Novel approaches for addressing adverse lifestyles in patients with Cardiovascular Disease and their families

Webinar Chair:
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Queens University Belfast

Issues for discussion

- **How to optimise self-management in lifestyle change**

  including telehealth strategies…

- **New strategies to overcome old obstacles in cardiovascular prevention:**

  How can the family help?

What are adverse lifestyles anyway?

- Lack of exercise & sedentary behaviour
- Processed foods & high fat diet
- Smoking, passive smoking & electronic cigarettes
- High stress jobs & home life
- Unchecked risk factors – hypertension, hyperlipidaemia
- Social deprivation – poor housing & access to healthcare

A Perfect Storm…….

Issues with current prevention programmes

What's behind the lack of adherence?

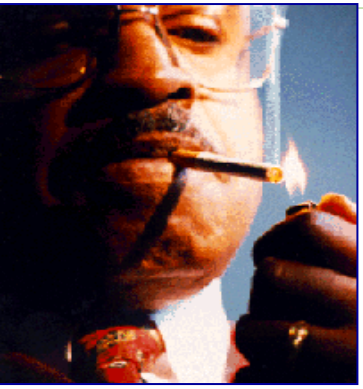
- **Personal resistance to change**
- **Poor motivation**
- **Inadequate understanding of risk**
- **Prevention programmes may be unattractive – time, location, components, length**
- **Poor infrastructure & lack of investment in prevention**

How to optimise self-management in lifestyle change
(including telehealth strategies)

Dan Gaita

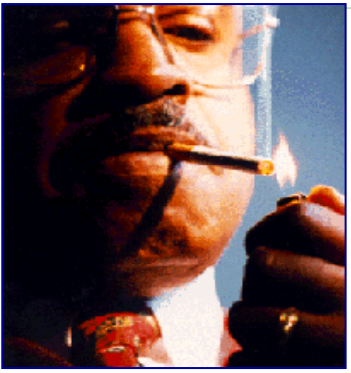
CENTRUL MEDICAL
FUNDATIA CARDIOPREVENT

Boli cardiovasculare
Diabet zaharat si obezitate
Boli respiratorii si alergii
Tulburari de somn



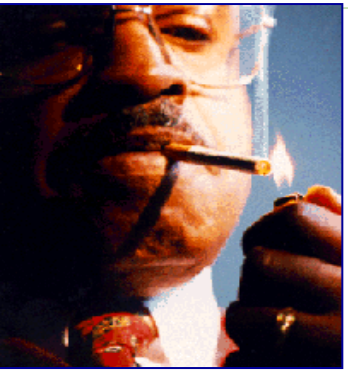
- Male, 57 y, hypertension, dyslipidemia
- History: **father** died at 45 y (MI)
- **Smoker** 20-30 cigarettes/day
- **No time for exercise** (enjoying sport TV channels..)
- Multinational company (extra-program, stress)
- No CVD history

- Weight 102 kg ,Height 173 cm
- BMI **34.2** kg/m^2 (abdominal obesity)
- BP ***165/90*** mmHg, HR 65 beat/min



- HbA1c 8.1%
- Fasting glucose 7.8 mmol/L (139 mg/dL)
- Creatinine 150 mmol/L (1.33 mg/dL)
- Total Cholesterol 6.3 mmol/L (243 mg/dL)
- Triglyceride 2.3 mmol/L (210 mg/dL)
- HDL cholesterol 0.9 mmol/L (35 mg/dL)
- LDL cholesterol 4.4 mmol/L (172 mg/dL)

Question 1



His CV risk is high?

1. Yes
2. No
3. I dont't know

Assessment of Total CV Risk

Systematic Coronary Risk Evaluation (SCORE)

European: 10 year risk for fatal CVD

Very High risk:

>10%/ a history of CVD/ DM/ CKD

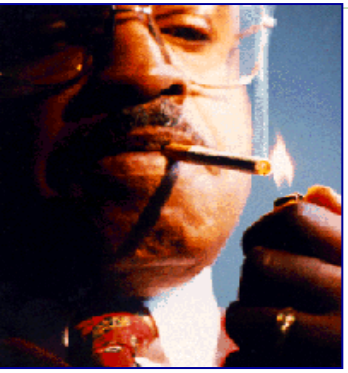
High risk:

5%-10%/ a very high level of chol/BP/ DM/ CKD

Moderate risk: 1%-5%

Low risk: ≤1%

Question 1



His CV risk is Very high!

1. Yes
2. No
3. I dont't know

CVD risk continuum

CVD

Diabetes mellitus

Chronic kidney disease

Risk factors

Healthy individuals

Large population at risk

High risk individuals

Clinical dichotomy

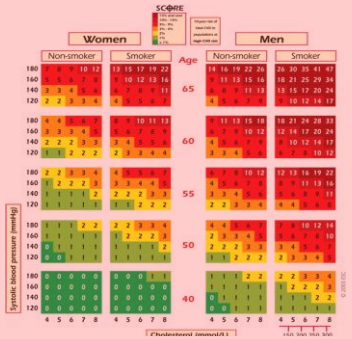
CVD

Diabetes mellitus

Chronic kidney disease

Healthy individuals

Risk factors



<1%

≥5%

Population prevention

Clinical prevention

Clinical dichotomy

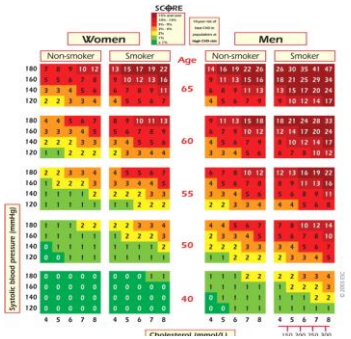
CVD

Diabetes mellitus

Chronic kidney disease

Healthy individuals

Risk factors



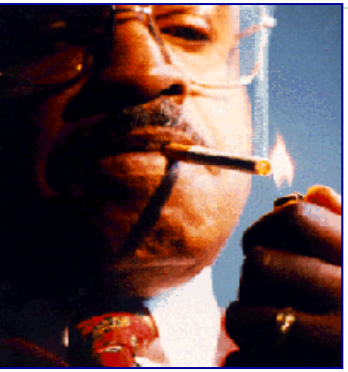
<1%

≥5%

Population prevention

Clinical prevention

Question 2



Lifestyle changes?

1. Nutrition
2. Physical activity
3. Smoking cessation
4. Stress mangement
5. CVD risk factors control

TOPICS

1. Why? He

"The only way to keep healthy is to
eat what you don't want,
drink what you don't like and to
do what you would rather not do"
Mark Twain

2. Sc ment

health

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ESC COUNCIL Cardiovascular Nursing and Allied Professions
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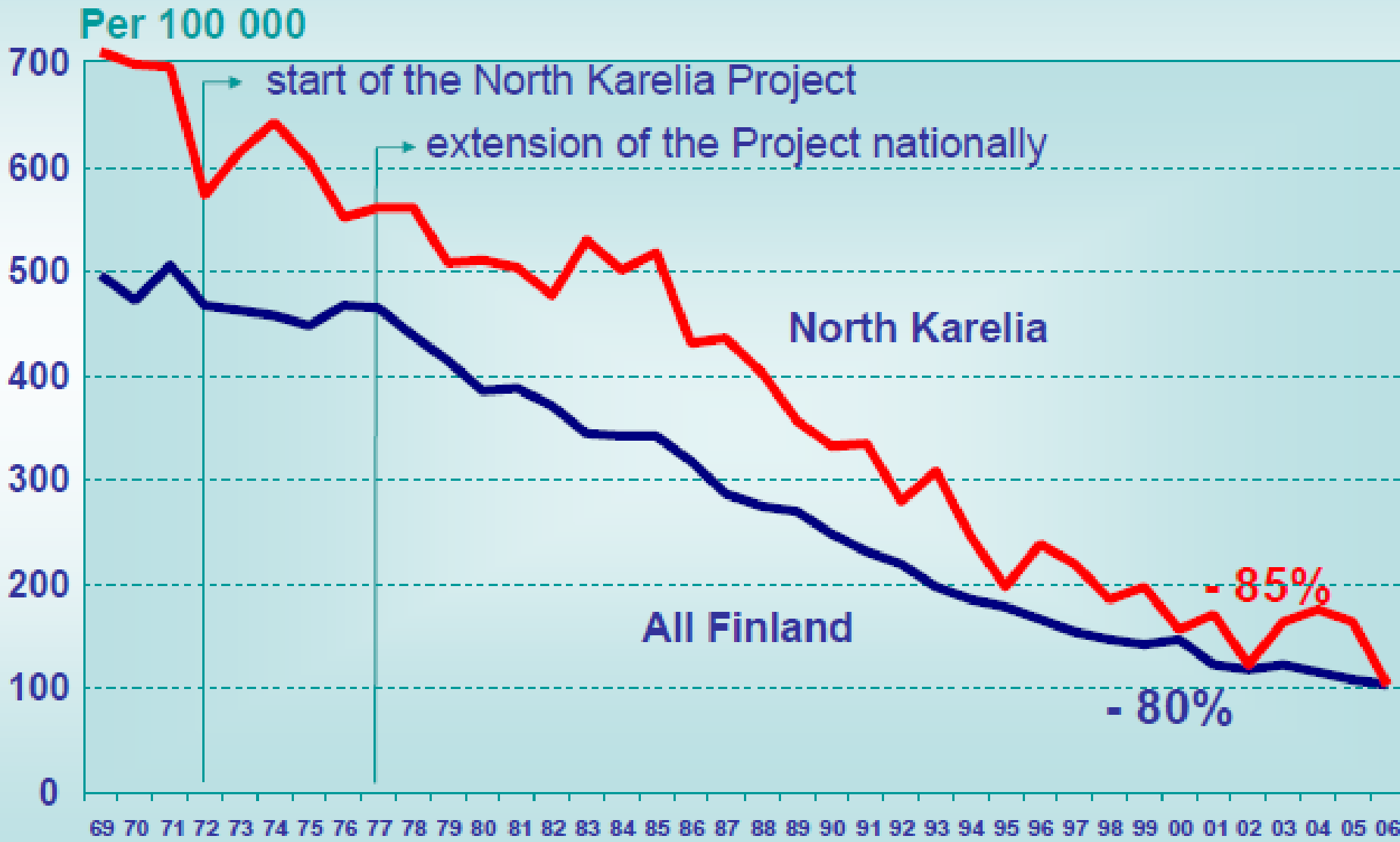
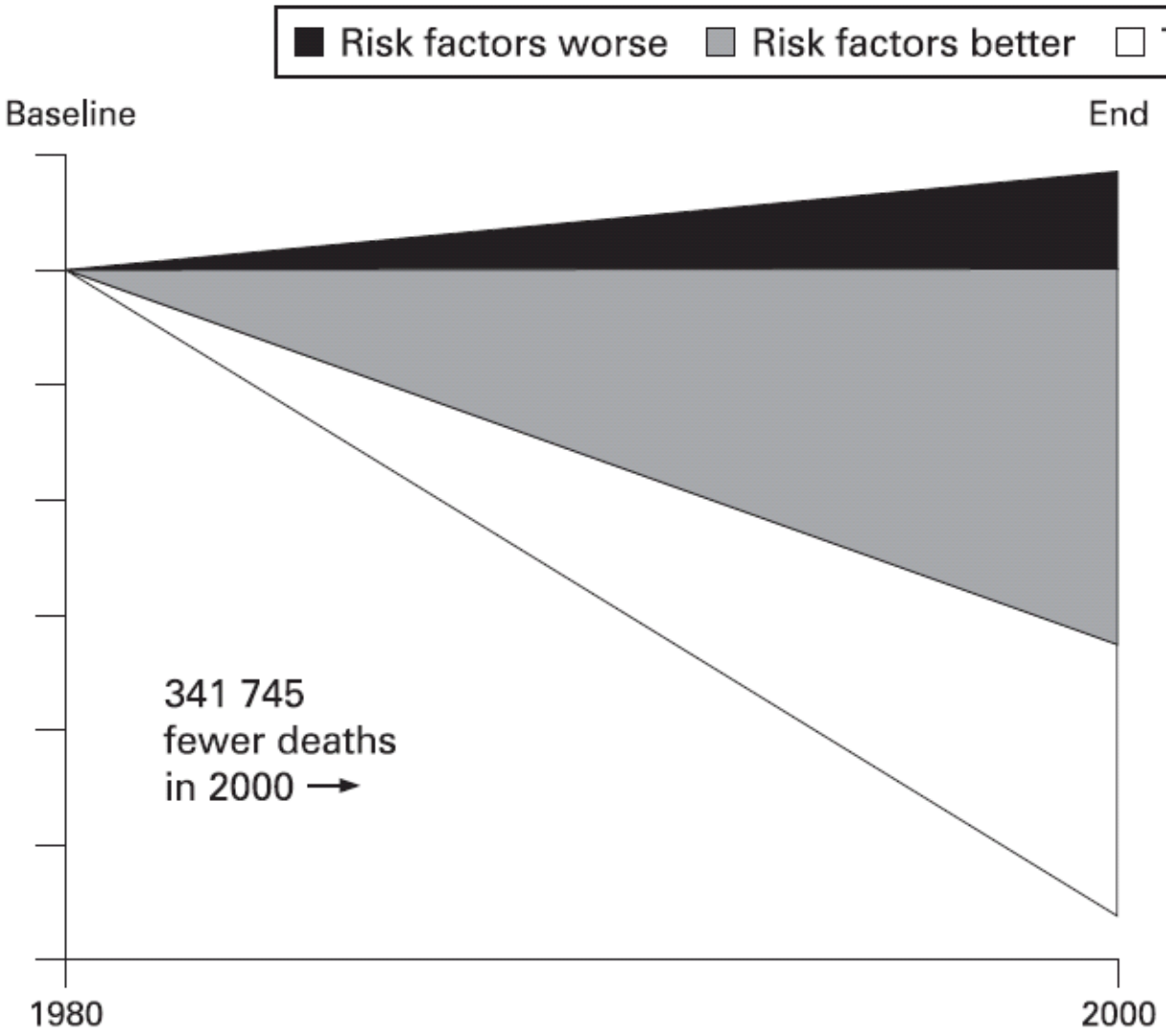
CHD Mortality in All Finland and in North Karelia, Men Aged 35-64



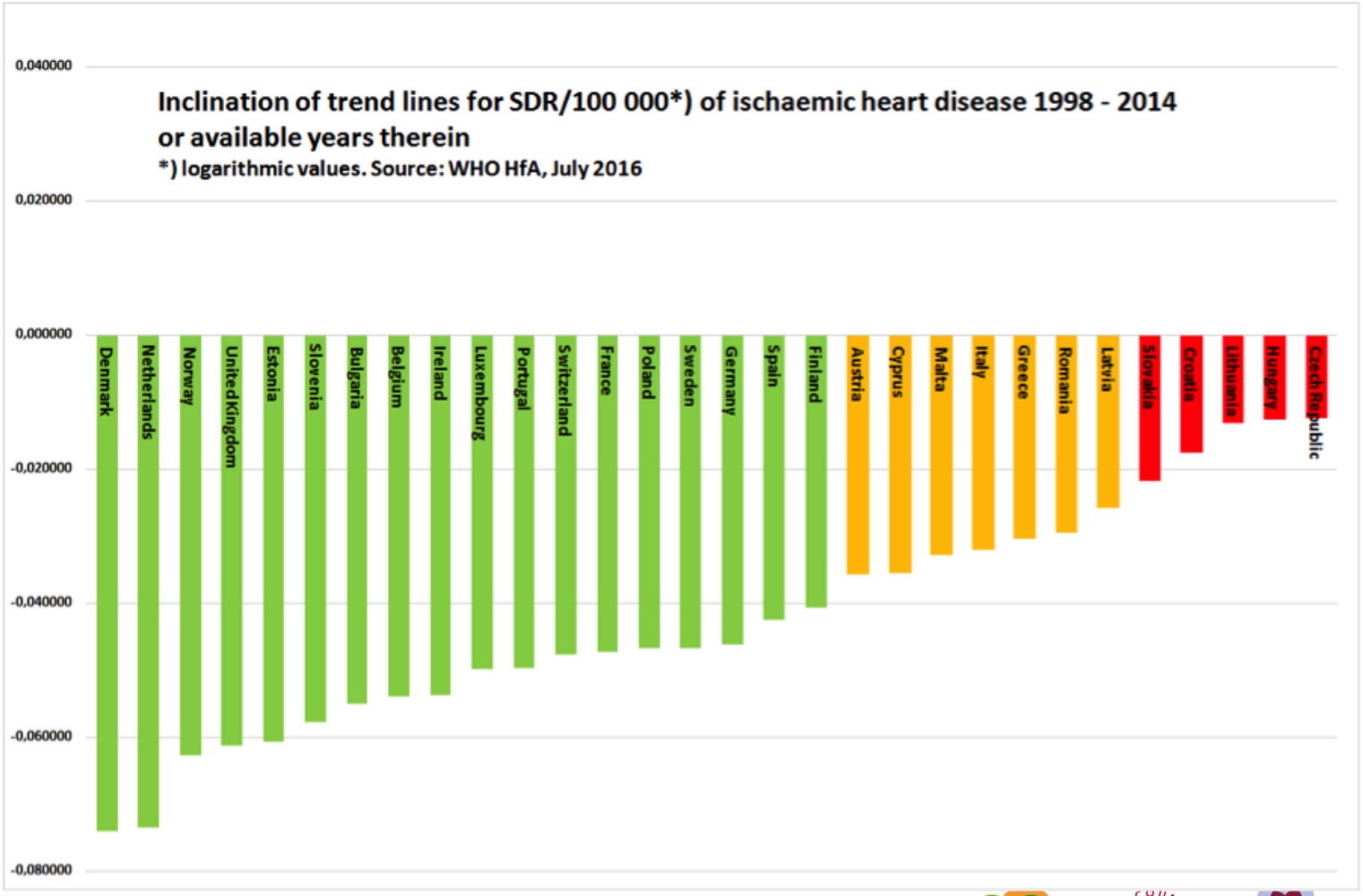
CHD deaths prevented or postponed

by treatments and risk factor changes, in the US 1980–2000.



