Lifetime risk of CVD

สมเกียรติ แสงวัฒนาโรจน์ พบ.

สาขาวิชาโรคหัวใจและหลอดเลือด ภาควิชาอายุรศาสตร์

คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ศูนย์โรคหัวใจ โรงพยาบาลจุฬาลงกรณ์ สภากาชาดไทย

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Menu

- Why lifetime risk ?
- Lifetime risk &
  Chronic care model
- How to reduce lifetime risk ?

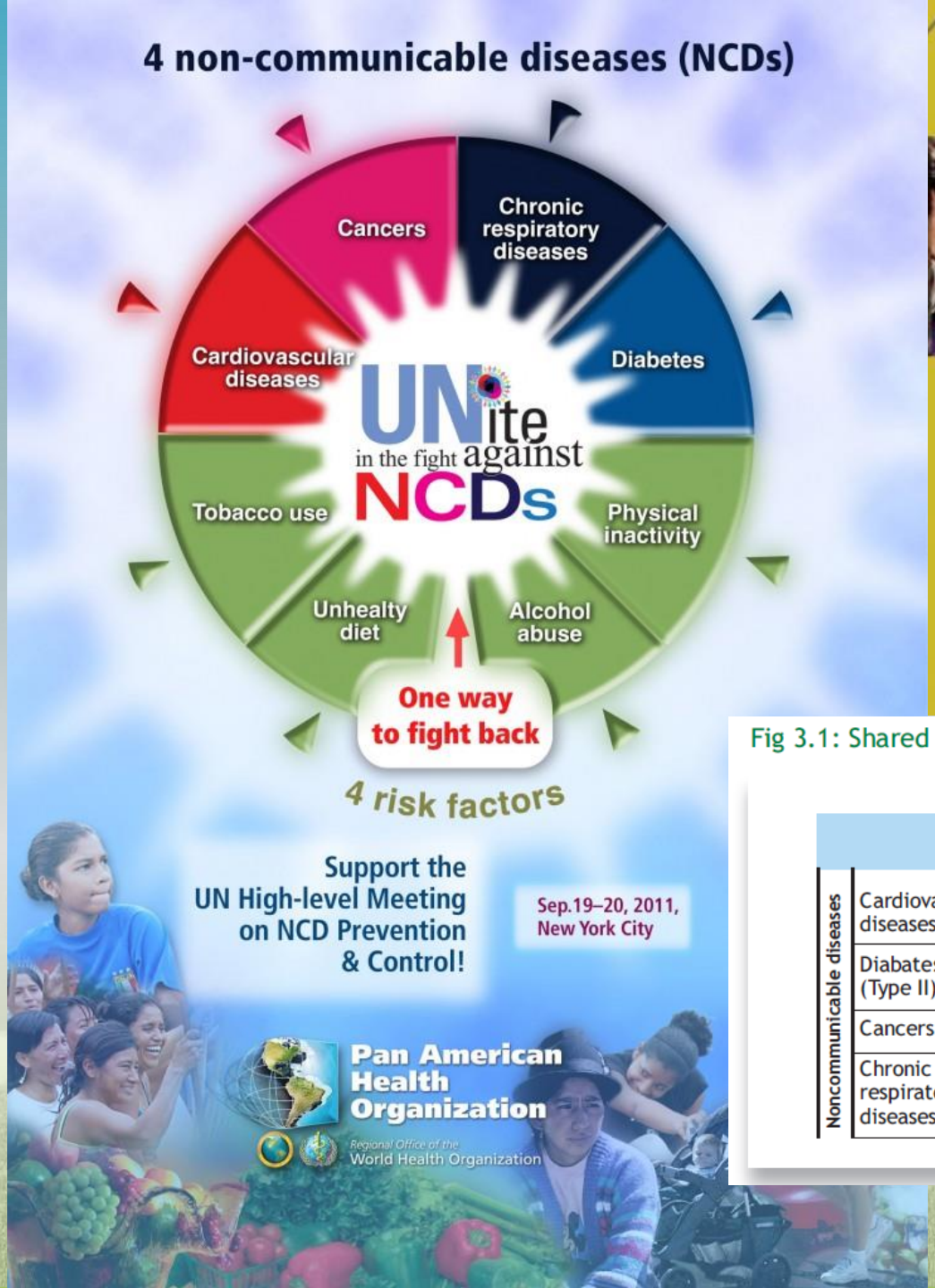


Fig 3.1: Shared risk factors for major noncommunicable diseases

ส.สูบบุหรี่ อ.อาหาร อ.ออกกำลัง ส.สุรา (อ.อารมณ์)

		Tobacco use	Unhealthy diet	Physical inactivity	Harmful use of alcohol
Noncommunicable diseases	Cardiovascular diseases	✔	✔	✔	✔
	Diabates (Type II)	✔	✔	✔	✔
	Cancers	✔	✔	✔	✔
	Chronic respiratory diseases	✔			

หลอดเลือด สมอง/หัวใจ

เบาหวาน

มะเร็ง

ความดันฯ

Menu

- Why lifetime risk ?
- Lifetime risk & Chronic care model
- How to reduce lifetime risk ?

BP during middle age & LifeTime CVD Risks

Allen N. Circulation 2012;125:37.

- Pooled data from 7 diverse US cohort studies. Remaining LTRs for CVD, CHD, and stroke for white and black men and women with death free of CVD as a competing event.
- LTRs for CVD by BP strata and by changes in BP over an average of 14 years were estimated. Starting at 55 years of age,followed up 61 585 men and women for 700 000 person-years.

BP during middle age & LifeTime CVD Risks

Allen N. Circulation 2012;125:37.

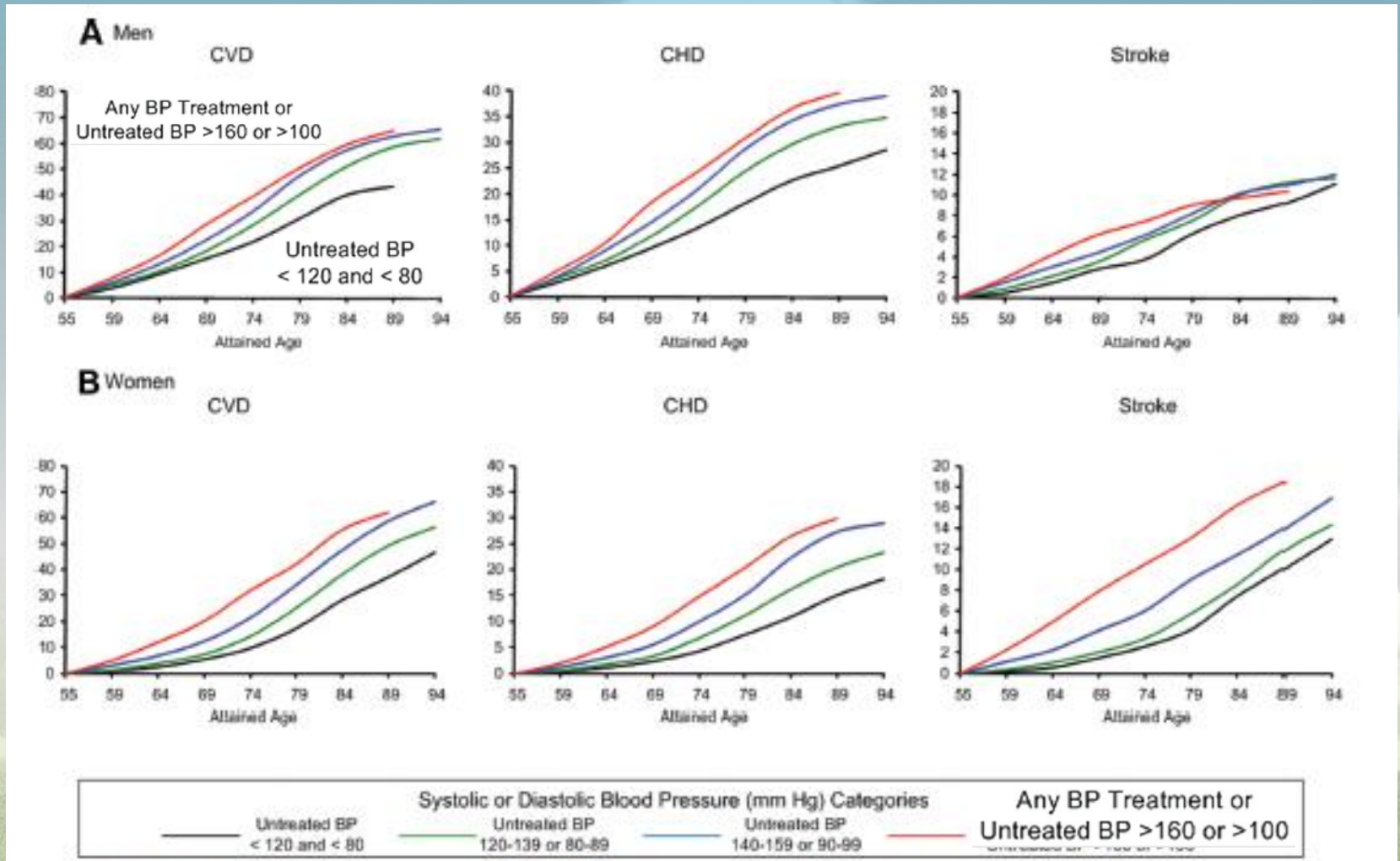


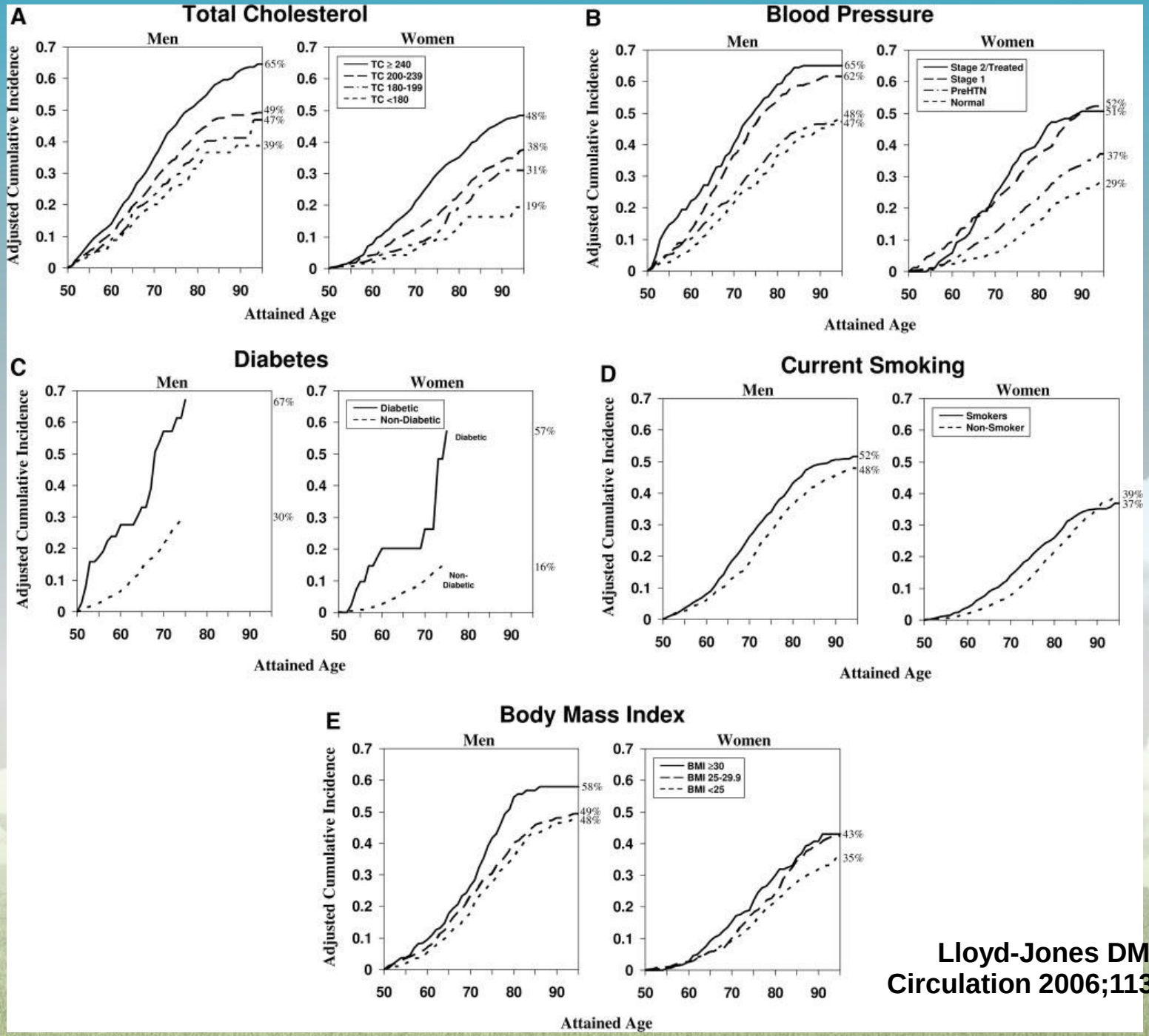
Figure. Cumulative lifetime risk (percent) of cardiovascular disease (CVD), coronary heart disease (CHD), and stroke adjusted for competing risk of non-CVD death by blood pressure (BP) category for men (**A**) and women (**B**).

Lifetime risks@50 years

Lloyd-Jones DM. Circulation 2006;113:791

Lifetime risk of all atherosclerotic CVD (MI, coronary insufficiency, angina, atherothrombotic stroke, intermittent claudication, or cardiovascular death).

- Framingham Heart Study participants who were free of CVD (myocardial infarction, coronary insufficiency, angina, stroke, claudication) at 50 years of age. Lifetime risks to 95 years of age were estimated for men and women, with death free of CVD as a competing event.
- Followed up 3564 men and 4362 women for 111 ,777 person-years; 1757 had CVD events and 1641 died free of CVD.



