Is there justification to change the single risk factor approach?

Shanthi Mendis

MBBS MD FRCP FACC

Senior Adviser

Chronic Disease and Health Promotion

World Health Organization

Geneva, Switzerland

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SINGLE RISK FACTOR APPROACH

"Risk factors viewed as diseases"

- Hypertension
- Hyperlipidaemia
- Diabetes

(tobacco, ?metabolic syndrome, obesity, gender, age, family history)

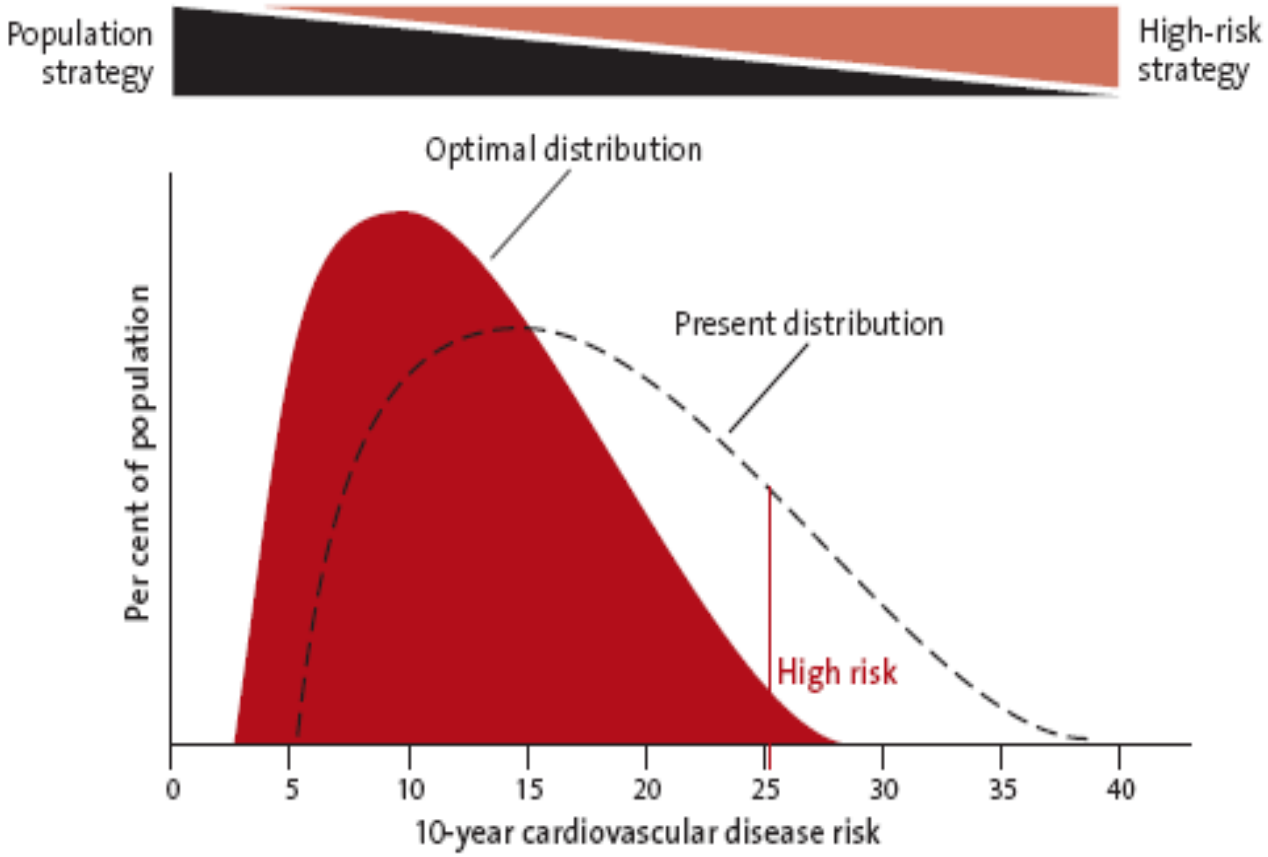
Guidelines: Single Risk Factor

First GL using explicit evidence-based methodology

SINGLE RISK FACTOR APPROACH
Is it necessary to change paradigm?

- Clustering of three major risk factors
- Other risk factors
- Close association between CVD and diabetes
- Importance of bp control for outcomes in diabetes
- Hypertension or diabetes as entry points
- Pragmatism, PHC, health workers
- Science (cost effectiveness)