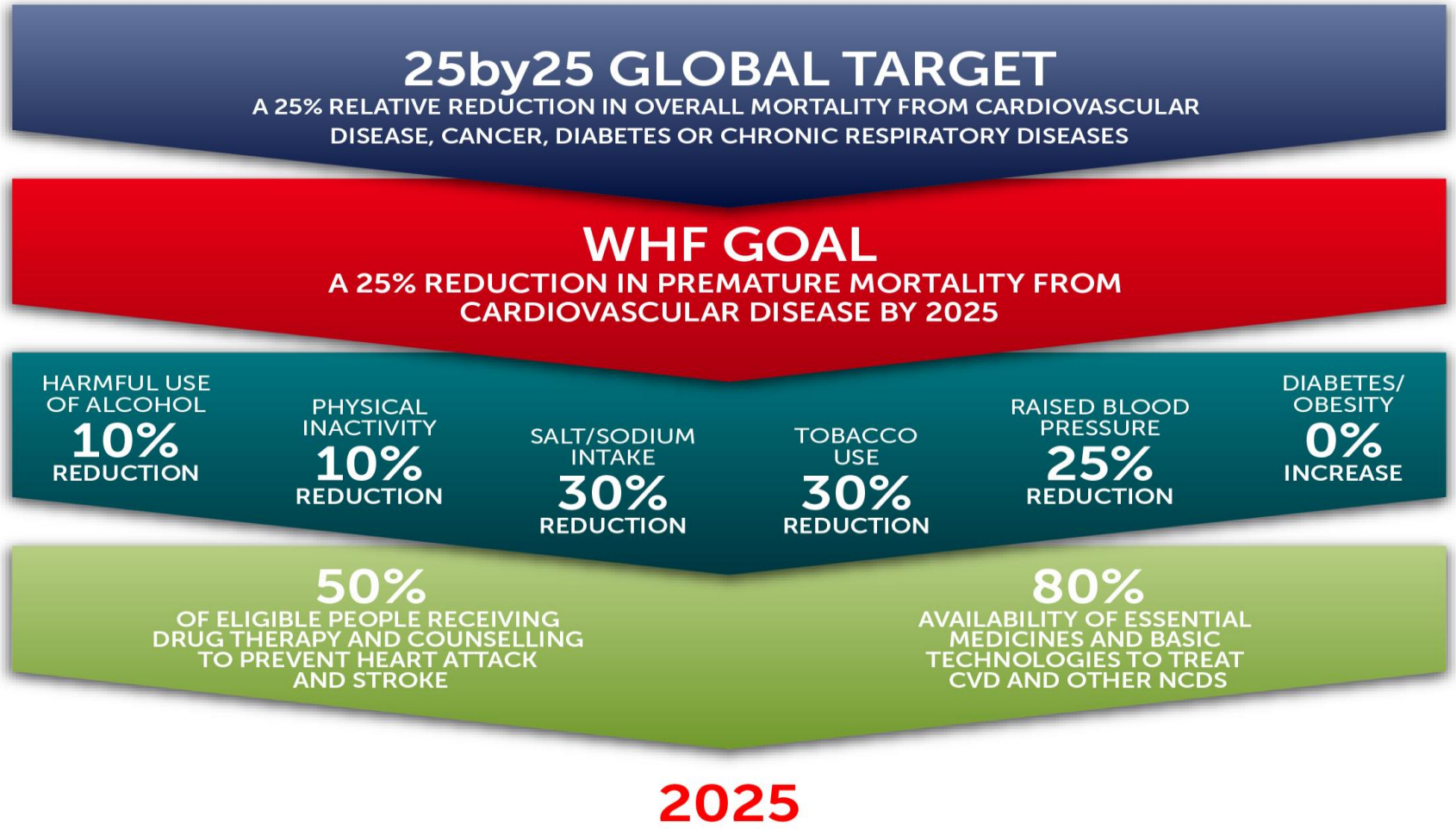
Risk factors worse	+17%
Obesity (increase)	+7%
Diabetes (increase)	+10%
Risk factors better	–61%
Population BP fall	–20%
Smoking	–12%
Cholesterol (diet)	–24%
Physical activity	–5%
Treatments	–47%
AMI treatments	–10%
Secondary prevention	–11%
Heart failure	–9%
Angina: CABG and PCI	–5%
Hypertension therapies	–7%
Statins (primary prevention)	–5%
Unexplained	–9%

Prevention = Civilization



Euro Heart Index 2016

WHO Targets and WHF Goal



TOPICS

1. Why? How? What?

2. Self-management

Telehealth

"It is easier to fight for one's principles than to live up to them." — Alfred Adler

Self-Management

Self-manageme

= '**the successful outco** **appropriate individuals a** **support him or her** ***to de*** ***living the rest of t*** ***ons of*** ***g term***

… **edu** **with improved:**
r, adherence,
management,
uality of life
ealthcare utilisation

Information/
Awareness/
Access to healthy option

Self-management

European Heart Journal (2016) 37, 2315–2381
doi:10.1093/eurheartj/ehw106

Self-management & the adoption of a healthy lifestyle, such as through diet, physical activity, and other health-related behaviours (e.g. smoking cessation) essential for the chronic diseas

Thus **telerehabilitation** could further widen participation to more patients and provide monitoring and greater individualized behavioural support, but large-scale randomized trials are needed.

Smoking	No exposure to to
Diet	Low in sat… …grain produc…
Physical activity	…moderate aerobic PA …ek) or 75 minutes …robic PA (15 minutes for …combination thereof.
	…5 kg/m². Waist circumference <94 cm (men) …0 cm (women).
	<140/90 mmHg[a]
…ids[b] LDL[c] is the primary target	**Very high-risk: <1.8 mmol/L (<70 mg/dL),** or a reduction of at least 50% if the baseline is between 1.8 and 3.5 mmol/L (70 and 135 mg/dL)[d] **High-risk: <2.6mmol/L (<100 mg/dL),** or a reduction of at least 50% if the baseline is between 2.6 and 5.1 mmol/L (100 and 200 mg/dL) **Low to moderate risk: <3.0 mmol/L (<115 mg/dL).**
HDL-C	No target but >1.0 mmol/L (>40mg/dL) in men and >1.2 mmol/L (>45 mg/dL) in women indicate lower risk.
Triglycerides	No target but <1.7 mmol/L (<150 mg/dL) indicates lower risk and higher levels indicate a need to look for other risk factors.
Diabetes	HbA1c <7%. (<53 mmol/mol)

TOPICS

1. Why? How? What?

2. Self-Management

3. Telehealth

"I have never in my life learned anything from any man who agreed with me" - Dudley Field Malone

What is Telehealth?

The way to permit doctors
examine and treat patients remotely,
in real time,
using **online streaming video technology**
& **interactive tools**

What is Telehealth? (1)

Patients

- Timely access to locally unavailable services
- Reduces the burden and cost of transportation for care
- Increases patient engagement and self-management

Health Professionals

- Access to consultative services
- Supports team based, collaborative care delivery models
- Helps mitigate workforce shortages

What is Telehealth? (2)

Hospital Systems

- Facilitates appropriate transfers, keeps patients local when appropriate
- Decreases readmissions through remote patient monitoring tools

Communities

- Increased broadband deployment
- Enhances community hospital viability and supports workforce

Telehealth Scope of Services (1)

Telemedicine: Live (Audio-Video) Interaction

- Scheduled and unscheduled
- Specialty consults, Primary Care, Employee
- Ancillary health and wellness services

Telehealth Scope of Services (2)

Remote Patient Monitoring

Chronic disease management

- Hospitals- at risk population, cost avoidance/reduction
- Clinics- ACOs, Private practice, hospital owned
- Telemetry monitoring

Post Acute monitoring

Store & Forward &
Diagnostic Tests Interpretation

Cardiology!

Remote Patient Monitoring (RPM)

Home health services using telecommunications to enhance the delivery of home health care including:

- **Daily Health Sessions**
- **Personalized Interventions**
- **Targeted Education**
- **Health Coach**
- **Behavior Modification**
- **Patient Empowerment**

Home-health

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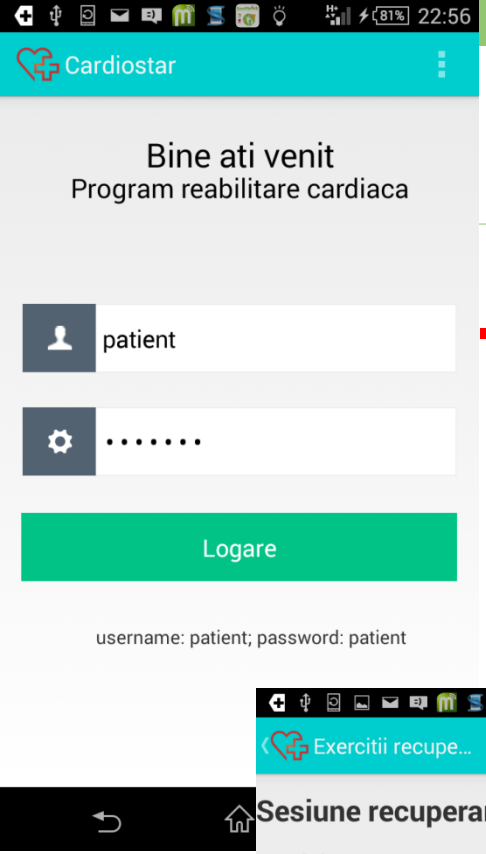
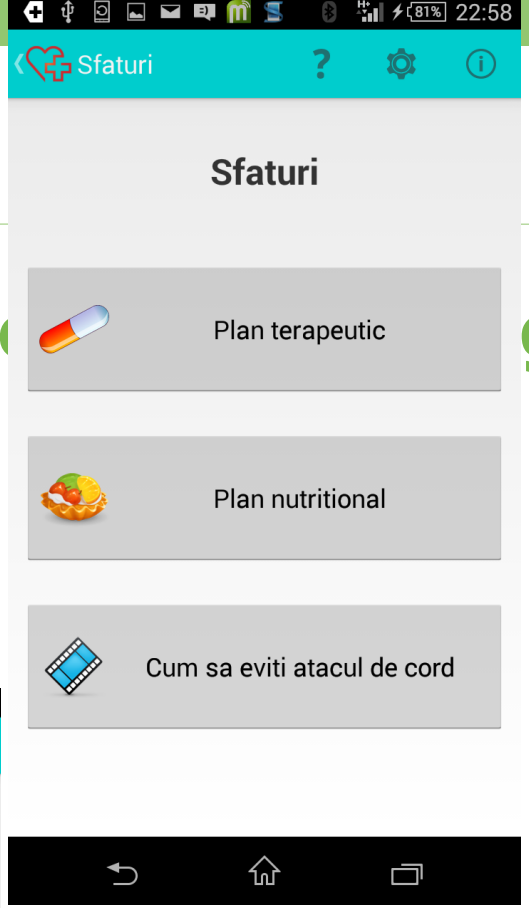
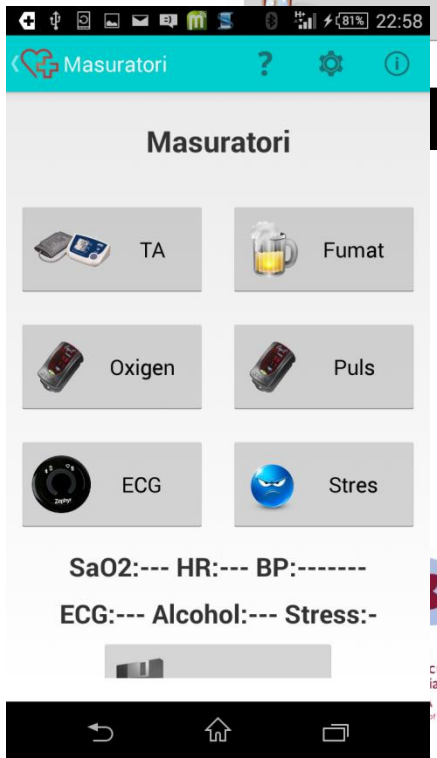
UNELE NUMERE
au nevoie
DE TOATĂ GRIJA TA