Lloyd-Jones DM.
Circulation 2006;113:791

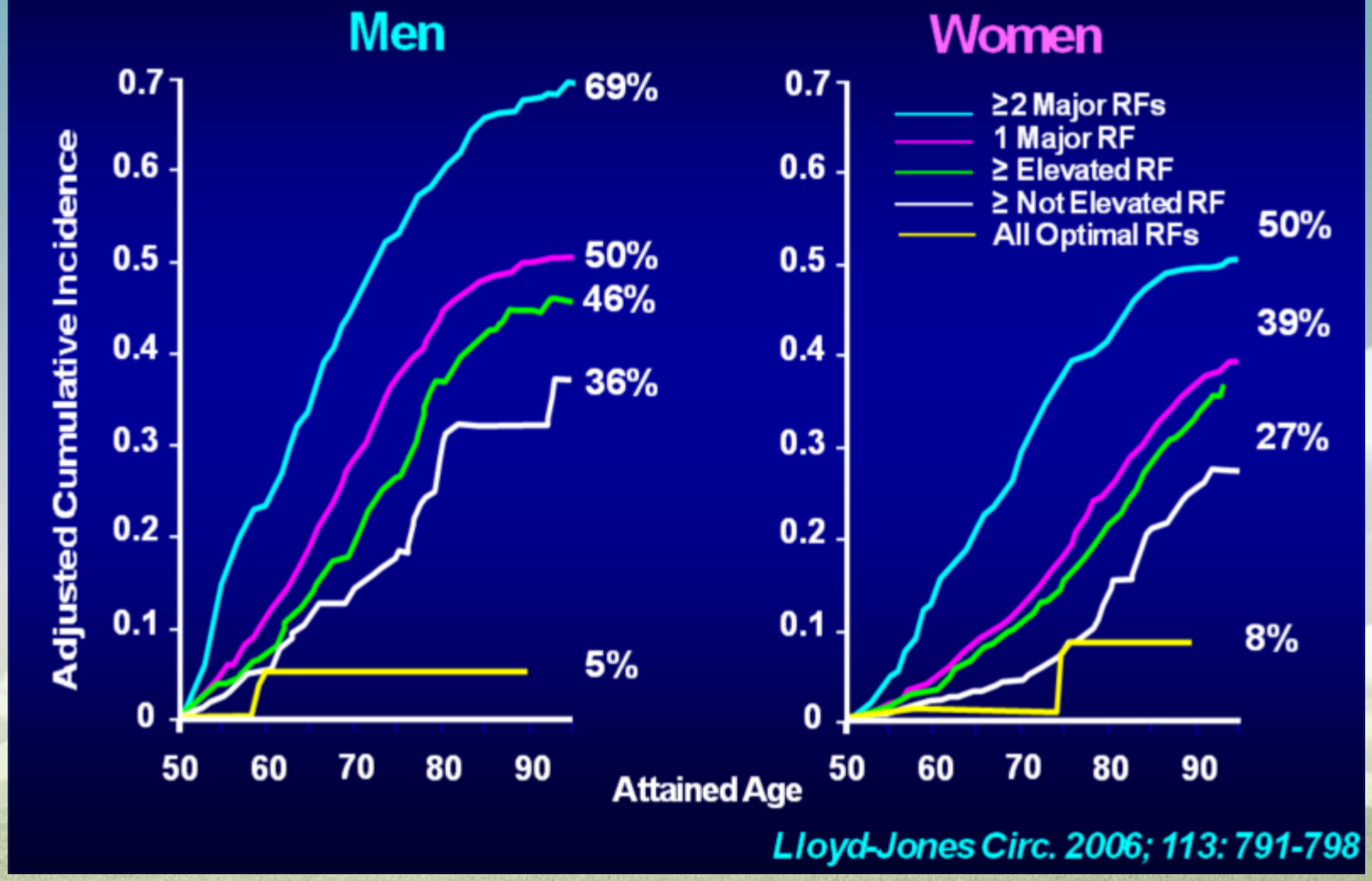
Table 1 | Risk-factor definitions and lifetime-risk stratification* **(From 50 to 95 years old)**

Risk factor or estimate	Low predicted lifetime risk		High predicted lifetime risk		
	All risk factors optimal	≥1 nonoptimal risk factor	≥1 elevated risk factor	1 major risk factor	≥2 major risk factors
Systolic/diastolic blood pressure (mmHg)	<120/80	120–139/ 80–89	140–159/ 90–99	≥160/≥100 (or treated)	≥160/≥100 (or treated)
Total cholesterol level (mg/dl)	<180	180–199	200–239	≥240	≥240
Diabetes mellitus	No	No	No	Yes	Yes
Smoking	No	No	No	Yes	Yes
Predicted lifetime risk for men (%)	5	36	46	50	69
Predicted lifetime risk for women (%)	8	27	39	39	50

*Based on risk-factor profile among Framingham cohort participants aged 50 years. Lifetime risk refers to the risk of all atherosclerotic cardiovascular disease (myocardial infarction, coronary insufficiency, angina, atherothrombotic stroke, intermittent claudication, or cardiovascular death). An individual's risk stratum is the highest stratum for which any of the individual's risk factors are eligible.[8]

Lloyd-Jones DM.
Circulation 2006;113:791

Framingham Heart Study : Lifetime Risk



Lloyd-Jones Circ. 2006; 113: 791-798

Lifetime risk of CVD in US

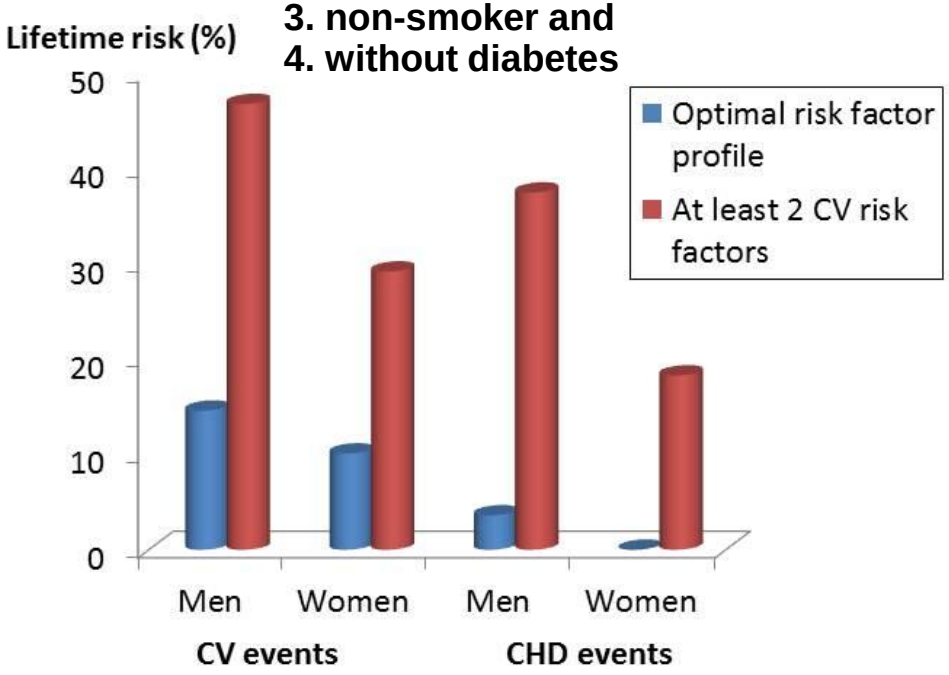
Meta-analysis. Berry JD. N Engl J Med 2012;366:321.

- 18 cohort studies: 257,384 black men & women and white men & women whose CVD risk factors @ ages 45, 55, 65 & 75 yrs. BP, cholesterol level, smoking & DM status to stratify into 5 mutually exclusive categories. The remaining lifetime risks of CV events were estimated for participants in each category @ each age, with death free of CVD treated as a competing event.

Lifetime risk of CVD in US

Berry JD. N Engl J Med 2012;366:321.

Lifetime risk of CV and CHD events at age 55 years.
Optimal risk factor management was defined as:
1. total cholesterol <4.7 mmol/L,
2. untreated blood pressure <120/80 mmHg,
3. non-smoker and
4. without diabetes



Lifetime risk of CVD in US

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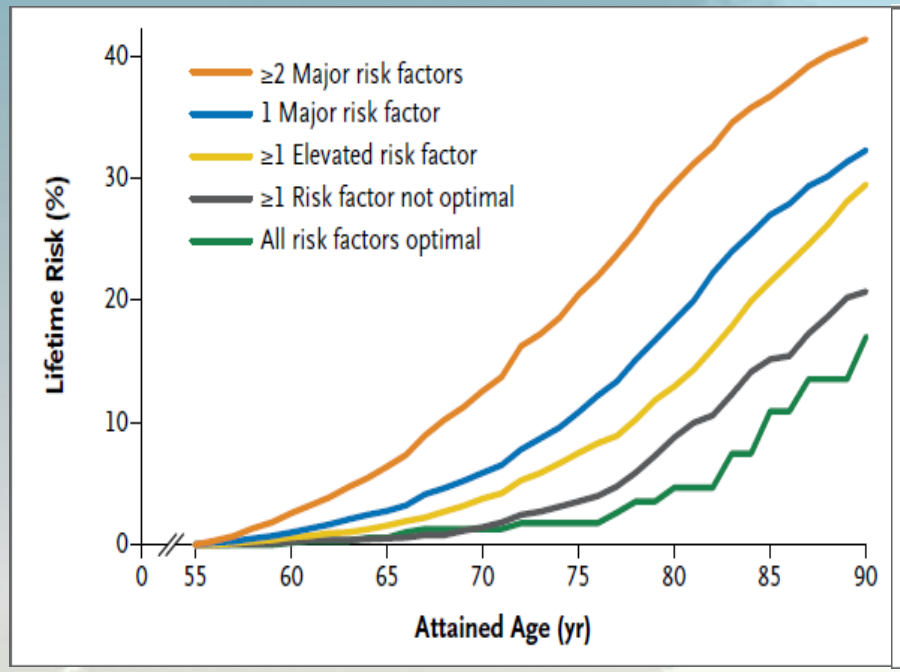


Figure 1. Lifetime Risk of Death from Cardiovascular Disease among Black Men and White Men at 55 Years of Age, According to the Aggregate Burden of Risk Factors and Adjusted for Competing Risks of Death.

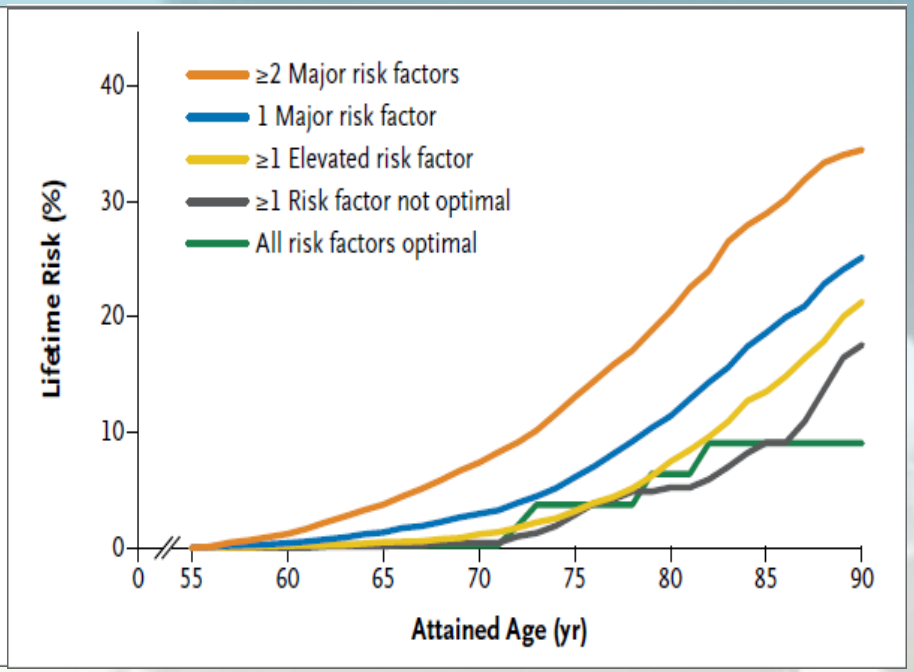


Figure 2. Lifetime Risk of Death from Cardiovascular Disease among Black Women and White Women at 55 Years of Age, According to the Aggregate Burden of Risk Factors and Adjusted for Competing Risks of Death.

The data were derived from the 17 studies in the pooled cohort; data from the Multiple Risk Factor Intervention Trial were not included.

Why start at the young ?

Short-term vs. Lifetime CV risk

Karmali KN. Nat Rev Cardiol 2013;10:111.

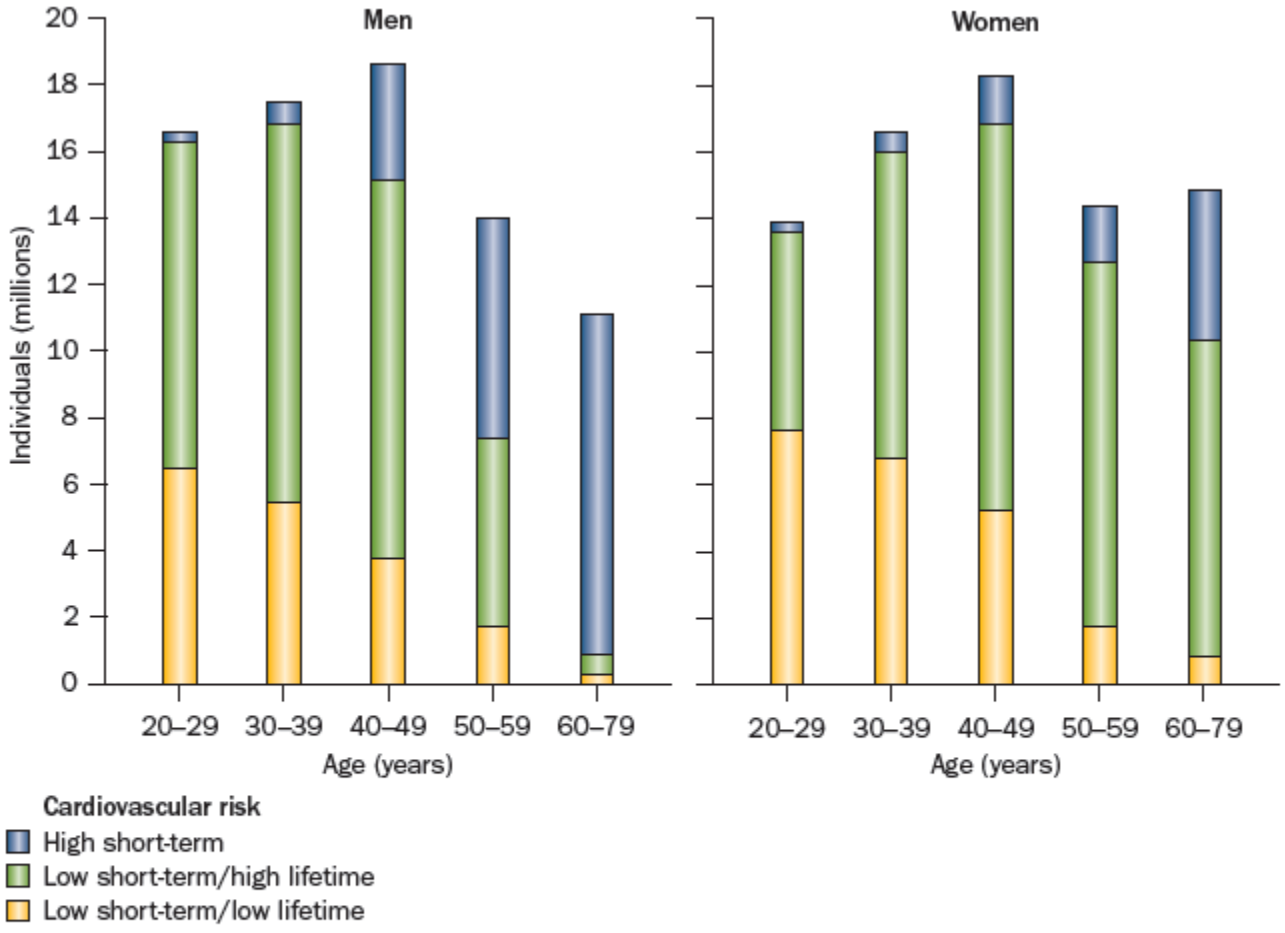


Figure 1 | Sex-specific and age-specific population estimates of risk distribution among US adults aged 20–79 years, without diagnosed cardiovascular disease. Data from the National Health and Nutrition Examination Survey 2003–2006.[16] Reprinted from Marma, A. K. *et al.* Distribution of 10-year and lifetime predicted risks for cardiovascular disease in US adults: findings from the

Healthy lifestyle in the young: lower CV risk 20 yr later CARDIA. Liu K.Circulation 2012;125:996.

- Coronary Artery Risk Development in (Young) Adults study sample 3154 black & white participants 18-30 yrs, at year 0 (1985–1986) who attended the year 0, 7, and 20 examinations. Healthy lifestyle factors: average BMI <25 kg/m2, no or moderate alcohol intake, higher healthy diet score, higher physical activity score, never smoking.
- Mean age (25 yrs) and women (56%)

Healthy lifestyle in the young: lower CV risk 20 yr later CARDIA. Liu K.Circulation 2012;125:996.

Table 2. Low Risk Status at Year 20 by Number of Healthy Lifestyle Factors, Year 0 to 20, Among CARDIA Study Participants (n=3154)

อ.อาหาร อ.ออกแรงเคลื่อนไหว อ.อ้วน ส.สุบบุหรี่ ส.สุราแอลกอฮอล

	HLFs, n* (average of year 0, 7 &20)					*P* for Trend
	0–1	2	3	4	5	
No. (%)	485 (15.4)	956 (30.3)	959 (30.4)	566 (18.0)	189 (6.0)†	. . .
Low risk at Y20, %	2.1	13.6	29.8	40.1	64.0	<0.0001
Odds ratio‡ (95% CI) for low risk at Y20	1	8.1 (3.1–21.0)	20.5 (8.0–52.7)	31.4 (12.4–79.9)	74.8 (27.5–204.0)	. . .
Total never smokers through Y20, n§	558	729	492	189	. . .	. . .
Low risk at Y20 among never smokers, %	25.1	39.2	46.1	64.0	. . .	<0.0001
Odds ratio‡ (95% CI) for low risk at Y20 among never smokers	1	1.8 (1.4–2.4)	2.4 (1.8–3.2)	4.3 (2.9–6.3)	. . .	. . .