A combination of population-wide and high risk strategies



Mendis S 2005

Cost-effective Approaches

1. **Population**
2. **High risk**
3. **Secondary prevention**

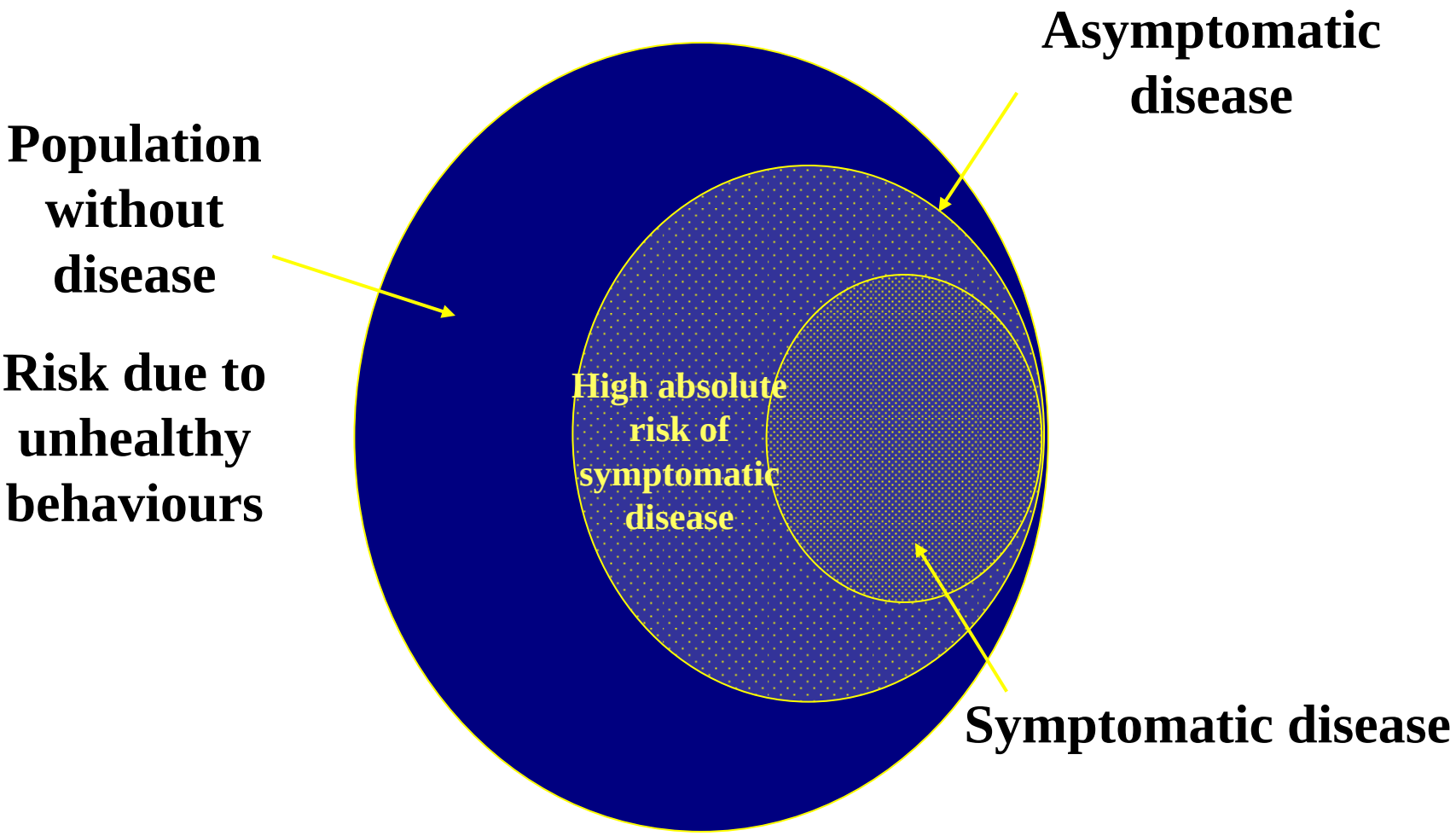
- The prevention paradox- high risk individuals gain most, number of CVD deaths larger in medium- low risk subjects .
- The three strategies should be complementary, not competitive

Population-based Approaches

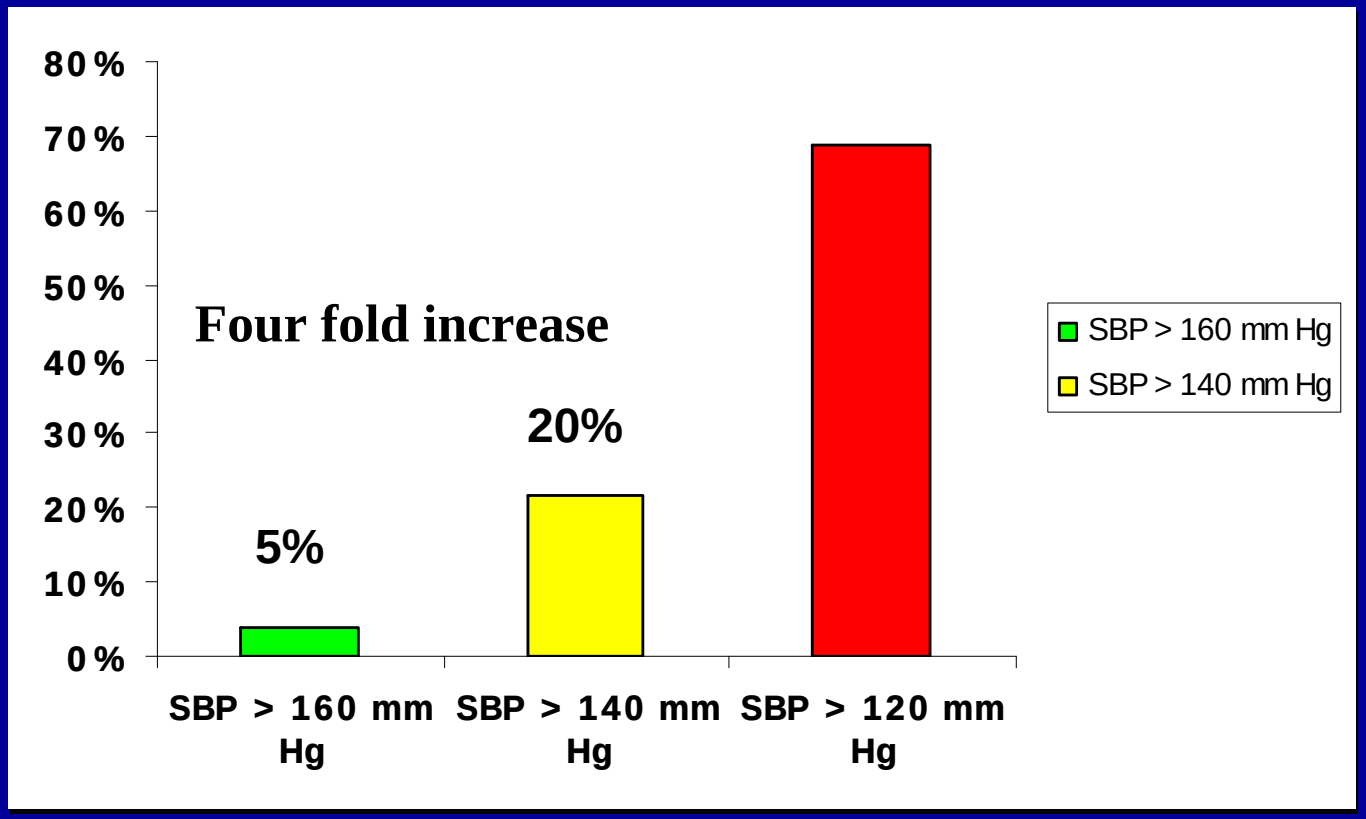
Very cost-effective policies for promotion of