#ŞtiuCâtAm



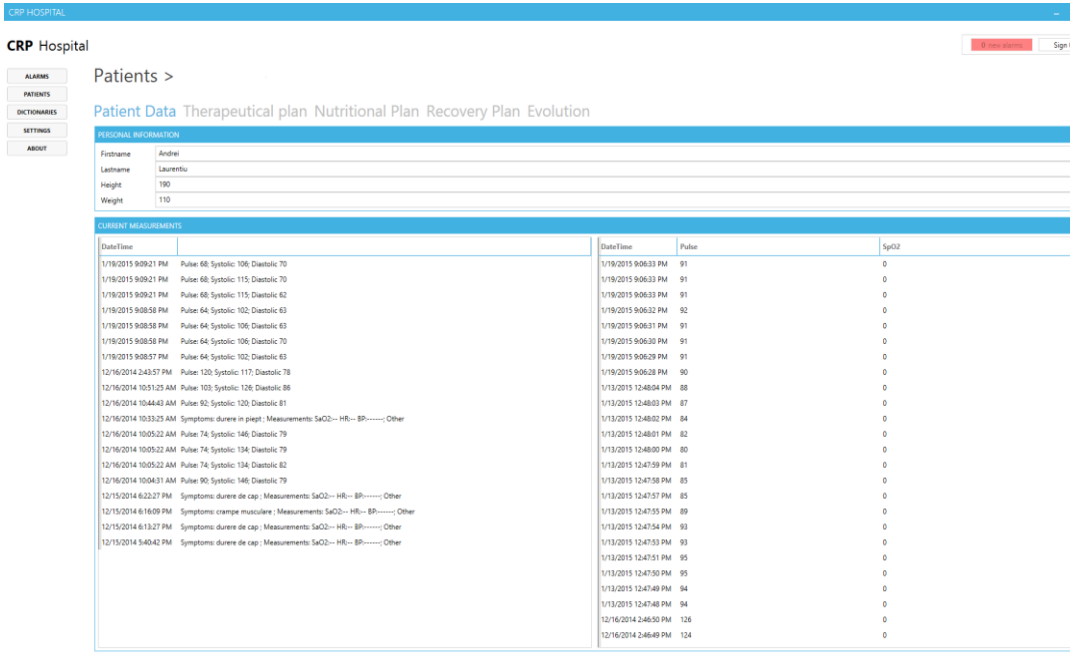




S. Busnatu's courtesy

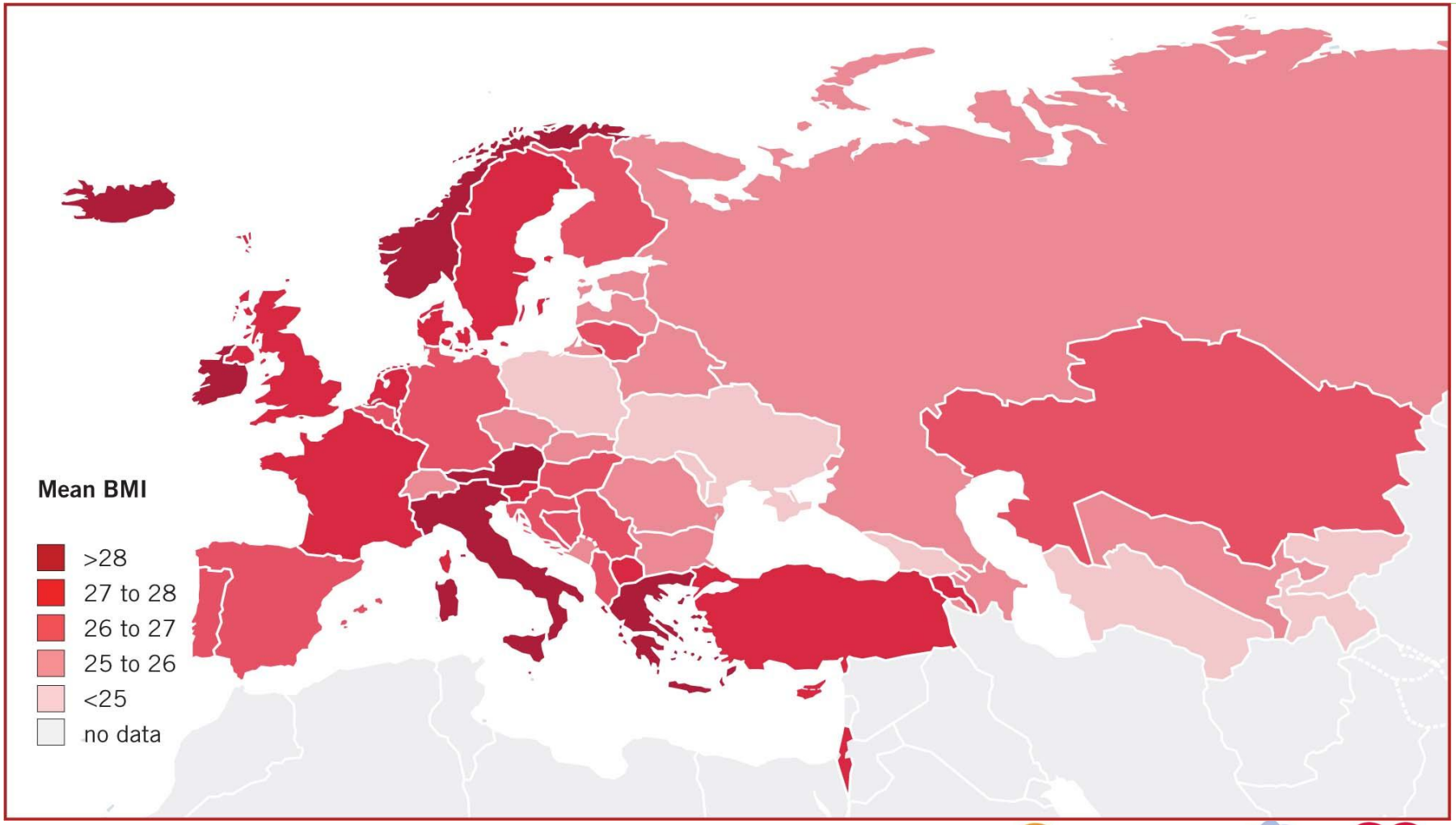
7 - Weeks Cardiovascular Online Rehabilitation

- *personalized **physical activity** sessions, 4 per week*
- ***nutritional indications***
- *real time **medical therapy titration***
- *BP/HR/O_2/ECG **monitoring***
- *ECG -**1- channel monitoring**(planned for the Beta version)*

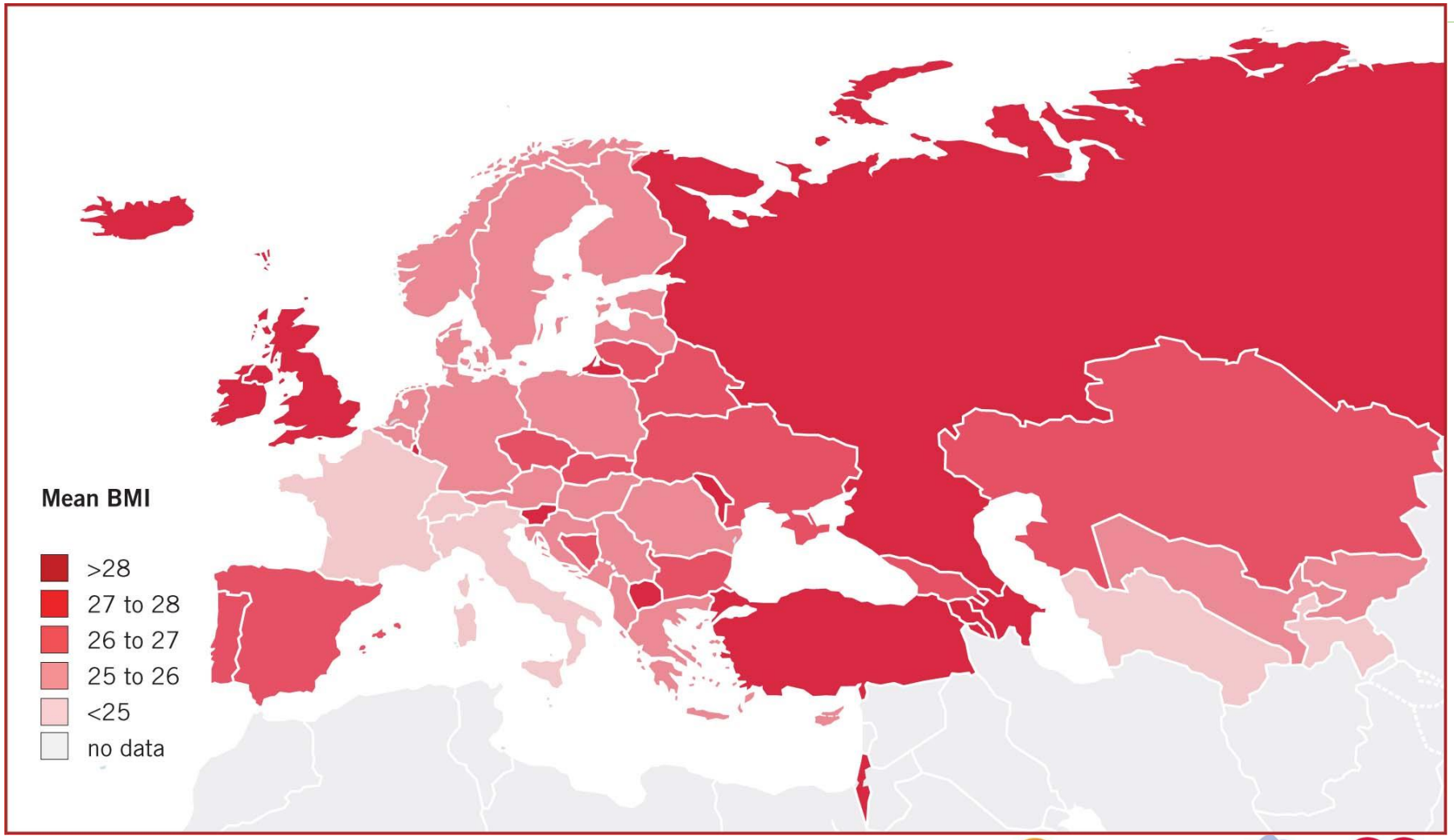



Models...

Mean BMI - men



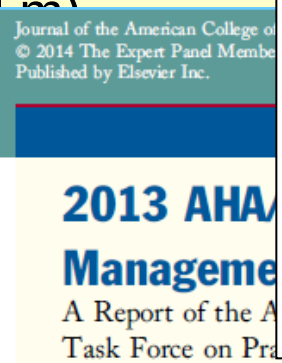
Mean BMI - women



World Health Organization

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a **risk to health.**

A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by the square of his or her height (in m)



Merriam-Webster

Definition of *OBESITY*

a condition characterized by the **excessive accumulation and storage of fat in the body**

An Encyclopædia Britannica Company

Obesity raises the **risk of morbidity** from hypertension, dyslipidemia, type 2 diabetes mellitus (diabetes), coronary heart disease (CHD), stroke, gallbladder disease, osteoarthritis, sleep apnea and respiratory problems, and some cancers. Obesity is also associated with increased **risk of all-cause and CVD mortality.**

Obesity & CV Risk

Risk factor	Change	Change in CHD risk, %
Obesity, men	+ 1%	+ 3.6
	+ 1 BMI unit	+ 15.8
	+ 1 kg	+ 5.4
Obesity, women	+ 1%	+ 3.3
	+ 1 BMI unit	+ 14.3
	+ 1 kg	+ 5.2

11 Studies , > 30,000 W, > 13,000 M

After adjusted for other risk factors, such as hypertension, dyslipidemia, diabetes, or smoking

Anderson JW et al. Obes Res 2001;9:326S-334S

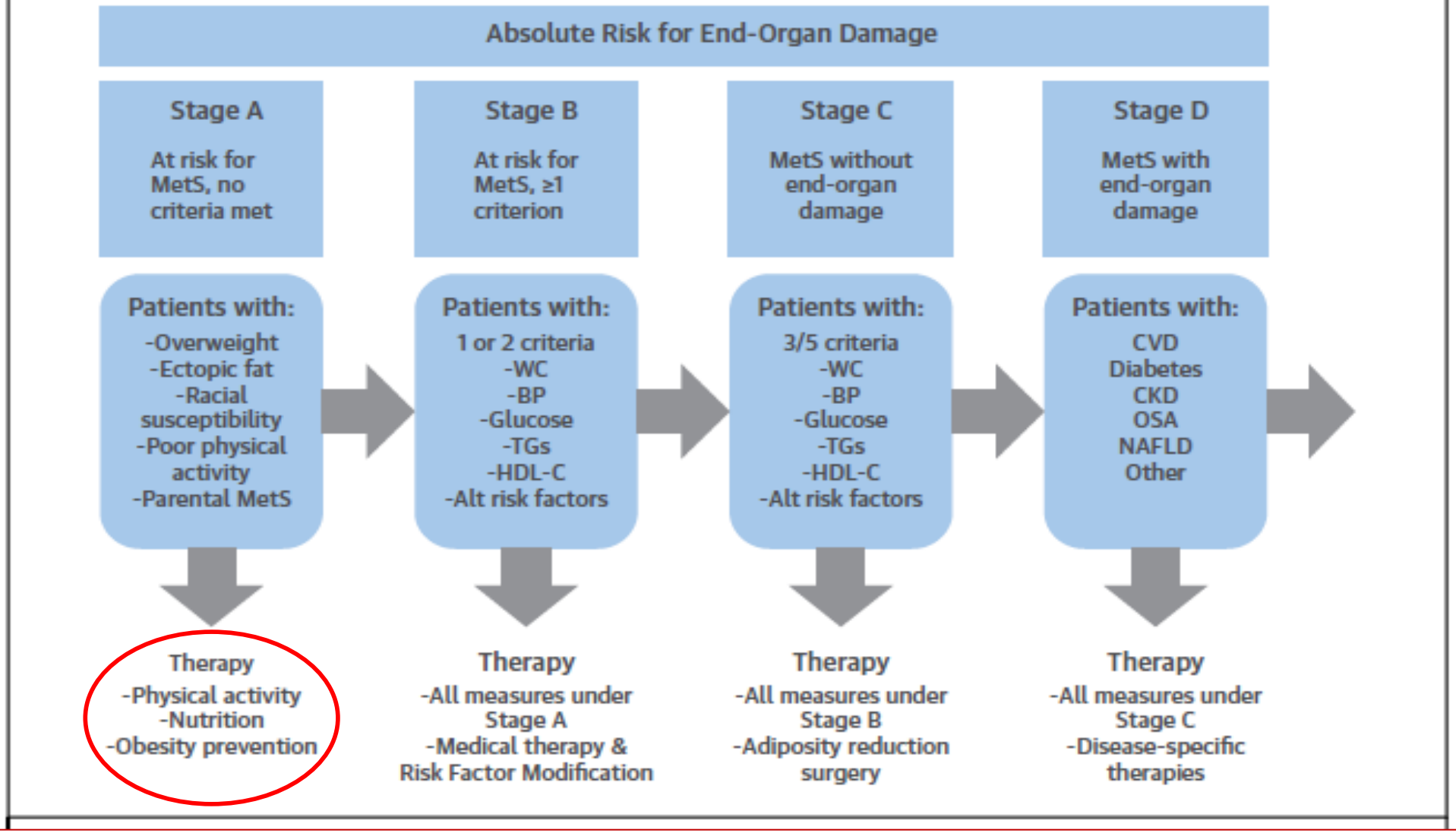
Weight gain? Looks the same…

Risk factor	Change	Change in CHD risk, %
Weight gain, men	+ 1%	+ 2.1
	+ 1 BMI unit	+ 9.1
	+ 1 kg	+ 3.1
Weight gain, women	+ 1%	+ 2.9
	+ 1 BMI unit	+ 15.6
	+ 1 kg	+ 5.7

11 Studies , > 30,000 W, > 13,000 M

After adjusted for other risk factors, such as hypertension, dyslipidemia, diabetes, or smoking

