary

primordial

1) TAN NIP

2) FOCUS Fixed Dose Combination Drug for Secondary cardiovascular Prevention

SECURE
SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE IN THE ELDERLY

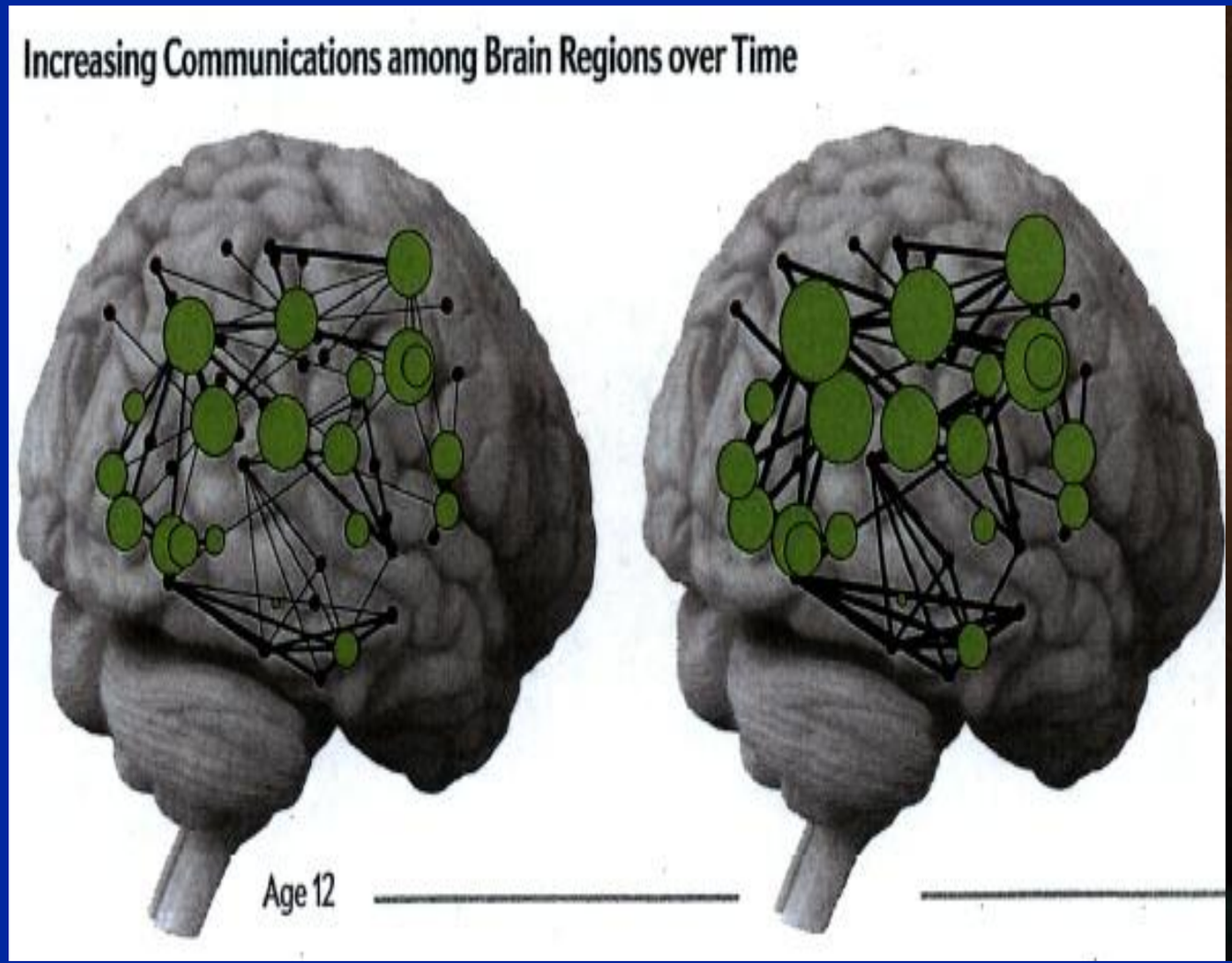
3) HRP
PESA
AWHS

4) IIIP

5) 50/50

6) Sí! Programa de Salud Integral

6). Child's Brain Development Less Networking Brings Atention