CARDIA indicates Coronary Artery Risk Development in (Young) Adults; HLFs, healthy lifestyle factors; Y20, year 20; and CI, confidence interval.
*HLFs are based on the average of year 0, 7, and 20 data.
†Sums to 3155 because of rounding.
‡Adjusted for age, sex, and race.
§Never smokers have at most 4 HLFs.

“ไม้อ่อนดัดง่าย และ อยู่นาน”

Healthy lifestyle in the young: lower CV risk 20 yr later CARDIA. Liu K.Circulation 2012;125:996.

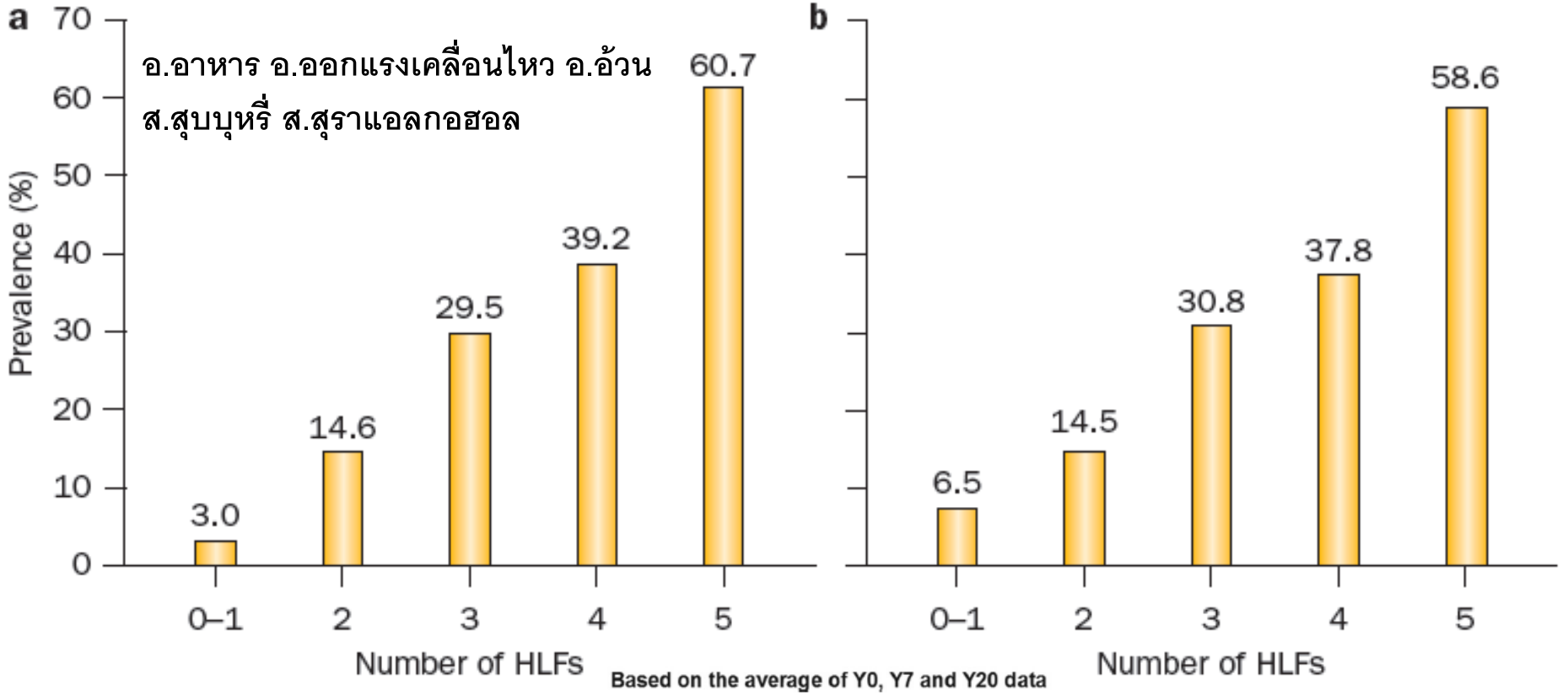


Figure 2 | Prevalence of a low-risk profile at 20-year follow-up adjusted for age, sex, and ethnicity according to HLFs among participants in the CARDIA study.[23] HLFs include BMI <25 kg/m^2, no or moderate alcohol intake, high healthy diet score, high physical activity score, and never having smoked. **a** | Data with multiple imputations (n=3,154). **b** | Complete data only (n=2,336). Results show a graded and direct relationship between the number of HLFs and the prevalence of a low cardiovascular-risk profile in middle age (P<0.0001 for trend).[23] Abbreviation: HLF,

Healthy lifestyle in the young: lower CV risk 20 yr later CARDIA. Liu K.Circulation 2012;125:996.

ไม่สูบบุหรี่ตั้งแต่วัยรุ่น มีโอกาสเสี่ยงฯน้อย ๒๐ ปี ต่อมา **38%**

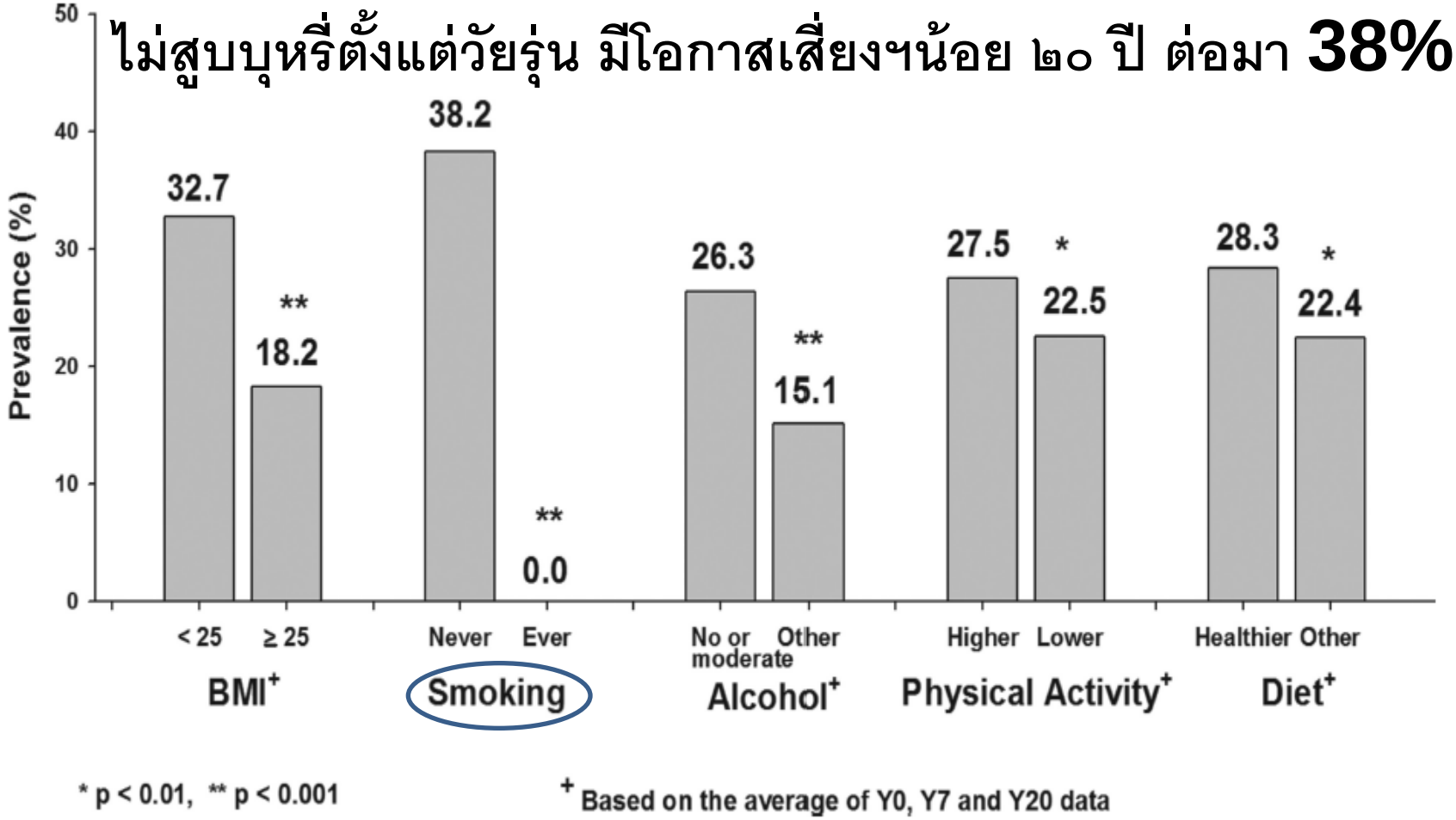
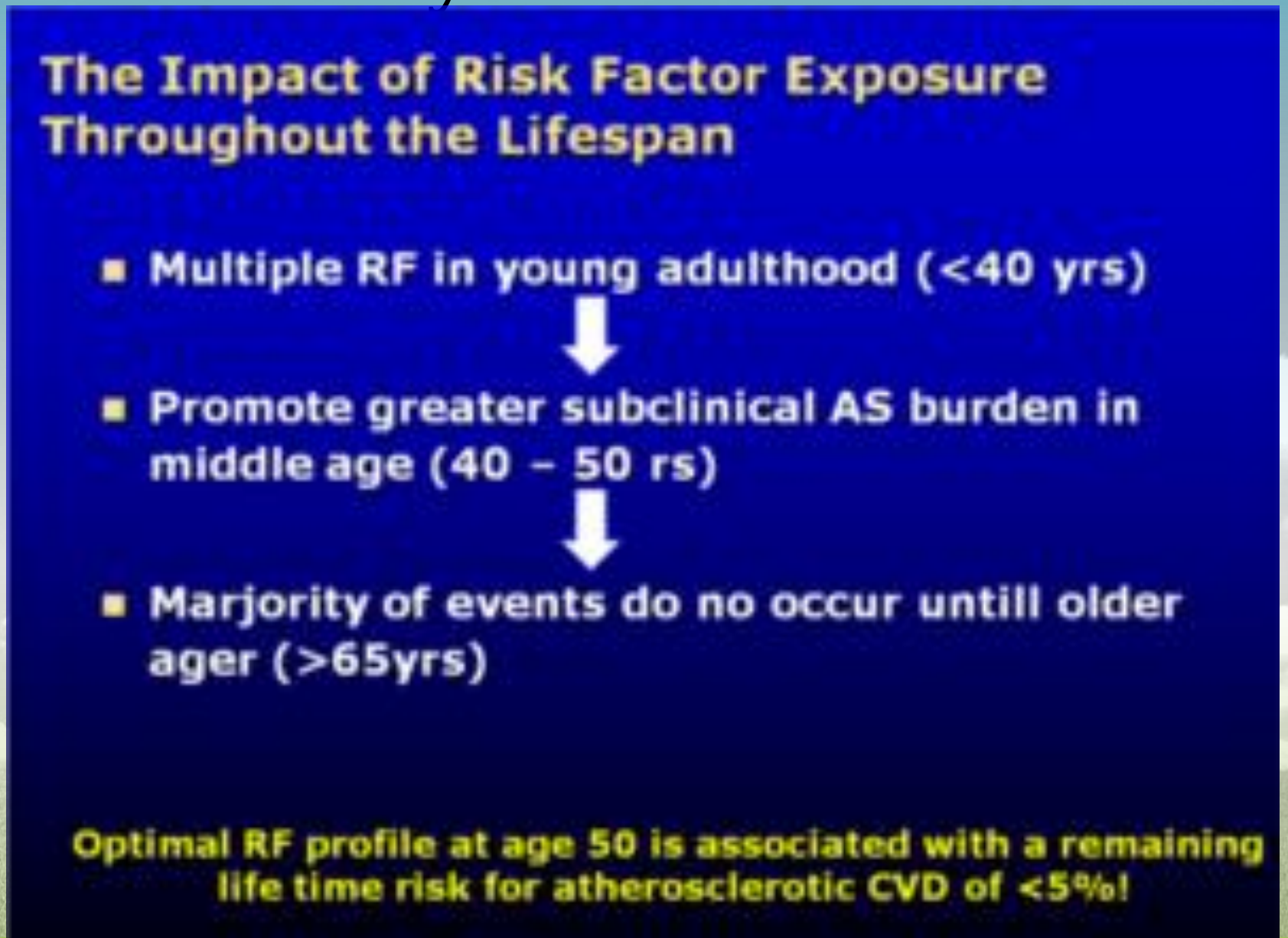


Figure 3. Age-, sex-, and race-adjusted prevalence of low risk profile at year 20 (Y20) by individual healthy lifestyle factors (HLF) among Coronary Artery Risk Development in (Young) Adults (CARDIA) Study Participants. *P* value was computed with logistic regression. BMI indicates body mass index.

Why lifetime risk ?



Menu

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  Chronic care model
- How to reduce lifetime risk ?

HARRISON'S

Harrison's Lecture Notes

CHAPTER 10

The Safety and Quality of Health Care

CCM proposes that 'by using a collaborative approach, providers and patients work together to identify problems, set priorities, establish goals, create treatment plans and solve issues along the way'

Wagner EH.Ann Intern Med 1997, 127:1097

รู้ทุกข์ ละสมุทัย แจ้งนิโรธ เจริญมรรค

Chronic Care Model

Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine, 18th Edition*: www.accessmedicine.com

Total risk assessment tools

Variables	Framingham	SCORE	EGAT
Population	5,251	>200,000	3,499
Age	30-74 y	35-70 y	35-55 y
Predict	CHD event*	Fatal CVD	CHD event*
Include DM	Yes	No	Yes
Include WC	No	No	Yes
Implement	Lipid	Lipid, HT	Not yet

*** CHD event:**

- **Framingham = fatal CHD and non-fatal MI**
- **EGAT = fatal, non-fatal MI and CABG/PCI**

แบบไม่ต้องมีผลเลือด

โอกาสเกิดเส้นเลือดหัวใจตีบรุนแรงในเวลา 10 ปี (%) ในผู้ที่ไม่เป็นเบาหวาน

ผู้หญิง

อายุ (ปี)	ไม่สูบบุหรี่		สูบบุหรี่	
	< 80 ซม.	≥ 80 ซม.	< 80 ซม.	≥ 80 ซม.
50-54	เป็นความดันโลหิตสูง: 2	4	3	7
	ไม่เป็นความดันโลหิตสูง: 1	2	2	4
45-49	เป็นความดันโลหิตสูง: 1	3	2	4
	ไม่เป็นความดันโลหิตสูง: 1	2	1	2
40-44	เป็นความดันโลหิตสูง: 1	2	1	3
	ไม่เป็นความดันโลหิตสูง: 0	1	1	2
35-39	เป็นความดันโลหิตสูง: 1	1	1	2
	ไม่เป็นความดันโลหิตสูง: 0	1	0	1

รอบเอว

ผู้ชาย

ไม่สูบบุหรี่		สูบบุหรี่	
< 90 ซม.	≥ 90 ซม.	< 90 ซม.	≥ 90 ซม.
4	8	5	12
2	4	3	7
2	5	4	8
1	3	2	4
2	4	2	5
1	2	1	3
1	2	2	4
1	1	1	2

รอบเอว

หมายเหตุ

: เส้นเลือดหัวใจตีบรุนแรง คือ 1. ตายจากกล้ามเนื้อหัวใจตายเฉียบพลัน หรือ 2. เกิดกล้ามเนื้อหัวใจตายเฉียบพลัน หรือ 3. ต้องได้รับทำ

: ดัดแปลงจาก EGAT heart score, version 1, พฤษภาคม 48 เป็นการประเมินโอกาสเสี่ยงคร่าวๆ และ ใช้เพื่อการสร้างเสริมสุขภาพเท่านั้น

โรงพยาบาลจุฬาลงกรณ์ สภากาชาดไทย และ คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

แบบใช้ผลเลือดโคเลสเตอรอล

อายุ (ปี)	ความดันโลหิต	ไม่เป็นเบาหวาน: รอบเอว < 80 ซม. ไม่สูบบุหรี่		ไม่เป็นเบาหวาน: รอบเอว < 80 ซม. สูบบุหรี่		ไม่เป็นเบาหวาน: รอบเอว ≥ 80 ซม. ไม่สูบบุหรี่		ไม่เป็นเบาหวาน: รอบเอว ≥ 80 ซม. สูบบุหรี่		เป็นเบาหวาน: รอบเอว < 80 ซม. ไม่สูบบุหรี่		เป็นเบาหวาน: รอบเอว < 80 ซม. สูบบุหรี่		เป็นเบาหวาน: รอบเอว ≥ 80 ซม. ไม่สูบบุหรี่		เป็นเบาหวาน: รอบเอว ≥ 80 ซม. สูบบุหรี่	
		< 280	≥ 280	< 280	≥ 280	< 280	≥ 280	< 280	≥ 280	< 280	≥ 280	< 280	≥ 280	< 280	≥ 280	< 280	≥ 280
50-54	เป็นความดันโลหิตสูง	3	6	4	9	5	11	8	16	8	16	11	20	14	20	20	>20
	ไม่เป็นความดันโลหิตสูง	2	4	2	5	3	6	4	9	4	9	6	14	8	16	11	20
45-49	เป็นความดันโลหิตสูง	2	4	3	6	4	8	5	11	5	11	8	16	9	20	14	>20
	ไม่เป็นความดันโลหิตสูง	1	2	2	4	2	4	3	6	3	6	4	9	5	11	8	16
40-44	เป็นความดันโลหิตสูง	1	3	2	4	2	5	4	8	4	8	5	11	6	14	9	20
	ไม่เป็นความดันโลหิตสูง	1	2	1	2	1	3	2	4	2	4	3	6	4	8	5	11
35-39	เป็นความดันโลหิตสูง	1	2	1	3	2	4	2	5	2	5	4	8	4	9	6	14
	ไม่เป็นความดันโลหิตสูง	1	1	1	2	1	2	1	3	1	3	2	4	2	5	4	8

โคเลสเตอรอลรวม (มิลลิกรัม%)

รขยายเส้นเลือดหรือผ่าตัดเส้นเลือดหัวใจ

AstraZeneca

โอกาสเสี่ยงรวมโดย **EGAT heart score**

ผู้ป่วยหญิงไทยคู่ อายุ ๕๓ ปี เป็นความดันโลหิตสูงมา ๔ ปี กินยาลดความดันฯ ไม่เป็นเบาหวาน ไม่สูบบุหรี่

ตรวจร่างกาย: ความดันโลหิต ๑๓๘/๘๒ มิลลิเมตรปรอท รอบเอว ๘๔ ซม.