Anderson JW et al. Obes Res 2001;9:326S-334S



Sperling L et al. J Am Coll Cardiol.2015; 66(9):1050-67

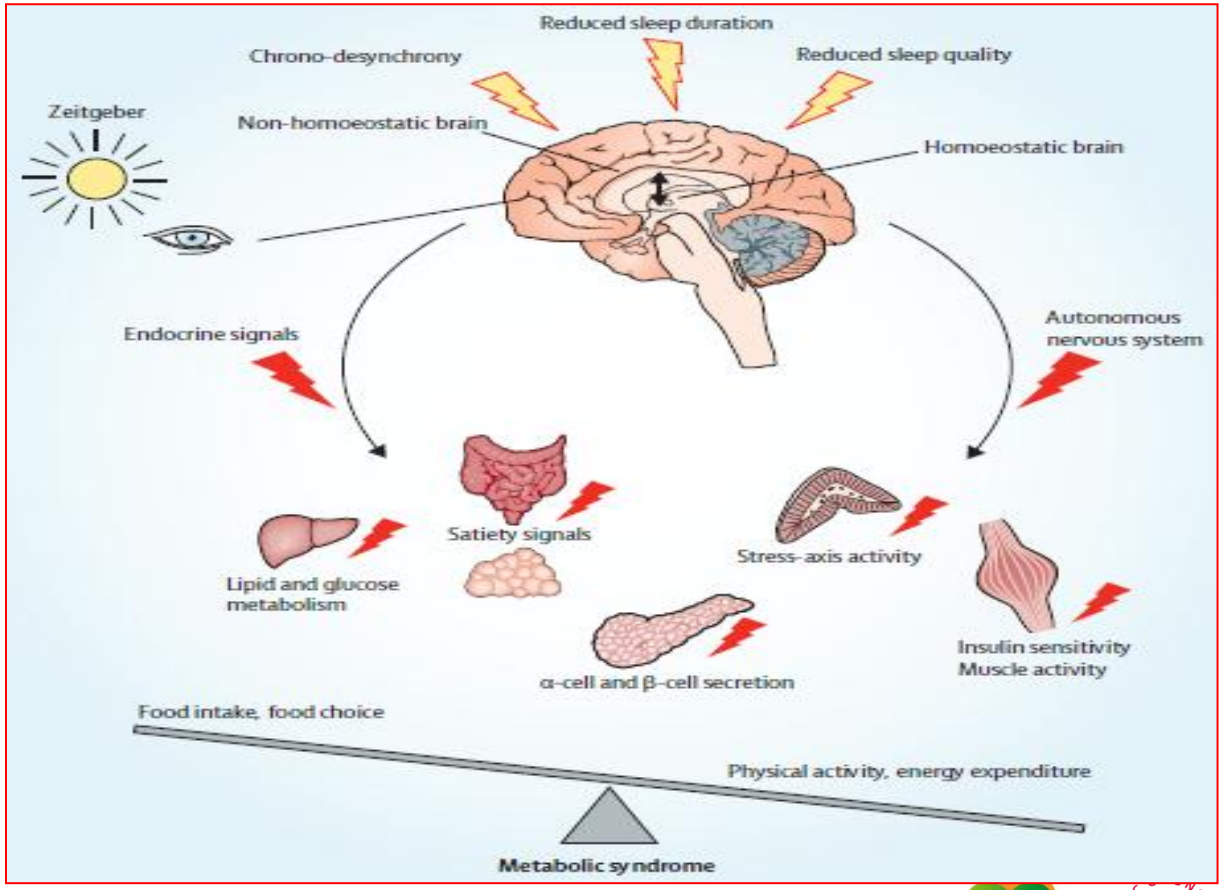

MHO
MHO
MHO
MHO
MHO
MHO

Review

Lancet Diabetes Endocrinol
2015; 3: 52–62

The metabolic burden of sleep loss

Sebastian M Schmid*, Manfred Hallschmid*, Bernd Schultes*



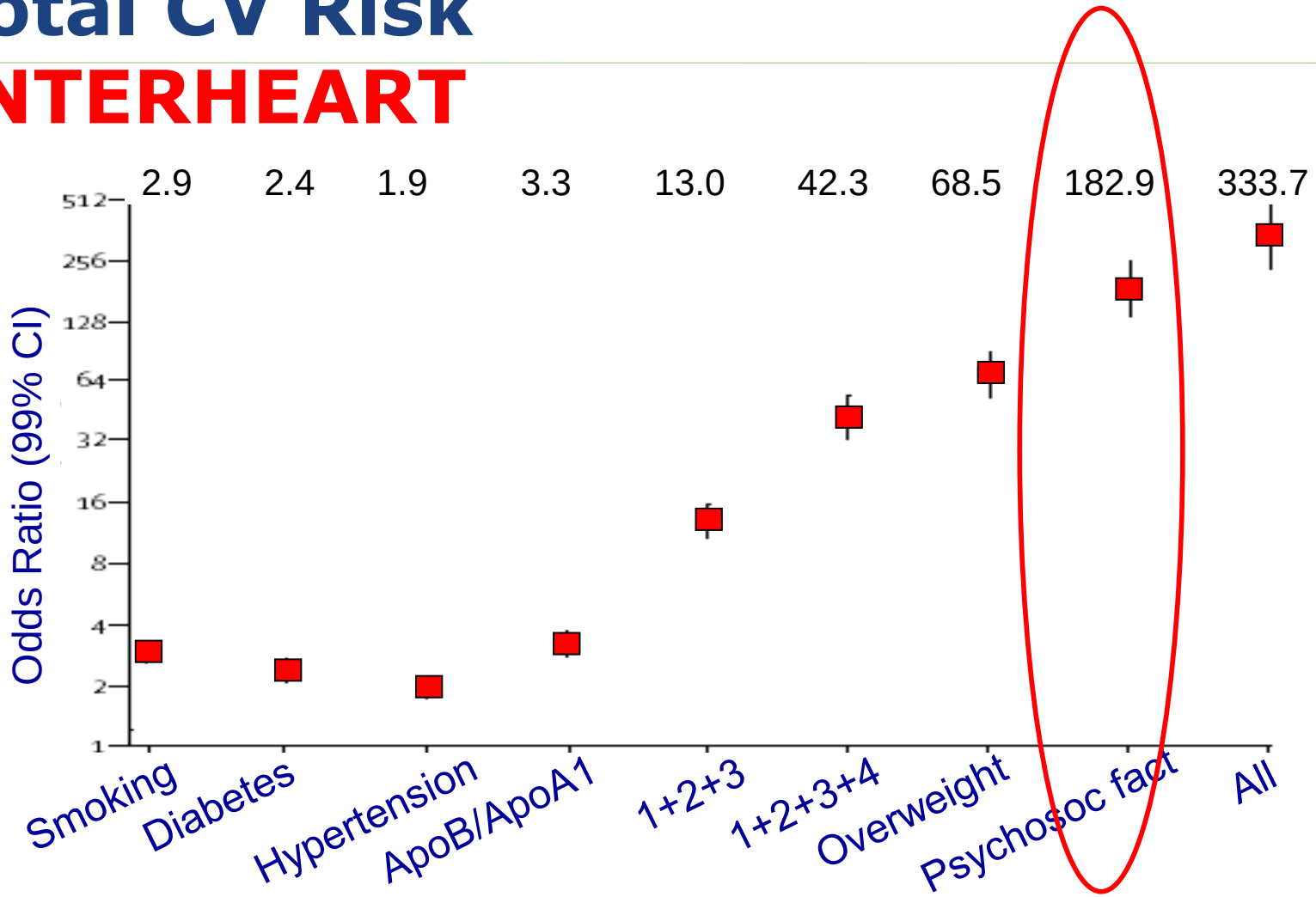
INTEGRATED CARE MODEL FOR MetS

	Community health	Healthcare system	Industry
Stakeholders	Peer leaders Community health department workers Community organizations	Physician Physician assistants Nurse practitioners Ancillary health professionals	Drug companies Device companies
Goals	Create opportunities to screen families Increase awareness through community engagement strategies Promote healthy behaviors	Form an integrated network of care (general practitioners and specialists) Gather more data/evidence for MetS care; Share with real-time data Provide robust and focused health promotion training to clinicians Insurers to cover those at-risk	Focus on ectopic fat Provide evidence-based therapy Provide alternative methods of measuring obesity

Sperling L et al. J Am Coll Cardiol.2015; 66(9):1050-67

Total CV Risk

INTERHEART

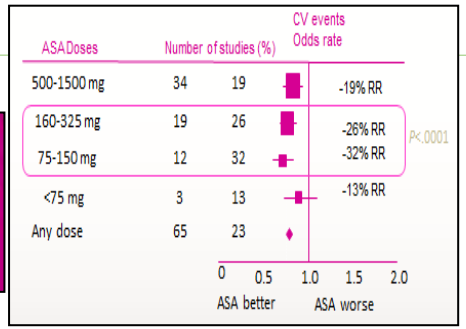


Adherence?

Antiaggregant

- **22%** RRR of stroke
- **20%** RRR of coronary events

AT trialists collaboration. Baignent. BMJ 2002;324:71-86

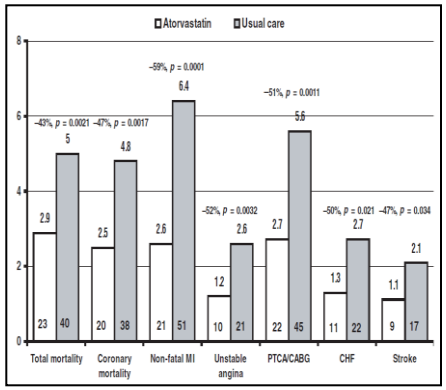


3 +...

Statin

- **43%** RRR of total mortality
- **52%** RRR of non fatal MI
- **47%** RRR of coronary mortality
- **47%** RRR of stroke

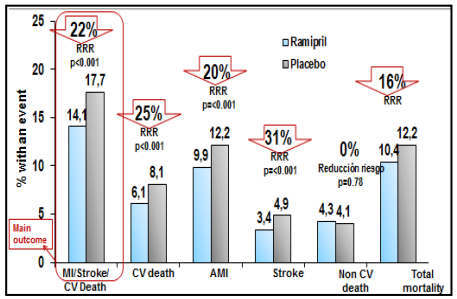
Atorvastatin SmPC. GREACE study. Athyros GV.. Curr Med Res Opinion 2002. 220-228



ACEI

- **26%** RRR of cardiovascular death
- **20%** RRR of AMI
- **31%** RRR of stroke

HOPE Yusuf S et al. NEJM 2000;342(3):145-53



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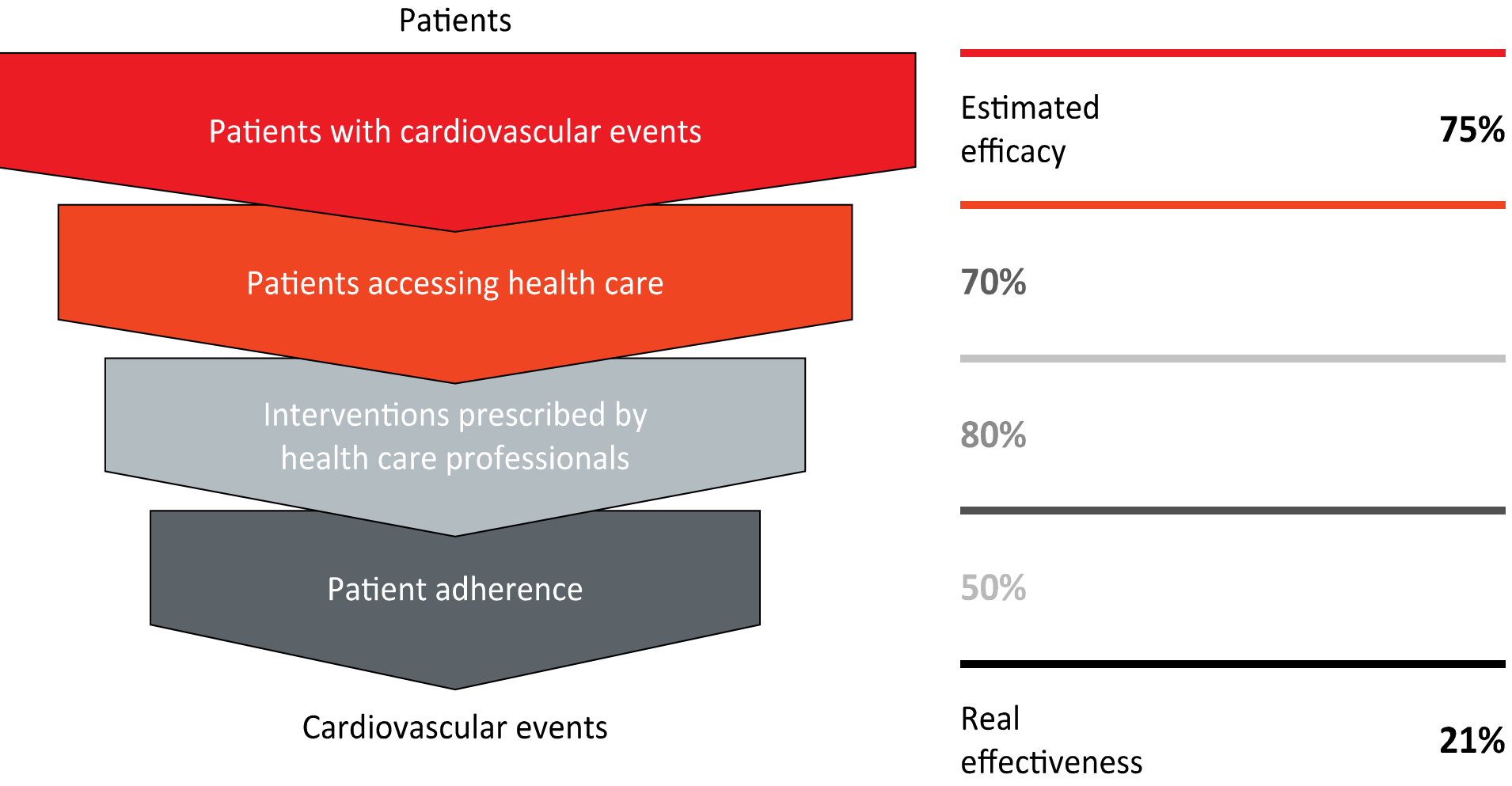
Reducing Premature Cardiovascular Morbidity and Mortality in People With Atherosclerotic Vascular Disease

Treatment cascade for patients with known cardiovascular disease



Safety
&
Legal aspects

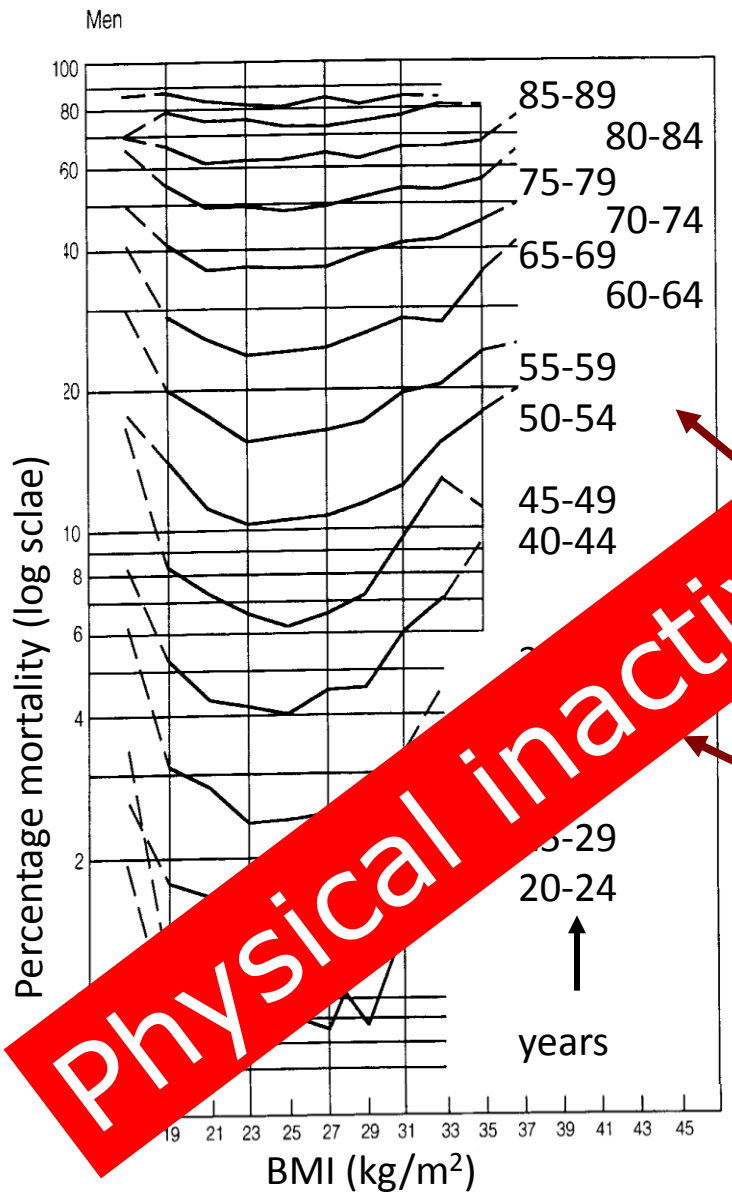
Conclusions

1. Tailor

2. Prioritize(stratify risk)

3. Interdisciplinary

10 year Mortality by BMI grou



„The Norwegia… …rience"

Populati…

N = …

No impact of BMI at >75y

- attenuated with older age

- U shaped relationship

Waaler; Acta med Scand 1984; 679: 1-56

Physical inactivity it counts more!