1B

JN Giedd. Scientific American 2015;312:32

6a).COLOMBIA – CHILDREN'S PROGRAM



HOW YOUR BODY & HEART WORK



HEALTHY FOOD HABITS



PHYSICAL ACTIVITY



EMOTIONAL HABITS TO AVOID ADDICTIONS

EDUCATIVE GOAL: HEALTHY HABITS FOR CHILDREN BETWEEN 3 & 5 YRS

CHILDREN

3-5



6-8



9-14



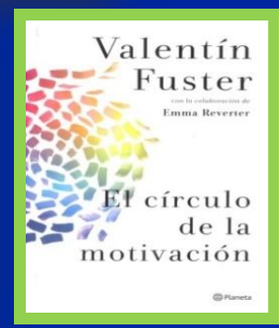
GENERAL PUBLIC



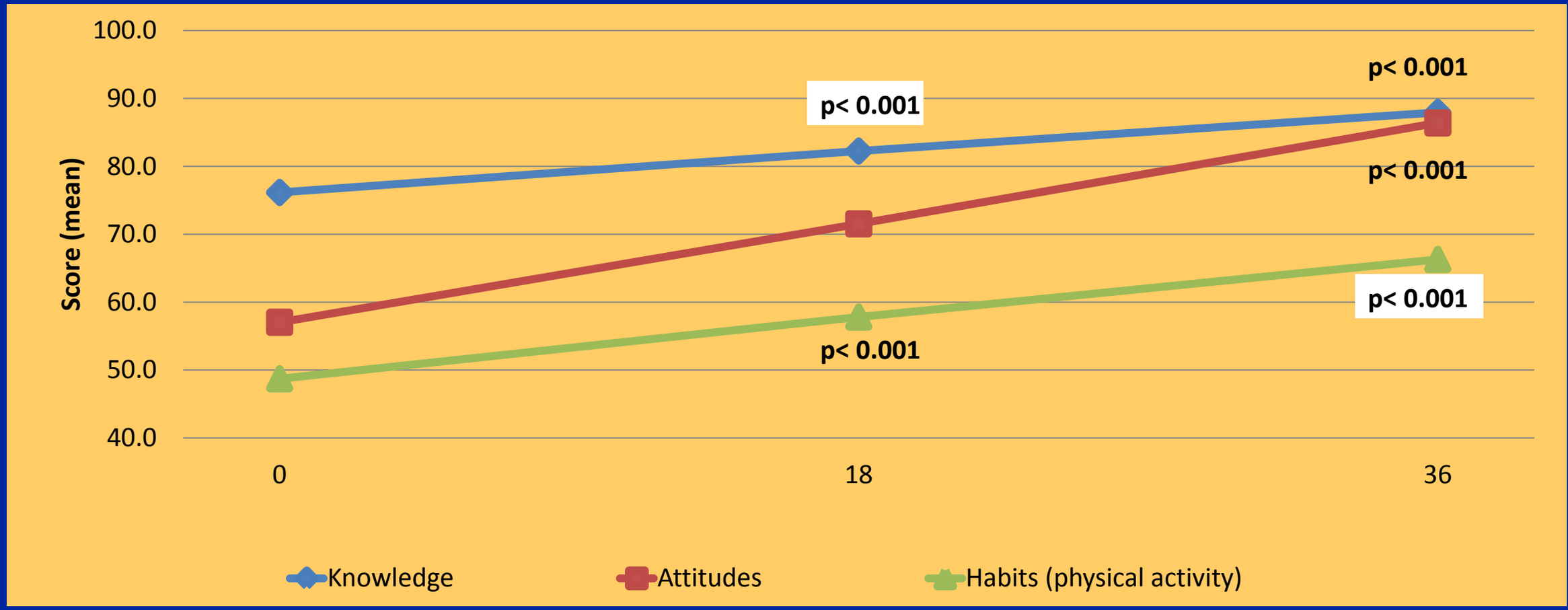








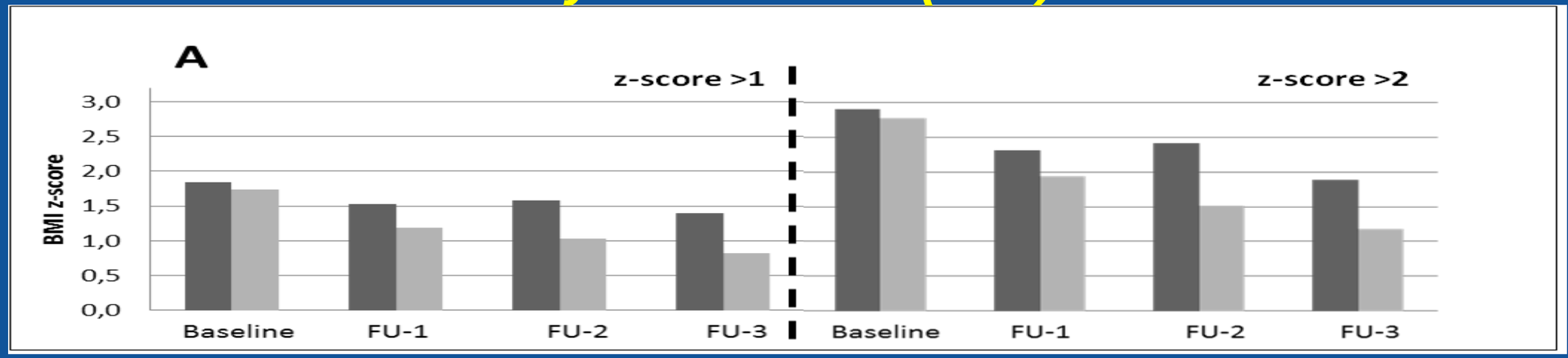
In Children's KAH Mean Scores*



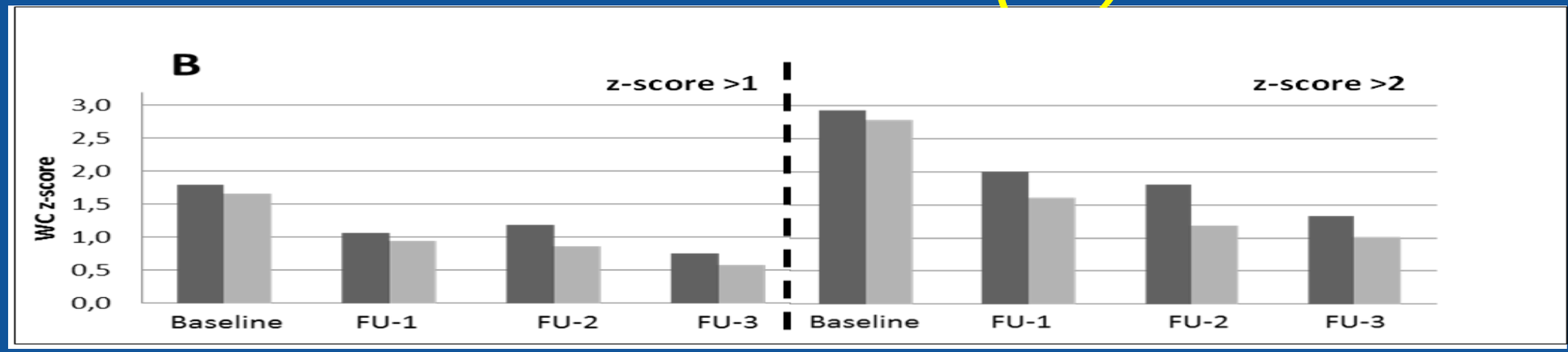
The Amer J of Med 2012; 126, 27
The Amer J of Med 2013;126:1122
Bogota – 25,000

6b). Changes In Anthropometric Variables At Each FU In Overweight Children

Body Mass Index (BMI)