ผลเลือด: โคเลสเตอรอล(รวม) ๒๕๐, แอลดีแอล ๑๕๒, เอชดีแอล ๕๘ มิลลิกรัมต่อเดซิลิตร


โอกาสเกิดเส้นเลือดหัวใจตีบรุนแรงในเวลา 10 ปี (%)
ผู้หญิง
ไม่เป็นเบาหวาน
เป็นเบาหวาน
รอบเอว < 80 เซนติเมตร
รอบเอว ≥ 80 เซนติเมตร
อายุ (ปี)
ไม่สูบบุหรี่
สูบบุหรี่
เป็นความดันโลหิตสูง
ไม่เป็นความดันโลหิตสูง
50-54
2 4 2 5 3 6 4 9
1 2 1 3 2 4 2 5
4 9 6 14 8 16 11 20
2 5 4 8 4 9 6 14
45-49
1 2 2 4 2 4 3 6
1 1 1 2 1 2 2 4
3 6 4 9 5 11 8 16
2 4 2 5 3 6 4 9
40-44
1 2 1 2 1 3 2 4
0 1 1 1 1 2 1 2
2 4 3 6 4 8 5 11
1 2 2 4 2 4 3 6
35-39
1 1 1 2 1 2 1 3
0 1 0 1 1 1 1 2
1 3 2 4 2 5 4 8
1 2 1 2 1 3 2 4
< 280 ≥ 280
โคเลสเตอรอลรวม (มิลลิกรัม%)

European Heart Journal (2012) **33**, 1635–1701
doi:10.1093/eurheartj/ehs092

JOINT ESC GUIDELINES

European Guidelines on cardiovascular disease prevention in clinical practice (version 2012)

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

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

European Heart Journal (2012) **33**, 1635–1701
doi:10.1093/eurheartj/ehs092

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re 6 Illustration of the risk–age concept.

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association®

Predicting the 30-Year Risk of Cardiovascular Disease : The Framingham Heart Study

Michael J. Pencina, Ralph B. D'Agostino, Sr, Martin G. Larson, Joseph M. Massaro and Ramachandran S. Vasan

Circulation. 2009;119:3078-3084; originally published online June 8, 2009;

Methods and Results—We prospectively followed 4506 participants (2333 women) of the Framingham Offspring cohort aged 20 to 59 years and free of CVD and cancer at baseline examination in 1971–1974 for the development of "hard" CVD events (coronary death, myocardial infarction, stroke). We used a modified Cox model that allows adjustment for competing risk of noncardiovascular death to construct a prediction algorithm for 30-year risk of hard CVD. Cross-validated survival C statistic and calibration χ^2 were used to assess model performance. The 30-year hard CVD event rates adjusted for the competing risk of death were 7.6% for women and 18.3% for men. Standard risk factors

FRAMINGHAM HEART STUDY

A Project of the National Heart, Lung and Blood Institute and Boston University

Atrial Fibrillation (10-year risk)

Cardiovascular Disease (30-year risk)

Congestive Heart Failure

Coronary Heart Disease (10-year risk)

Coronary Heart Disease (2-year risk)

Diabetes Risk Score

General Cardiovascular Disease (10-year risk)

www.framinghamheartstudy.org/risk/cardiovascular30.html

Cardiovascular Disease (30-year risk)

(based on Pencina, D'Agostino, Larson, Massaro, Vasan. 'Predicting the 30–Year Risk of Cardiovascular Disease: The Framingham Heart Study', Circulation 2009)

Outcome

"Hard" CVD (coronary death, myocardial infarction, stroke), "general" CVD (coronary death, myocardial infarction, coronary insufficiency, angina, ischemic stroke, hemorrhagic stroke, transient ischemic attack, peripheral artery disease, heart failure)

Duration of follow–up

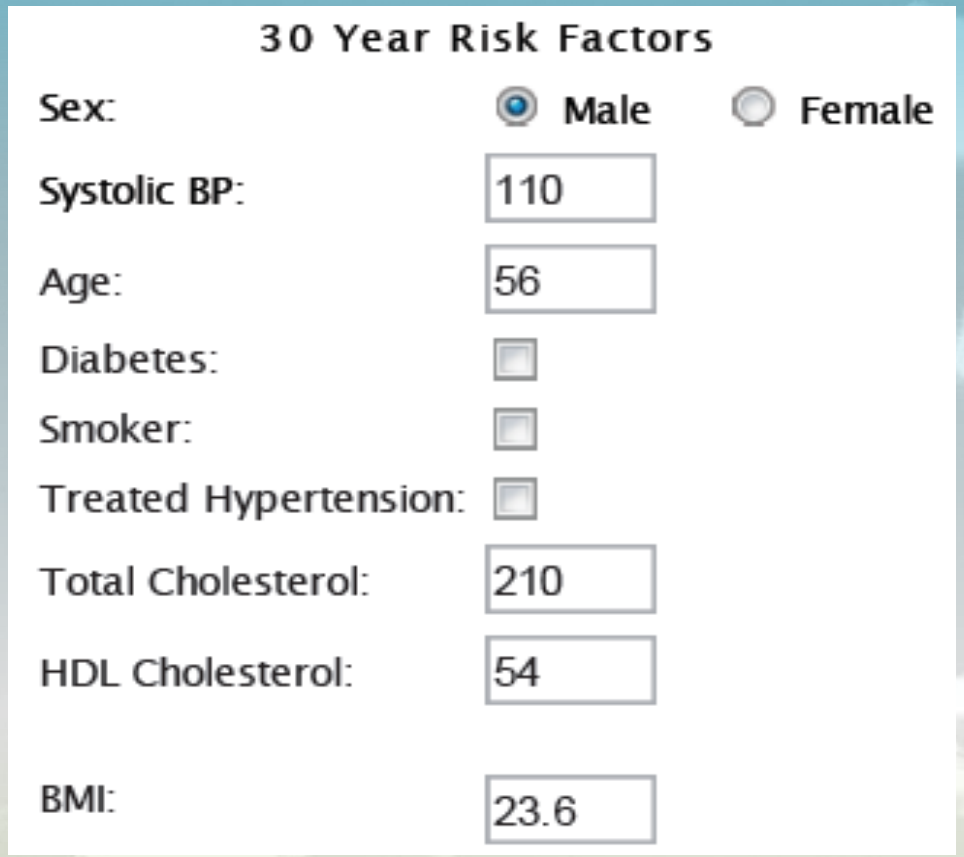
Maximum of 35 years, 30–year risk prediction

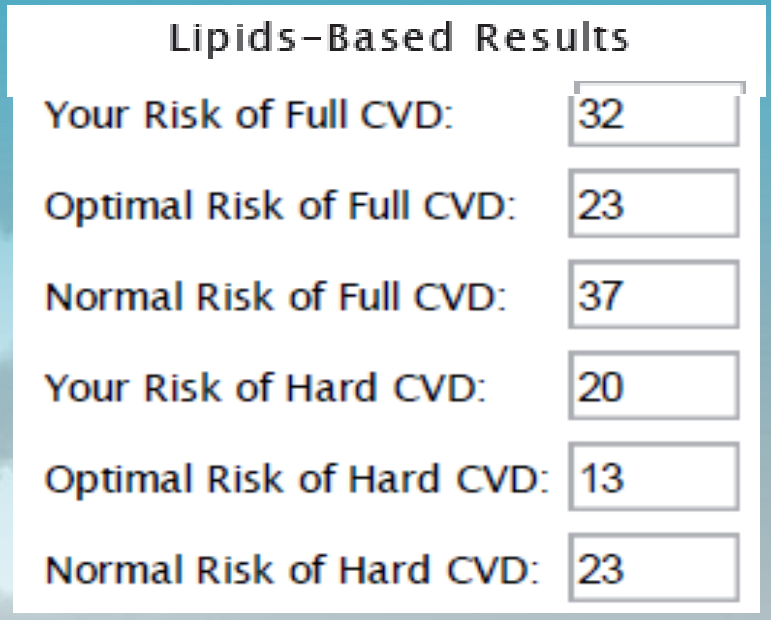
Population of interest

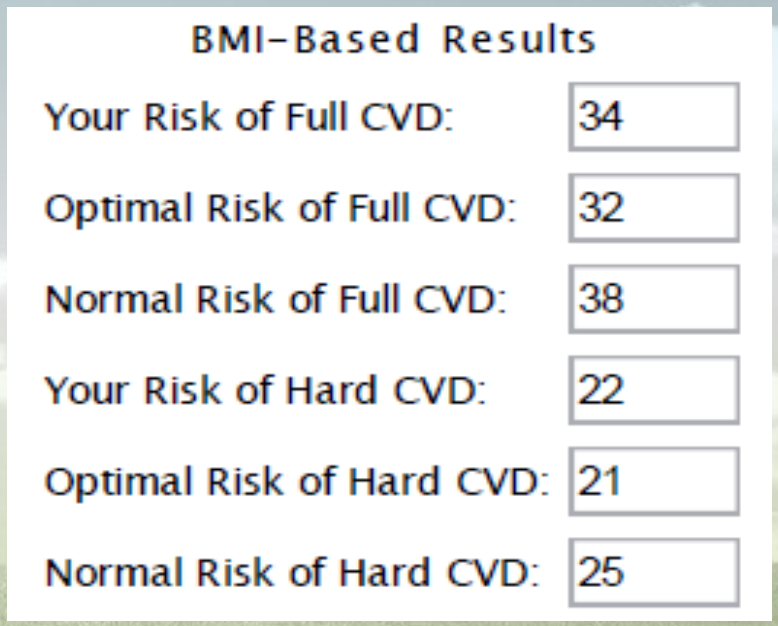
Individuals 20 to 59 years and free of CVD and cancer at baseline examination

Predictors

- Male Sex
- Age
- Systolic Blood Pressure (SBP)
- Use of Antihypertensive treatment (yes/ no)
- Smoking
- Diabetes mellitus
- Total cholesterol
- HDL cholesterol
- BMI replacing lipids in a simpler model







www.framinghamheartstudy.org/risk/cardiovascular30.html

Derivation, validation, and evaluation of a new QRISK model to estimate lifetime risk of cardiovascular disease: cohort study using QResearch database

Cite this as: *BMJ* 2010;341:c6624
doi:10.1136/bmj.c6624

Julia Hippisley-Cox, professor of clinical epidemiology and general practice,[1] Carol Coupland, associate professor in medical statistics,[1] John Robson, senior lecturer general practice,[2] Peter Brindle, research and evaluation programme director[3]

- Patients aged 30–84 years who were free of cardiovascular disease and not taking statins between 1 January 1994 and 30 April 2010: 2 343 759 in the derivation dataset, and 1 267 159 in the validation dataset.

Welcome to the QRISK®-lifetime cardiovascular risk calculator

Welcome | Information | Publications | About | Copyright | Contact Us | Software

About you

Age: 56

Sex: (•) Male ( ) Female

Ethnicity: Other Asian

Leave blank if unknown

Postcode:

Clinical information -- check those that apply

- Diabetic? ☐
- Had a heart attack, angina, stroke or TIA? ☐
- Angina or heart attack in a 1st degree relative < 60? ☐
- Chronic kidney disease? ☐
- Atrial fibrillation? ☐
- On blood pressure treatment? ☐
- Rheumatoid arthritis? ☐

Modifiable risk factors - leave blank if unknown

	Current	What if?
Do you smoke?	Non smoker	Non smoker
Cholesterol/HDL ratio:	4	
Systolic blood pressure (mmHg):	110	
Height (cm):	169	
Weight (kg):	68	

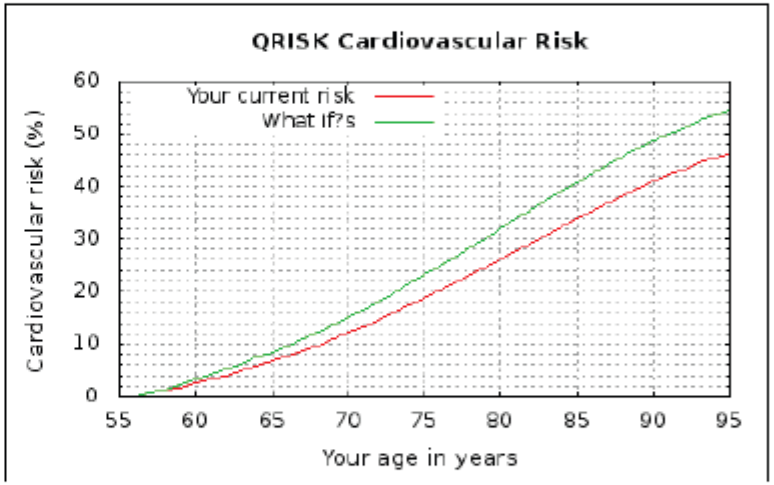
Re-calculate

Calculate risk up to 95 years of age. Calculate

Your result www.qrisk.org/lifetime/index.php

Your QRISK-lifetime score

	Current	What if?
Your lifetime risk (i.e. by the time you are 95)	46.3%	54.4%



In other words, in a crowd of 100 people like you, 46 will develop heart disease or have a stroke/TIA by the time they are 95, and 46 will do so over the rest of their life.

Your score has been calculated using estimated or corrected data, as some information was left blank.

Your body mass index was calculated as 23.8 kg/m^2.

(If you can only see one line in the graph, that's because the risk profiles are the same, and one line has been drawn on top of the other.)