- Tobacco control
- Healthy Diet
- Physical activity

Population, high cardiovascular risk and established disease

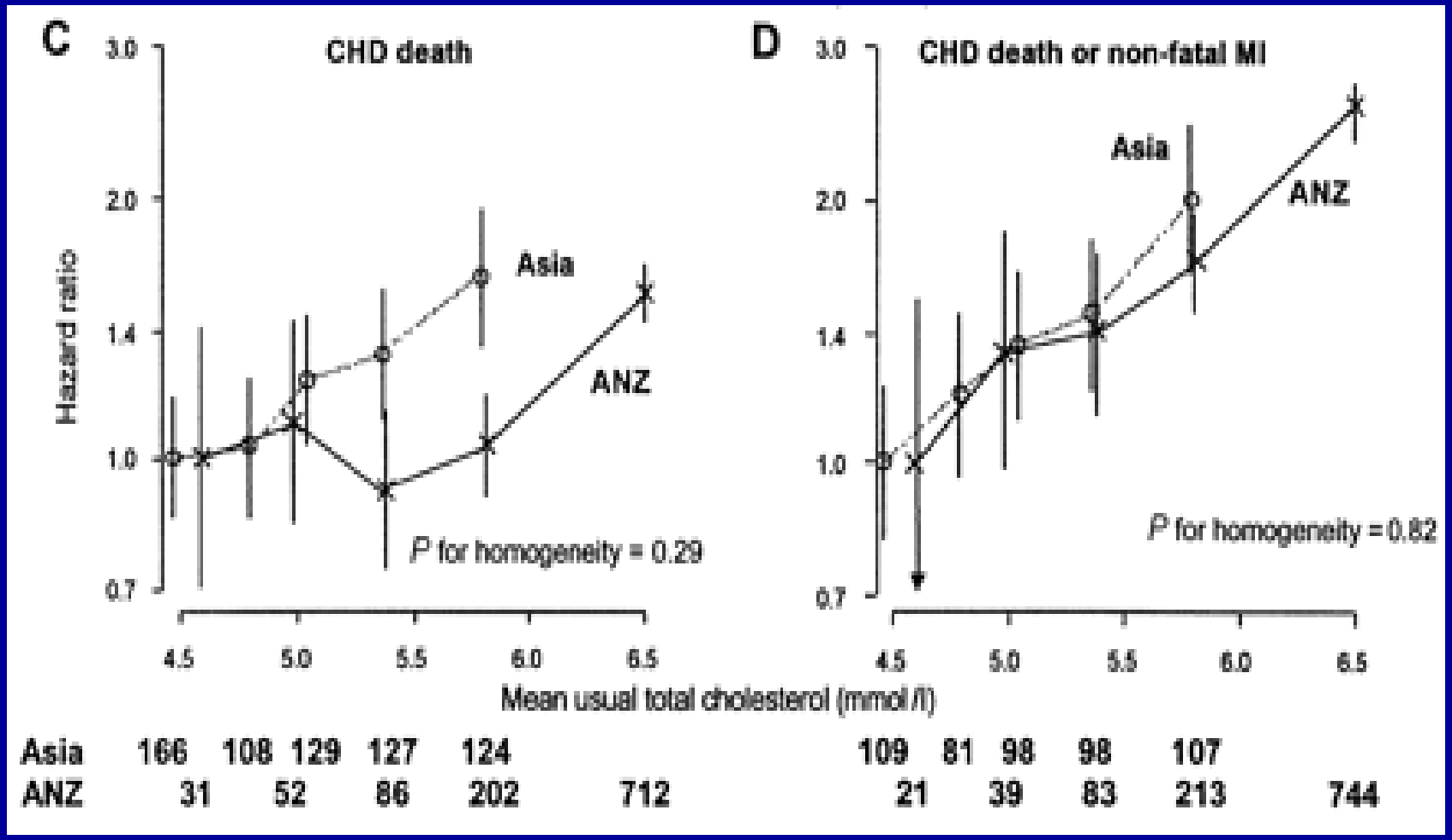