Wolfram Doehner's courtesy

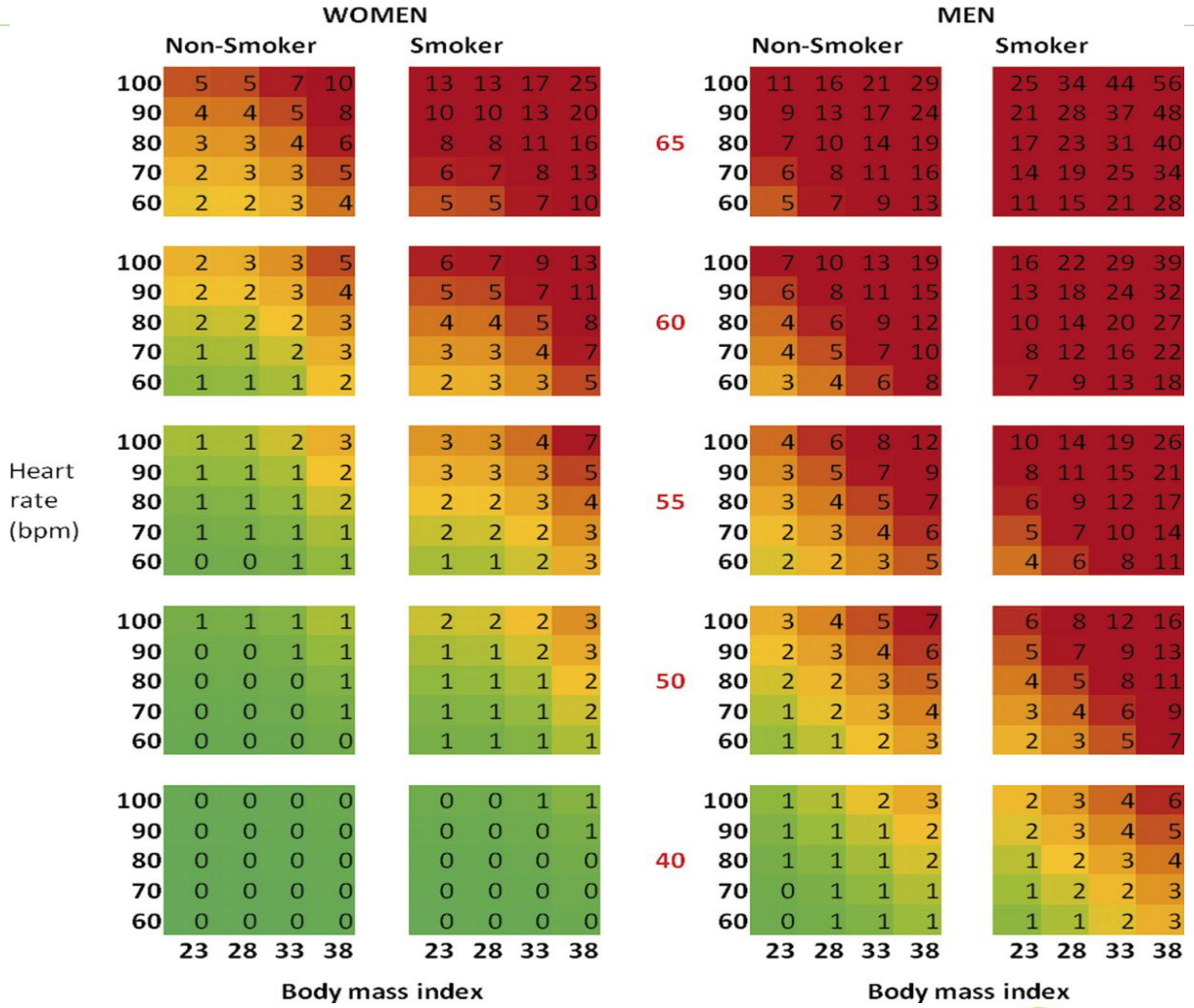
Conclusions

1. Tailor

2. Prioritize(stratify risk)

3. Interdisciplinary

BMI and resting heart rate



Cooney M T et al. Eur Heart J 2010;eurheartj.ehq164

Early intervention

- **Unhealthy diets begin to influence CV markers early in life - dyslipidemia, high blood pressure, impaired glucose tolerance, as well as obesity and metabolic syndrome may become rooted as early as 3 to 5 years of age, increasing the risk of development of atherosclerosis in adolescence and early adulthood.**

- **Education (Knowledge) can include such topics as how the body and heart work, healthy food habits, physical activity, and emotional habits to avoid addictions.**

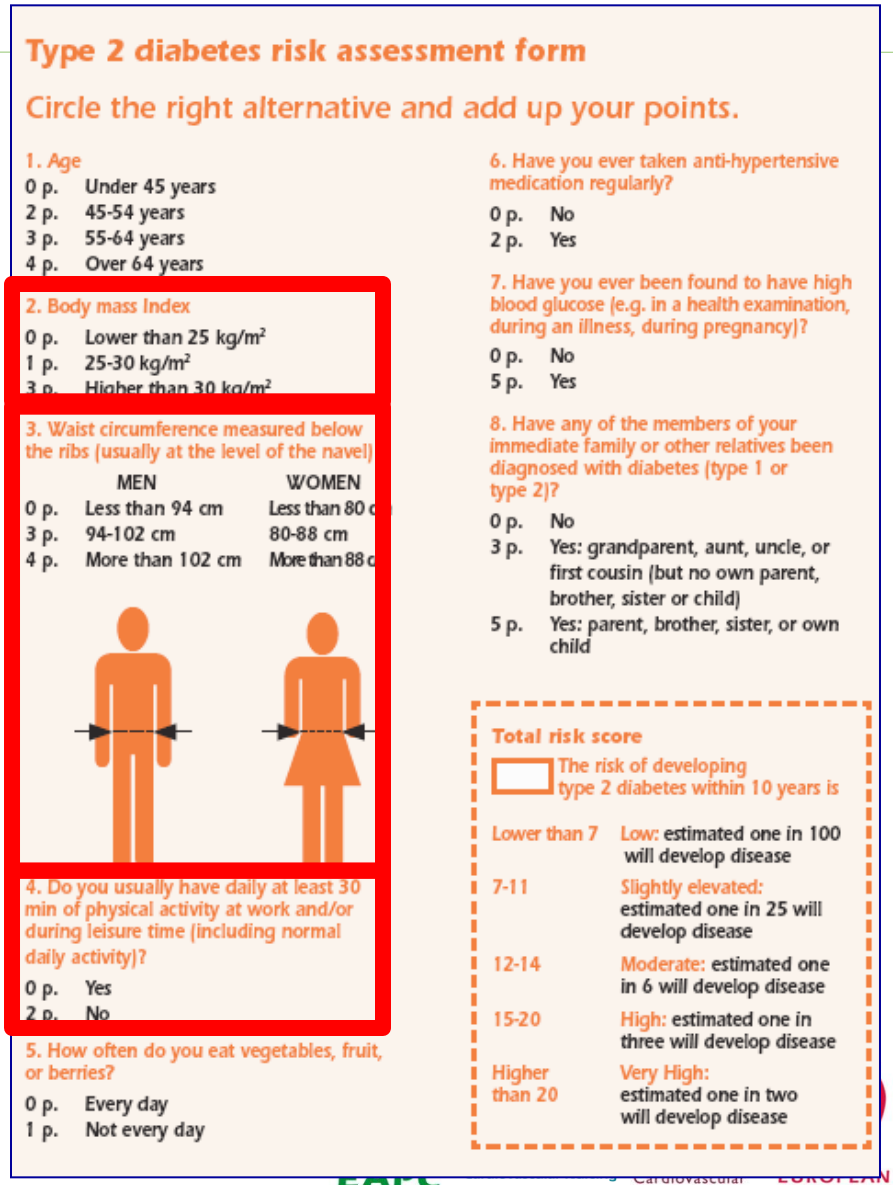
- **The optimal period of time to motivate behavior in favor of health is between the age of 3 to 5 years - evolving evidence that our behavior as adults has its roots in the environment that we live in from age 3 to 5 years.**

Fuster V. et al. J Am Coll Cardiol.2015 Oct 6; 66(14):1627-9

Assessment of the Risk for Diabetes

FINDRISC

Finnish Diabetes Risk Score (FINDRISC) to address 10-year risk of type 2 DM (T2DM) in adults



Type 2 diabetes risk assessment form

Circle the right alternative and add up your points.

1. Age
0 p. Under 45 years
2 p. 45-54 years
3 p. 55-64 years
4 p. Over 64 years

2. Body mass index
0 p. Lower than 25 kg/m²
1 p. 25-30 kg/m²
3 p. Higher than 30 kg/m²

3. Waist circumference measured below the ribs (usually at the level of the navel)

	MEN	WOMEN
0 p.	Less than 94 cm	Less than 80 c
3 p.	94-102 cm	80-88 cm
4 p.	More than 102 cm	More than 88 c

4. Do you usually have daily at least 30 min of physical activity at work and/or during leisure time (including normal daily activity)?
0 p. Yes
2 p. No

5. How often do you eat vegetables, fruit, or berries?
0 p. Every day
1 p. Not every day

6. Have you ever taken anti-hypertensive medication regularly?
0 p. No
2 p. Yes

7. Have you ever been found to have high blood glucose (e.g. in a health examination, during an illness, during pregnancy)?
0 p. No
5 p. Yes

8. Have any of the members of your immediate family or other relatives been diagnosed with diabetes (type 1 or type 2)?
0 p. No
3 p. Yes: grandparent, aunt, uncle, or first cousin (but no own parent, brother, sister or child)
5 p. Yes: parent, brother, sister, or own child

Total risk score

The risk of developing type 2 diabetes within 10 years is

Lower than 7	Low: estimated one in 100 will develop disease
7-11	Slightly elevated: estimated one in 25 will develop disease
12-14	Moderate: estimated one in 6 will develop disease
15-20	High: estimated one in three will develop disease
Higher than 20	Very High: estimated one in two will develop disease

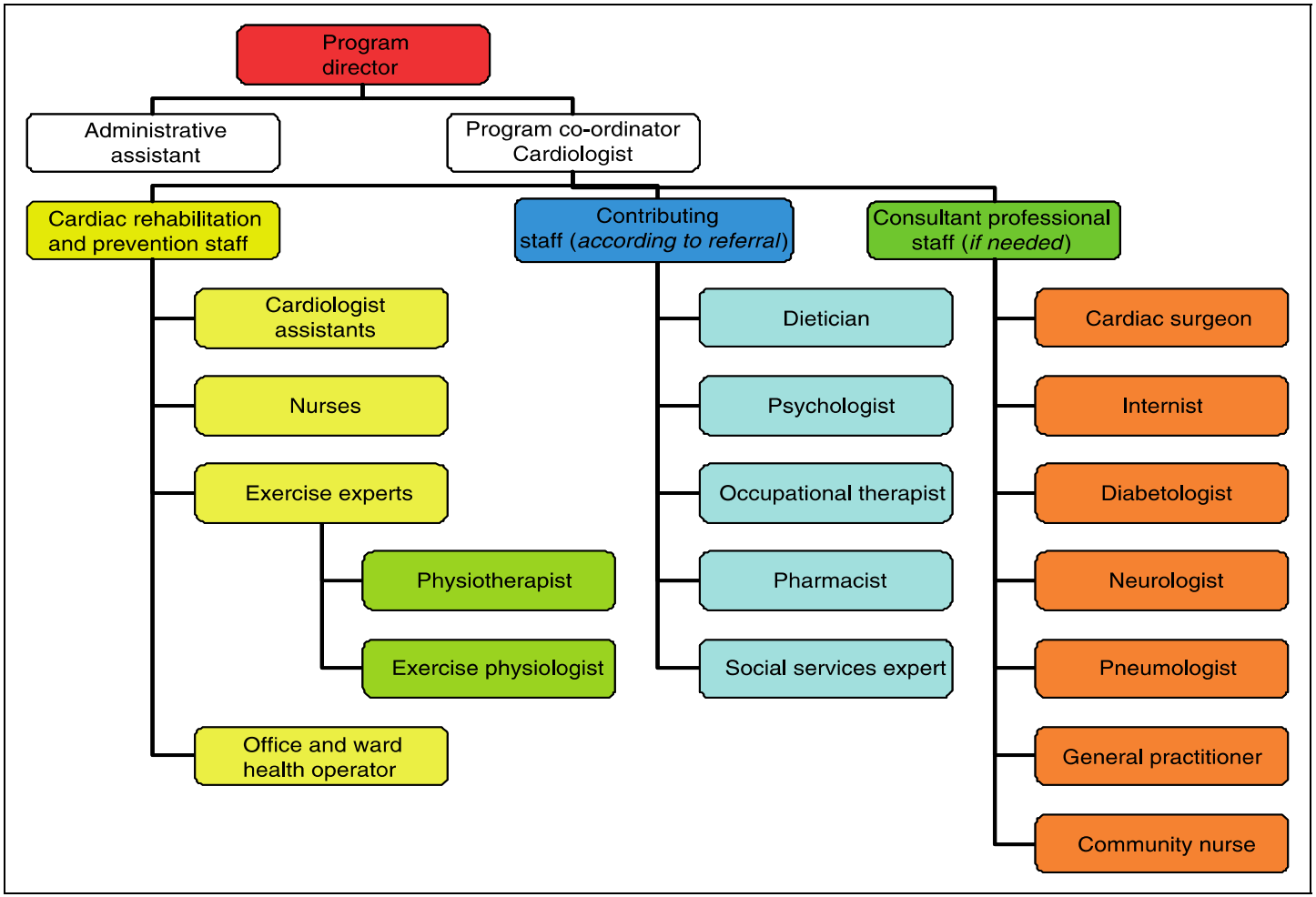
Conclusions

1. Tailor

2. Prioritize (stratify risk)

3. Interdisciplinary

Interdisciplinary team



Secondary prevention in the clinical management of patients with CVD. EJPC 2012

Health Determinants

- **BEHAVIORS**
  - **NO SMOKING**
  - **OPTIMAL NUTRITION**
  - **DAILY EXERCISE**
  - **ADIPOSITY (BMI<25)**
- **FACTORS**
  - Cholesterolemia
  - Glycemia
  - Blood pressure

Minimum 5!

American Heart Association


Early to bed,
Early to rise,
Work like hell
RESPECT GUIDELINES!!

New strategies to overcome old obstacles in cardiovascular prevention

How can the family help?

Dr Catriona Jennings

The Issues

- Contribution of unhealthy lifestyles – smoking, poor diet and sedentarism - to non communicable disease burden e.g. CVD, risk factors like obesity, hypertension and diabetes
- Increasingly dependent aged population left with increased health care needs
- Increasing inequalities worldwide

How do we manage these problems?

Some approaches which have been shown to work


1 May 1994 Volume 120
Annals of Internal Medicine
A Case-Management System for Coronary Risk Factor Modification after Acute Myocardial Infarction
Robert F. DeBusk, MD; Nancy Houston Miller, RN; H. Robert Superko, MD;
Charles A. Dennis, MD; Randal J. Thomas, MD, MS; Henry T. Lew, MD; Walter E. Berger III, MD;
Robert S. Heller, MD; Jonathan Rompf, MD; David Gee, MD; Helena C. Kraemer, PhD;
Albert Bandura, PhD; Ghassan Ghandour, PhD; Mia Clark, RD, MPH; Raksha V. Shah, RD, MS;
Lynda Fisher; and C. Barr Taylor, MD
Nurse-coordinated multidisciplinary, family-based cardiovascular disease prevention programme (EUROACTION) for patients with coronary heart
and
asymptomatic individuals at high risk of
disease: a paired, cluster-randomise
D A Wood, K Kotseva, S Con
EUROACTION Study Group
Summary
Background Our aim
cardiology programm
Europea
2014
AL RESEARCH
n and epidemiology
persistent smokers:
S varenicline trial
otseva[1], Dirk De Bacquer[2], Arno Hoes[3], Jose de Velasco[4],
Mead[1], Jennifer Jones[1], Serena Tonstad[6], and David Wood[1],
CTION PLUS Study Group[‡]
Received 25 June 2013; revised 6 December 2013; accepted 27 January 2014
Effects of Intensive Multiple Risk Factor Reduction on Coronary Atherosclerosis and Clinical Cardiac Events in Men and W
With Coronary Artery Dis
The Stanford Coronary Risk Interve
William L. Haskell, PhD; Edwin L. Alderma
Sally F. Mackey, MS, RD; H.
Iain M. John
Ro
Nurse led care well documented
Heart 1998;80
447
art disease: a
nics in primary
ain, H G Deans, J M Rawles, J L Squair
Secondary prevention of coronary disease
ESS
ORIGINAL ARTICLE
Effect of a nurse-coordinated prevention programme on cardiovascular risk after an acute coronary syndrome: main results of the RESPONSE randomised trial
Harald T Jorstad,[1] Clemens von Birgelen,[2] A Marco W Alings,[3] Anho Liem,[4] Jan Melle van Dantzig,[5] Wybren Jaarsma,[6] Dirk J A Lok,[7] Hans J A Kragten,[8] Keesjan de Vries,[9] Paul A R de Milliano,[10] Adrie J A M Withagen,[11] Wilma J M Scholte op Reimer,[1] Jan G P Tijssen,[1] Ron J G Peters[1]

TABLE 1 Nurse Case Management Trials—Summary of Findings

Nursing Intervention	Significant Outcomes
Optimize management of dyslipidemia	Improved measures of dyslipidemia
CVD risk reduction: lifestyle (diet and exercise)	10-year CVD risk reduction
Hypertension (5 E program: Education, Engagement, Environment, Evidence, Evaluation)	Blood pressure, BMI, and weight reduction
Diabetes and hypertension	Blood pressure and diabetes improved
Smoking cessation (education, counseling, and follow-up)	Significant "quit" rate
CVD risk with medication counseling and management	Less CAD progression; all CVD risk factors lowered; decreased Framingham score
CVD risk management cost evaluation	Cost effective

Data from Berra et al. (16).