ClinRisk

Welcome to the QRISK®-lifetime cardiovascular risk calculator

Welcome | Information | Publications | About | Copyright | Contact Us | Software

About you

Age: 56

Sex: (•) Male ( ) Female

Ethnicity: Other Asian

Leave blank if unknown

Postcode:

Clinical information -- check those that apply

- Diabetic? ☐
- Had a heart attack, angina, stroke or TIA? ☐
- Angina or heart attack in a 1st degree relative < 60? ☐
- Chronic kidney disease? ☐
- Atrial fibrillation? ☐
- On blood pressure treatment? ☑
- Rheumatoid arthritis? ☐

Modifiable risk factors - leave blank if unknown

	Current	What if?
Do you smoke?	Non smoker	Non smoker
Cholesterol/HDL ratio:	6	
Systolic blood pressure (mmHg):	130	
Height (cm):	169	
Weight (kg):	75	

Re-calculate

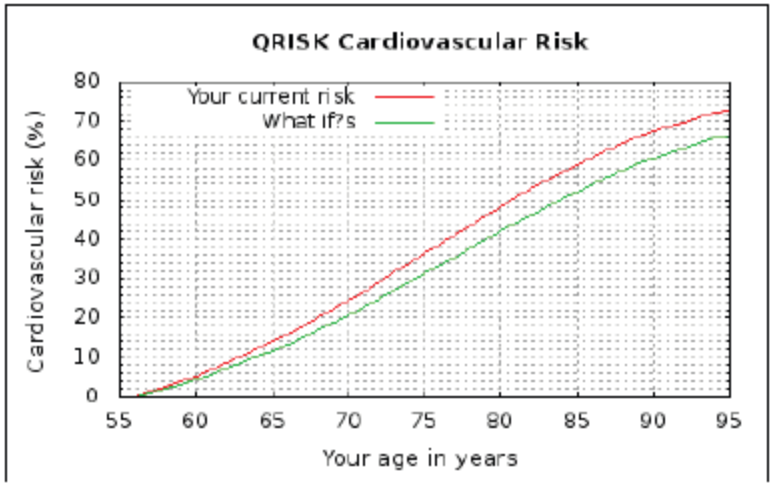
Calculate risk up to 95 years of age. Calculate

Your result

www.qrisk.org/lifetime/index.php

Your QRISK-lifetime score

	Current	What if?
Your lifetime risk (i.e. by the time you are 95)	72.8%	66.3%



In other words, in a crowd of 100 people like you, 73 will develop heart disease or have a stroke/TIA by the time they are 95, and 73 will do so over the rest of their life.

Your score has been calculated using estimated or corrected data, as some information was left blank.

Your body mass index was calculated as 26.3 kg/m^2.

(If you can only see one line in the graph, that's because the risk profiles are the same, and one line has been drawn on top of the other.)

If I am on Anti-HT, dyslipid & obese

Menu

- Why lifetime risk ?
- Lifetime risk & Chronic care model
- How to reduce lifetime risk ?

Atherosclerosis: Risk Reduction Strategy
Lifetime Risk

- ❑ Treat to lower levels ?
- ❑ Target global risk
- ❑ Start earlier

How to: Med or Non-Med

- Poly-pill ?: long term outcome ?
- Statin in drinking water ?
- Anti-DM, Anti-HT drugs ?
- Anti-obesity, Anti-smoking agents?

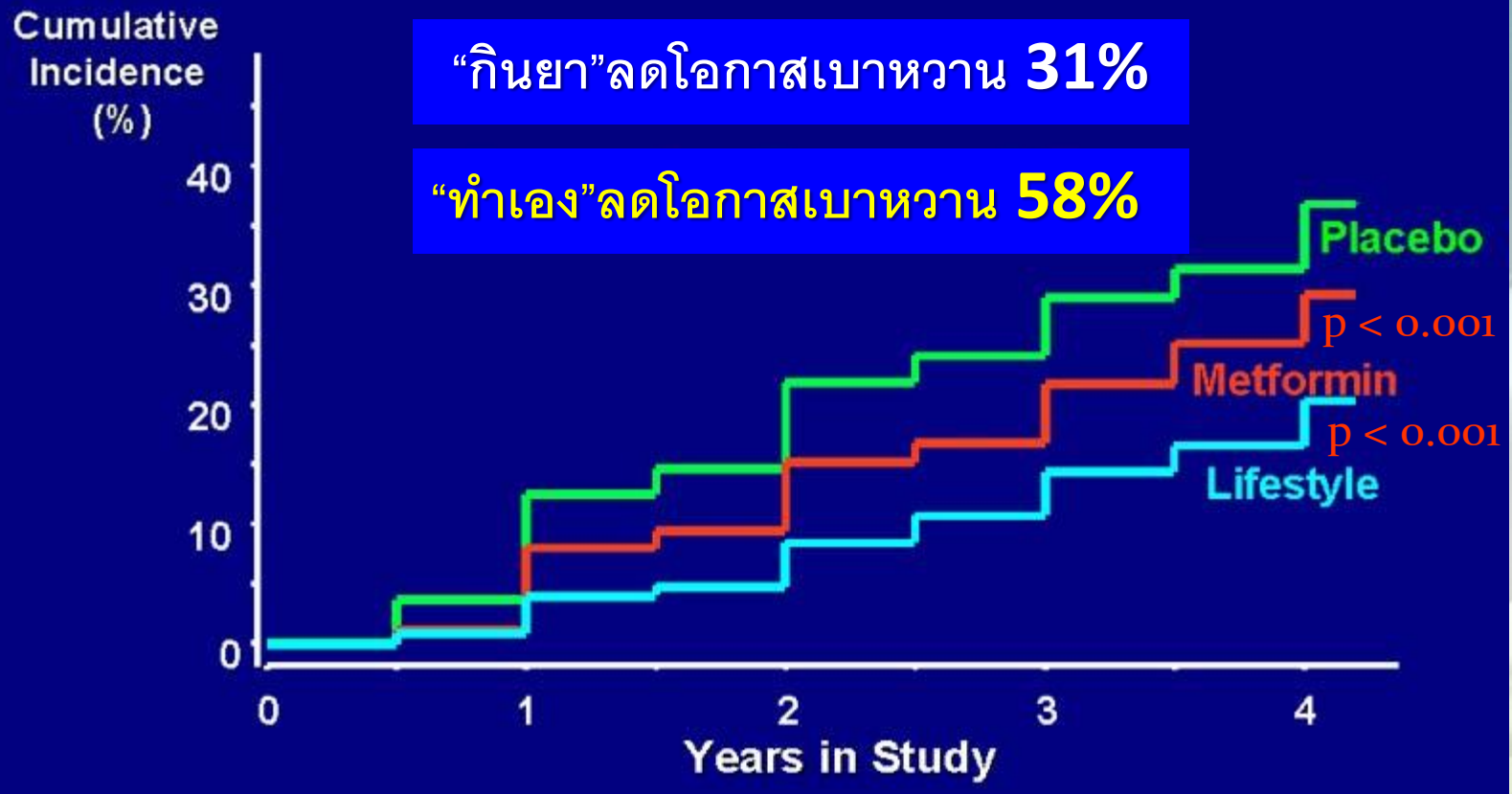
ป้องกัน เบาหวาน

“ทำเอง”

(ลดน้ำหนัก 7% ใน 6 เดือน + เดินเร็ว 150 นาทีต่อสัปดาห์)

ดีกว่า “กินยา”

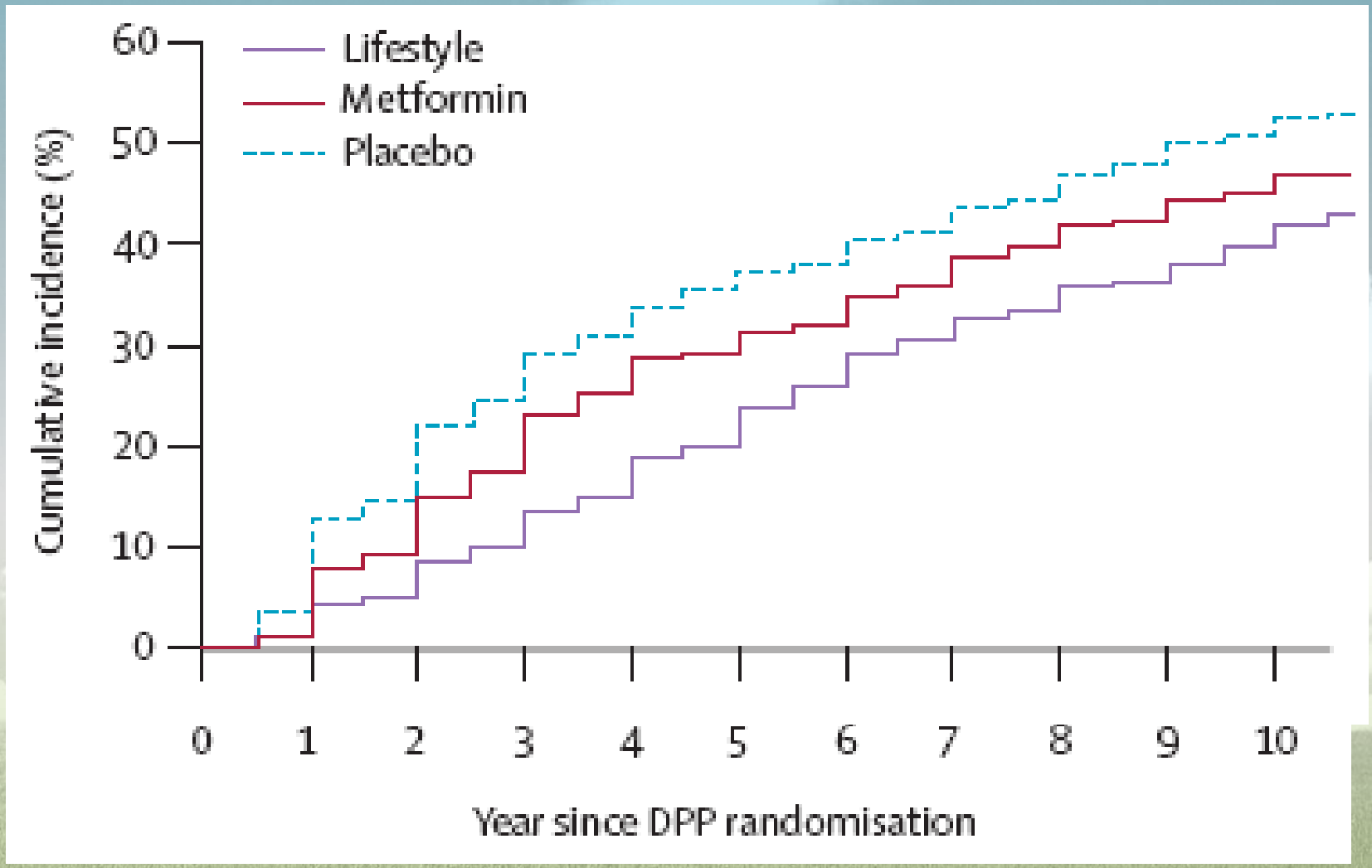
Diabetes Prevention Programme (DPP)



Knowler WC et al. *N Engl J Med.* 2002;346:393-403.

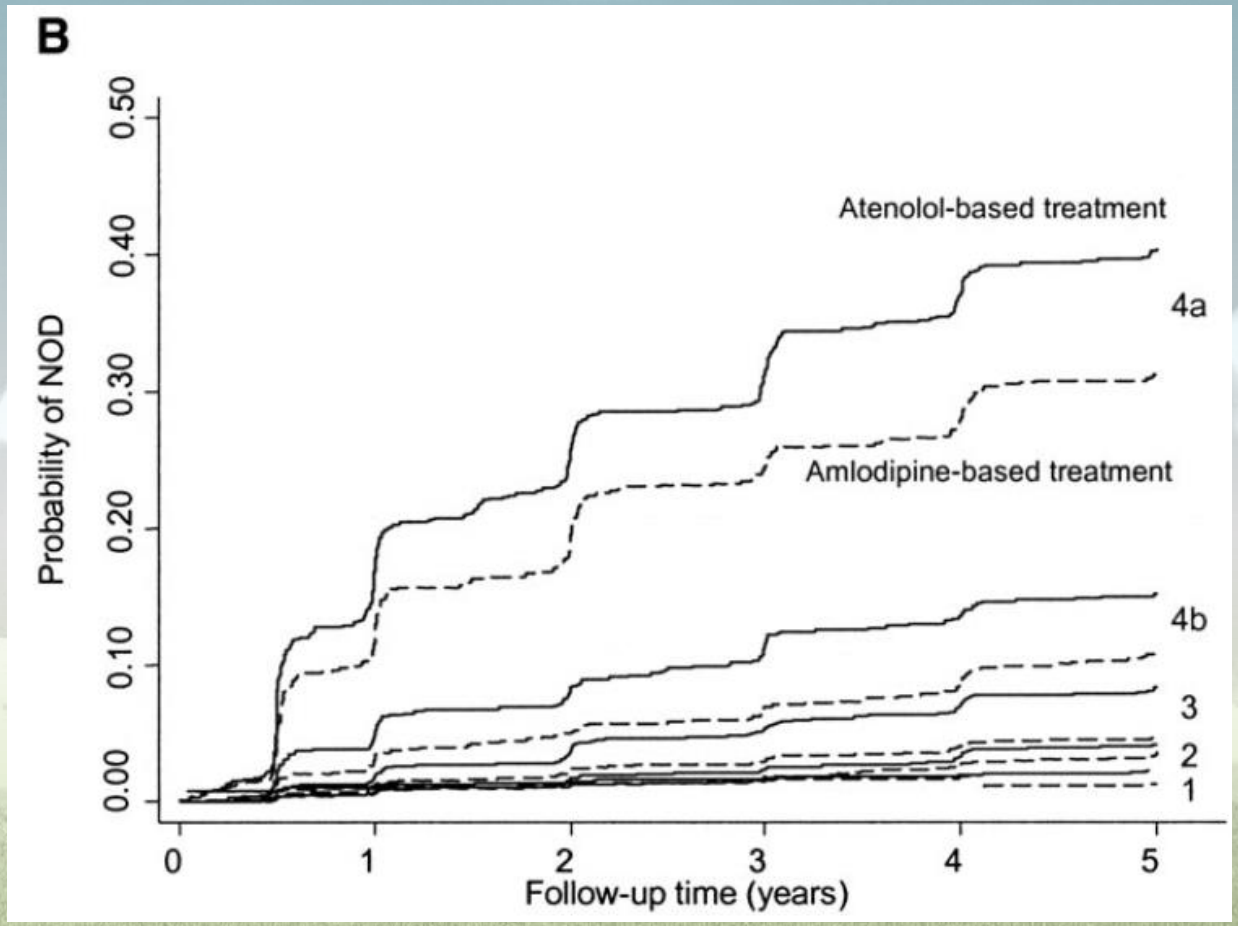
10 year follow-up DPP outcomes study

Diabetes Prevention Program. Lancet 2009;374:1677-86.