Prevalence of Hypertension by Threshold in Sub-Saharan Africa

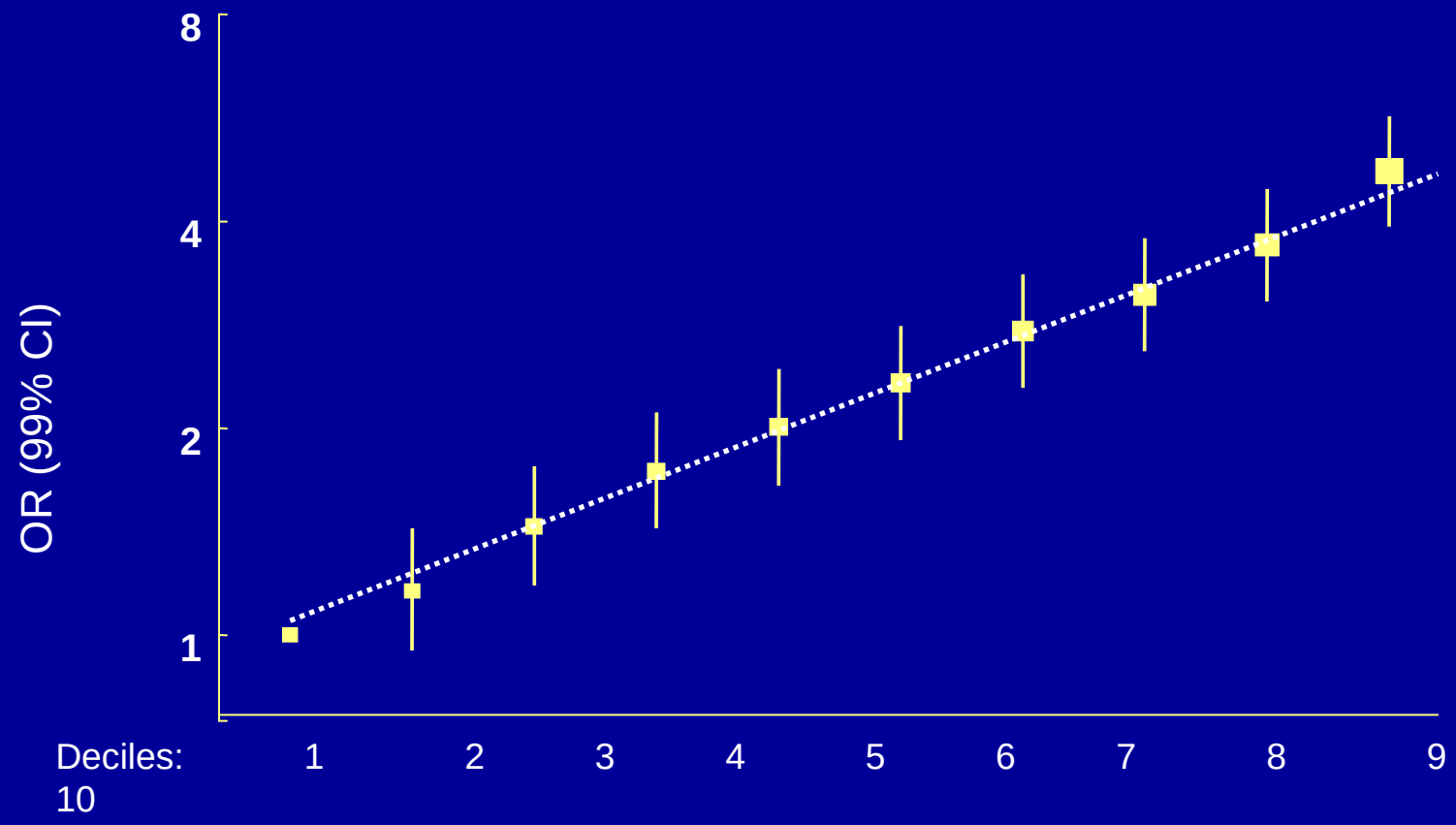


(GBD estimates)