BMI = body mass index; CAD = coronary artery disease; CVD = cardiovascular disease.

Haskell WL 1994 Circulation 89(3):975-990; DeBusk RF, Miller NH et al1994 Ann Intern Med 120(9): 721-729; *Campbell et al 1998* Heart 80;447-452*;* Wood D et al 2008 Lancet 371(9629): 1999-2012; Allen JK et al 2014 J Cardiovasc Nurs 29:305–14; Fonarow GC et al 2001 Am J Cardiol 87:819–22; Jorstad HT et al 2013 Heart 99(19):1421-30.

Multidisciplinary Cardiovascular Prevention and Rehabilitation: RCTs since 2010

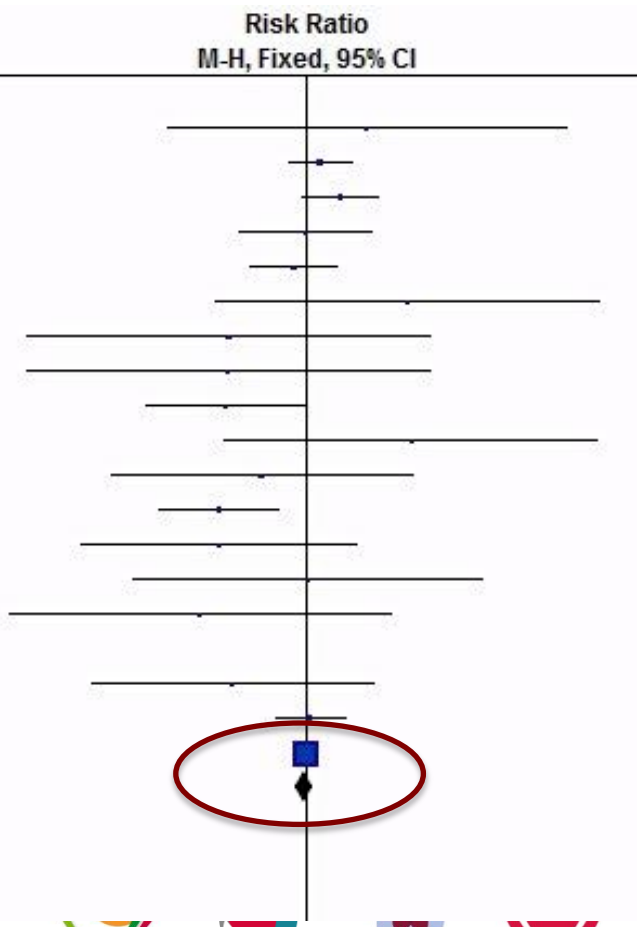
All-cause mortality

Gijs J van Halewijn Erasmus Rotterdam and Imperial College London

Study or Subgroup	Intervention Events	Intervention Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
1.1.1 All studies						
Astengo 2010	1	33	0	29	0.1%	2.65 [0.11, 62.56]
Brotons 2011	36	481	26	442	7.3%	1.27 [0.78, 2.07]
Carrington 2013	27	306	15	296	4.1%	1.74 [0.95, 3.21]
Cohen 2014	7	251	7	251	1.9%	1.00 [0.36, 2.81]
Haglin 2011	15	36	6	12	2.4%	0.83 [0.42, 1.65]
Hawkes 2013	2	215	0	215	0.1%	5.00 [0.24, 103.54]
He 2012	0	132	1	118	0.4%	0.30 [0.01, 7.25]
Janssen 2014	0	112	1	98	0.4%	0.29 [0.01, 7.09]
Jorstad 2013	3	366	10	349	2.8%	0.29 [0.08, 1.03]
Krebs 2013	2	14	0	15	0.1%	5.33 [0.28, 102.26]
Kubilius 2012	1	70	2	70	0.5%	0.50 [0.05, 5.39]
Moreno-Palanco 2011	5	118	20	121	5.3%	0.26 [0.10, 0.66]
Mosca 2010	1	132	4	134	1.1%	0.25 [0.03, 2.24]
Pinto 2011	1	64	1	66	0.3%	1.03 [0.07, 16.14]
Reid 2012 Online program	0	115	2	108	0.7%	0.19 [0.01, 3.87]
Reid 2012 Phone counselling	0	69	0	72		Not estimable
Saffi 2014	1	38	3	36	0.8%	0.32 [0.03, 2.90]
Stewart 2015	24	301	23	310	6.1%	1.07 [0.62, 1.86]
West 2012	245	899	243	905	65.4%	1.01 [0.87, 1.18]
Subtotal (95% CI)		**3752**		**3647**	**100.0%**	**0.99 [0.87, 1.12]**
Total events	371		364			

Heterogeneity: Chi² = 24.01, df = 17 (P = 0.12); I² = 29%

Test for overall effect: Z = 0.20 (P = 0.84)



Multidisciplinary Cardiovascular Prevention and Rehabilitation: RCTs since 2010

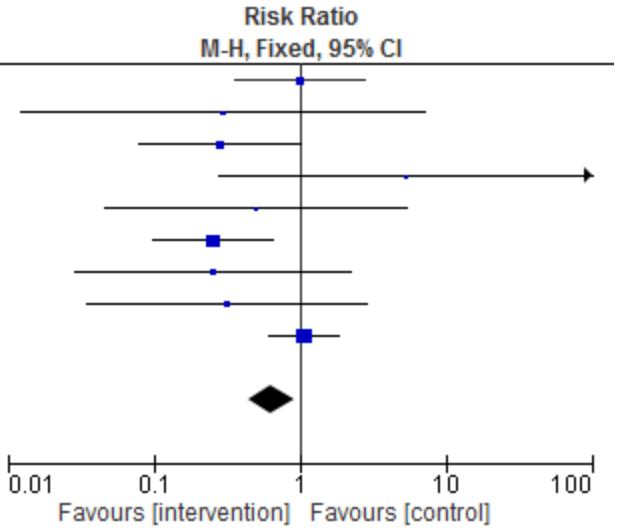
Additional analyses

More than 5 risk factors addressed

Study or Subgroup	Intervention Events	Intervention Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Cohen 2014	7	251	7	251	9.9%	1.00 [0.36, 2.81]
He 2012	0	132	1	118	2.2%	0.30 [0.01, 7.25]
Jorstad 2013	3	366	10	349	14.5%	0.29 [0.08, 1.03]
Krebs 2013	2	14	0	15	0.7%	5.33 [0.28, 102.26]
Kubilius 2012	1	70	2	70	2.8%	0.50 [0.05, 5.39]
Moreno-Palanco 2011	5	118	20	121	27.9%	0.26 [0.10, 0.66]
Mosca 2010	1	132	4	134	5.6%	0.25 [0.03, 2.24]
Saffi 2014	1	38	3	36	4.4%	0.32 [0.03, 2.90]
Stewart 2015	24	301	23	310	32.0%	1.07 [0.62, 1.86]
Total (95% CI)		**1422**		**1404**	**100.0%**	**0.64 [0.45, 0.92]**
Total events	44		70			

Heterogeneity: Chi² = 12.56, df = 8 (P = 0.13); I² = 36%

Test for overall effect: Z = 2.40 (P = 0.02)



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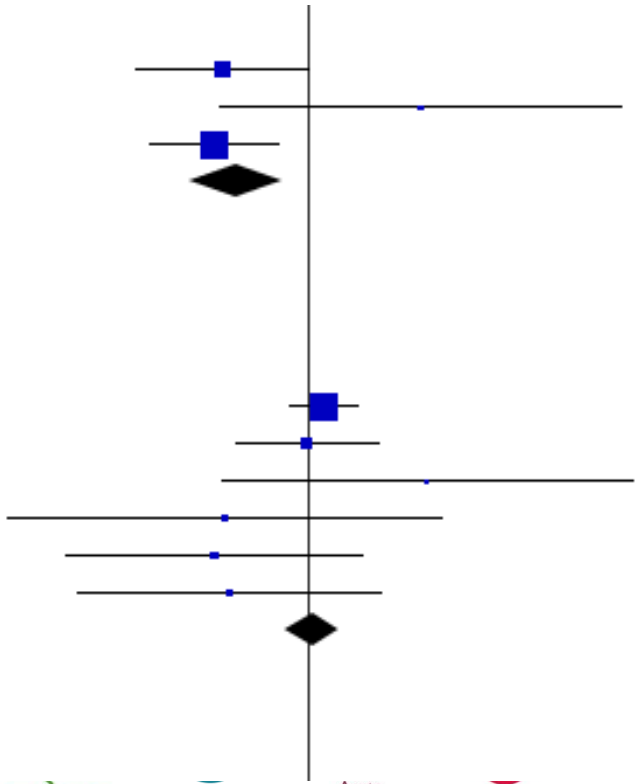
Multidisciplinary Cardiovascular Prevention and Rehabilitation: RCTs since 2010

Additional analyses

Prescription of medicines versus monitoring of medicines

1.1.4 Prescription of medicines in intervention group						
Jorstad 2013	3	366	10	349	33.6%	0.29 [0.08, 1.03]
Krebs 2013	2	14	0	15	1.6%	5.33 [0.28, 102.26]
Moreno-Palanco 2011	5	118	20	121	64.8%	0.26 [0.10, 0.66]
Subtotal (95% CI)		**498**		**485**	**100.0%**	**0.35 [0.18, 0.69]**
Total events	10		30			
Heterogeneity: Chi² = 3.77, df = 2 (P = 0.15); I² = 47%						
Test for overall effect: Z = 3.04 (P = 0.002)						
1.1.5 Monitoring of medicines in intervention group						
Brotons 2011	36	481	26	442	62.7%	1.27 [0.78, 2.07]
Cohen 2014	7	251	7	251	16.2%	1.00 [0.36, 2.81]
Hawkes 2013	2	215	0	251	1.1%	5.83 [0.28, 120.84]
He 2012	0	132	1	118	3.7%	0.30 [0.01, 7.25]
Mosca 2010	1	132	4	134	9.2%	0.25 [0.03, 2.24]
Saffi 2014	1	38	3	36	7.1%	0.32 [0.03, 2.90]
Subtotal (95% CI)		**1249**		**1232**	**100.0%**	**1.08 [0.72, 1.62]**
Total events	47		41			
Heterogeneity: Chi² = 5.15, df = 5 (P = 0.40); I² = 3%						
Test for overall effect: Z = 0.37 (P = 0.71)						



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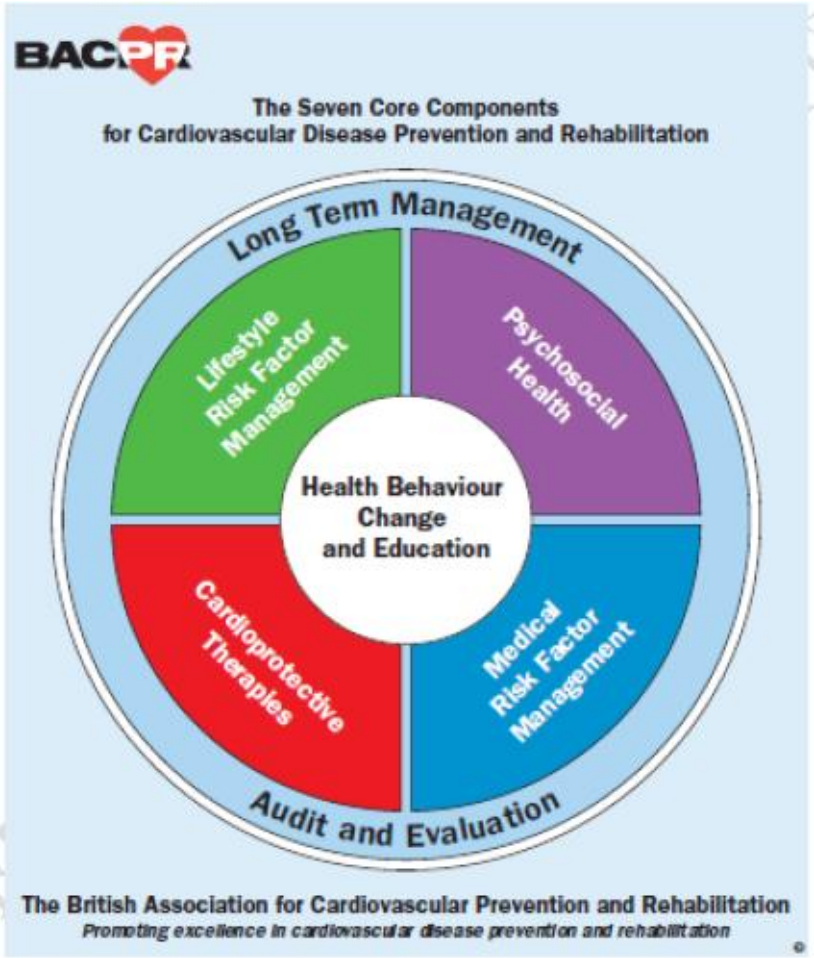
These models are seen as a standard and included in guidelines



European Heart Journal Advance Access published May 23, 2016

European Heart Journal
doi:10.1093/eurheartj/ehw106

JOINT ESC GUIDELINES

2016 European Guidelines on cardiovascular disease prevention in clinical practice

The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts)

Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR)

Authors/Task Force Members: Massimo F. Piepoli* (Chairperson) (Italy), Arno W. Hoes* (Co-Chairperson) (The Netherlands), Stefan Agewall (Norway)[1], Christian Albus (Germany)[9], Carlos Brotons (Spain)[10], Alberico L. Catapano (Italy)[3], Marie-Therese Cooney (Ireland)[1], Ugo Corrà (Italy)[1], Bernard Cosyns (Belgium)[1], Christi Deaton (UK)[1], Ian Graham (Ireland)[1], Michael Stephen Hall (UK)[7], F. D. Richard Hobbs (UK)[10], Maja-Lisa Løchen (Norway)[1], Herbert Löllgen (Germany)[8], Pedro Marques-Vidal (Switzerland)[1], Joep Perk (Sweden)[1], Eva Prescott (Denmark)[1], Josep Redon (Spain)[5], Dimitrios J. Richter (Greece)[1], Naveed Sattar (UK)[2], Yvo Smulders (The Netherlands)[1], Monica Tiberi (Italy)[1], H. Bart van der Worp (The Netherlands)[6], Ineke van Dis (The Netherlands)[4], W. M. Monique Verschuren (The Netherlands)[1]

Additional Contributor: Simone Binno (Italy)

Smoking cessation

Dietary change

Nurses

Dietitians

Monitor manage of blo pressu cholest and glu

Weight and shape management

Prescrip and adhe with ca protec medicat

Supervised exercise programme

Increasing physical activity in daily life

Physical activity specialists

Nurse prescribers/ Physicians

www.escardio.org/EAPC

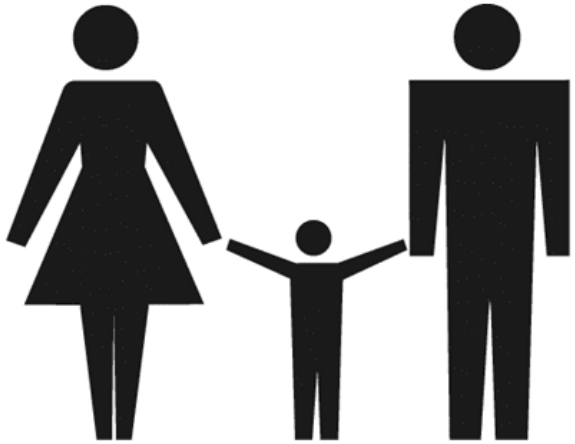
EAPC European Association of Preventive Cardiology

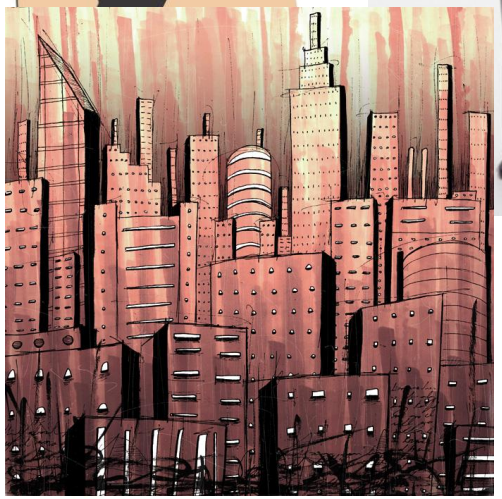
ESC COUNCIL Cardiovascular Nursing and Allied Professions

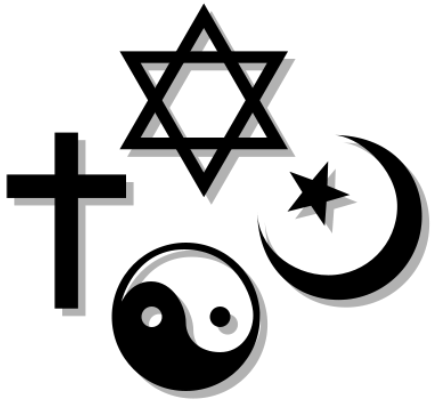
Acute Cardiovascular Care Association ACCA

EUROPEAN SOCIETY OF CARDIOLOGY®

Influences on health behaviour







The influence of spouses on each other

Is there any evidence for couples concordance?