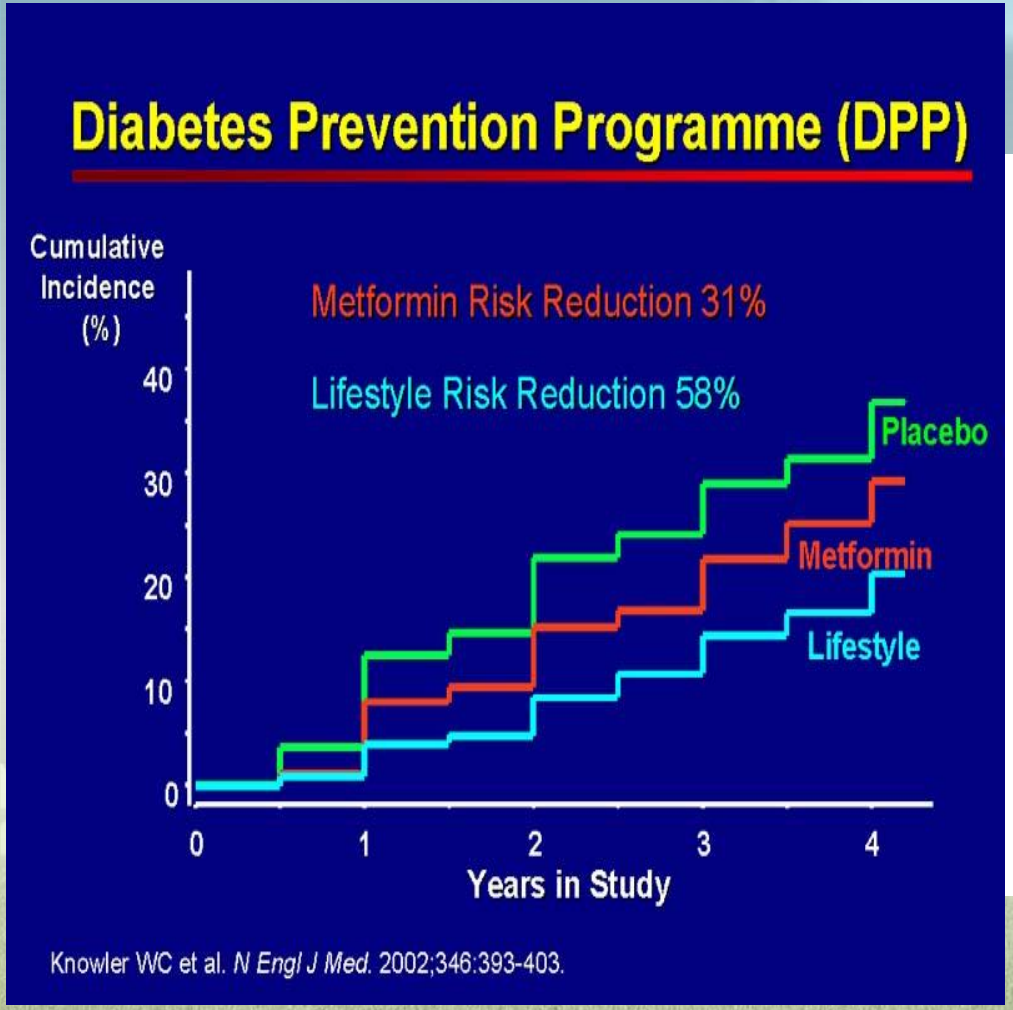
กินยาความดันฯไปเรื่อยๆ โอกาสเบาหวานก็มากขึ้นเรื่อย ๆ

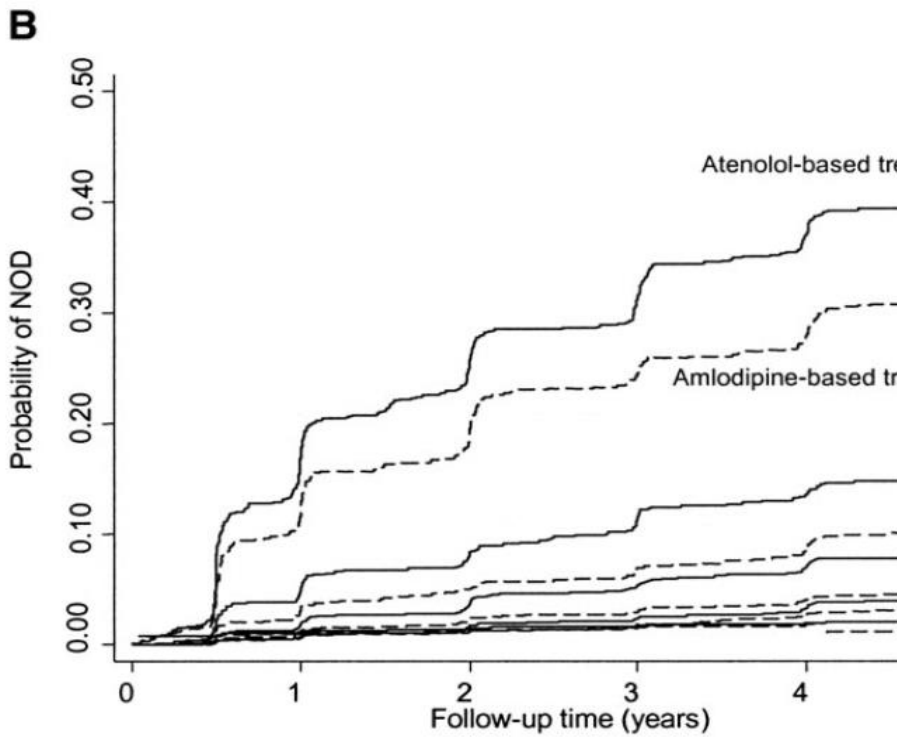
ASCOT-BPLA. Gupta AK. Diabetes Care 2008;31:982.



Anti-HT cf. Lifestyle in New Onset-DM

DPP cf. ASCOT-BPLA 2008





Statins but least fit more death than No statins but fit

กินยาลดไขมัน แต่ร่างกายไม่ฟิต(นั่ง ๆ นอน ๆ)

ตายมากกว่าไม่กินยาลดไขมัน แต่ร่างกายฟิต

Fitness & statins on death in dyslipidemia pts.

Veterans Affairs Medical Center Cohort. Lancet 2012

http://dx.doi.org/10.1016/S0140-6736(12)61426-3

- Dyslipidaemic veterans from VA Med Centers in Palo Alto, CA, and Washington DC, USA, exercise tolerance test 1986 - 2011.
- 4 fitness categories (peak metabolic equivalents achieved during exercise test) & 8 categories based on fitness status and statin treatment.
- 10 043 participants (mean age 58.8 ± 10.9 yrs). Median follow-up of 10.0 years (IQR 6,0–14.2), 2318 patients died, with an average yearly mortality rate of 22 deaths per 1000 person-yrs

ความฟิตของทหารผ่านศึก ยาลดไขมัน และการตาย

Veterans Affairs Medical Center Cohort. Lancet 2012

http://dx.doi.org/10.1016/S0140-6736(12)61426-3

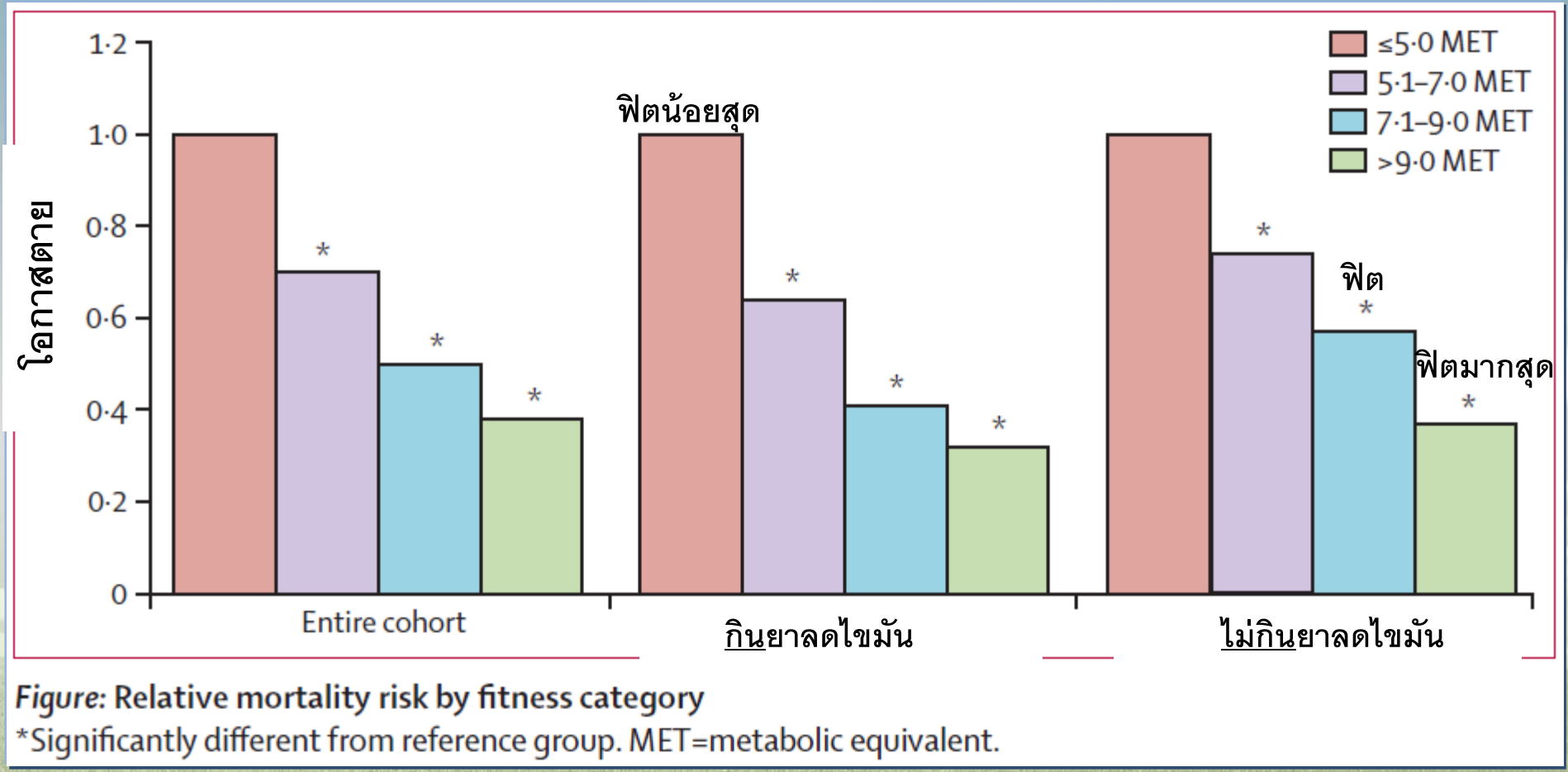


Figure: Relative mortality risk by fitness category

*Significantly different from reference group. MET=metabolic equivalent.

ความฟิตของทหารผ่านศึก ยาลดไขมัน และการตาย

Veterans Affairs Medical Center Cohort. Lancet 2012

http://dx.doi.org/10.1016/S0140-6736(12)61426-3

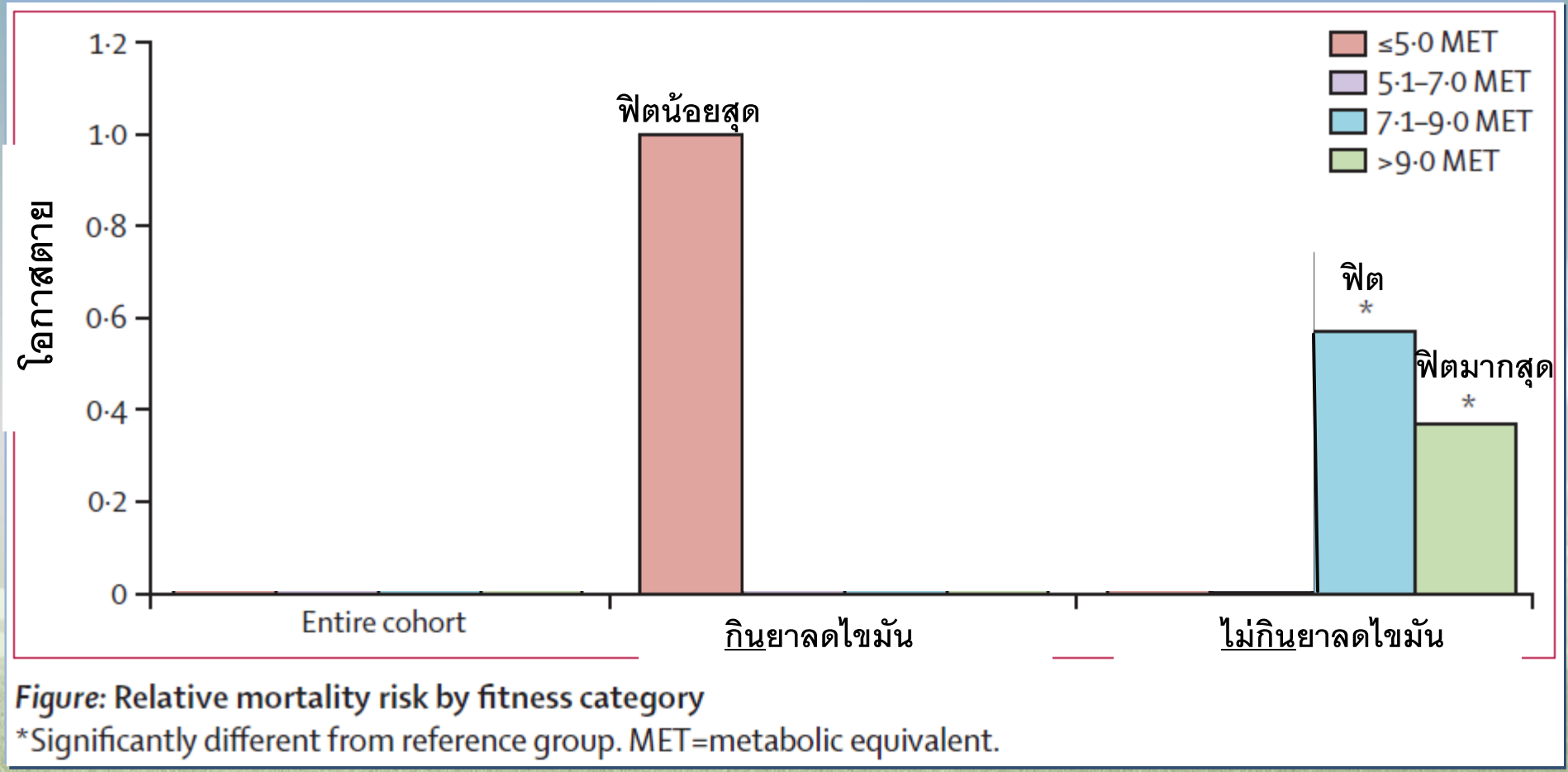


Figure: Relative mortality risk by fitness category

*Significantly different from reference group. MET=metabolic equivalent.

Regular Physical Activity
decrease death in Hypertension
But anti-hypertensive drugs don't
in mild hypertension

เคลื่อนไหวออกแรงสม่ำเสมอ ลดโอกาสตาย
ในผู้ป่วยความดันฯสูง
แต่..ยาลดความดันฯไม่ลด
ในผู้ป่วยความดันฯสูงไม่มาก

เคลื่อนไหวออกแรง ลดโอกาสตายในผู้ป่วยความดันฯสูง

Physical Activity decrease death in HT.

Systematic Review. Rossi A. J Hypertens. 2012 Jul;30:1277.

- Six articles (48,448 hypertensive men & 47,625 women)
- Patients with high BP who participated in any level of physical activity had a reduced risk (by **16–67%**) of cardiovascular mortality & > twofold increase in risk of mortality was noted in non-active individuals.

เคลื่อนไหวออกแรง ลดโอกาสตายในผู้ป่วยความดันฯสูง

Physical Activity decrease death in HT.

Systematic Review. Rossi A. J Hypertens. 2012 Jul;30:1277.

First author (year)	Cardiovascular mortality	All-cause mortality	Multivariate model*
Engström [30] (1999)	Relative risk (95% CI): hypertensive/ vigorous physical activity: 0.33 (0.11–0.94); hypertensive/ nonvigorous physical activity: 1.00; normotensive/vigorous physical activity: 0.72 (0.39–1.35); normotensive/nonvigorous physical activity: 1.00	Relative risk (95% CI): hypertensive/vigorous physical activity: 0.43 (0.22–0.82); hypertensive/nonvigorous physical activity: 1.00; normotensive/ vigorous physical activity: 0.89 (0.60–1.31); normotensive/ nonvigorous physical activity: 1.00	Normotensive: smoking; hypertensive: smoking, antihypertensive therapy and SBP
Hu [37] (2007)	Hazard ratios (95% CI) – men: Low 1, Mod 0.84 (0.77–0.91), High 0.73 (0.62–0.86); trend $P < 0.001$; women: Low 1, Mod 0.78 (0.70–0.87), High 0.74 (0.58–0.94); trend $P < 0.001$	–	Age, study year, education, alcohol, smoking, BMI, SBP, cholesterol, antihypertensive drug use and diabetes

เคลื่อนไหวออกแรง ลดโอกาสตายในผู้ป่วยความดันฯสูง

Physical Activity decrease death in HT.

Systematic Review. Rossi A. J Hypertens. 2012 Jul;30:1277.