Asia-Pacific Cohort Studies: Usual Cholesterol Level and CHD

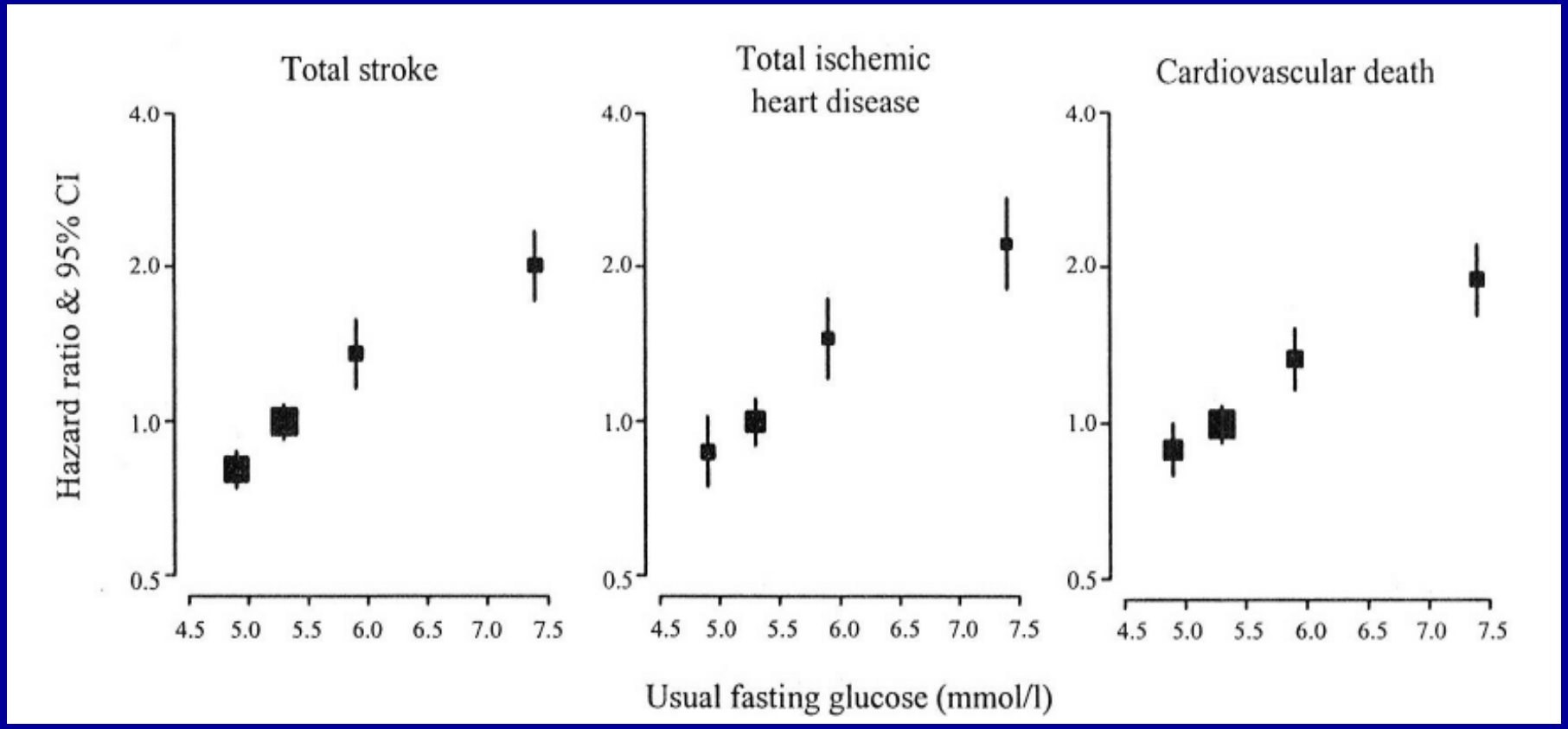


Apolipoprotein B/A-1 and AMI

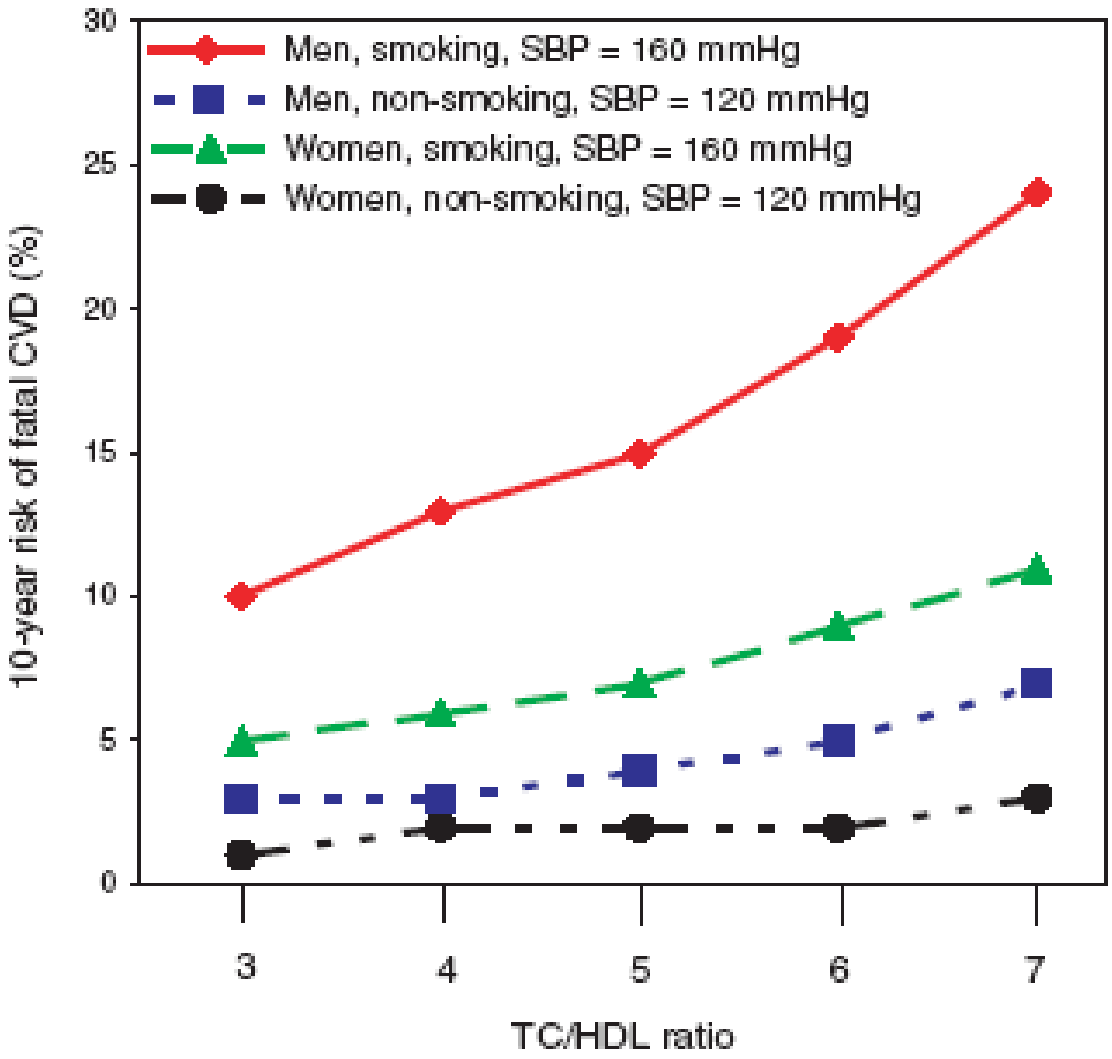


INTERHEART Study

Asia-Pacific Cohort Studies: Usual Fasting Glucose Level and Risk of CVD



Total Risk of Fatal CVD



The multiplicative effects of risk factors.

Target-level Treatment

A) 44-year-old man

- Non-smoker
- Non-diabetic
- TC: HDL 4
- BP of 145/95.