American Journal of Epidemiology
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Vol. 169, No. 1
DOI: 10.1093/aje/kwn234
Advance Access publication November 20, 2008

Meta-Analysis

Spousal Concordance for Major Coronary Risk Factors: A Systematic Review and Meta-Analysis

Augusto Di Castelnuovo*, Gianni Quacquaruccio*, Maria Benedetta Donati, Giovanni de Gaetano, and Licia Iacoviello

Initially submitted January 22, 2008; accepted for publication July 14, 2008.

Spousal pairs permit assessment of determinants of diseases related to environment, because they share the same lifestyle and environment. The authors reviewed spouses' concordance for the major coronary risk factors. A search of the MEDLINE, PubMed, and EMBASE databases was performed. Seventy-one papers were selected for a total of 207 cohorts of pairs and 424,613 correlations in more than 100,000 couples. The most strongly correlated within-pairs factors were smoking and body mass index, with overall correlations of 0.23 (95% confidence interval: 0.12, 0.36) and 0.15 (95% confidence interval: 0.05, 0.25), respectively. Statistically significant positive correlations were also found for diastolic blood pressure, triglycerides, total and low density lipoprotein cholesterol, weight, and the waist/hip ratio. The overall odds ratios for concordance in hypertension, smoking, diabetes, and obesity were all statistically significant, ranging from 1.16 to 3.25. Assortative mating influenced concordance for blood pressure, smoking, glucose, low density lipoprotein cholesterol, weight, body mass index, and waist circumference. This systematic review shows a statistically significant positive spousal concordance for the majority of main coronary risk factors. However, the strength of the concordance was markedly different among factors and appeared to be quite modest for all of them. Interventions to reduce cardiovascular risk factors should be addressed jointly to both members of a marital couple.

Castelnuovo A et al 2009; 169: 1-8 American Journal of Epidemiology

Dynamics for couples concordance

- **Non-random mating**
  - Selection of a mate on the basis of a particular phenotype
  - Social homogamy
- **Convergence of behaviours over relationship duration**
- **Social control – illness as an opportunity for healthy change**

Zietsch 2011 Am Nat 177:605-16; Smith 1994 Demography 31:81-93; Umberson 1987 J Health Soc Behav 28:306-19

645 couples (one with incident CHD mostly male patients): lifestyle Profiles at baseline

	Patients %	Partners %
Prevalence of smoking*	30	21
Ever smoked	70	50
Fruit and vegetables ≥ 400g/day*	50	52
Saturated fat < 10% total energy*	44	44
Moderate intensity physical activity ≥ 30 minutes 5+ times/week*	25	30
Median steps per day**	5948	7074

* Prior to the cardiac event of the patient

** At baseline assessment

Observational study from EUROACTION RCT

Concordance for smoking habit in 645 couples at the time of the cardiac event

	Partner									
	Current			Ex			Never			
Patient	**O**	**E**	**O/E**	**O**	**E**	**O/E**	**O**	**E**	**O/E**	**Total**
Current	69	39.2	***1.76***	26	38.9	0.67	95	112	0.85	190
Ex	41	52.0	0.79	62	52.6	***1.18***	149	149	1.00	252
Never	23	41.9	0.55	44	41.5	1.06	136	120	***1.14***	203
Total	133			132			380			645

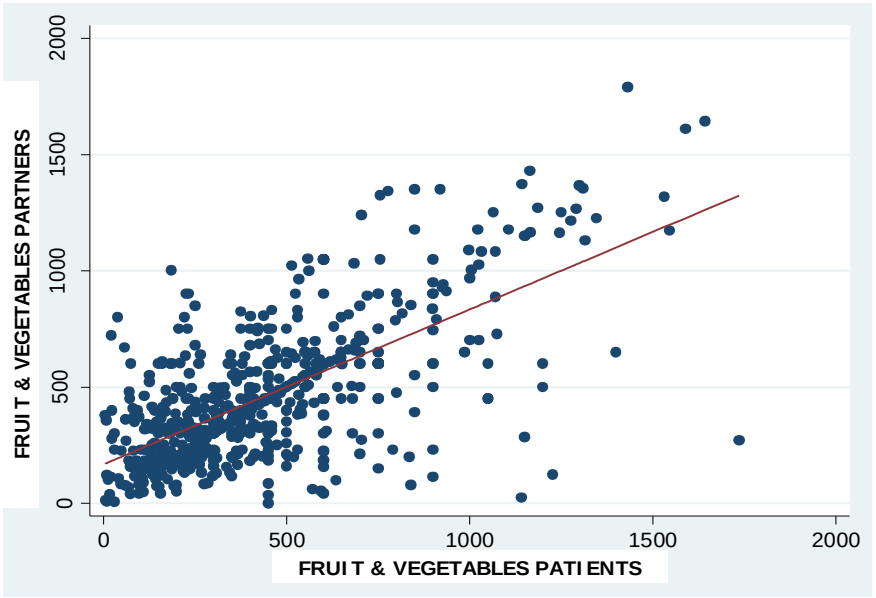
O = observed E = expected

P = 0.0001

Concordance for diet at baseline in EUROACTION couples

Fruit and vegetables

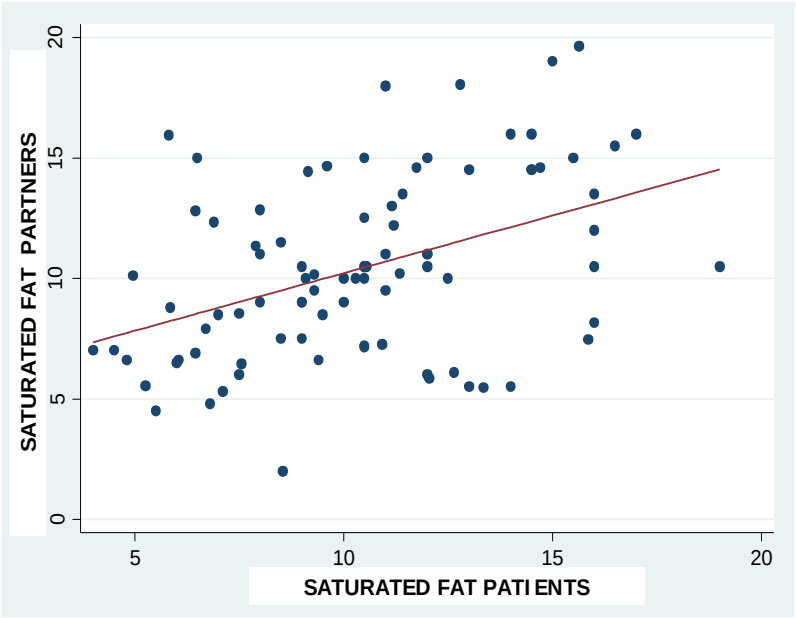
r=0.67



Pearson correlation coefficient r=0.67 , p<0.0001 (n=640)

Saturated fat

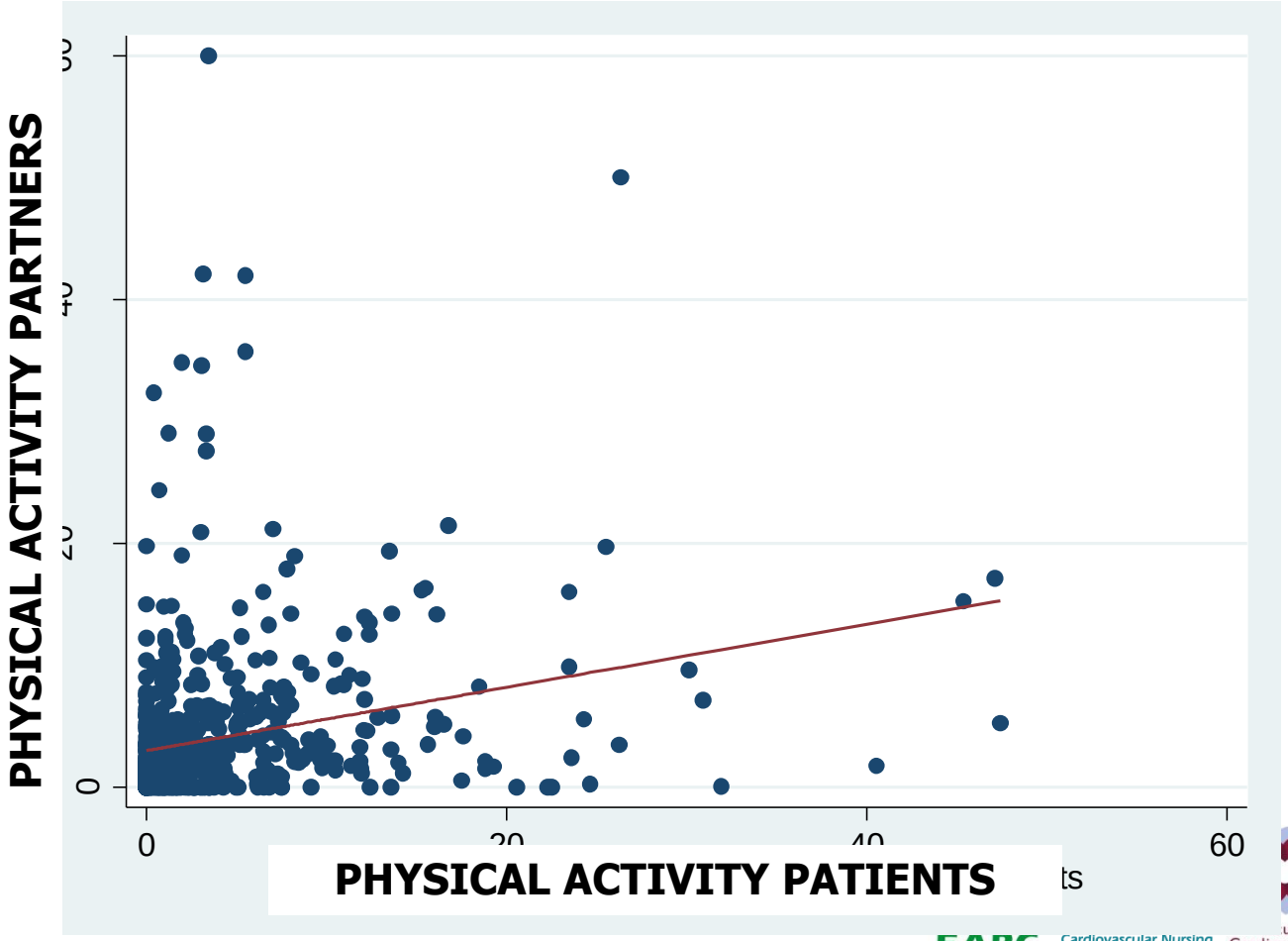
r=0.43



Pearson correlation coefficient r=0.43 , p<0.0001 (n=88)

Correlation at baseline between patients and partners for kcals of moderate intensity physical activity

Pearson correlation coefficient r=0.25 , p<0.0001 (n=605)



Other data worldwide

- **Smoking**
  - British Family Heart Study – primary prevention – smoking (Pyke 1996)
- **Saturated fat consumption**
  - Chinese couples Taiwan –0.41
  - Hawaiian couples – 0.43
- **Fruit and vegetable consumption**
  - Scottish couples - 0.45 fruit 0.66 vegetables
- **Physical Activity**
  - Canadian parents of junior school children – LTPA 0,24
  - Portuguese parents – 0.21

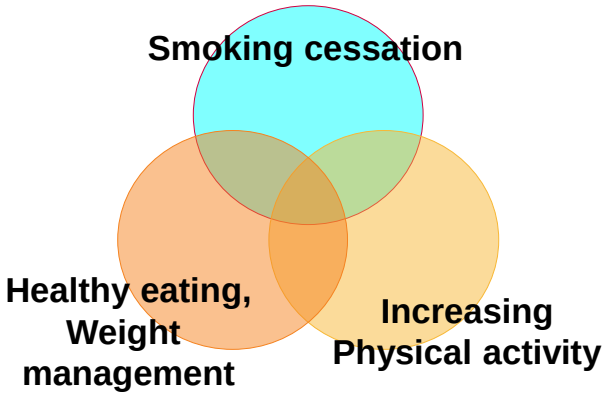
Pyke 1997 Arch Fam Med 6; 354-360; Lyu 2004 Int J Food Sc Nutr 55(3):227-36; Lee 1982 Am J Epid 115 (4) 515-525; Eastwood 1982 Am J Clin Nutr 36:290-3; Godin 1985 Can J Appl Sport Sci, 10, 36-43; Seabra 2008 Eur J Epidemiol, 23, 205-11

Involving the spouse to enhance nurse-led multidisciplinary approaches:
The EUROACTION family centred programme

- Why? To facilitate lifestyle change by optimising social support from family
- Premise – there is concordance for lifestyle and therefore lifestyle change may be more successful if the whole family is on board

Wood 2008 Lancet
371:1999-2012

A nurse led multidisciplinary family centred programme for coronary patients and their families



Cardiovascular Prevention and rehabilitation programme

Identification and recruitment

Multi-disciplinary initial assessment

16 week Preventive Cardiology Programme

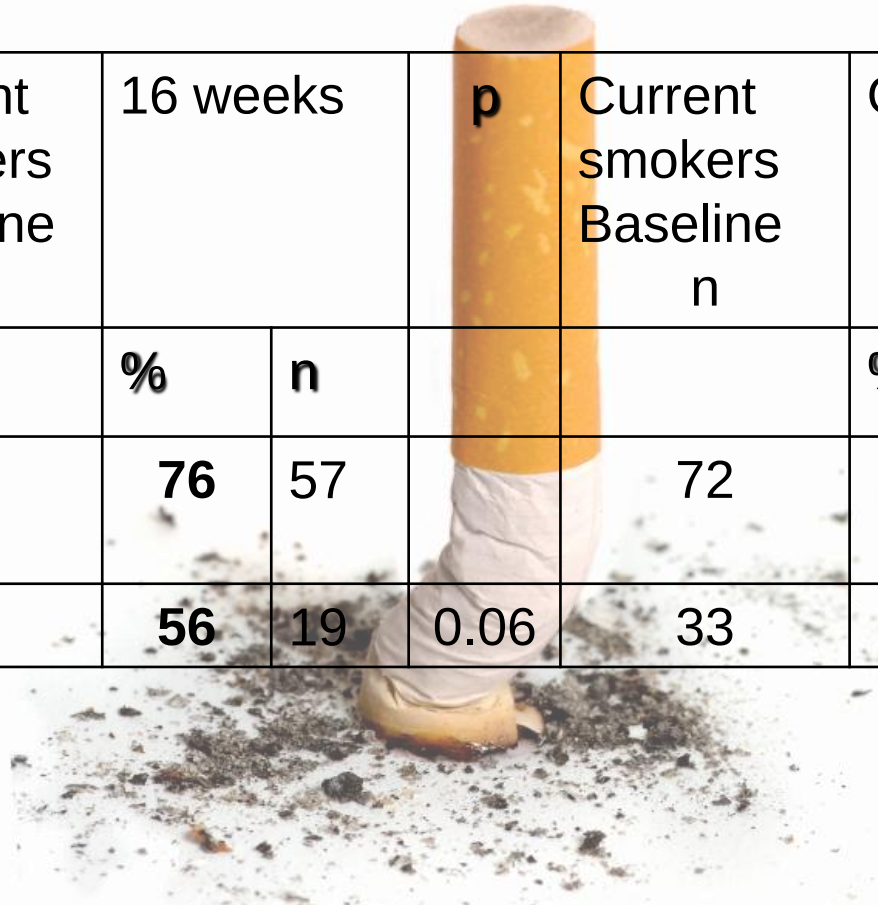
- Empowering families to change their lifestyle: smoking, diet and physical activity
- Blood pressure, blood cholesterol and blood glucose management
- Compliance with cardio-protective medication
- One to one and group approach
- Supervised hospital and home exercise programme
- Health promotion workshop programme