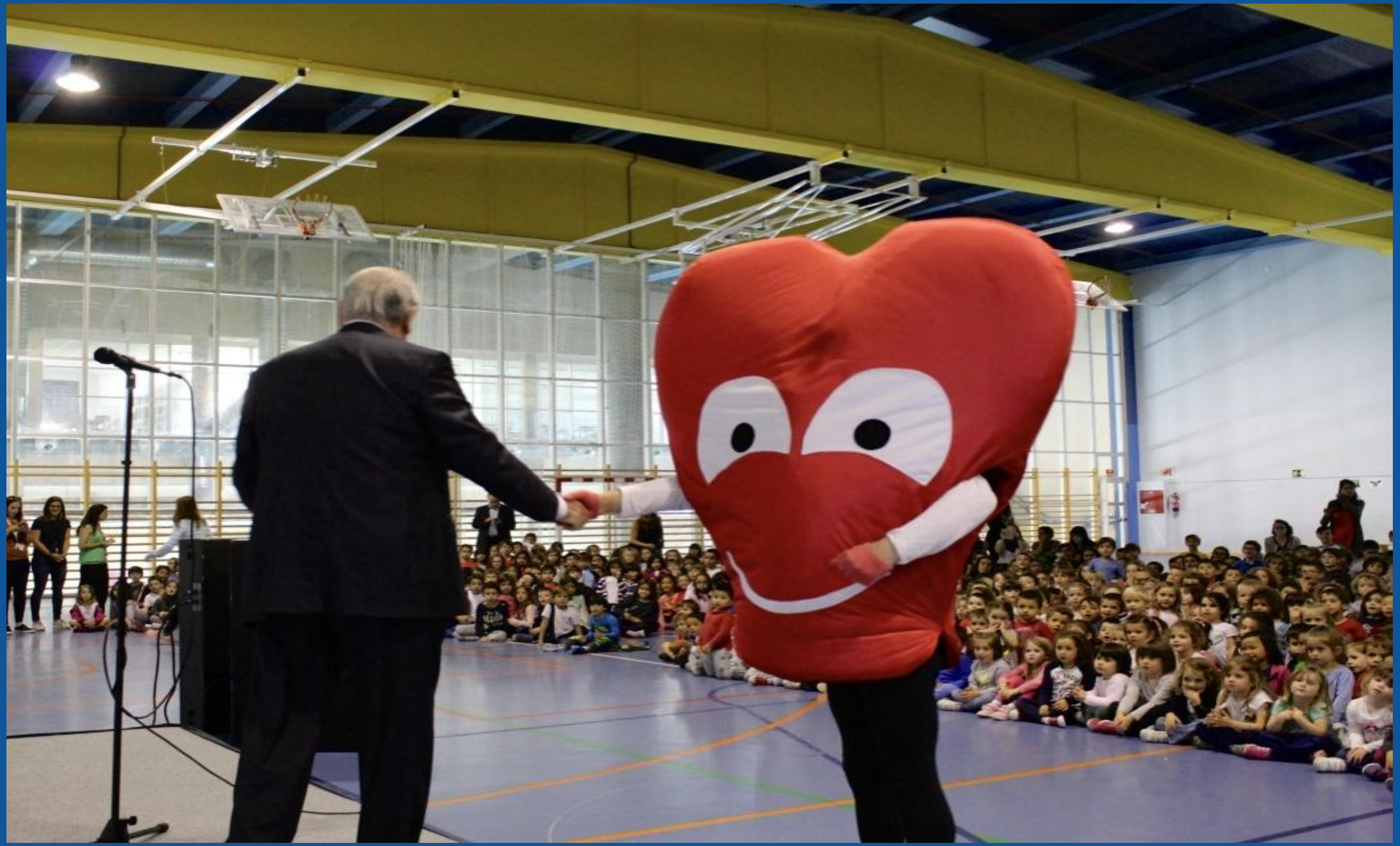


Waist Circumference (WC)



Control Intervention

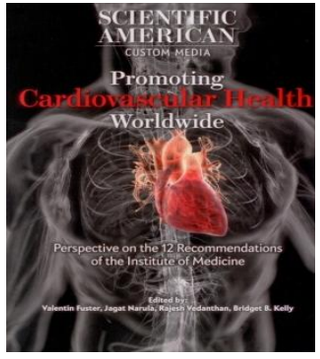
JL Peñalvo, V Fuster et. al. JACC 2015;65:1065. - 75,000,