B) 60-year-old man

- Smoker
- Non-diabetic
- TC: HDL ratio of 6
- BP of 139/84

A. Gets treated.

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B) 60-year-old man

- Smoker
- Non-diabetic
- TC: HDL ratio of 6
- BP of 139/84

A. Gets treated.

about 5%

about 15-20%

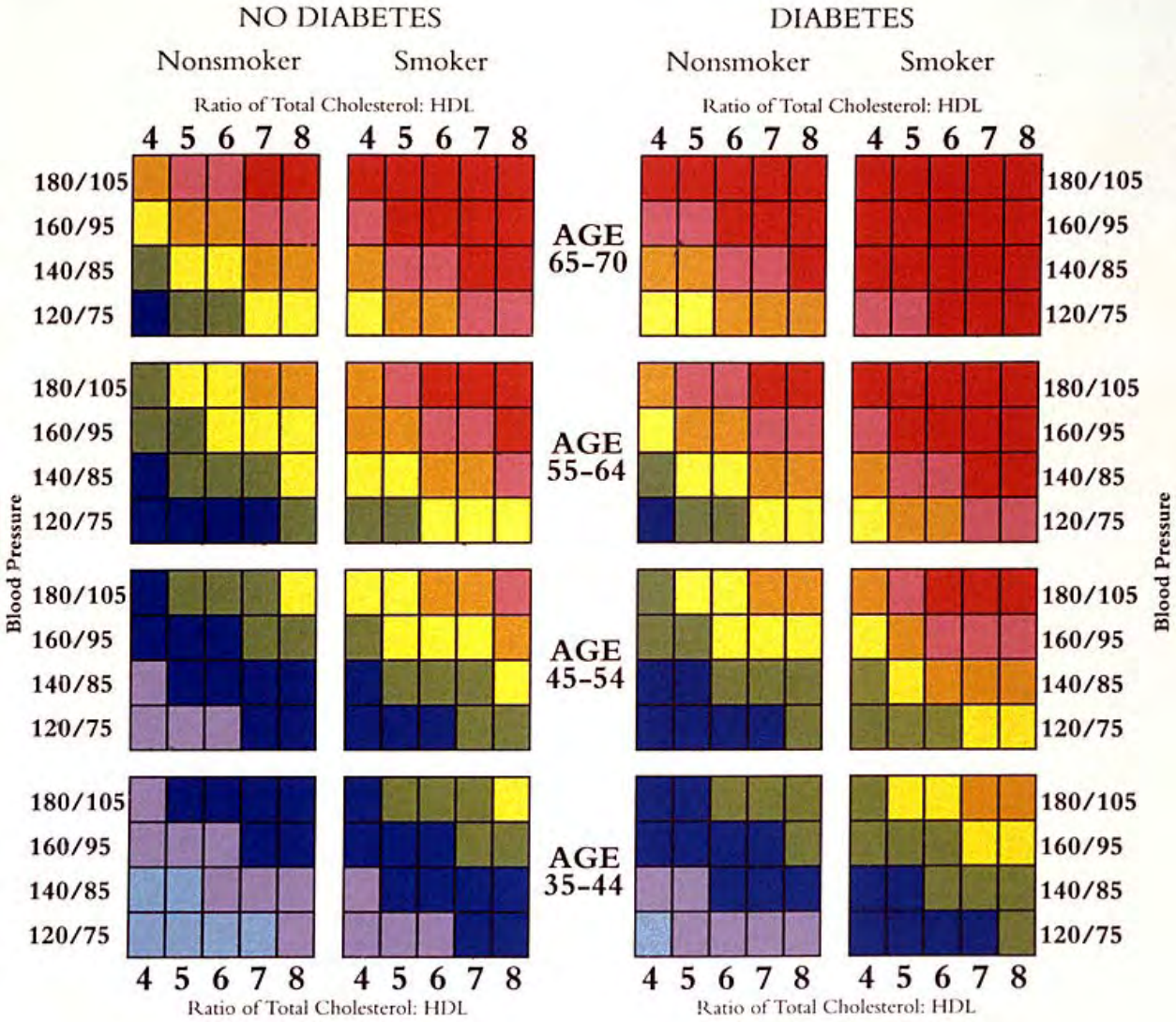
MULTIFACTORIAL RISK APPROACH

- Risk is multifactorial.
- Absolute CVD risk of any one risk factor is determined by the multiplicative effects (total risk) of the other concomitant risk factors.
- Therefore, the intensity of the prevention strategy should be guided by level of absolute multifactorial or total risk.

What is my patients total (multifactorial) risk of developing heart attack or stroke?

NEW ZEALAND GUIDELINES

RISK LEVEL: MEN



Age	Systolic blood pressure	Women										Men									
		Non-smoker					Smoker					Non-smoker					Smoker				
		3	4	5	6	7	3	4	5	6	7	3	4	5	6	7	3	4	5	6	7
65	180	7	8	9	11	14	12	15	17	21	26	12	14	17	22	27	22	26	31	38	47
	160	5	6	7	8	10	9	10	12	15	19	8	10	13	16	20	15	19	23	28	35
	140	3	4	5	6	7	6	7	9	11	13	6	7	9	11	14	11	13	17	20	26
	120	2	3	3	4	5	4	5	6	8	10	4	5	6	8	10	8	10	12	15	19
60	180	4	4	5	6	8	7	8	10	12	15	8	9	12	15	18	14	17	21	29	33
	160	3	3	4	5	6	5	6	7	9	11	5	7	8	11	13	10	13	15	19	24
	140	2	2	3	3	4	3	4	5	6	8	4	5	6	8	10	7	9	11	14	18
	120	1	2	2	2	3	2	3	3	4	5	3	3	4	5	7	5	6	8	10	13
55	180	2	2	3	3	4	3	4	5	6	8	5	6	7	9	12	9	11	14	17	22
	160	1	2	2	2	3	2	3	4	5	6	3	4	5	7	9	6	8	10	12	16
	140	1	1	1	2	2	2	2	3	3	4	2	3	4	5	6	5	6	7	9	11
	120	1	1	1	1	2	1	1	2	2	3	2	2	3	3	4	3	4	5	6	8
50	180	1	1	1	2	2	2	2	2	3	4	3	4	4	6	7	6	7	8	11	12
	160	1	1	1	1	1	1	1	2	2	3	2	3	3	4	5	4	5	6	8	10
	140	0	1	1	1	1	1	1	1	2	2	1	2	2	3	4	3	3	4	5	7
	120	0	0	0	1	1	1	1	1	1	1	1	1	2	2	3	2	2	3	4	5
40	180	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	1	2	2	3	4
	160	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	1	1	2	2	3
	140	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2
	120	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1