16 week assessment at end of programme

One year follow-up

EUROACTION: Non-smoking spouses help smoking coronary patients to quit

	Current smokers Baseline n	16 weeks		p	Current smokers Baseline n	One year		p
Patients		**%**	**n**			**%**	**n**	
Patient only smoked	75	**76**	57		72	**74**	53	
Both smoked	34	**56**	19	0.06	33	**58**	19	0.03



Reported smoking cessation was validated with breath CO ≤ 6ppm

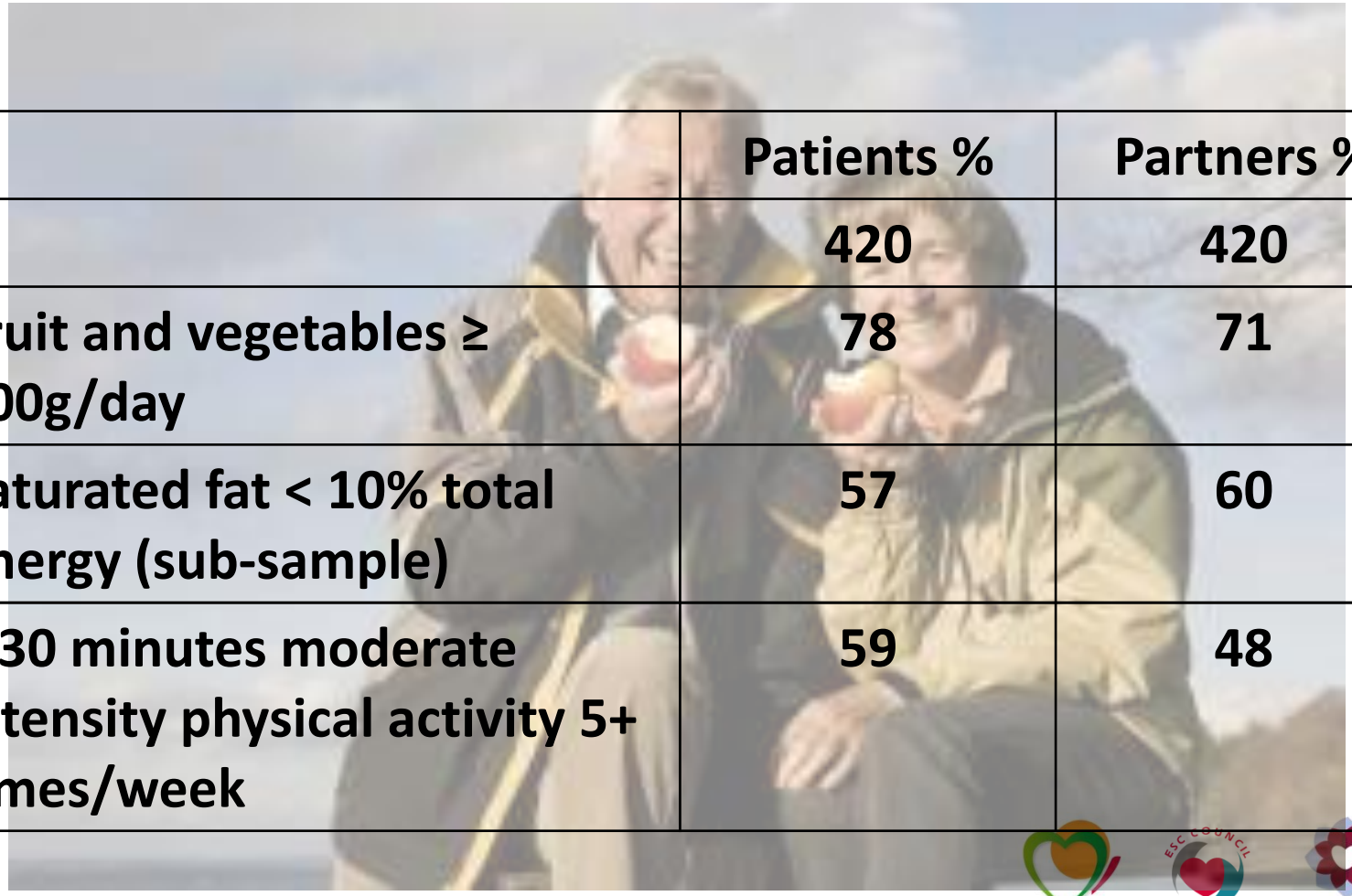
A closer look at the dynamics: smoking cessation

- **Israeli smokers post myocardial infarction and their wives (Vilchinsky 2011)**
  - Smoking cessation improved in patients who perceived that their wives were 'actively engaging' with their problem
  - Buffering (denial, minimising problem) and over protecting by wives was NOT useful
- **Health compromised smokers and spouses (Rohrbaugh 2012)**
  - Famcom study - Training couples to use personal pronoun in addressing smoking cessation together: 'we talk' improved smoking cessation

Vilchinsky 2011 Health Psychology 4;411-419

Rohrbaugh 2012 Fam Proc 51;107-121

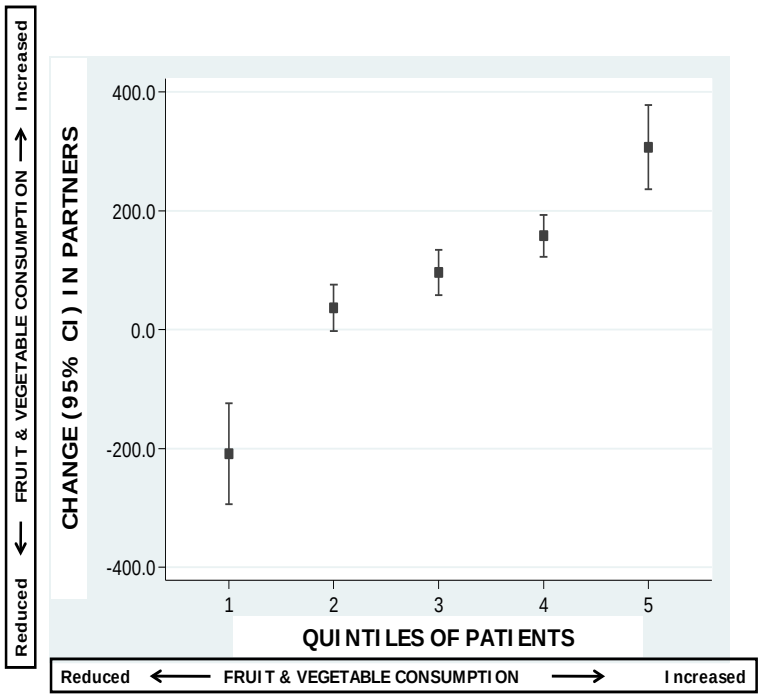
EUROACTION CORONARY COUPLES: Dietary and physical activity habits at 1 year (8 months after end of programme)



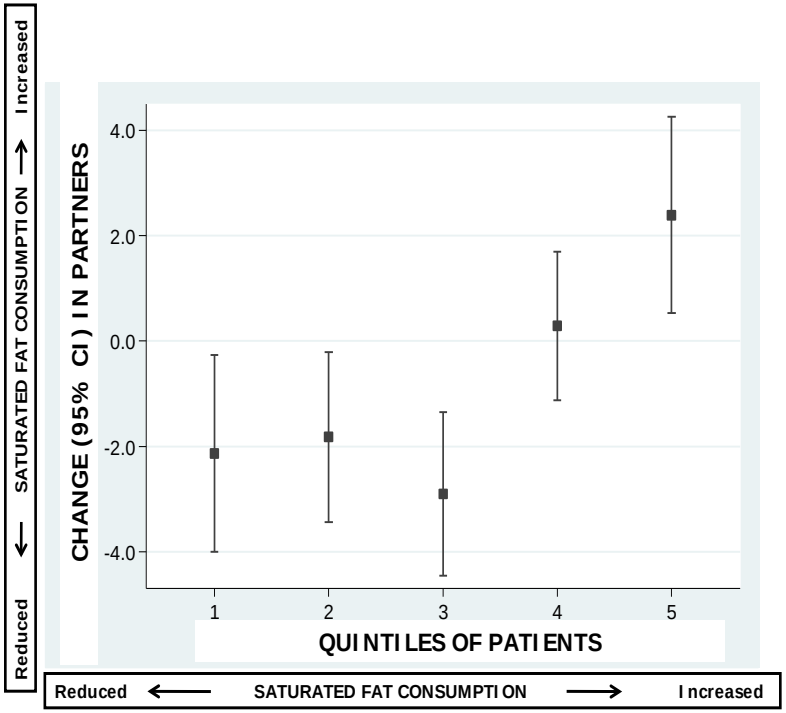
	Patients %	Partners %
	420	420
Fruit and vegetables ≥ 400g/day	78	71
Saturated fat < 10% total energy (sub-sample)	57	60
≥ 30 minutes moderate intensity physical activity 5+ times/week	59	48

Concordance for dietary change in EUROACTION couples (BL to 1 year)

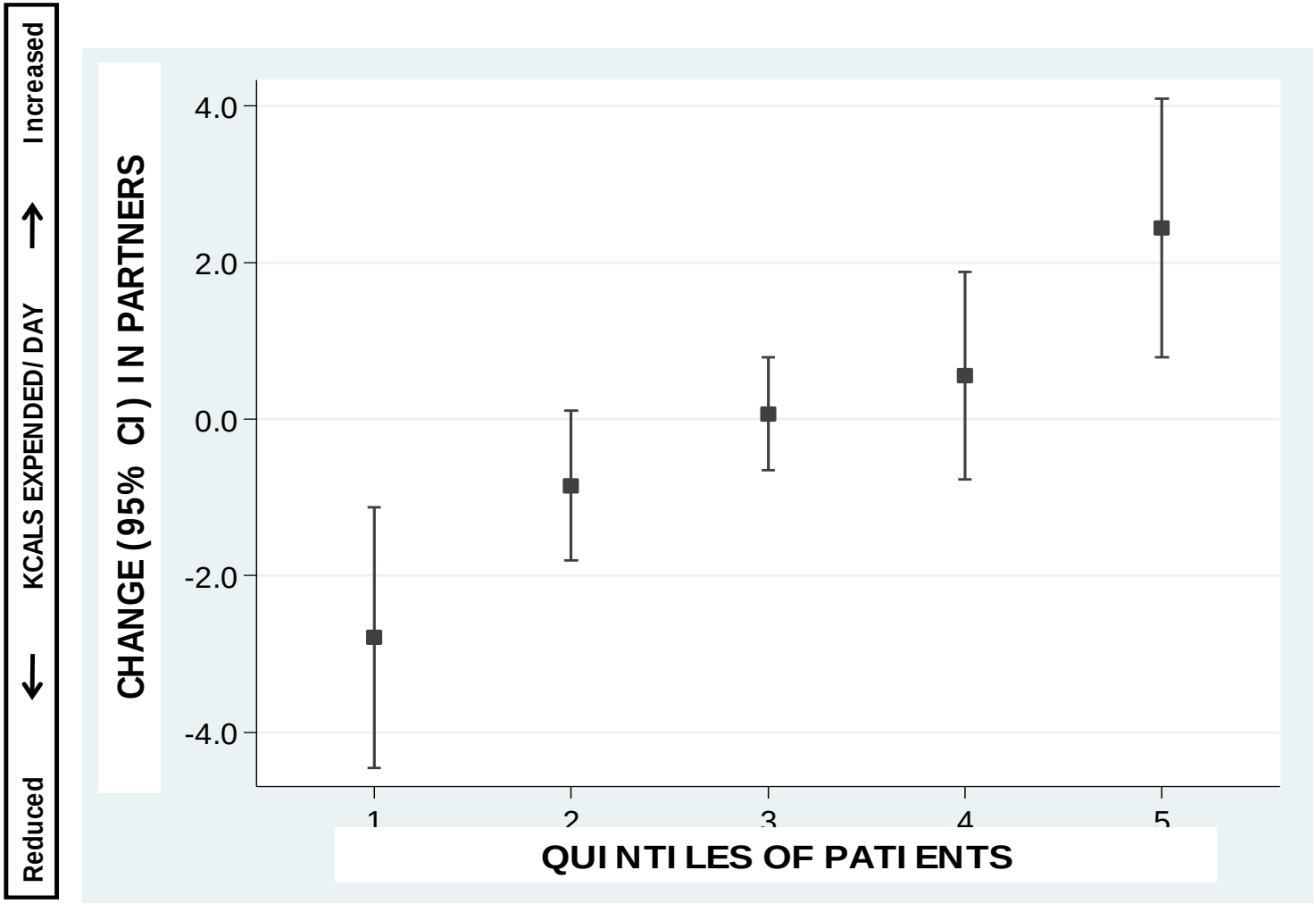
Fruit and vegetables



Saturated fat



Concordance for 7Day Activity Recall



A closer look at the dynamics: diet

- **Men with a premature myocardial infarction and their wives (Russel 1994 – case control study)**
  - Saturated fat intake in patients and wives at one year was less than in comparison group
  - Effect in wives reduced over time but not in patients
- **Women participating in a low fat diet study (Shattuck 1992)**
  - Women's low fat diets had a reduction effect on their partners' diets at one year

Russel B et al (1994) *Journal of the American Dietetic Association,* 94**,** 859-64.

Shattuck 1992 Am J Pub Health
82; 1244-50

A closer look at the dynamics: physical activity

- **Men post cardiac event and their wives (Macken 2000)**
  - Three quarters of wives were concordant with husbands re exercise at one year (most were exercising together)
- **Men post myocardial infarction and their wives (Dracup 1987)**
  - Men who were counselled re lifestyle and risk factors with their wives exercised more and sustained levels in long term better than those counselled alone
    Wives counselled with husbands exercised more during the short term

Macken et al (2000) J Cardiopulm Rehabil, 20, 361-8

Dracup 1984 Patient Educ Couns 6;169-77

MRFITT: spin-of effect of prevention intervention for men on their wives

	Intervention	Usual care	p
Smoking %	25	31	Not significant
weight	67	69	Not significant
Food record rating*	13	17	p<0.001
Dietary knowledge score**	30	27	p<0.001
LDL-C **(mg/dl)	127	142	p<0.01

Sexton M et al (1987) *J Behav Med,* 10**,** 251-61

Some determinants of good spousal support when health is a concern

- ‘Spinoff effect’ or passive adoption of the other’s habits
- Demonstrating an active engagement in a problem
- Sharing problems (not buffering or over-protecting)
- Involving the spouse in the health education intervention

Implications for research and clinical practice

- Concordance for lifestyles and concordance for change in couples exists and is an important factor in considering behaviour change theory
- Dynamics of change can and should inform the structure and management of prevention and rehabilitation programmes
- Further research – qualitative in depth investigation of couples dynamics to inform programme content
- Large RCT required to demonstrate effectiveness of a couples approach to CVD prevention

Nagging doesn't work!