Translation Studies Towards Promoting Healthy Aging

VF





primordial

primary

secondary

1) TAN NIP

2) FOCUS Fixed Dose Combination Drug for Secondary cardiovascular Prevention

SECURE
SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE IN THE ELDERLY

3) HRP PESA AWHS

4) IIIP

5) 50/50

6) Si! Programa de Salud Integral

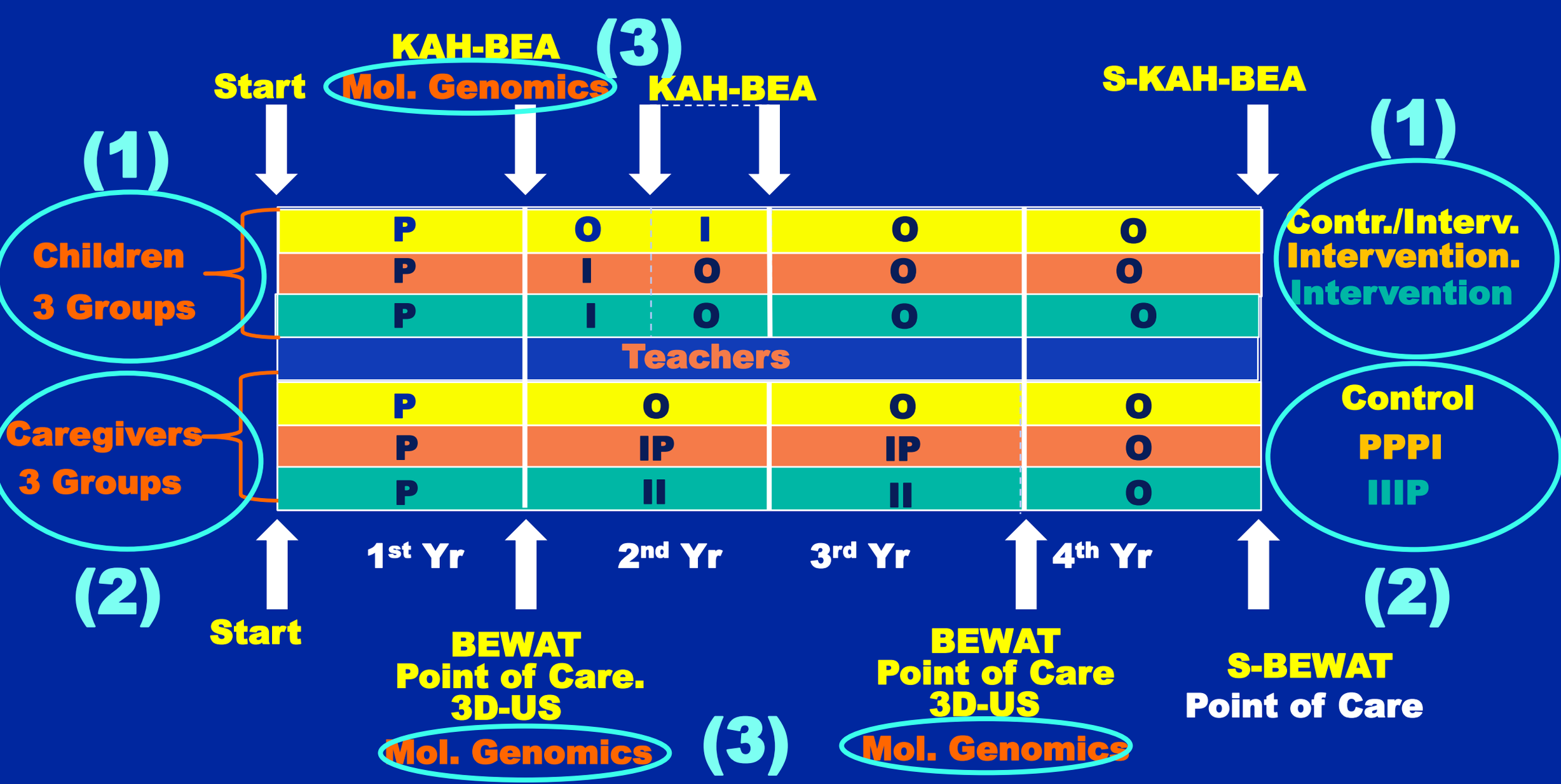


BARRIERS TO IMPLEMENTATION OF A HEALTH PROMOTION PROGRAM IN HARLEM, NY

THE FAMILIA STUDY

An AHA Strategically Focused Research Network Study

Sameer Bansilal, MD, MS, Rajesh Vedanthan, MD, MPH, Risa Jaslow, MS, RDN, Martha Hadley, PhD, Amy Siskind, PhD, Carmina Marcial, MA, Ana Victoria Soto, MD, Claire Kofler, BS, Zahi A Fayad, PhD, Valentin Fuster, MD,PhD



KAH-BEA = Knowledge, Attitude, Habit, -BMI, Exercise, Alimentation ;