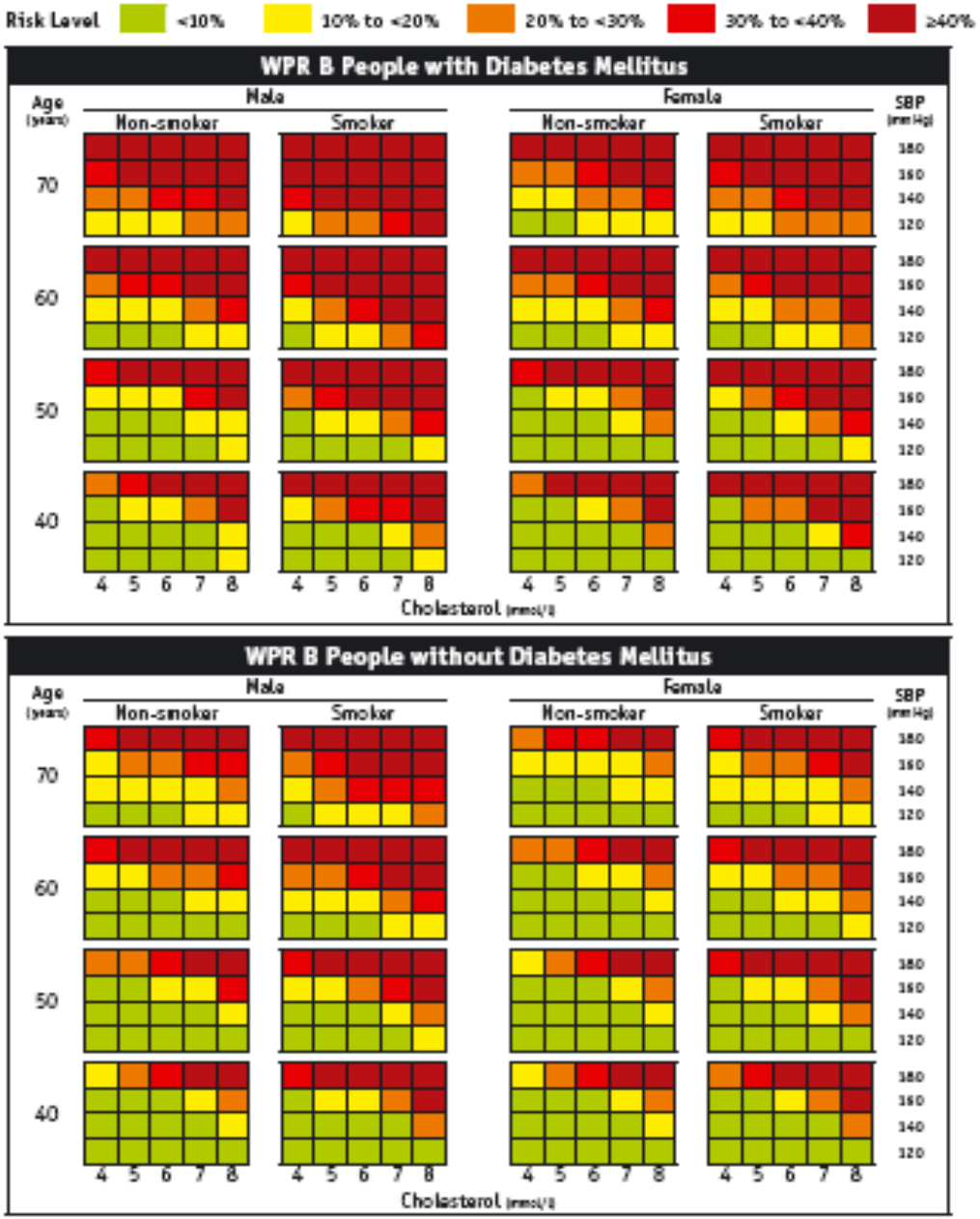
Total cholesterol:HDL
Cholesterol ratio

- 🟥 15% and over
- 🟥 10%–14%
- 🟥 5%–9%
- 🟧 3%–4%
- 🟨 2%
- 🟩 1%
- 🟩 < 1%

10-year risk of fatal CVD in populations at high CVD risk

AMR B
CARICOM

Figure 2. WHO/ISH risk prediction chart for WPR B. 10-year risk of a fatal or non-fatal cardiovascular event by gender, age, systolic blood pressure, total blood cholesterol, smoking status and presence or absence of diabetes mellitus.



Cost-effectiveness Of Selected Therapies: Impact of Underlying Risk.

Strategy	Patient group	Cost-effectiveness[a]
Lovastatin	Post MI	Cost saving and life saving
Lovastatin	Primary prevention Men 55-64 Chol >7 mmol/L (280 mg/dl) 3 risk factors	$X
Lovastatin	Primary prevention 35-44-year-old woman Chol >7 mmol/L(280 mg/dl) No other risk factors	Hundred fold $X

[a] $ values = dollars per year of life added.
Adapted from Kupersmith et al.

ADVANTAGES OF A MULTIFACTORIAL RISK APPROACH

- Concept of continuous risk replaces the dichotomous classification of risk factors
- Level of absolute (multifactorial) risk for which treatment is given is not fixed
- Treatment is targeted at those with the highest absolute cardiovascular risk
- Benefit is greatest in those at high multifactorial risk
- Avoids treatment of single risk factors in those at low multifactorial risk
- Cutoff points are arbitrary (Definition of hypertension 1980, 1990, 2000)

LIMITATION OF A TOTAL RISK APPROACH TO TREATMENT

•Concentrates treatment in the older population

unless

the effect of lifetime exposure is taken into account.

Population-wide measures compulsory

New Medical Paradigm

Total cardiovascular risk

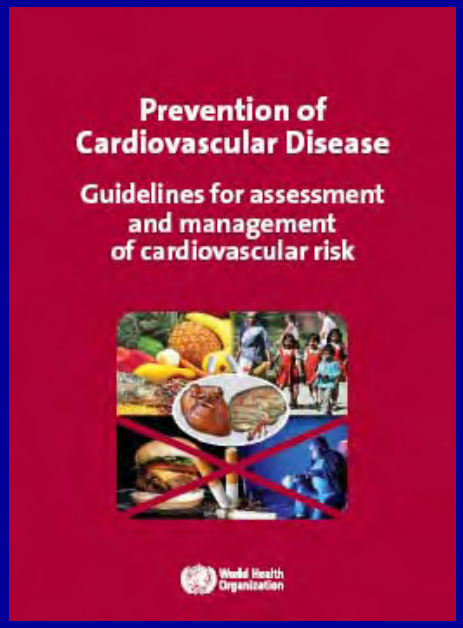
Cost-effective approach

It will improve outcomes

It is necessary to change the paradigm from single risk factor to total cardiovascular risk

- Clustering of three major risk factors
- Other risk factors
- Close association between CVD and diabetes
- Importance of BP control for outcomes in diabetes
- Hypertension or diabetes as entry points
- Pragmatism, PHC,
- Science
- Cost effectiveness/affordability

How to adopt the new medical paradigm of total cardiovascular risk?



WHO/ISH risk prediction charts