First author (year)	Blood pressure		Physical activity		Mortality and cause of death
	Classification	Measurement	Classification	Measurement	
Vatten (2006) [42]	Blood pressure groups: SBP: <120, 120–139, 140–159, ≥160 mmHg; DBP: <80, 80–89, 90–99, ≥100 mmHg	Calibrated mercury manometers, standard cuff size, measured to the nearest 2 mmHg	1. no activity; and three equal activity groups; 2. low, 3. medium, and 4. high	Self-report questionnaire	Cause of Death Registry, Norway

First author (year)	Cardiovascular mortality	Multivariate model*
Vatten [42] (2006) †	Relative risk (95% CI): high, medium, low, no activity Men <120 mmHg: 0.68 (0.43–1.07), 0.99 (0.70–1.39), 0.78 (0.51–1.20), 1.15 (0.72–1.85) 120–139 mmHg: 1.00 (Reference), 1.06 (0.86–1.32), 0.99 (0.78–1.26), 1.31 (1.02–1.67) 140–159 mmHg: 1.21 (0.97–1.52), 1.25 (1.02–1.55), 1.39 (1.11–1.74), 1.73 (1.37–2.19) >160 mmHg: 1.82 (1.46–2.28), 1.76 (1.42–2.17), 1.84 (1.45–2.34), 2.24 (1.78–2.83) Women <120 mmHg: 0.52 (0.28–0.97), 1.00 (0.61–1.65), 1.08 (0.62–1.86), 1.43 (1.84–2.44)	Age, BMI, marital status, education, alcohol and smoking

- ✓ **Mild HT: ♂**

No PA vs. High PA: ↑ CV death 1.73:1 (95% CI 1.37-2.19)

- ✓ **Mild HT: ♀**

No PA vs. High PA: ↑CV death 1.93:1 (95%CI 1.39-2.69)

ผู้ป่วยความดันฯสูงไม่มาก ที่ไม่เคลื่อนไหวออกแรง เพิ่มโอกาสตายจากโรคหัวใจและหลอดเลือด ๗๓-๙๓ %

ยาลดความดันฯ ไม่ลดโอกาสตายในผู้ป่วยความดันฯสูงไม่มาก

Anti-hypertensive not ↓ death in mild HT

Diao D. Cochrane Database of Systematic Reviews 2012, Issue 8. Art. No.: D006742. DOI: 10.1002/14651858.CD006742.pub2.

- Anti-HT drug on mortality & morbidity in adults with mild HT (systolic BP 140-159 ± diastolic BP 90-99 mmHg) & ŝ CVD. RCTs > 1 yr duration.
- mortality, stroke, CHD, total CVEs & withdrawals due to adverse effects.
- 11 RCTs identified 4 were included in this review, with 8,912 participants.

ยาลดความดันฯ ไม่ลดโอกาสตายในผู้ป่วยความดันฯสูงไม่มาก

Anti-hypertensive not ↓ death in mild HT

Diao D. Cochrane Database of Systematic Reviews 2012, Issue 8. Art. No.: D006742. DOI: 10.1002/14651858.CD006742.pub2.

Comparison 1. Treatment versus No Treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Mortality	4	8912	Risk Ratio (M-H, Fixed, 95% CI)	0.85 [0.63, 1.15]
2 Stroke	3	7080	Risk Ratio (M-H, Fixed, 95% CI)	0.51 [0.24, 1.08]
3 Coronary Heart Disease	3	7080	Risk Ratio (M-H, Fixed, 95% CI)	1.12 [0.80, 1.57]
4 Total CV events	3	7080	Risk Ratio (M-H, Fixed, 95% CI)	0.97 [0.72, 1.32]
5 Withdrawals due to adverse effects	1	17354	Risk Ratio (M-H, Fixed, 95% CI)	4.80 [4.14, 5.57]

Initiation of antihypertensive drug treatment

Mancia G. 2013 ESH/ESC guidelines. Eur H J doc 10.1093/euheartj/eht151

Recommendations	Class [a]	Level [b]
Prompt initiation of drug treatment is recommended in individuals with grade 2 and 3 hypertension with any level of CV risk, a few weeks after or simultaneously with initiation of lifestyle changes.	I	A
Lowering BP with drugs is also recommended when total CV risk is high because of OD, diabetes, CVD or CKD, even when hypertension is in the grade 1 range.	I	B
In elderly hypertensive patients drug treatment is recommended when SBP is ≥160 mmHg.	I	A
Unless the necessary evidence is obtained it is not recommended to initiate antihypertensive drug therapy at high normal BP.	III	A
Lack of evidence does also not allow recommending to initiate antihypertensive drug therapy in young individuals with isolated elevation of brachial SBP, but these individuals should be followed closely with lifestyle recommendations.	III	A

ยาอดบุหรี่ตัวใหม่เพิ่มโอกาส
โรคหัวใจและหลอดเลือด

ยาอดบุหรี่ Varenicline ↑โอกาสโรคหัวใจหลอดเลือด 72%

Systematic Review 14 DBRCTs.(n=8216, 7-52 wks) Singh S. CMAJ 2011. DOI:10.1503 /cmaj.110218

Study	Cardiovascular events, *n/N*		Weight, %	Peto OR (95% CI)
	Varenicline	Placebo		
Protocol A3051080[16]	1/394	0/199	1.2	4.50 (0.07–285.96)
Protocol A3051095[17]	1/493	0/166	1.0	3.81 (0.04–347.82)
Fagerstrom et al.[18]	0/214	1/218	1.4	0.14 (0.00–6.95)
Gonzales et al.[19]	2/352	2/344	5.4	0.98 (0.14–6.97)
Jorenby et al.[20]	1/344	1/341	2.7	0.99 (0.06–15.88)
Nakamura et al.[21]	1/465	0/154	1.0	3.79 (0.04–352.44)
Niaura et al.[22]	2/160	0/160	2.7	7.44 (0.46–119.40)
Nides et al.[23]	1/383	0/127	1.0	3.79 (0.04–352.09)
Oncken et al.[24]	2/518	0/129	1.7	3.49 (0.11–112.44)
Rigotti et al.[9]	25/355	20/359	57.3	1.28 (0.70–2.34)
Tashkin et al.[25]	5/250	2/254	9.4	2.42 (0.55–10.74)
Tonstad et al.[26]	4/603	0/607	5.4	7.48 (1.05–53.20)
Tsai et al.[27]	1/126	0/124	1.4	7.27 (0.14–366.57)
Williams et al.[28]	6/251	1/126	8.3	2.40 (0.49–11.67)
Overall	**52/4908**	**27/3308**	**1.72 (1.09–2.71)**	

Heterogeneity: $I^2 = 0\%$

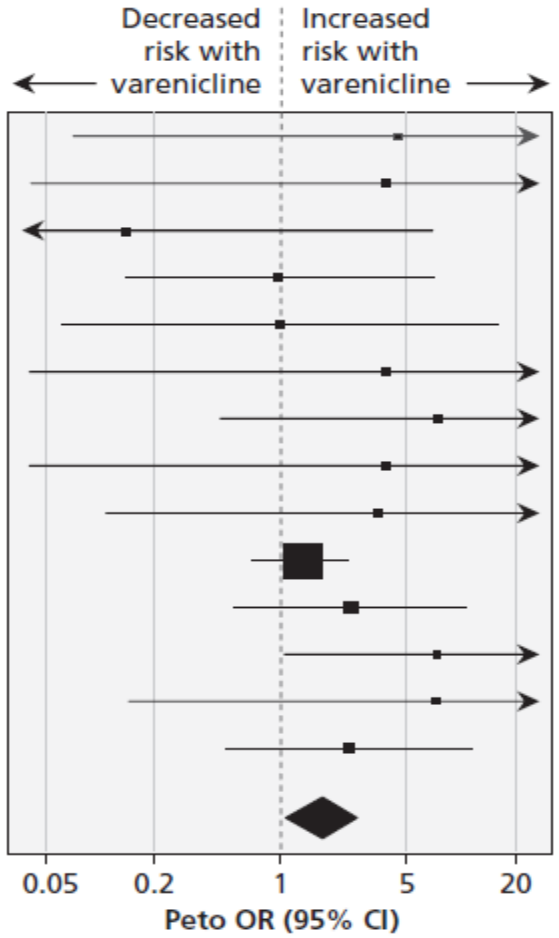


Figure 2: Meta-analysis of double-blind placebo-controlled randomized trials of the risk of serious adverse cardiovascular events associated with the use of varenicline. An odds ratio (OR) greater than 1.0 indicates an increased risk of a serious adverse cardiovascular event. CI = confidence interval.

ยาลดความอ้วนตัวใหม่เพิ่มโอกาส
โรคหัวใจและหลอดเลือด

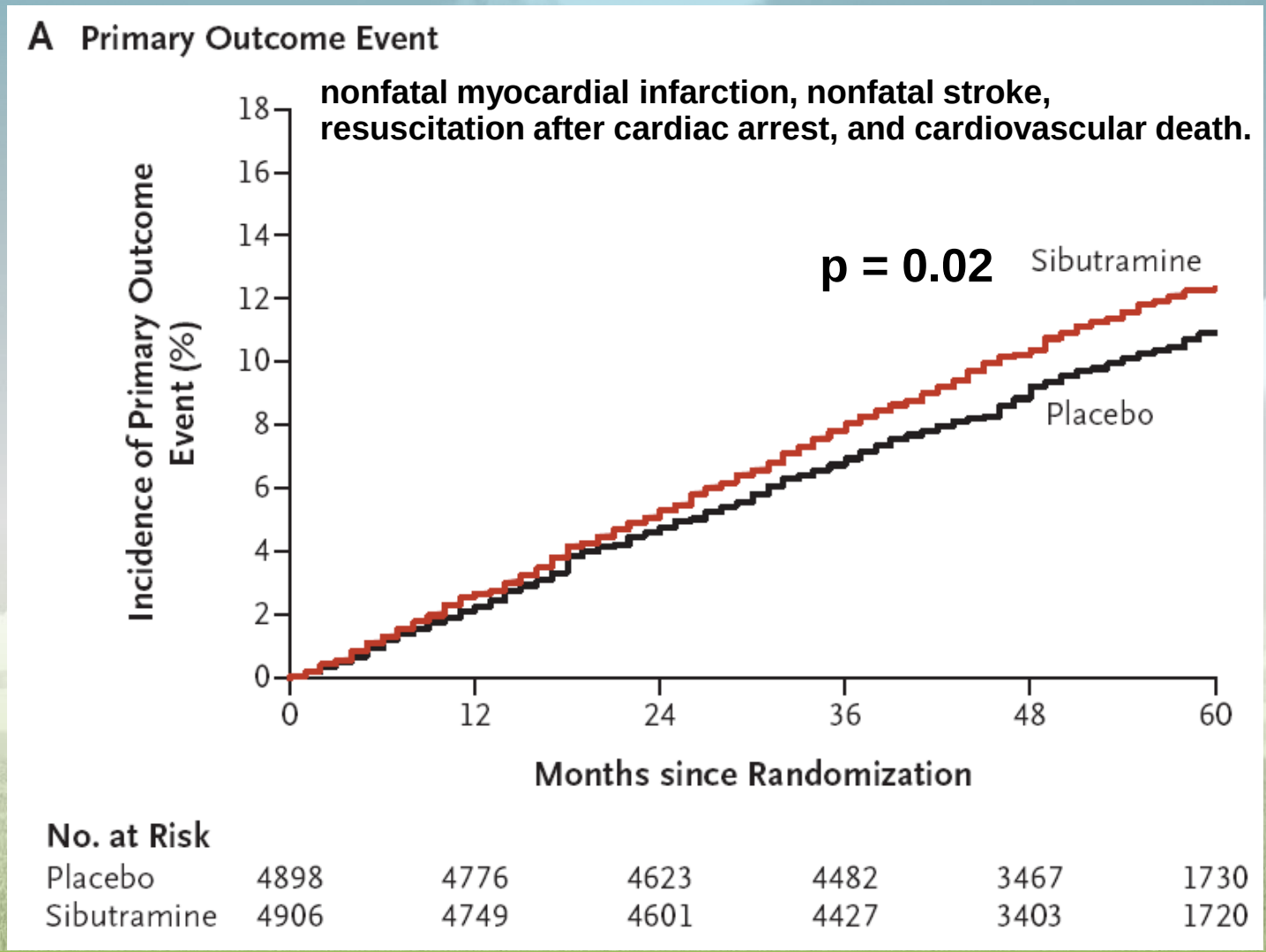
Sibutramine Cardiovascular Outcome Trial

James WPT. N Engl J Med 2010;363:905-17.

- 10,744 overweight or obese, ≥ 55 yrs with preexisting CVD ± T2DM assess CV consequences of weight Mx with and without sibutramine.
- Sibutramine in addition to participating in a weight-Mx program during 6-wk, single-blind, lead-in period, after which 9804 subjects underwent random assignment in a double-blind fashion to sibutramine (4906 subjects) or placebo (4898 subjects).

Sibutramine Cardiovascular Outcome Trial

James WPT. N Engl J Med 2010;363:905-17.



ชี่กง ความดันฯสูง อัมพาต และ การเสียชีวิต ๓๐ ปี

Qi gong, Stroke, HT & 30 y mortality

Wang C. Proceedings 2nd World conference for Academic Exchange of Medical Qigong. Beijing,1993:123-124

- 242 hypertensive pts randomly divided
  - Qigong 30 min twice a day
  - Control (n = 122,120 each)
- All received anti-HT drugs
- 30 years follow-up
- Mortality rate, stroke incidence, stroke death rate.

Sancier K. Movement & body-centered therapies in Kligler B. ed. Integrative Medicine. 2004: 248