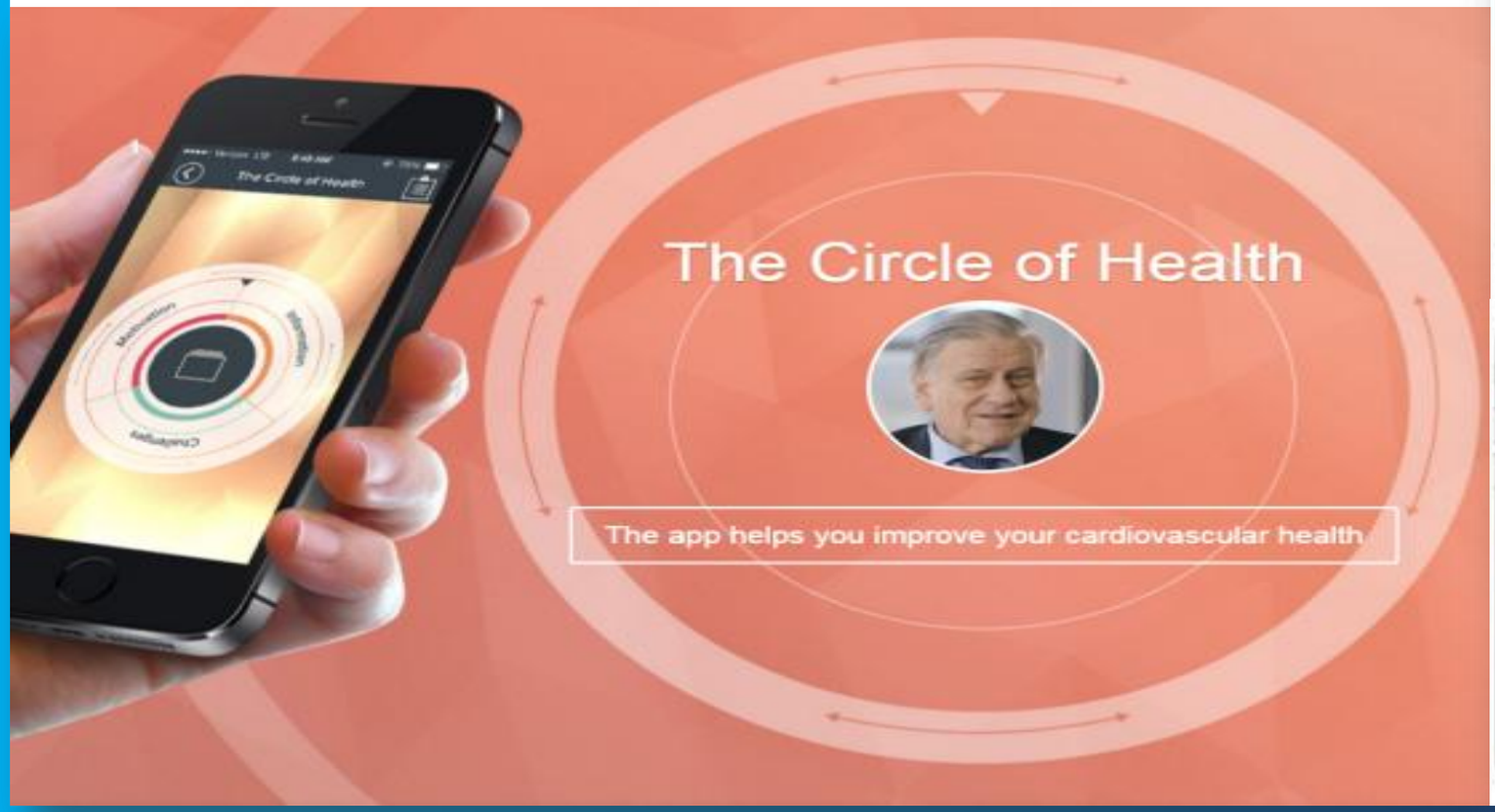
FUSTER-BEWAT = BP, Exercise, Weight, Alimentation, Tobacco; S=Sustained