ชี่กง ความดันฯสูง อัมพาต และ การเสียชีวิต ๓๐ ปี

Qi gong, Stroke, HT & 30 y mortality

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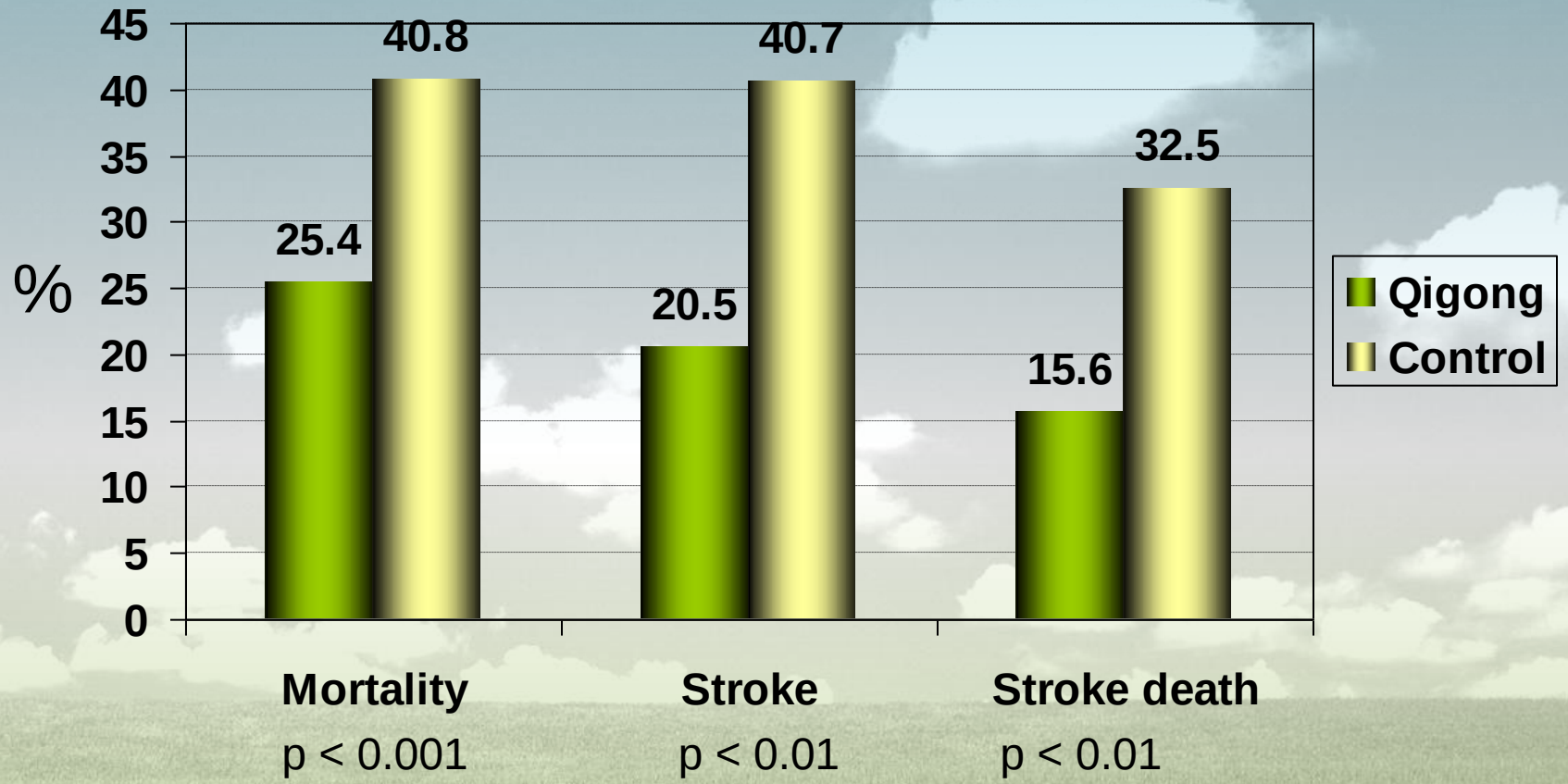
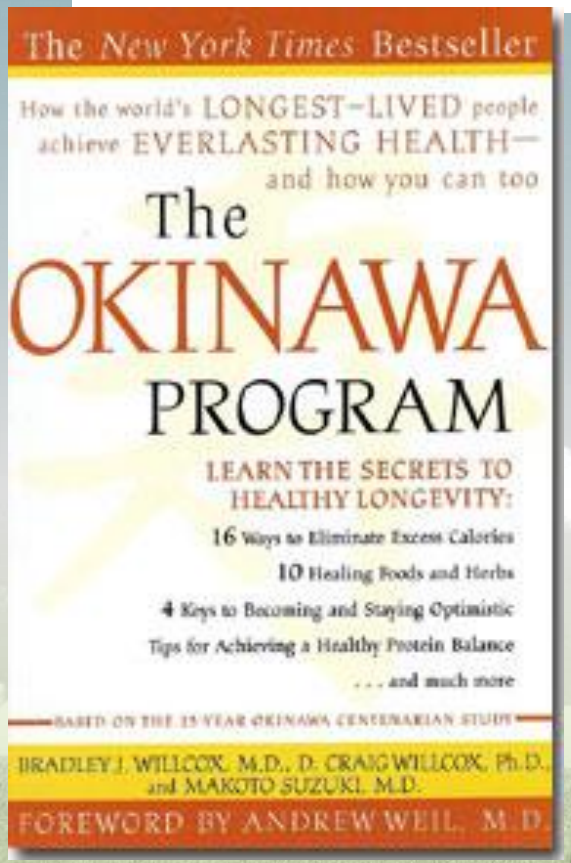
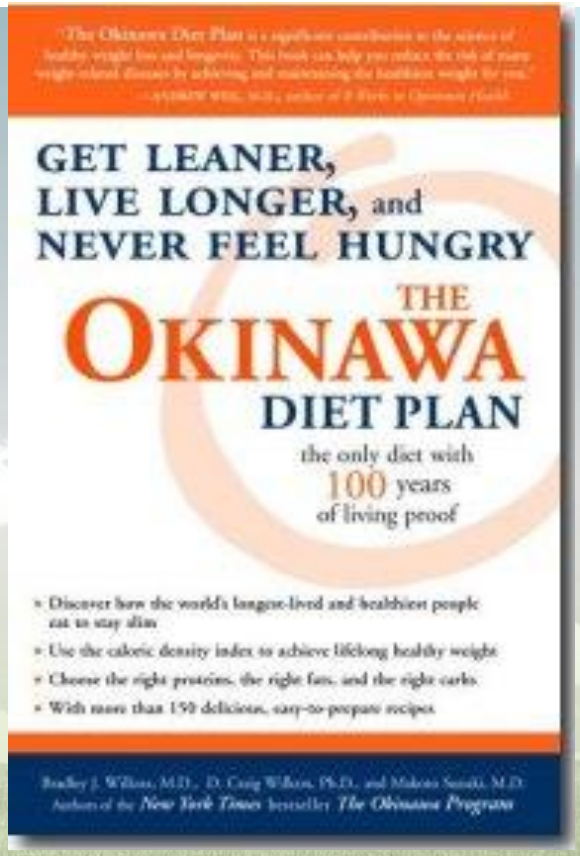


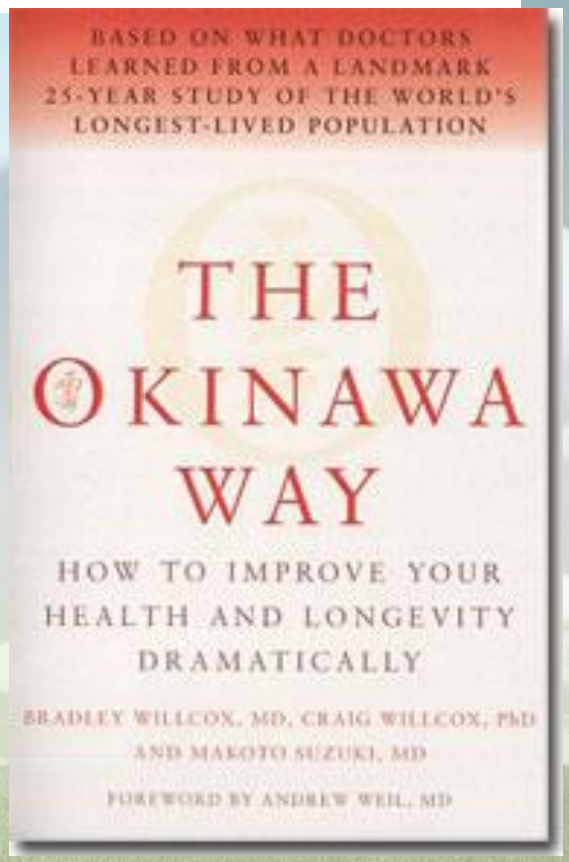
Sancier K. Movement & body-centered therapies in Kligler B. ed. Integrative Medicine. 2004: 248

長寿

Okinawa Centenarian Study







ชาวโอกินาวา ตายจากหลอดเลือดหัวใจน้อยกว่า ชาวอเมริกัน ๖ ถึง ๑๑ เท่า

Mortality of Okinawans, Japanese & American

Willcox BJ. Ann N Y Acad Sci 2007;1114:434-55.

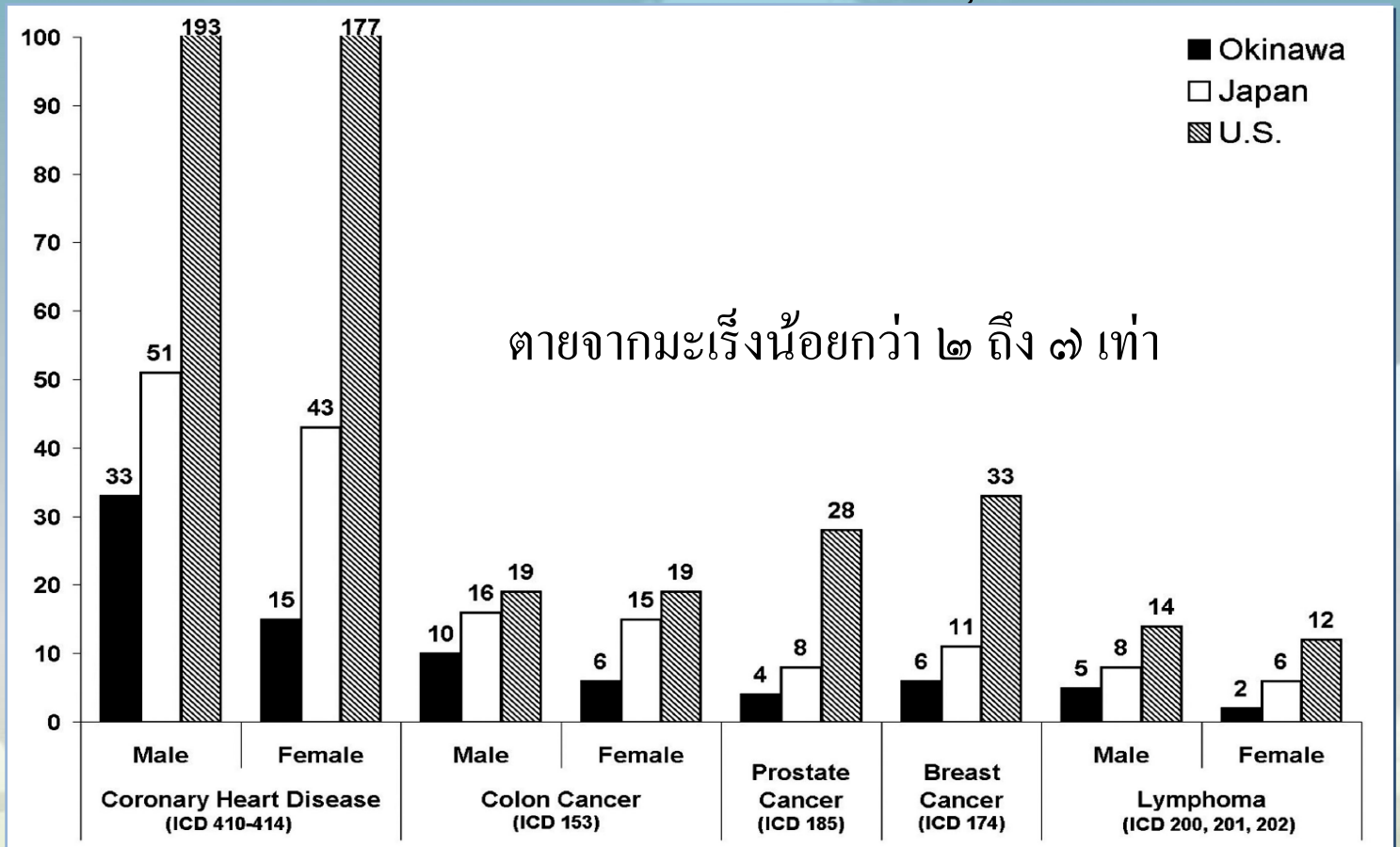


FIGURE 5. Mortality from age-associated diseases in Okinawans versus Americans. Numbers represent age-adjusted mortality rate in deaths per hundred thousand persons per year for 1995. Coding was according to ICD-9 codes; populations were age-adjusted to World Standard Population. These data show markedly lower mortality risk from age-related diseases in Okinawans versus other Japanese and Americans.

คนอายุเกินร้อย ๑๒ คน ไม่เป็นเบาหวาน มะเร็ง ไขมันสูง หรือโรคพาร์กินสัน

Supercentenarians in Okinawa

Willcox DC. J Geroentolo Med Sci 2008:11:1201-9

Table 2. Medical and Social History of Supercentenarians

Social History	
Education, y ($n = 7$)	
None	4 (57%)
≤8 y	2 (29%)
9–12 y	1 (12%)
>12 y	0
Living situation, at age 100 y ($n = 11$)	
With family	8 (73%)
Nursing home	2 (18%)
Hospital	1 (9%)
Living situation at age 110 y ($n = 8$)	
With family	1 (12.5%)
Nursing home	5 (62.5%)
Hospital	2 (25%)

Past Medical History (ICD 9) ($n = 12$)*	Cases n (%) and Average Age (year range) at Diagnosis
Cataracts (366)	5 (42%): <80
Fracture (800–829)	4 (33%): 80–100
Pneumonia (486)	4 (33%): 1: <80, 3: >100
Dementia (290)	3 (25%): 80–100
Tuberculosis (010–018)	1 (8%): <80
Malaria (084)	1 (8%): <80
Hypertension (401)	1 (8%): 80–100
Heart disease (410–414)	1 (8%): >100
Stroke (430–438)	1 (8%): >100
COPD (490–496)	1 (8%): 80–100
Cancer (140–239)	0
Diabetes mellitus (250)	0
Hyperlipidemia (272)	0
Parkinson's disease (332)	0
Health Habits ($n = 12$)	
Ever smoked	5 (42%)
Ever drank alcohol	4 (33%)
Never drank alcohol and/or smoked	5 (42%)

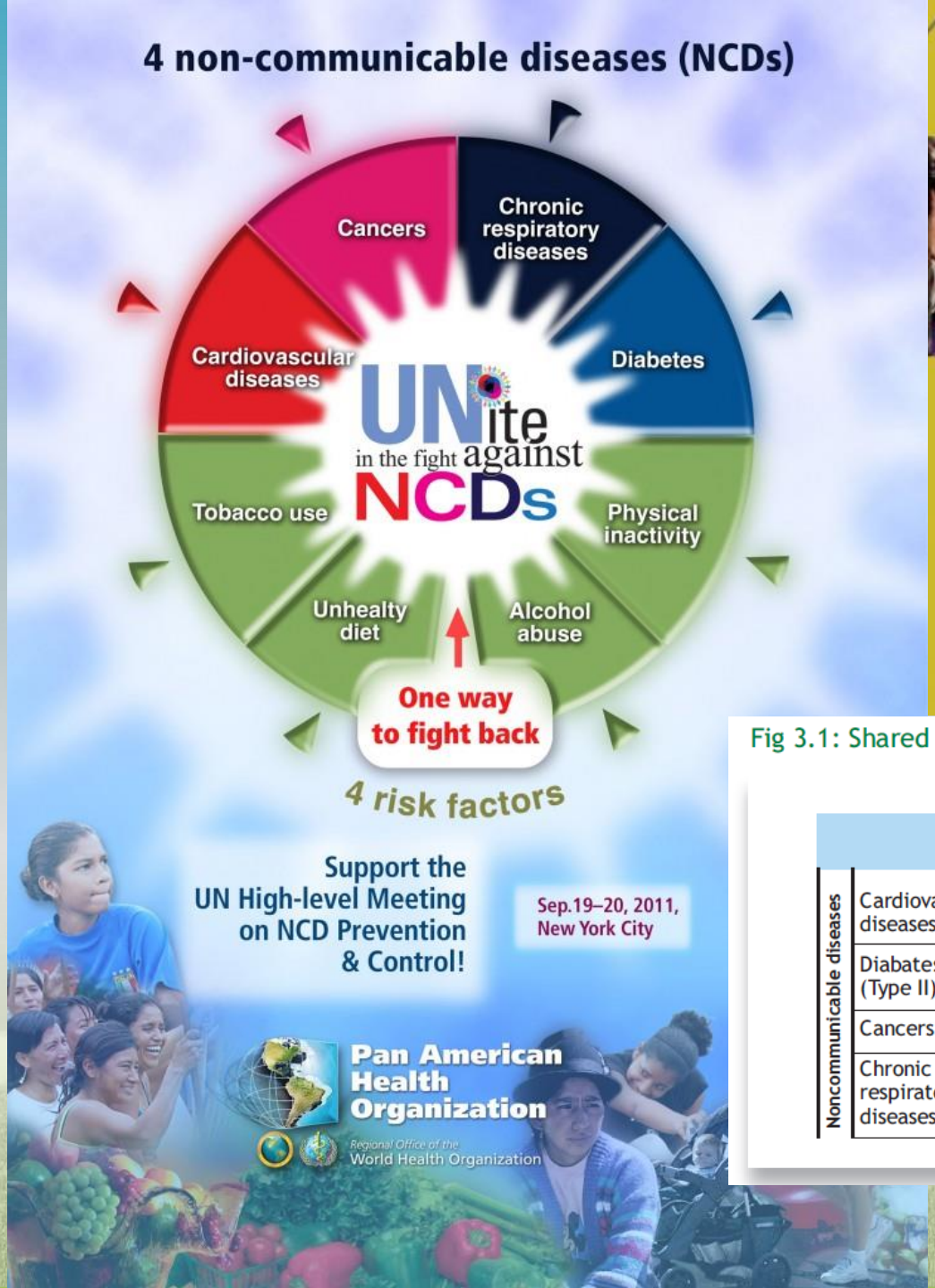


Fig 3.1: Shared risk factors for major noncommunicable diseases

ส.สูบบุหรี่ อ.อาหาร อ.ออกกำลัง ส.สุรา (อ.อารมณ์)

		Tobacco use	Unhealthy diet	Physical inactivity	Harmful use of alcohol
Noncommunicable diseases	Cardiovascular diseases	✔	✔	✔	✔
	Diabates (Type II)	✔	✔	✔	✔
	Cancers	✔	✔	✔	✔
	Chronic respiratory diseases	✔			

หลอดเลือด สมอง/หัวใจ

เบาหวาน

มะเร็ง

ความดันฯ

Cardiovascular Prevention & Rehabilitation

www.thaiheart.org/CARES-THAI

- CVM: Healthy Heart

- อบรมประจำปีชมรมฟื้นฟูหัวใจ

Take home message (ห่อกลับบ้าน)

- Lifetime risk better than short-term risk assessment.
- CVD Prevention better than cure, especially in younger age.
- ไม้อ่อนดัดง่าย และ อยู่นาน
- ดัดเอง “ทำเอง” ดีกว่า “กินยา” อย่างเดียว