Interactive "Circle of Health" - App

Actividades previstas

Fundaciónprocnic

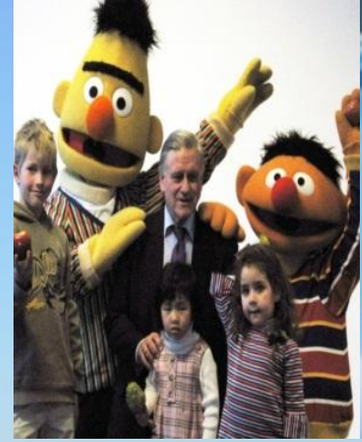
Icahn School of Medicine at Mount Sinai





www.thecircleofhealth.org

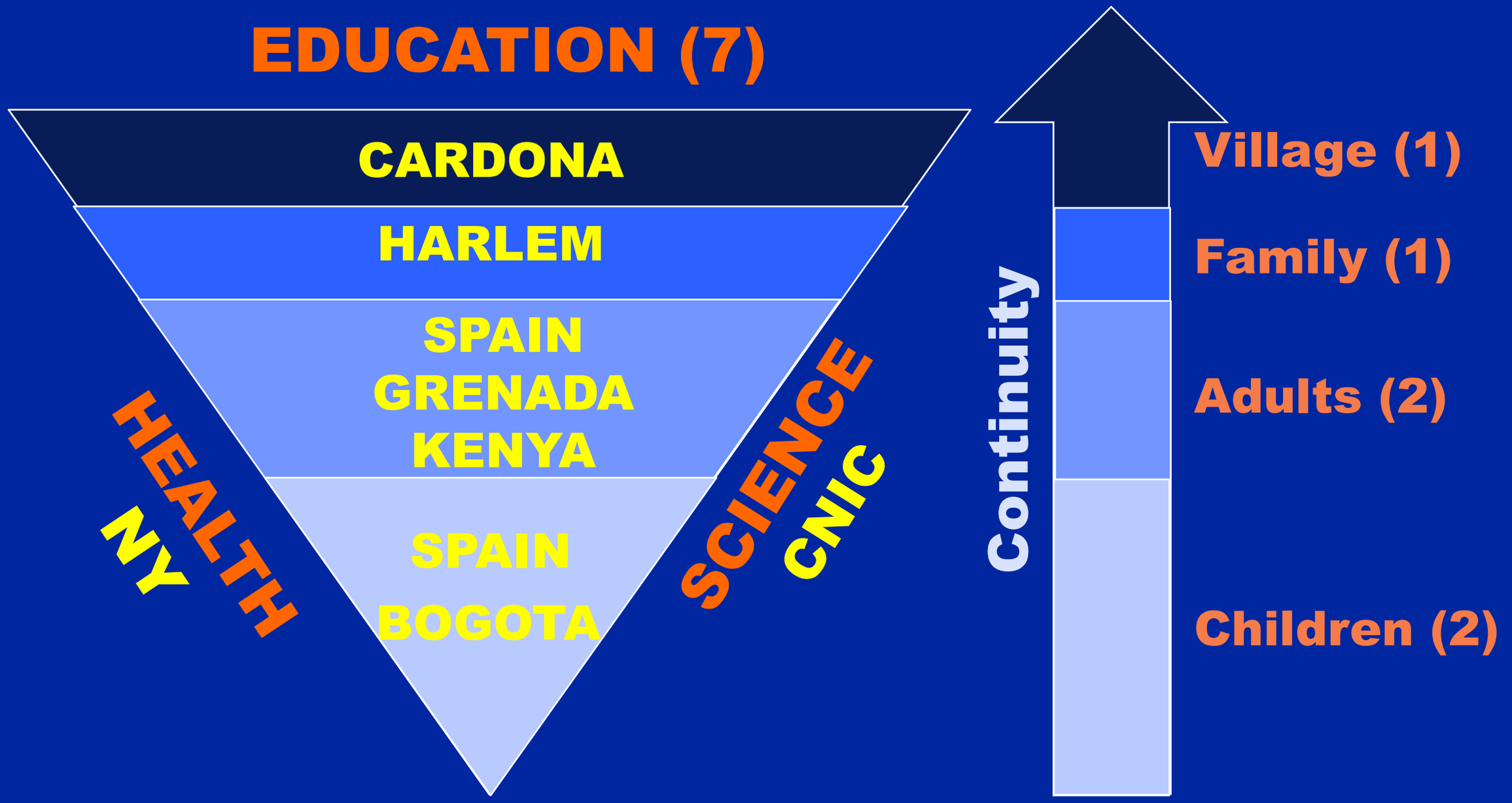
HEALTH
ENVIRONMENT
SCIENCE
EDUCATION







EDUCATION (7)



CONCEPTS, SCIENTIFIC STUDIES TO GOVERNMENTS

Our Scientific & Funding Challenge
Disease to Health, Aging to Birth

The Heart & The Brain (3)

Vienna, June 16, 2016

No Disclosures